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ANALYSIS OF THE EFFICACY OF CARBON DIOXIDE SEQUESTRATION IN DEPLETED SHALE GAS RESERVOIRS

A Dissertation in
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by
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Abstract

In this study, the possibility of industrial CO_2 storage in shale gas reservoirs is investigated numerically by using one of the most advanced computational simulators in oil and gas industry, PSU-SHALECOMP, which is a compositional dual porosity, dual permeability, multi-phase reservoir simulator. A computationally inexpensive stimulated reservoir volume (SRV) model which has the ability to generate a similar behavior of an equivalent discrete fracture network model is defined and implemented. Three different commercial production profiles are history-matched by using the SRV approach effectively.

It is re-proved that implementation of the horizontal borehole technology and hydraulic fracturing are the two most important factors that will increase the efficacy of methane production and carbon dioxide injection processes. It is observed that significantly large percentage of the produced gas originates from the fractured zone so as significantly large percentage of the injected gas will end up occupying the pore spaces in the fractured zone. Injection of carbon dioxide into undepleted shale gas reservoirs is not promising because of its ultra-tight permeability characteristics. Injection of carbon dioxide into shale gas reservoirs that have produced approximately 30% of the initial gas in place is promising. It is observed that when 30% of shale gas production is achieved, up to 70% of the depleted gas volume is expected to be replaced by carbon dioxide.

The storage capacity of the depleted shale gas reservoir can be increased by injecting carbon dioxide at a rather low rate. A low rate injection of carbon dioxide will increase its residence time in the flow domain increasing its chances for adsorption.

If the SRV zones of the production and injection wells are not in direct communication, it is not expected to see carbon dioxide breakthrough at the producing well. It is also investigated that contribution of carbon dioxide in enhancing the shale gas recovery is negligible.

The study includes developments of four artificial neural network tools that have different production of methane and injection of carbon dioxide constraints. These four forward tools can produce production and injection profiles of a given system within an error range of 3.83% to 5.23%. This part of the study also includes four additional artificial neural network tools that predicts wellbore design and hydraulic fracture characteristics within an error range of 8.24% to 9.93%.

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List of Symbols

Roman

SRV : stimulated reservoir volume

A : area (acres)

$L_{x,y}$: length of reservoir (ft)

h : thickness of reservoir (ft)

D : top depth (ft)

D : Diffusivity coefficient (m^2/s)

n : number of transverse fracture planes

k_m : matrix permeability (md)

k_f : fracture permeability (md)

SRV-k_f : stimulated reservoir volume fracture permeability

T_i : reservoir temperature (F)

$P_{i,m}$: initial reservoir pressure in matrix (psi)

$P_{i,f}$: initial reservoir pressure in fracture (psi)

$S_{w,m}$: matrix water saturation

$S_{w,f}$: fracture water saturation

SRV-$S_{w,f}$: stimulated reservoir volume fracture water saturation

L_{hw} : horizontal wellbore length (ft)

L_f : length of fracture (ft)

x_f : half-length of fracture (ft)

w_f : width of fracture (ft)

Greek

ϕ_m	: matrix porosity
ϕ_f	: fracture porosity
SRV-ϕ_f	: stimulated reservoir volume fracture porosity
Δx_s	: fracture spacing
SRV-Δx_s	: stimulated reservoir volume fracture spacing

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Chapter 1

Introduction

In this study, the possibility of industrial carbon dioxide (CO_2) storage in shale gas reservoirs is investigated numerically by using one of the most advanced computational simulators in the oil and gas industry, PSU-SHALECOMP, which is a compositional dual porosity, dual permeability, multi-phase reservoir simulator. The simulator treats the shale gas reservoir as a dual porosity, dual permeability system consisting of a shale matrix and a fracture network. It is also capable of investigating the effects of water presence in the micropore structure and those of matrix shrinkage and swelling in relation to CO_2 injection and production operations. In numerical experiments designed, mainly Marcellus shale reservoir, rock and fluid properties are entered to examine potential injection rates of CO_2 and final CO_2 capacities via single and multiple horizontal well systems.

The research objectives include the following goals:

- Evaluation of the potential for management of CO_2 from industrial sources through storage in depleted Marcellus shale gas wells,
- Investigation of the potential to use injected CO_2 to enhance production of remaining gas through mechanisms similar to those used in enhanced coalbed methane (CH_4) production,
- To predict deliverability/injectivity rates that can be achieved as a function of project implementation parameters,
- Investigation of CO_2 breakthrough at production wells,

- To define and implement a computationally inexpensive stimulated reservoir volume (SRV) model which has the ability to generate a similar behavior of an equivalent discrete fracture network model,

The project was initiated with modification to the existing model PSU-COALCOMP to allow for the representation of the crushed zone (stimulated reservoir volume [SRV]) with its relevant characteristics such as inner zone fracture permeability and porosity, matrix permeability and porosity. Siripatrachai [3] at PSU developed a tool that converts a discrete set of hydraulic fractures to an equivalent SRV. This conversion is based on the similarities in the recovery performance of the model representations. In this study, a similar SRV approach is used to define discrete fracture network to be able to have to perform computationally inexpensive simulations.

In this study, a numerical model called PSU-SHALECOMP is used, which is the modified version of PSU-COALCOMP that is developed by Prob and Ertekin [4] in 2010. PSU-SHALECOMP is a numerical model that simulates the two-phase gas-water flow in naturally fractured systems, which can be modeled as dual-porosity, dual-permeability systems with the change of the internal stress due to production or injection that is called shrinkage and swelling effect. The flow in the pressure field follows Darcys law and the flow in concentration field is assumed to be a Knudsen flow and follows Ficks law of diffusion. In this model, the gas phase is considered as a multi-component system that can consist of multiple number of hydrocarbons as well as carbon dioxide, nitrogen etc. However, the water phase is assumed to be a single component. The gas flow is also considered as multi-mechanistic meaning that it follows both Darcian flow and Fickian flow. However, the water flow neglects the flow that is occurred by diffusion.

According to DOE's Annual Energy Outlook [5] in 2012, 141 trillion cubic feet (TSCF) of gas considered as technically recoverable. It is shown that 50% to 70% of the depleted gas volume is expected to be replaced by carbon dioxide. Therefore, 70 to 100 TSCF of carbon dioxide can be sequestered in depleted Marcellus Shale Formation.

Chapter 2

Literature Review

Long-term storage (sequestration) of industrial CO_2 in geological formations such as coal bed seams and shale have been gaining interest to reduce the global greenhouse effects and it side effect on climate change. The gas storage mechanism in shale reservoirs is characteristically different than the conventional hydrocarbon formations [6]. Adsorption is the main storage mechanism in shale gas reservoirs at high pressures [6]. Depending upon the total organic carbon content and the adsorptive capacity of the shale; CO_2 adsorption capacity increases with increasing organic carbon content [7]. The experimental studies show that CO_2 adsorption capacity of Devonian shale is five times more favorable than CH_4 adsorption capacity in terms of the median value of the tested samples [7].

2.1 CO_2 Storage Mechanisms in Geological Formations

CO_2 can be stored in underground formations by two different trapping mechanisms, including both physical and geochemical trapping mechanisms [8]. CO_2 may be trapped and becomes immobile in a conventional reservoir, in which the CO_2 is located underneath a thick seal. The CO_2 can also be stored in an unconventional reservoir such as coal-bed or shale reservoir by an adsorption process, which is physical trapping mechanism [8]. Depending on the water content within a formation, the CO_2 can be converted to solid minerals, which is a chemical trapping mechanism, and can be trapped with the combination of physical and chemical trapping mechanisms [8]. In this study, the physical trapping mechanism of CO_2 via adsorption in depleted shale reservoirs is

investigated. Numerical investigations of this study show that CO_2 is in supercritical condition and the injection operations have slightly-compressible or incompressible flow behavior. The red ellipse in Figure 2.1 shows the region that the CO_2 is usually in.

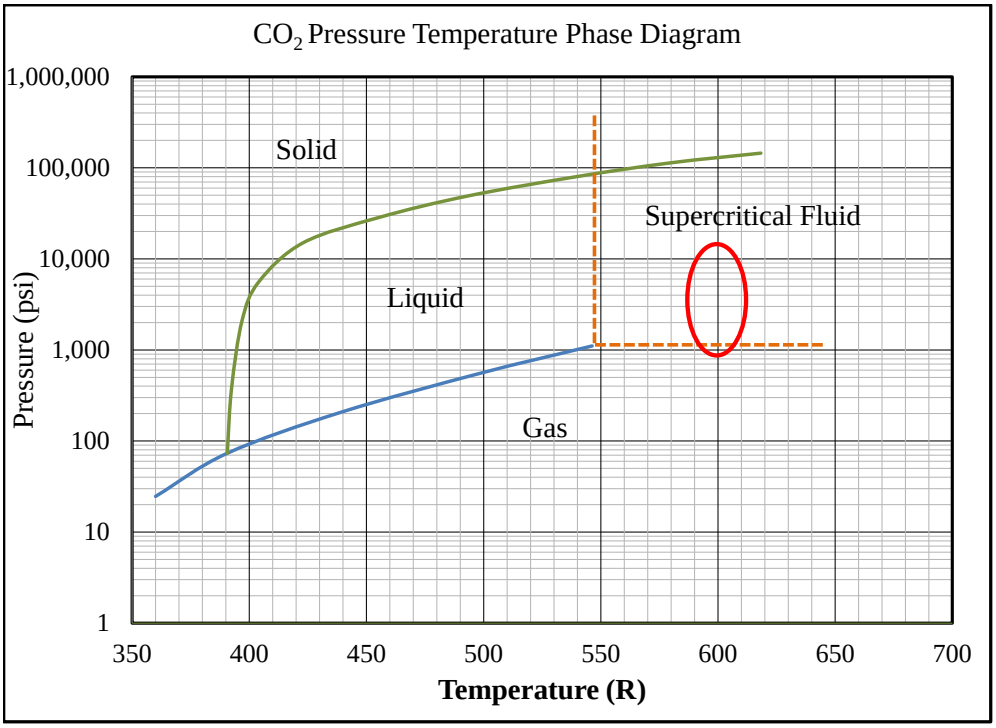


Figure 2.1. CO_2 pressure temperature phase diagram

Shale gas formations can be found in many parts of the world. The possibility of CO_2 storage in shale formations are considered to be very significant because of their large volume. However, the ultra-tight permeability values of these formations do not allow hydrocarbon production without stimulating the reservoirs. The stimulation technique is called hydraulic fracturing and is essential to produce CH_4 out of these reservoirs as well as to inject CO_2. To maximize the well performance from shale gas reservoirs, a large fracture network is needed to produce CH_4.

Busch et. al in 2008 [9] investigated the sealing ability of cap formations and provided a more positive opinion. In this study, it is stated that the injected CO_2 that migrates from storage reservoir to the cap rock will be immobilized and the possible leakage will be minimized because of its slow and diffusion driven flow behavior, which leads additional CO_2 storage potential due to the preference of CO_2 adsorption over CH_4 by the shale rock.

Leakage may occur in three possible ways [10]. These are

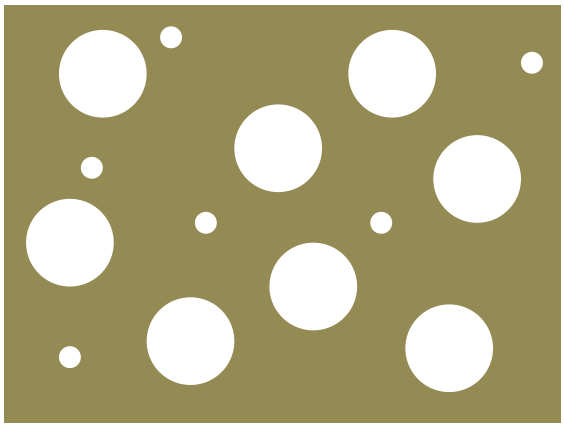
- leakage by seal-breaching
- long-term leakage by by capillary sealing efficiency ([9], [11], [12]) and permeability (after capillary breakthrough pressure is exceeded)
- diffusive loss of dissolved gas through water-saturated pore space

There are few data available on the diffusive transport of CO_2 transport in geological seals. The research that are done are mainly focused on light hydrocarbon losses especially from natural gas reservoirs (e.g. [13], [14], [15], [16], [17], [18]). These studies establish a good background for the production of CH_4 and injection of CO_2 in shale gas reservoirs because the cap rocks often have high content of clay mineral, i.e. shale gas reservoirs. Krooss et al. [19] in 2003 investigated diffusion of CO_2 parameters of samples mainly from coal and shale reservoirs. In this study, it is showed that these formations are good candidates of CO_2 storage in chemical and physical forms. It is reported that CO_2 dissolves in the formation fluid, converted to other chemical forms that are solid or adsorbed by rock matrix or organinc content of the formation [19].

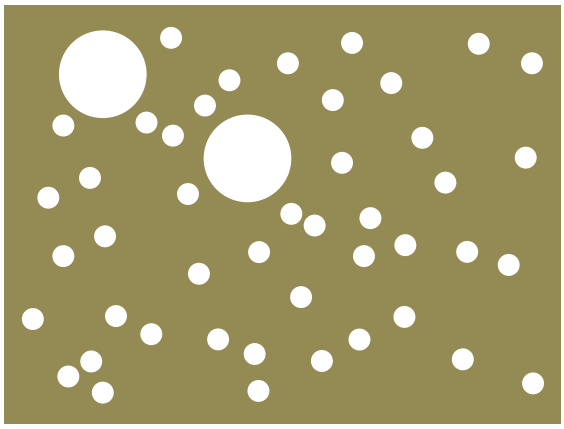
Hildenbrand [20] in 2003 investigated the capillary sealing efficiency of fine-grained sedimentary by CO_2 breakthrough experiments and CO_2 diffusion experiments that are on fully water-saturated samples. The CO_2 diffusion experiments show that CO_2 diffusion coefficients varies from 10^{-9} to 10^{-11} m^2/s. These CO_2 diffusion coefficient values are used in our investigations.

Ghaith [21] in 1990 investigated the temporal oscillations in methane release rate from a kerogen-rich shale. Oscillatory release of methane is modeled via reaction-transport equations. In Ghaith's study, CH_4 diffusion coefficient is taken as 10^{-11} m^2/s. CH_4 diffusion coefficient is also taken as 10^{-11} m^2/s in this study.

It is important to understand the physics fluid flow of shale gas reservoirs is necessary for the evaluation of a reservoirs and the optimization of the production. The gas storage is in the form of compressed gas in pores and also in adsorbed form to the pore walls and in soluble gas form in solid organic materials, i.e. kerogen and clays. Figure 2.2 shows the comparison between a conventional reservoir with an unconventional reservoir. It can be seen that unconventional shale gas reservoir has more micropores and nanopores than a conventional reservoir. The size of these pores ranges from a few nanometers to a few micrometers [1].



(a) Conventional



(b) Unconventional

Figure 2.2. Comparison between pores in conventional and unconventional shale gas reservoirs [1]

The surface area in nanopores is significantly larger than a reservoir that has larger pore sizes and less nanopores as conventional reservoirs have for the same pore volume. This larger surface area allows larger volumes for gas desorption and adsorption. The gas flow in these nanpore system is different from Darcy flow [1], i.e. Fickian. Figure 2.3 shows an atomic force microscopy (AFM) image of nanopores in 3-D view. Javapour [2] states that diffusion is an important gas transport process in shale gas reservoirs that diffusion contribution is higher in smaller pores that are called micropores and nanopores.

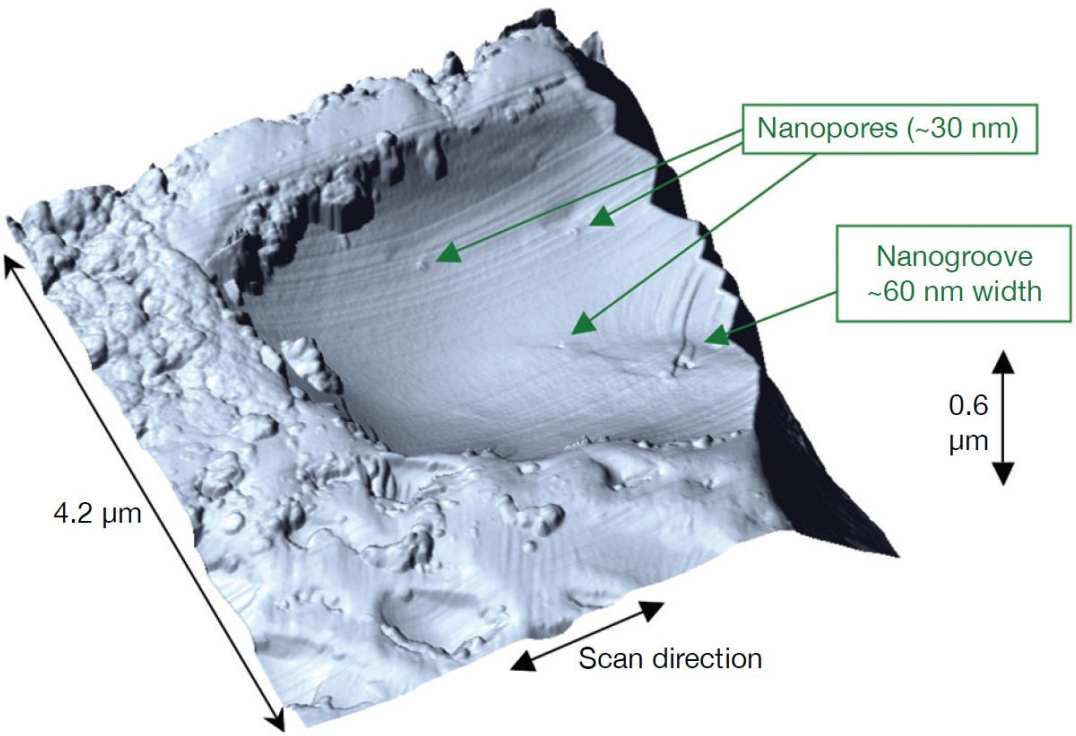


Figure 2.3. AFM image of nanopores and nanogrooves in a fine-grained mudrock [2]

Microseismic fracture monitoring tools have shown that large fracture networks can be generated in shale gas reservoirs. For example, in conventional reservoirs and tight gas sands, single-plane-fractures and conductivity are enough to describe the characteristics of the stimulated zone for the numerical models [22]. However, the results that are produced using the numerical models with the discrete fracture plane approach in shale gas models are not considered accurate enough because of the complex fracture nature of shale gas reservoirs. In this study, the concept of a stimulated reservoir volume (SRV) is introduced to the PSU-SHALECOMP models to define the hydraulic fractures in the computational model.

2.2 A Different Simulation Approach to Stimulated Shale Reservoirs

Shale reservoirs already have complex network structures since they have natural fractures. The concepts of single-plane-fractures and conductivity are insufficient to describe stimulation per-

formance as in conventional reservoirs or tight gas sands [22]. It is thought that the concept of using *SRV* defines the production performance better in shale gas systems. The size of the complex network structures in shale gas reservoirs can be represented as the 3D volume of the microseismic fracture mapping in numerical simulators. The *SRV* can be approximated by modifying the values of fracture spacing, fracture permeability and fracture porosity which are the driving factors to describe a *SRV* [22].

Figure 2.4 [22] shows the different types of fracture growth from a simple fracture to a complex fracture network. The complexity depends on the formation type. For instance, it is hard to create a complex fracture network in tight-gas formations. However, it is possible with the new fracturing tools to create a complex fracture network in shale formations, since they already have a natural fracture network and they are more brittle than conventional reservoirs or tight gas sand reservoirs. If we can create a complex fracture network in tight formations, we can get more desorbed gas from the matrix into the fractures, as the surface area increases drastically thus, affecting the production performance immediately.

The concept of an *SRV* is defined differently by various researchers. It is also called effective stimulated volume or stimulated reservoir area. The translation of the microseismic data distribution into the affected reservoir volume differs slightly between definitions [23]; however, the definition of the overall concept is similar in terms of area, thickness, fracture porosity, fracture permeability, and fracture spacing.

The *SRV* number is often used semiquantitatively; the larger *SRV* values lead to larger cumulative production values [23]. Production values also depend on the spacing of the fractures (both natural and hydraulic fractures), the conductivity values of hydraulic fractures, permeability and porosity of hydraulic fractures [23].

Tight reservoirs can be simulated for higher *SRV* values. A new hydraulic fracturing method is used to increase *SRV* values called The Texas two-step [24], which is explained in Chapter 4 in greater detail. The idea behind this method is that after fracturing each end of an interval, the operator runs in hole again and fractures the middle of the interval [24]. With this new technique, even larger volumes of stimulated zones can be achieved, which leads to larger production and injection values.

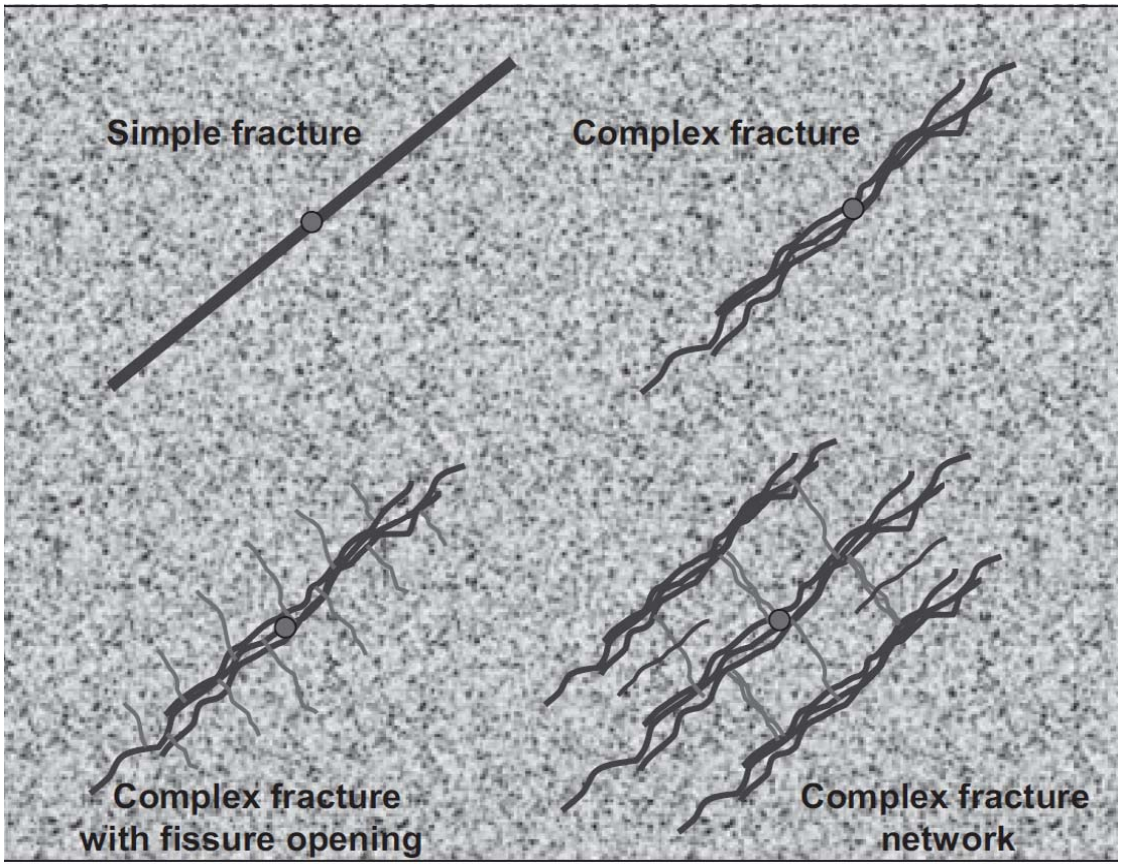


Figure 2.4. Types of fracture growth

Fracture intensity and fracture complexity are relatively new areas of interest for improving production results in low-permeability reservoirs with horizontal lateral completions. The goal of the stimulation process in all tight reservoirs is to maximize the surface area of productive rock and connect cleats to the wellbore [24]. By using these techniques with further advancement in stimulation technology, the industry will continue to get better production performances.

Chapter 3

Statement of the Problem

It is considered that the possibility of sequestration of industrial carbon dioxide (CO_2) in depleted shale gas reservoirs can help to reduce the CO_2 emissions which are mainly produced by power generating plants and heavy industry plants such as steel, paper, chemical etc. In these types of hydraulically fractured shale reservoir, which have a relatively large depth and have captured mainly methane for a long period of time, it is expected to secure industrial CO_2 in large volumes once they are depleted.

Most of the existing reservoir simulators often treat shale gas reservoirs as dual-porosity, single-permeability flow systems with no water saturation and with no permeability in the matrix structure. The PSU-SHALECOMP simulator, is a compositional dual-porosity, dual-permeability, multi-phase reservoir simulator and has been assembled within the overall framework of an existing coalbed methane reservoir simulator [25]. In the PSU-SHALECOMP simulator, shale gas reservoir is considered as a dual-porosity, dual-permeability system consisting of shale matrix and fracture network. The model also takes the effects of water presence which takes matrix shrinkage and swelling into account [26].

In PSU-SHALECOMP simulator, computations on the partial adsorption capacity of gas components are based on the thermodynamic equilibrium between gas components in the free and adsorbed phases following the ideal adsorbed solution model using an analogy to vapor-liquid-equilibria (VLE) calculations [27]. In order to perform rigorous adsorption/desorption thermodynamical computations the model receives the pure component adsorption isotherms for each component and from that information, it then constructs a multi-component Langmuir

sorption isotherms [27]. It is shown that CO_2 adsorption capacity of Marcellus shale is up to five times more favorable than CH_4 adsorption capacity [7], which can contribute to CO_2 sequestration in Marcellus shale formations in a positive impact. The PSU-SHALECOMP simulator is capable of capturing these flow behaviors in shale formations.

The PSU-SHALECOMP reservoir model is an extension of the PSU-COALCOMP. The code is written using the C++ programming language and can run on UNIX and PC-based platforms. The proposed model is capable of simulating the flow of multi-component gas and water in fracture and matrix systems in three dimensional, body-centered, Cartesian coordinate system in heterogeneous and anisotropic media. The flow of gas follows the multi-mechanistic flow mechanism while the water flow obeys Darcy's law. The highly nonlinear formalisms are linearized by the Newton-Raphson procedure, and resulting linear system of equations is solved in a fully implicit form using the generalized minimal residual solver method (GMRES) [28].

In reservoir simulation applications, conventional representation and design of hydraulic fracturing is achieved by placing discrete transverse fracture planes in the computational domain. However, microseismic field data hint that multi-stage hydraulic fracturing often creates an extensively fractured zone next to the wellbore. Accordingly, in reservoir simulation efforts, to represent and capture the effects of this crushed zone or stimulated reservoir volume more accurately, it is also proposed to represent the system in the form of a composite double-porosity system. The crushed region can be represented by an elliptical or cylindrical zone of high fracture permeability with more dense fracture spacing. However, difficulties still exist in the field optimization and characterization of the fractured zone in relation with understanding of which model (discrete transverse fracture planes or *SRV* approach) is more representative.

The biggest advantage of the *SRV* approach is that it is computationally inexpensive when the simulation times are compared with its equivalent discrete fracture network model, which has the same behavior in terms of production performances [3].

Chapter 4

Formulation of the Compositional Fluid Flow in Dual-porosity, Dual-permeability Domains

Shale gas reservoirs are dual porosity systems that consist of shale matrix and fracture network in between like coalbed methane (CBM) reservoirs. Initially, hydrocarbons, which is mainly methane, are stored in the surfaces of shale rock in the adsorbed state and as free phase in the shale matrix and also in the fractures. In this study, it is considered that the hydrocarbon that exist in the reservoir is 100% methane. The methane gas is delivered from the matrix via the fracture network to the wellbore.

There are many numerical models developed to simulate the behavior of the CBM reservoirs. Many CBM models, including the commercial ones, consider the reservoirs with dual-porosity/single-permeability domain characteristics. In these early models, only the flow in the fractures is taken into consideration that is called single permeability model. The assumption of modeling a shale gas or CBM reservoir with a single permeability model results in over-prediction of gas production that leads early pressure drop in the reservoir [4]. Hence, it depletes the reservoirs faster. However, in reality, the methane flow from the matrix supports the production and generate larger production values.

The flow of gas in both coal matrix as well as shale matrix and fracture networks is driven by a pressure field which follows Darcy's law, and a concentration field which follows Fick's law of diffusion [29]. King and Ertekin [30] in 1986 developed a numerical model that the gas is flowing under a multi-mechanistic model. The gas follows two driving mechanisms, including flow through the pressure field (Darcian flow) and, flow through the concentration field (Fickian flow). The model uses the non-equilibrium sorption that includes pseudo steady-state formulation. The simulator is capable of modeling a CBM or a shale gas reservoir with a dual-porosity, single-permeability characteristics. However, it is only capable of modeling a production or injection with a single well in rectangular, cylindrical or elliptical coordinate geometry without water presence in the reservoir.

Remner et al. [31] in 1986 modified the existing simulator and developed a two-dimensional cartesian coordinate system and two-phase that includes water and gas phases, multi-mechanistic flow model for CBM reservoirs that is treated again a dual-porosity, single-permeability system with a quasi-steady kinetic-type state model. This model incorporates the effect of Langmuir isotherms to calculate the sorption rates for a methane.

Sung et al. [32] also in 1986 modified the existing simulator that includes flow of methane and water for the CBM reservoirs that are stimulated by hydraulic fractures that are modeled by superimposing fracture nodes on the matrix nodes.

Manik et al. [27] in 2002 developed a model of compositional gas and water transport for shale gas and CBM reservoirs. The simulator is capable of modeling a reservoir in a three-dimensional design. It is two-phase, which is single component for water and multi-component for a gas mixture, which can not only model production scenarios but also carbon dioxide and nitrogen injections for enhanced gas recovery. In this study, ideal absorbed solution (IAS) theory is inserted to model adsorption and desorption of gases which have a significant impact on production and injection scenarios especially in CBM reservoirs. The Peng-Robinson equation of state is used in developing the multi-component model.

Prob and Ertekin [4] in 2010 developed a numerical model that simulates the two-phase gas-water flow in naturally fractured systems, which can be modeled as dual-porosity, dual-permeability systems with the change of the internal stress due to production or injection that is called shrinkage and swelling effect. The flow in the pressure field follows Darcys law and the flow in concentration field is assumed to be a Knudsen flow and follows Ficks law of diffusion. In

this model, the gas phase is considered as a multi-component system that can consist of multiple number of hydrocarbons as well as carbon dioxide, nitrogen etc. However, the water phase is assumed to be a single component. The gas flow is also considered as multi-mechanistic meaning that it follows both Darcian flow and Fickian flow. However, the water flow neglects the flow that is occurred by diffusion.

4.1 Governing Equations

The multi-mechanistic superficial gas velocity of a fluid that includes both Darcian and Fickian flow mechanisms, assuming that the gas density and concentration gradients are parallel and act independently, can be written as follows [29]:

$$\nu_g^T = -\frac{k}{\mu_g}\frac{\partial P}{\partial L} - D\frac{M_g}{\rho_g}\frac{1}{RT}\frac{\partial}{\partial L}\left(\frac{p_g S_g}{Z}\right) \tag{4.1}$$

The equation 4.2 shows the gas flow equation for component l in the fracture domain, which is obtained by using the equation 4.1. The term $\phi_F S_{g,f} A$ in the following equation defines the effective area of gas diffusion.

$$\begin{aligned}
&\frac{\partial}{\partial x}\left[\frac{D_{l,f}\phi_F S_{g,f} A_x}{5.615}\frac{\partial}{\partial x}\left(X_{l,f}\frac{S_{g,f}}{B_{g,f}}\right) + X_{l,f}\frac{A_x k_{x,f} k_{rg,f}}{\mu_g B_{g,f}}\frac{\partial \Phi_{g,f}}{\partial x} + R_{sw,l,f}\frac{A_x k_{x,f} k_{rw,f}}{\mu_w B_{w,f}}\frac{\partial \Phi_{w,f}}{\partial x}\right]\Delta x \\
&+\frac{\partial}{\partial y}\left[\frac{D_{l,f}\phi_F S_{g,f} A_y}{5.615}\frac{\partial}{\partial y}\left(X_{l,f}\frac{S_{g,f}}{B_{g,f}}\right) + X_{l,f}\frac{A_y k_{y,f} k_{rg,f}}{\mu_g B_{g,f}}\frac{\partial \Phi_{g,f}}{\partial y} + R_{sw,l,f}\frac{A_y k_{y,f} k_{rw,f}}{\mu_w B_{w,f}}\frac{\partial \Phi_{w,f}}{\partial y}\right]\Delta y \\
&+\frac{\partial}{\partial z}\left[\frac{D_{l,f}\phi_F S_{g,f} A_z}{5.615}\frac{\partial}{\partial z}\left(X_{l,f}\frac{S_{g,f}}{B_{g,f}}\right) + X_{l,f}\frac{A_z k_{z,f} k_{rg,f}}{\mu_g B_{g,f}}\frac{\partial \Phi_{g,f}}{\partial z} + R_{sw,l,f}\frac{A_z k_{z,f} k_{rw,f}}{\mu_w B_{w,f}}\frac{\partial \Phi_{w,f}}{\partial z}\right]\Delta z \\
&+\Gamma_{g,l,f} + q_{g,l} + R_{sw,l,f} q_w = \frac{1}{5.615}\frac{\partial}{\partial t}\left[X_{l,f}\frac{V_b \phi_F S_{g,f}}{B_{g,f}} + R_{sw,l,f}\frac{V_b \phi_F S_{w,f}}{B_{w,f}}\right]
\end{aligned} \tag{4.2}$$

It is known that fracture spacing values of shale gas and coal bed methane matrix domains are rather small. Therefore, the gas flow for the component l in the matrix domain can be written as in the equation 4.3.

$$\Gamma_{g,l,m} + q_{srp,l} = \frac{1}{5.615}\frac{\partial}{\partial t}\left[X_{l,m}\frac{V_b \phi_M S_{g,m}}{B_{g,m}} + R_{sw,l,m}\frac{V_b \phi_M S_{w,m}}{B_{w,m}}\right] \tag{4.3}$$

The gas flow potentials are defined to be, Equation 4.4, Equation 4.5.

$$\Phi_{g,f} = p_{g,f} - \frac{1}{144}\frac{g}{g_c}\rho_g G \tag{4.4}$$

$$\Phi_{g,m} = p_{g,m} - \frac{1}{144}\frac{g}{g_c}\rho_g G \tag{4.5}$$

One assumptions that is made to define the water flow is neglection of Fickian flow of water in the fracture domain, which means that the water only follows Darcy's law in the fracture domain (Equation 4.6) .

$$\begin{aligned} &\frac{\partial}{\partial x}\left[\frac{A_x k_{x,f} k_{rw,f}}{\mu_w B_{w,f}}\frac{\partial \Phi_{w,f}}{\partial x}\right]\Delta x + \frac{\partial}{\partial y}\left[\frac{A_y k_{y,f} k_{rw,f}}{\mu_w B_{w,f}}\frac{\partial \Phi_{w,f}}{\partial y}\right]\Delta y \\ &+\frac{\partial}{\partial z}\left[\frac{A_z k_{z,f} k_{rw,f}}{\mu_w B_{w,f}}\frac{\partial \Phi_{w,f}}{\partial z}\right]\Delta z + \Gamma_{w,f} + q_w = \frac{1}{5.615}\frac{\partial}{\partial t}\left[\frac{V_b \phi_F S_{w,f}}{B_{w,f}}\right] \end{aligned} \tag{4.6}$$

Equation 4.7 shows the water flow equation in the matrix domain.

$$\Gamma_{w,m} = \frac{1}{5.615}\frac{\partial}{\partial t}\left[\frac{V_b \phi_M S_{w,m}}{B_{w,m}}\right] \tag{4.7}$$

Equations 4.8 and 4.9 show the water flow potentials.

$$\Phi_{w,f} = p_{w,f} - \frac{1}{144}\frac{g}{g_c}\rho_w G \tag{4.8}$$

$$\Phi_{w,m} = p_{w,m} - \frac{1}{144}\frac{g}{g_c}\rho_w G \tag{4.9}$$

4.2 Auxiliary Equations

In this set of formulations, there are $2NC+8$ number of unknown variables where NC represents the number of components. These unknown variables are $P_{g,f}$, $P_{g,m}$, $P_{w,f}$, $P_{w,m}$, $S_{g,f}$, $S_{g,m}$, $S_{w,f}$, $S_{w,m}$, $X_{l,f}$, $X_{l,m}$, where l= 1,2,.., NC. Therefore, if the NC value increases, the number of unknowns for the mole fractions of the gas phase also increases by the nuber of NC. To solve

these unknowns, there should be same number of equations. $2NC+2$ number of equations are acquired through the set of governing equations that represent the flow of gas and water both in the fractures and the matrix blocks. The six of the equations which complete the rest of the number of equations can be obtained from capillary pressure relationships, saturation and mole fracture constraints. The equations 4.10, 4.11, 4.12, 4.13, 4.14, 4.15 include these relationships and constraints for the matrix and fracture domains. Finite-Difference approximations of the partial differential equations (PDE's) describing the simultaneous flow of gas and water in the fracture and matrix domains can be found in Prob and Ertekin, 2010 [4] in detail.

- Capillary pressure relationships

$$p_{cgw,f}\left(S_{g,f}\right) = p_{g,f} - p_{w,f} \tag{4.10}$$

$$p_{cgw,m}\left(S_{g,m}\right) = p_{g,m} - p_{w,m} \tag{4.11}$$

- Saturation constraints

$$S_{g,f} + S_{w,f} = 1 \tag{4.12}$$

$$S_{g,m} + S_{w,m} = 1 \tag{4.13}$$

- Mole fraction constraints

$$\sum_{l=1}^{NC} X_{l,f} = 1 \tag{4.14}$$

$$\sum_{l=1}^{NC} X_{l,m} = 1 \tag{4.15}$$

4.3 Calculations of Multi-component Sorptions

Manik and Ertekin [27] in 2002 numerically modeled Myers and Prausnitz's [33] study which involves the thermodynamically consistent multi-component gas sorption equilibria where the partial adsorption capacity of gas components is determined and calculated by the partial pressures of gas components in the free gas mixture successfully [27]. The following equations show these equilibrium relations between particular components both in the free gas and the adsorbed gas phases:

$$f_l = f_l^0 Y_l X_l \tag{4.16}$$

or

$$PY_l\varphi_l = P\varphi_l^0\gamma_l X_l \tag{4.17}$$

where P_l^0 is a standard state pressure of pure component l in the adsorbed phase and f_l^0 is fugacity of pure component l in gas phase at standard conditions. Peng-Robinson [34] equation of state (EOS), which is the most common EOS that is used in oil and gas industry, is implemented to find out the partial fugacity coefficient of the free gas components (φ_l) and pure component fugacity coefficient at standard state condition (φ_l^0). Equation 4.18 shows the relationship between the pure adsorption capacity ($Ve_l^0 w$) and the pure component spreading pressure at the standard state condition (π_l^0) where spreading pressure is π [27]. The pure component adsorption capacity ($Ve_l^0 w$) as a function of pressure of pure component l in the gas phase at standard state (p_l^0) can be described by any of the pure component sorption equations that are Langmuir, Toth and Unilan sorption isotherm equations [27].

$$\psi_l^0 = \left(\frac{\pi_l^0 \tilde{A}}{RT}\right)\left(\frac{RT_{sc}}{p_{sc}}\right) = \int_0^{f_l^0} \frac{Ve_l^0}{f} df \tag{4.18}$$

Equation 4.19 shows the spreading pressure group of all pure components at the standard state conditions, which are equal to each other due to the fact that the equality of all pure component spreading pressures at standard conditions are equal [27].

$$\psi_1^0 = \psi_2^0 = ... = \psi_{NC}^0 \tag{4.19}$$

The thermodynamically consistent ideal adsorbed solution (IAS) theory that is implemented in PSU-COALCOMP is used as a tool to investigate the potentials of enhanced coalbed methane recovery in field scale coalbed reservoir simulators [27]. In this study, this IAS theory is used to investigate carbon dioxide injection possibilities in formations that have shale gas reservoir characteristics. The IAS model assumes that the adsorbed phase behaves like an ideal solution as described by activity coefficients of unity for all values of pressure, temperature and composition

[27]. The total adsorption capacity (Ve_t) and the partial adsorption capacity (Ve_l) are calculated in equation 4.20 and equation 4.21 with the relationships that is assumed in the IAS.

$$\frac{1}{Ve_t} = \sum_{l=1}^{NC} \frac{X_l}{Ve_l^0} \tag{4.20}$$

$$Ve_l = X_l Ve_t \tag{4.21}$$

In equation 4.20 Ve_l^0 represents the equilibrium condition adsorption capacity of pure component l in standard state and in equation 4.21 Ve_t represents the equilibrium condition total adsorption capacity.

To calculate the multi-component sorption, $2NC$ number of unknowns are needed that are fugacity of pure component l in gas phase at standard state (f_l^0) and mole fraction of component l in adsorbed phase (X_l). Equations 4.16 and 4.19 provides $2NC$-1 number of equations [27]. The fraction constraint of the adsorbed phase (Equation 4.22) completes the set of equations that are needed to calculate the multi-component sorption.

$$\sum_{l=1}^{NC} X_l = 1 \tag{4.22}$$

With a given set of independent variables (T, P, Y_1, Y_2,.., Y_{NC-1}), fugacity of pure component l in gas phase at standard state (f_l^0) and mole fraction of component l in adsorbed phase (X_l) can be solved iteratively by using the multi-component sorption objective function that is defined in equation 4.23 [27].

$$\Re\left(\psi^0\right) = \left(\sum_{l=1}^{NC} X_l\right) - 1 = 0 \tag{4.23}$$

Equation 4.24 shows the Newton-Raphson procedure of the solution of pure component spreading pressure group at standard state (ψ^0) [27]. The procedure can be found in Manik, 1999 [35] in greater detail.

$$\psi^0\Big|^{k+1} = \psi^0\Big|^{k} - \left\{\left[\left(\sum_{l=1}^{NC} \frac{f_l}{f_l^0} - 1\right)\right] \Big/ \left[-\sum_{l=1}^{NC} \frac{f_l}{f_l^0 Ve_l^0}\right]\right\}\Bigg|^{k} \tag{4.24}$$

4.4 Sorption Rate Calculation

King and Ertekin [30] proposed a first order kinetic model that calculates the gas component sorption rate by using double porosity non-equilibrium sorption rate equation as follows:

$$\frac{\partial Va_l}{\partial t} = \frac{1}{\tau}\left(Va_l - Ve_l\right) \tag{4.25}$$

In Equation 4.25, Va_l is the volume adsorbed of component l and Ve_l is the equilibrium condition partial adsorption capacity of component l, where τ is the sorption time constant, which represents the time lag due to the diffusion process within the micropores of the coal or shale gas formations. The amount of gas component adsorbed on the matrix surface (Equation 4.26) can be found by integration of Equation 4.25

$$Va_l\Big|^{n+1} = Va_l\Big|^{n} exp\left(\frac{-\Delta t}{\tau}\right) + Ve_l\Big|^{n+1}\left[1 - exp\left(\frac{-\Delta t}{\tau}\right)\right] \tag{4.26}$$

Equation 4.26 is the modified version of the original equation that is proposed by King and Ertekin [30], which is found by integrating Equation 4.25 that assumes constant component adsorption capacity is evaluated at time level *n+1*. It is observed by Kohler and Ertekin [36] that this assumption eliminates oscillations in the sorption rate calculations. In the original equation [30], it is evaluated at arithmetic average of time levels n and *n+1*).

The gas component sorption rate over time interval Δt can be approximated by the following equation:

$$\left(q_s\right)_i = \frac{Va_l\Big|^{n+1} - Va_l\Big|^{n}}{\Delta t} \tag{4.27}$$

An iterative linear equation solver (GMRES) and advance matrix preconditioners (ParaSails and FASP) are incorporated to PSU-COALCOMP simulator by Erhan and Ertekin [28] in 2013. To increase the computational efficacy of the numerical simulator, two additional subroutines are implemented to have better initial guess at the Newton-Raphson iterations and decrease the oscillations experienced during the Newton-Raphson iterations [28]. These improvements are also added to PSU-SHALECOMP simulator that yield significant decreases in the simulation time [28].

Chapter 5

Stimulated Reservoir Volume Approach

If clay content is high in shale formations, it gets more difficult to hydraulically fracture the formation, and it also get more difficult to keep a fractures open after releasing the pressure at the wellhead [37]. High clay content makes the formation softer. Haynesville shale is a good example for clay-dominated shale formations, which has about 2.106 psi of Young's modulus value [38]. If shale formation contains more quartz, it gets more brittle and it is easier to hydraulically fracture the formation, and it is easier to get higher stimulated reservoir volume zones [37]. The Barnett shale is mainly quartz with a high Young Modulus value of around 6.106 psi [38]. Higher Young's modulus values means the formation is more brittle and can be hydraulically fractured better. The Marcellus shale has lower quartz content than the Barnett shale. However, it is rather brittle [39]. Figure 5.1 shows the brittleness and isotropy of these three major shale reservoirs. It is easier to hydraulically fracture Barnett Shale, which creates larger *SRV* zones in the formation with smaller amount of water volumes. The Marcellus shale formation is transitional. Some parts of Marcellus shale formation have large quartz content, which makes it easier to hydraulically fracture. However, if the quartz content is lower, it requires extra volumes of fluid to produce CH_4 feasibly. Smaller *SRV* zones are observed in Haynesville shale formation due to its softness (high clay content). Lower water volumes is required since the fractures are planar, which makes the *SRV* zones smaller.

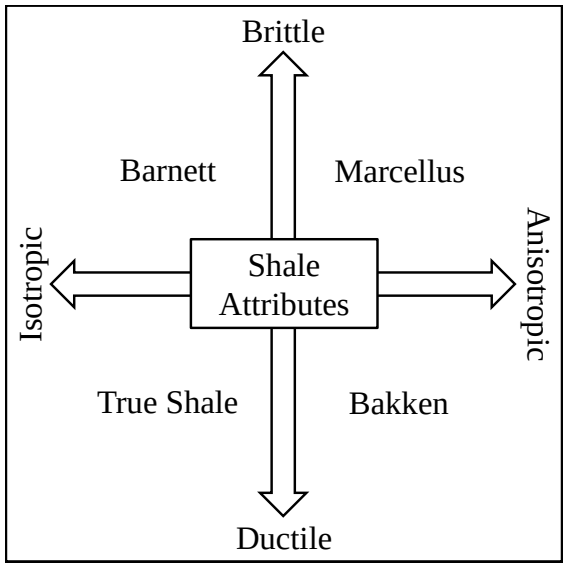
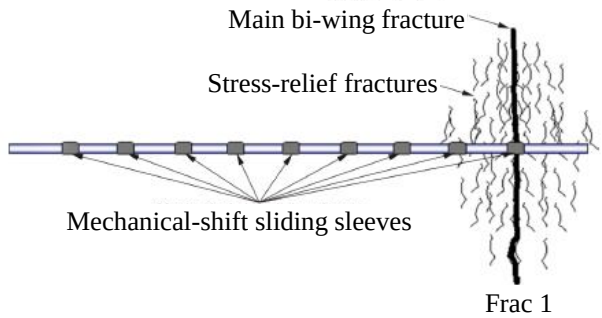


Figure 5.1. US Shale attributes

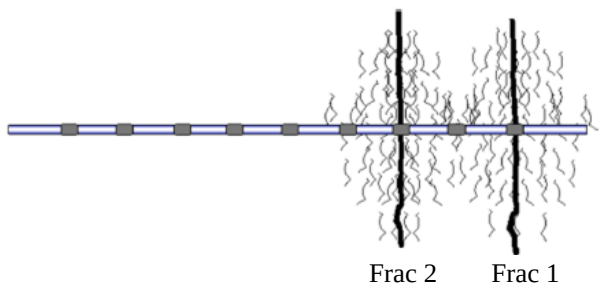
With the advancements in hydraulic fracturing technology, it is possible to have larger *SRV* zones in shale formations. It is vital to have larger surface area in tight and ultra-tight formations to exploit hydrocarbons. It is also important to maximize the surface area in CO_2 injection operations since sorption has significant impact in shale and coalbed methane reservoirs.

Net fracture-extension pressure in brittle, heterogeneous rock such as Barnett or Marcellus shale formations will also cause stress-relief fractures. According to micro-seismic investigations, these stress-relief fractures are parallel to the main fractures. However, these stress-relief fractures are usually not be connected to the main hydraulic fractures as they are parallel (Figure 5.2a) to the propagation of hydraulic fractures. The new fracturing technique called "Texas two-step" can improve the connectivity of these stress-relief fractures [24].

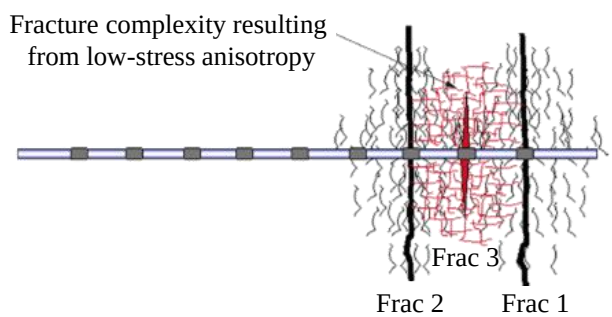
After stimulating the second interval (Figure 5.2b), instead of stimulating the third one towards the heel, the tool runs in hole and stimulates the interval between first and second hydraulic fractures (Figure 5.2c) [24]. The critical point in stimulating the third fracture is to take advantage of the altered stress in the rock, which is in horizontal direction to the hydraulic fractures, and connect parallel stress-relief fractures with the new horizontal ones [24]. Larger *SRV* zones (Figure 5.2d) can be achieved with these types of advanced techniques in hydraulic fracturing in brittle formations such as Barnett, Marcellus or Woodford shales, which would help to produce more hydrocarbons or inject more CO_2.



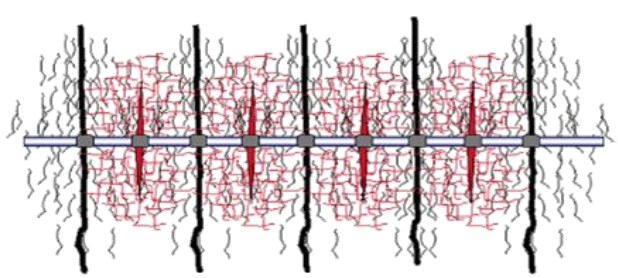
(a) Main fracture with unconnected stress-relief fractures



(b) Fracture 2 placed showing stress-relief fractures not connected to main fracture



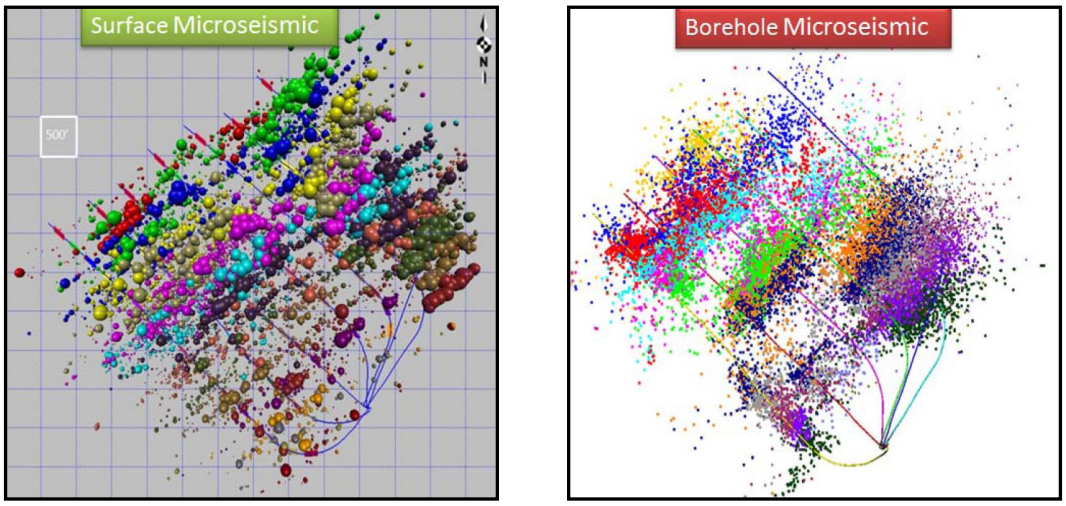
(c) Placement of fracture 3 with stress interference between fractures 1 and 2 optimized to reduce stress anisotropy. Reduced stress anisotropy during placement of Fracture 3 results in connectivity to existing stress-relief fractures



(d) Two-step stress interference method completion

Figure 5.2. The Texas two-step hydraulic fracturing technique

Figure 5.3 shows a microseismic survey which was done in a Marcellus shale gas field [40]. It can be seen that there are significant numbers of seismic activities observed between each of the fracture stages which are created by both brittleness of the formation and hydraulic fracturing operations. It can also be seen that there are fracture connectivities between lateral wells. These microseismic surveys show that instead of having planar or discrete fractures it is more likely to have "crushed" zone or *SRV* zone in major shale gas fields of the USA. Therefore, this crushed zones can be modeled as *SRV* zones in numerical simulations.



(a) Surface microseismic (b) Borehole microseismic

Figure 5.3. Microseismic event distribution from a surface survey (left) and borehole survey (right)

Figure 5.4 and Figure 5.5 [41] show the discrete fracture modeling technique. As it is mentioned above, discrete or planar fracture modeling can be a better modeling technique in conventional reservoirs, tight gas sands or shale reservoirs with low-quartz content because these reservoirs tend to have planar fractures rather then having *SRV* zones when they are hydraulically fractured.

Simulations with discrete fracture modeling often experience long simulation times or simulation failures due to convergence problems even with the most advanced commercial reservoir modeling simulators. It is considered that the *SRV* approach is a faster and reliable alternative to discrete fracture modeling in terms of production performances, pressure, molar concentration, saturation distributions and simulation time results etc.

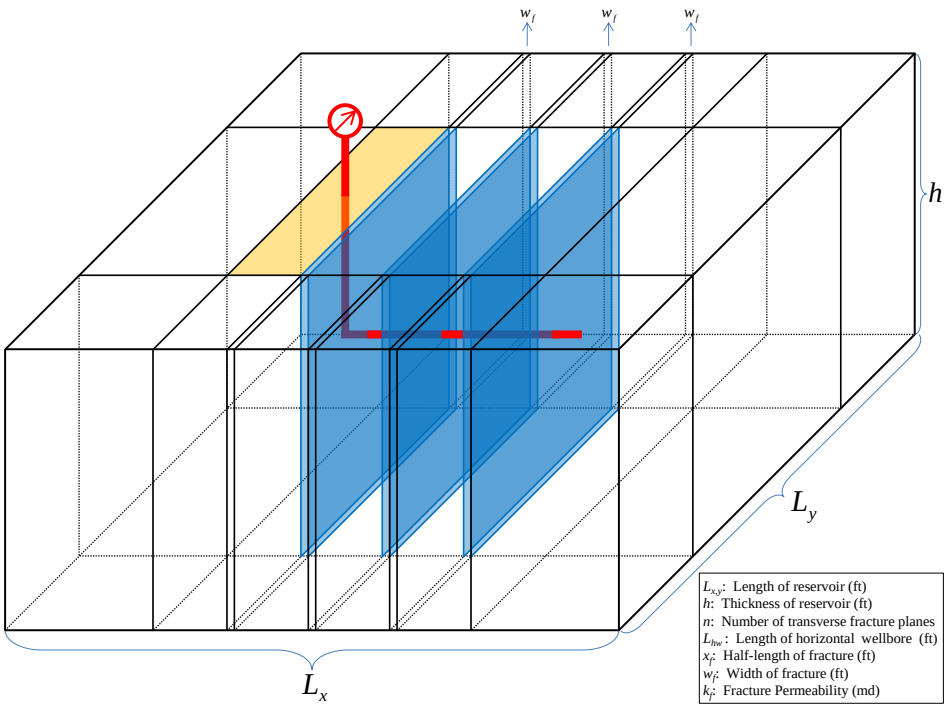


Figure 5.4. A sample 3D view for models with hydraulic fracture

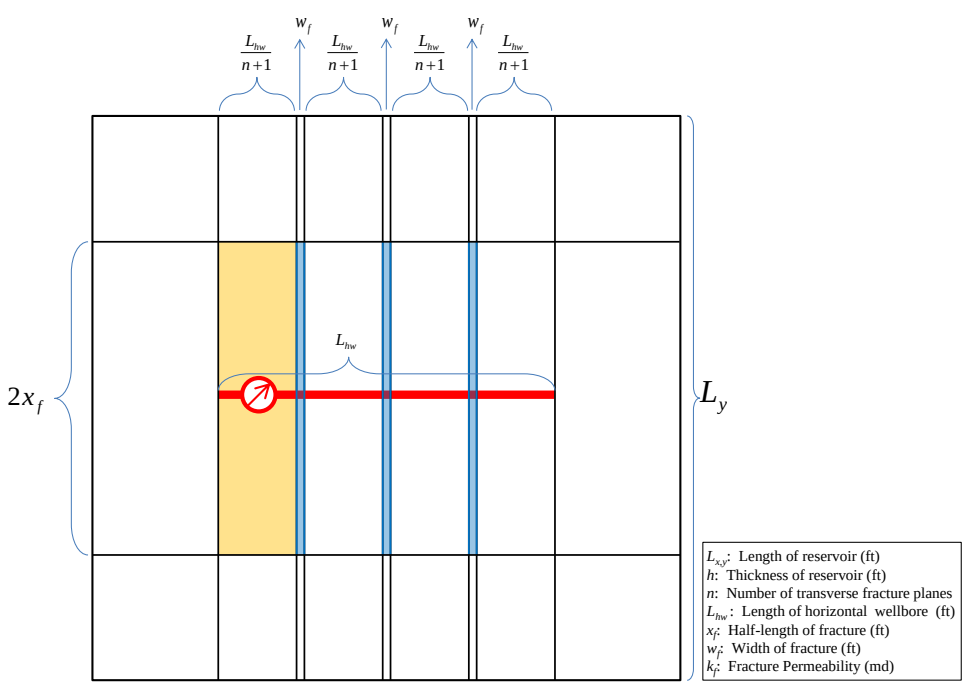


Figure 5.5. Top view for models with hydraulic fracture

Figure 5.6 and Figure 5.7 show the 3D and top view of the *SRV* zone approach. Siripatrachai [3] states that this *SRV* zone has significantly larger fracture permeability (k_f) values compared to unstimulated sections of the reservoir. In this study, addition to fracture permeability fracture porosity (ϕ_m) is increased slightly depending on the the amount of the water injected to hydraulically fracture the formation and to stimulate the reservoir for higher hydrocarbon productions. [3] also states that fracture spacing (Δx_s) in the *SRV* zone is reduced since the number of fractures is increased in the *SRV* zone because of hydraulic fracturing operations, which results in smaller values than natural fracture spacing values. Therefore, three of the reservoir parameters are altered to define hydraulic fractures as *SRV* zone, which are *SRV* fracture permeability, fracture porosity and *SRV* fracture spacing abbreviated as *SRV*-k_f, *SRV*-ϕ_f and *SRV*-Δx_s, respectively. The elliptical area that represents the top view of the *SRV* zone can be seen in Figure 5.7. In this study, the minor axis of the ellipse is considered as the half-length of hydraulic fracture (x_f) and the major axis is the length of the horizontal wellbore (L_{hw}). The thickness (h) of the reservoir is also considered as *SRV* zone's thickness.

5.1 Validation of *SRV* Zone Approach

History matching of the normalized field data from a Marcellus shale well (provided by the US-DOE) is completed for 1 MMSCFD (low-rate), 10 MMSCFD (mid-rate) and 20 MMSCFD (high-rate) of initial flow rates to validate the *SRV* zone approach. It is shown that PSU-SHALECOMP simulator has yielded very good matches with the normalized field data with the implementation of the *SRV* technique. For the low-rate case, the minimum characteristic values for the parameters are used as provided also by the DOE. Similarly, mean values are used for the mid-rate case and maximum values are used for the high-rate case. These parameters can be found in Table 5.1.

In shale gas reservoirs, sharp production declines in the late stages usually are not observed. This is attributed to well-known production transient characteristic of shale reservoirs in which the boundary dominated flow does not come into the picture. Accordingly, hyperbolic decline curves are expected to represent shale production performances of shale gas reservoirs more effectively than exponential decline curves.

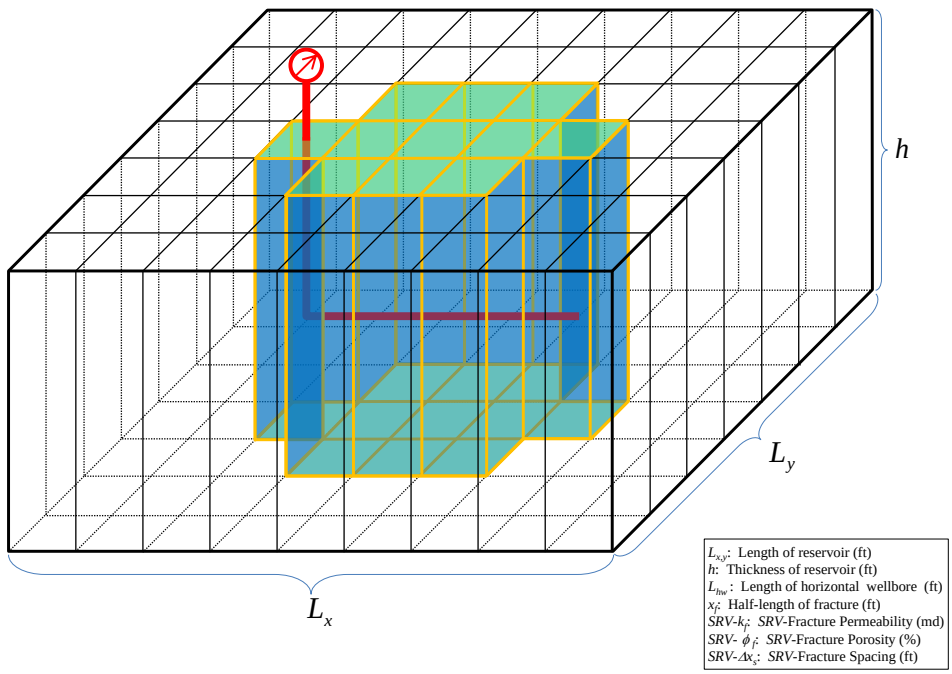


Figure 5.6. A sample 3D view for *SRV* zone model

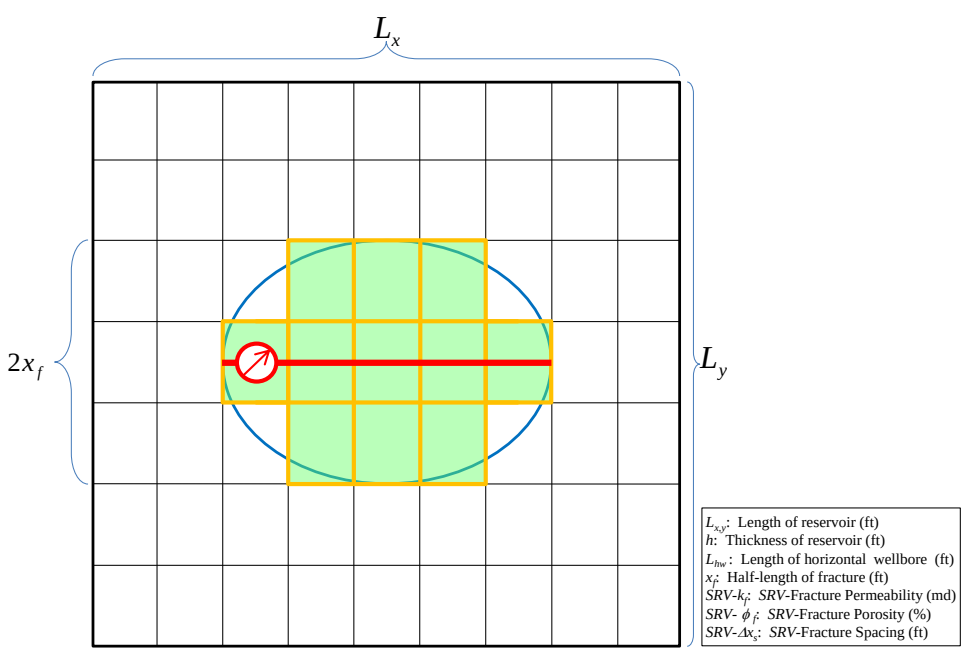


Figure 5.7. A sample top view for *SRV* zone model

Table 5.1. Reservoir and wellbore design parameters for history matching

Source: National Energy Technology Laboratory - US Department of Energy

Parameter	low rate	mid rate	high rate	Unit
Initial Flow Rates (q_{i-prod})	1	10	20	MMscfd
Grid Size on X direction (L_x)	100	215	270	ft
Grid Size on Y direction (L_y)	80	215	270	ft
Area (A)	53	307	484	acres
Thickness (h)	264	271	276	ft
Depth (D)	6,500	6,500	6,500	ft
Matrix Porosity (ϕ_m)	6	8.5	11	%
Fracture Porosity (ϕ_f)	0.6	1.05	1.5	%
Matrix Permeability (k_m)	0.0003	0.0006	0.0009	md
Fracture Permeability (k_f)	0.0007	0.00185	0.003	md
Fracture Spacing (Δx_s)	2.5	1.7	0.9	ft
Reservoir Temperature (T_i)	142	142	142	F
Reservoir Pressure (P_i)	3,940	3,940	3,940	psi
Water Saturation in Matrix ($S_{w,m}$)	10	10	10	%
Water Saturation in Fracture ($S_{w,f}$)	0.1	0.1	0.1	%
Langmuir Volume of CH_4 (V_{L-CH_4})	73	73	73	scf/ton
Langmuir Pressure of CH_4 (P_{L-CH_4})	726	726	726	psi
Langmuir Volume of CO_2 (V_{L-CO_2})	75	75	75	scf/ton
Langmuir Pressure of CO_2 (P_{L-CO_2})	400	400	400	psi
Horizontal Wellbore Length (L_{hw})	500	1,935	2,970	ft
Hydraulic Fracture Half-length (x_f)	120	537.5	675	ft
Production Psf ($P_{sf-prod}$)	568	495	1,110	psi
SRV Fracture Porosity (*SRV*-ϕ_f)	1.2	2.1	3	%
SRV Fracture Permeability (*SRV*-k_f)	0.007	0.0185	0.03	md
SRV Fracture Spacing (*SRV*-Δx_s)	0.25	0.17	0.1	ft

Table 5.2 and Table 5.3 show the relative permeability and capillary pressure data for water and gas phases. It can be seen from Table 5.2 that water is assumed as immobile in shale formations. Because there is very small amount or no water production is observed in shale gas wells.

Table 5.2. Relative permeability and capillary pressure data for water

S_w	k_{rw}	P_{cow}
0	0	0
1	0	0

Table 5.3. Relative permeability and capillary pressure data for gas

S_g	k_{rg}	P_{cog}
0	0	0
1	1	0

5.1.1 Low-rate Case

In this case, initial production is selected as 1 MMSCFD as it is mentioned previously. Following figures show the top views of SRV-ϕ_f, SRV-k_f and SRV-Δx_s, respectively. Stimulated reservoir zones can be seen around the horizontal wellbores on Figure 5.8, Figure 5.9, Figure 5.10.

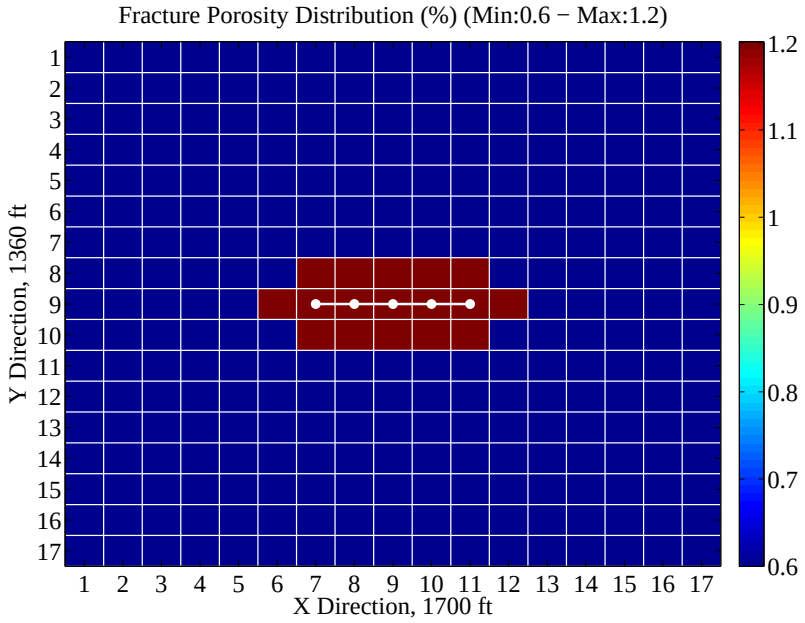


Figure 5.8. Fracture porosity values for low-rate case

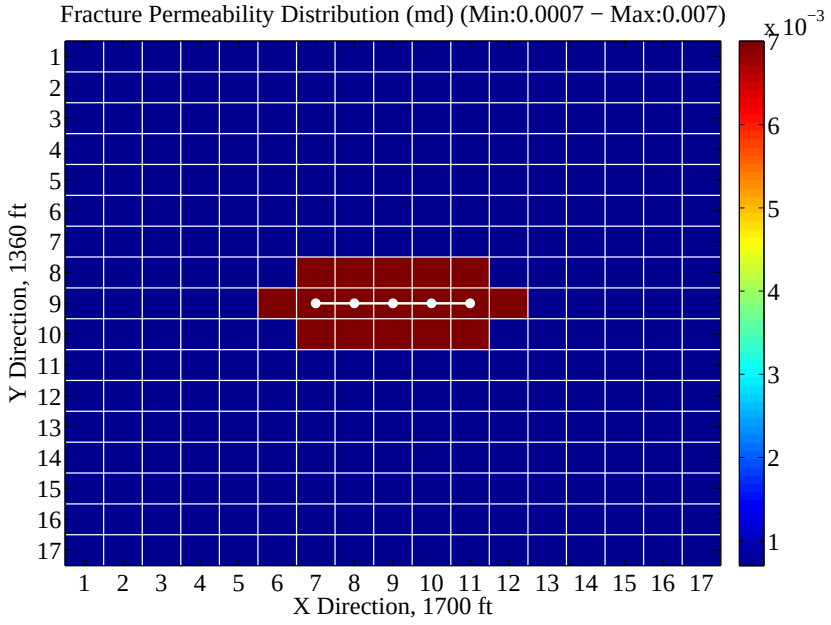


Figure 5.9. Fracture permeability values for low-rate case

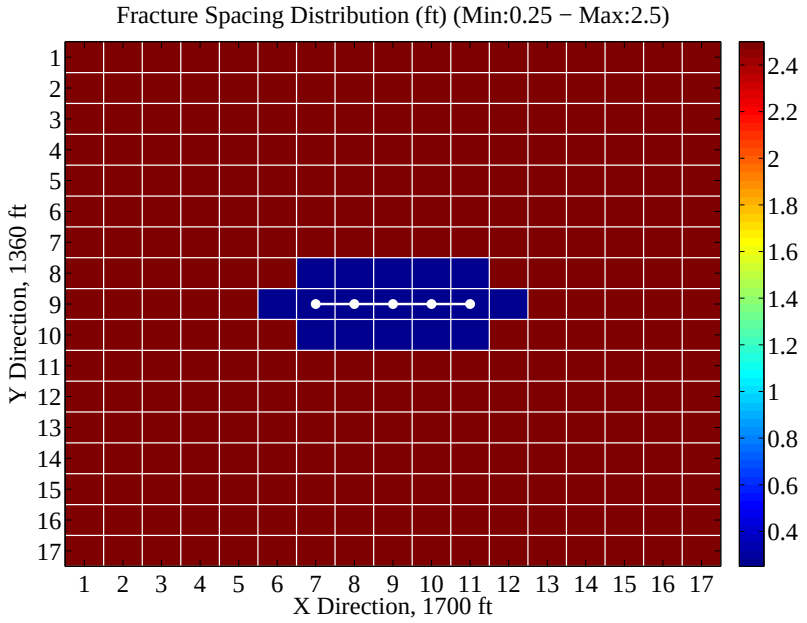


Figure 5.10. Fracture spacing values for low-rate case

In this history match, reservoir area is kept relatively small as well as the horizontal wellbore length and hydraulic fracture dimensions to match the proposed initial flow rate, which is 1 MMSCFD. The importance of horizontal wellbore lengths and hydraulic fracture dimensions come into the picture when low production values are encountered during the production stage and high pressures values at well-blocks are seen during injection stage. With relatively small horizontal wellbore lengths and hydraulic fracture dimensions, methane production becomes unfeasible. Moreover, cumulative CO_2 injection volumes do not reach expected levels because of high pressures at the injection well block. These high pressures may cause unwanted fractures which may connect the shale formation to the overburden and/or overburden formations. Thus, controlled injection of CO_2 into that particular formation may prove to be difficult.

The following figures show the daily flow rate and the cumulative production of methane vs. time. In shale gas reservoirs, sharp production declines in the late stages usually are not observed.

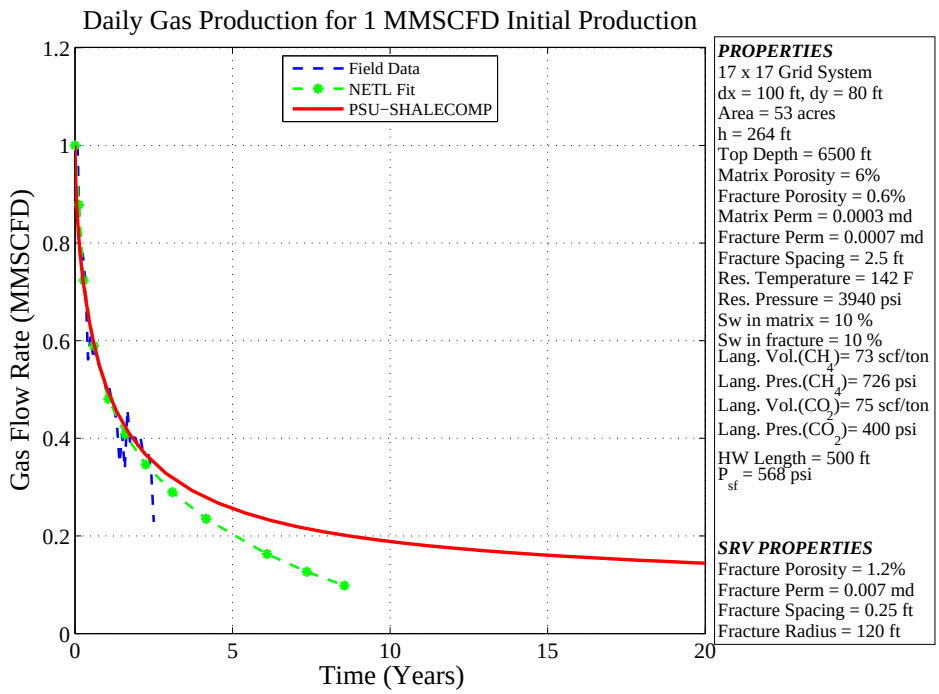


Figure 5.11. Low-rate case daily production history match

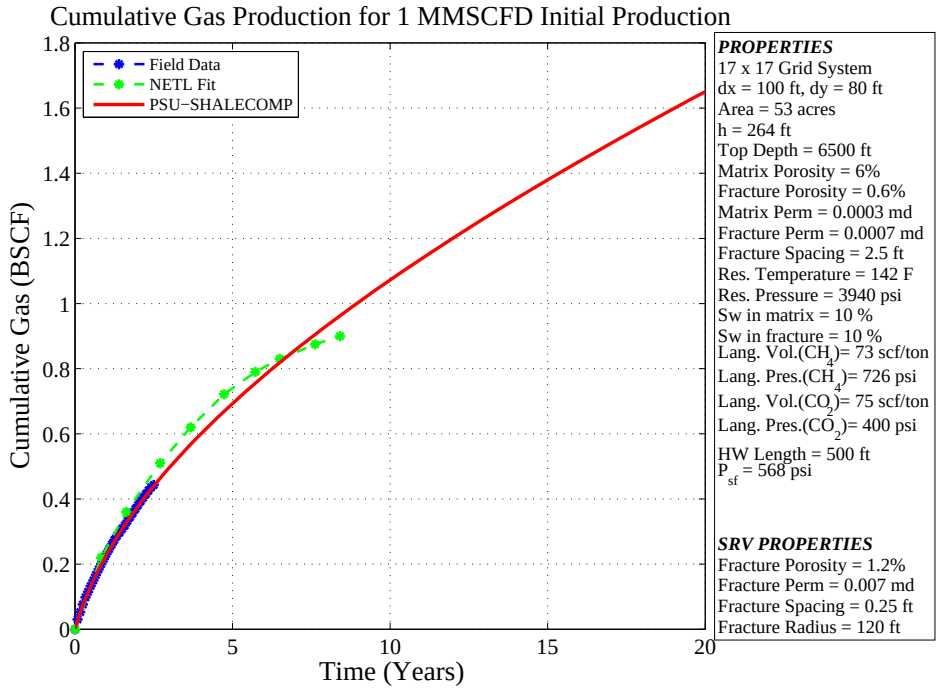


Figure 5.12. Low-rate case 20-year cumulative production history match

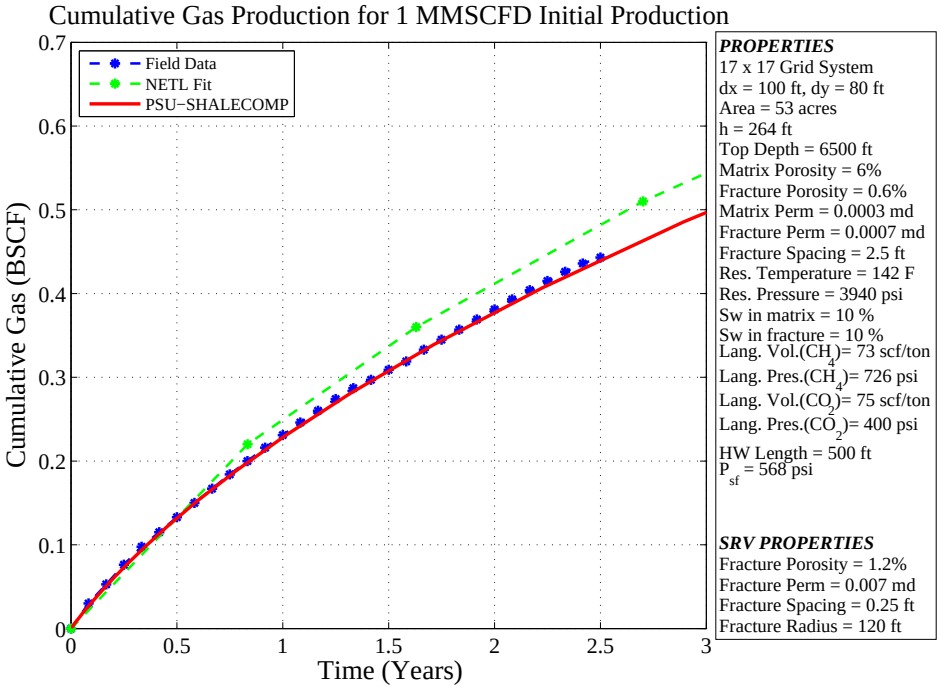


Figure 5.13. Low-rate case 3-year cumulative production history match

Also, CO_2 injection possibilities were investigated for the low-rate case. The pressure distribution at the end of the production period can be seen in Figure 5.14. At the end of the 3rd year of injection, simulation is stopped because of the pressure constraints at the bottomhole pressure because it reaches 5,000 psi (Figure 5.15). These high pressures may create unwanted fractures of environmental concern such as connecting the shale formation to the overburden and/or underburden formations or may cause casings burst. Since the horizontal wellbore length and hydraulic fracture dimension values are kept relatively small to match the historical production, the CO_2 flow into unstimulated zones is very small.

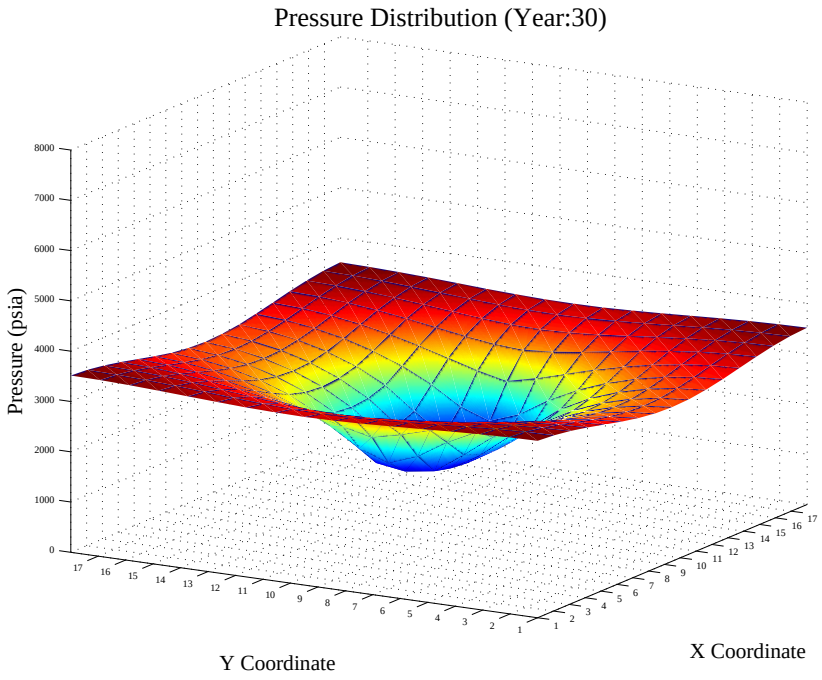


Figure 5.14. Low-rate pressure distribution at 30th year

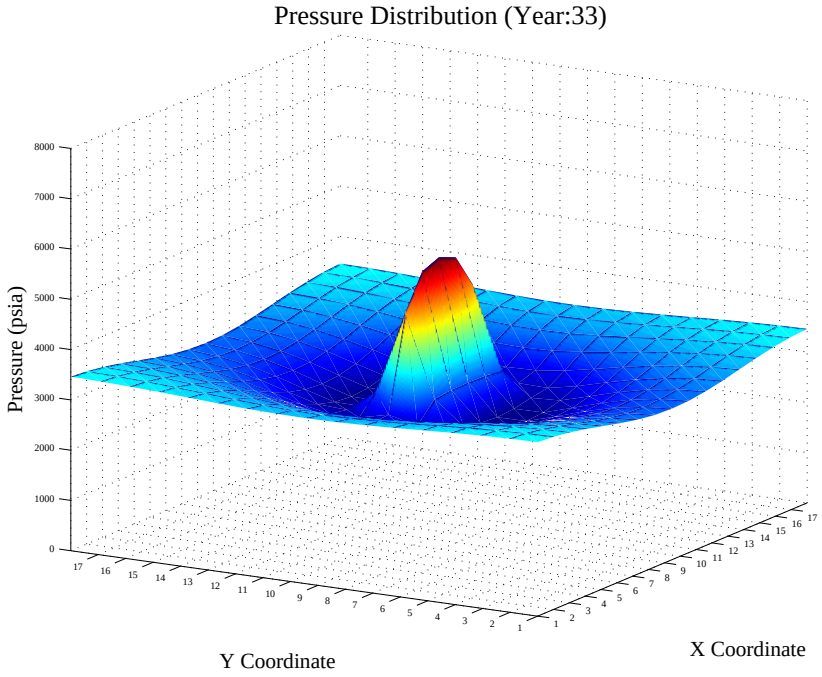


Figure 5.15. Low-rate pressure distribution at 33th year

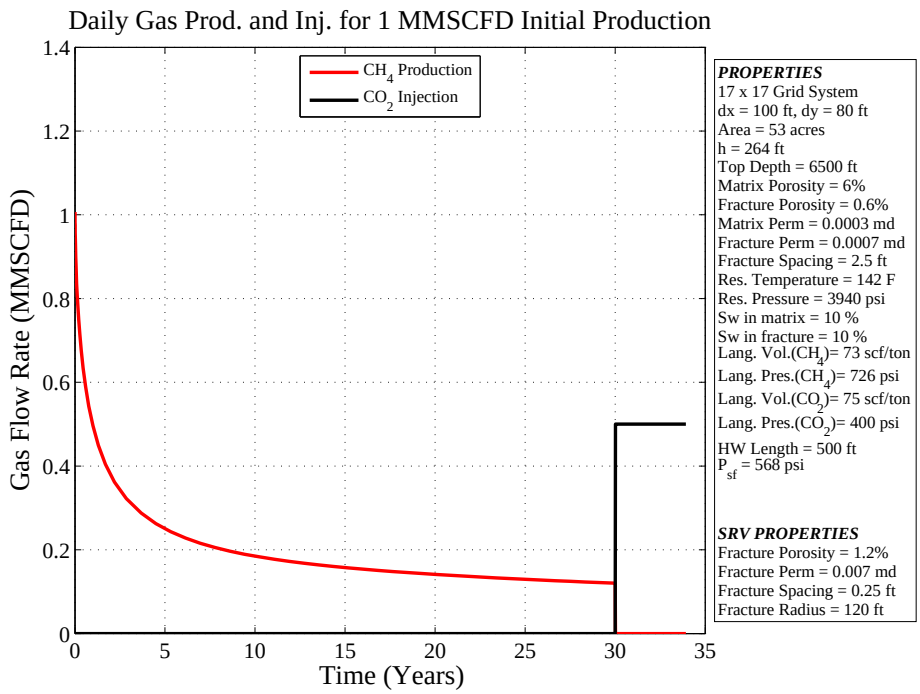


Figure 5.16. Low-rate daily production and injection performances

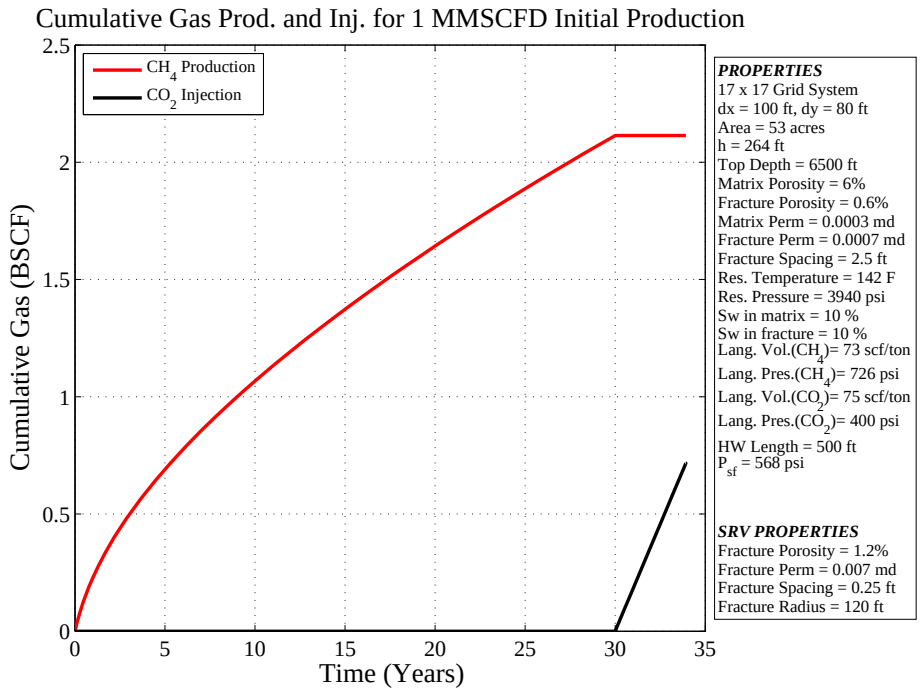


Figure 5.17. Low-rate cumulative production and injection performances

5.1.2 Mid-rate Case

In this history match, the reservoir area is determined to be 307 acres. Horizontal wellbore length and hydraulic fracture dimensions are adjusted to match the proposed initial flow rate as 10 MMSCFD. Following figures show the top views of SRV-ϕ_f, SRV-k_f and SRV-Δx_s for mid-rate, respectively. Stimulated reservoir zones can be seen around the horizontal wellbores on Figure 5.18, Figure 5.19, Figure 5.20.

Figure 5.21, Figure 5.22, Figure 5.23 show the daily flow rate and the cumulative production of methane vs. time. It can be observed that PSU-SHALECOMP is capable of matching the historical data very effectively with the combination of SRV approach.

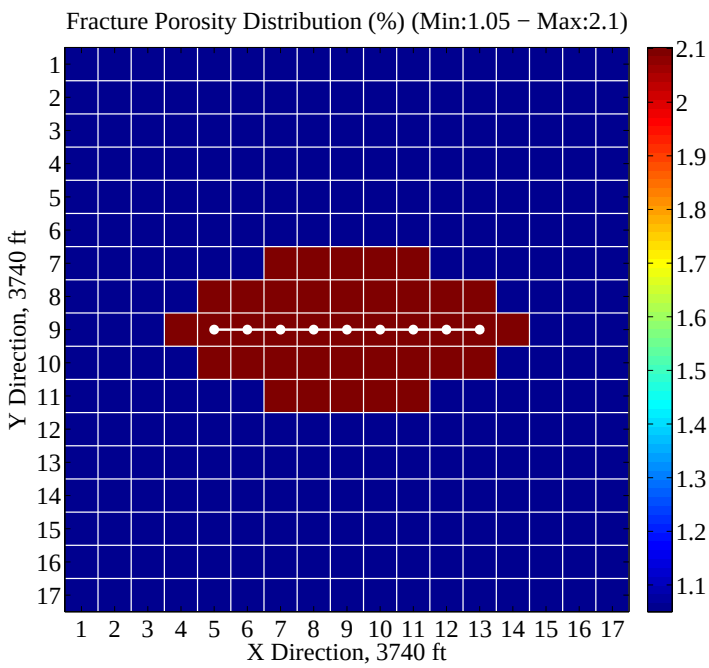


Figure 5.18. Fracture porosity values for mid-rate case

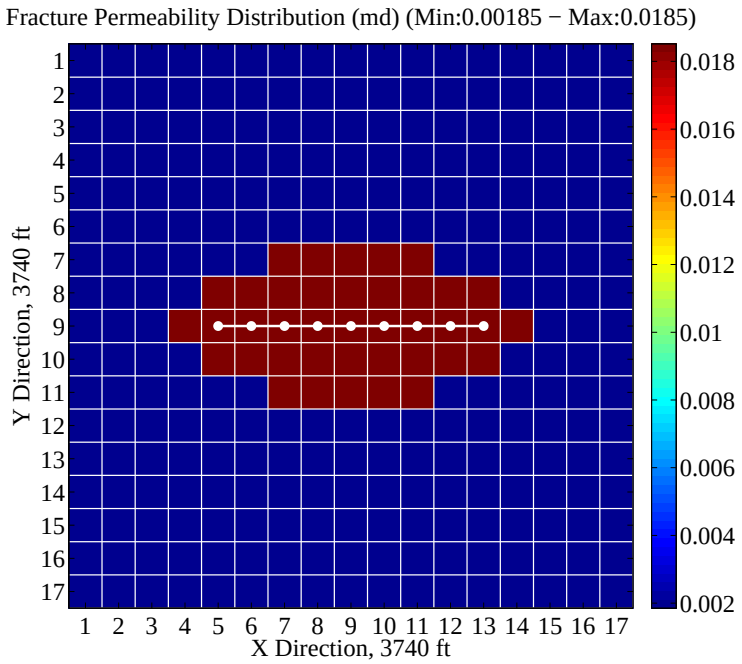


Figure 5.19. Fracture permeability values for mid-rate case

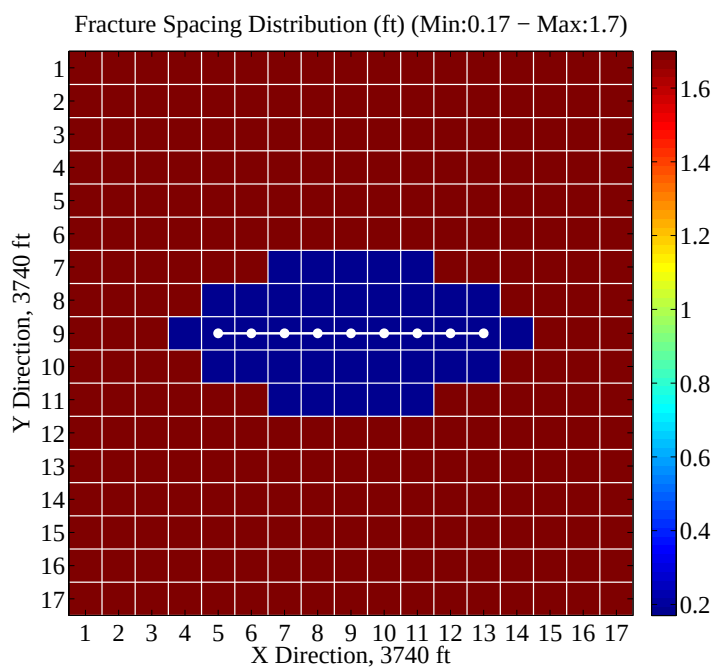


Figure 5.20. Fracture spacing values for mid-rate case

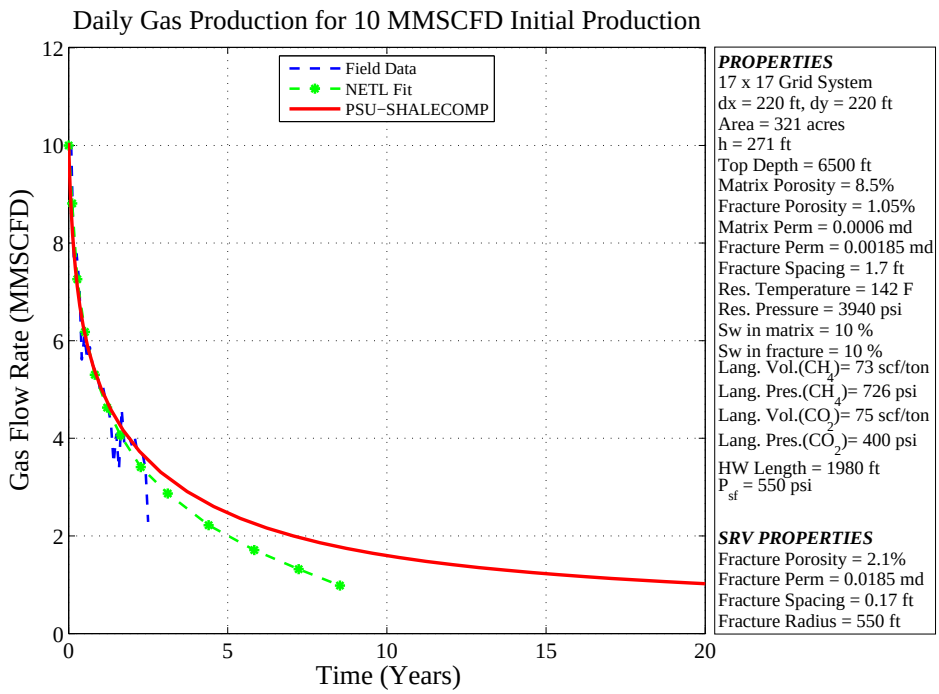


Figure 5.21. Mid-rate case daily production history match

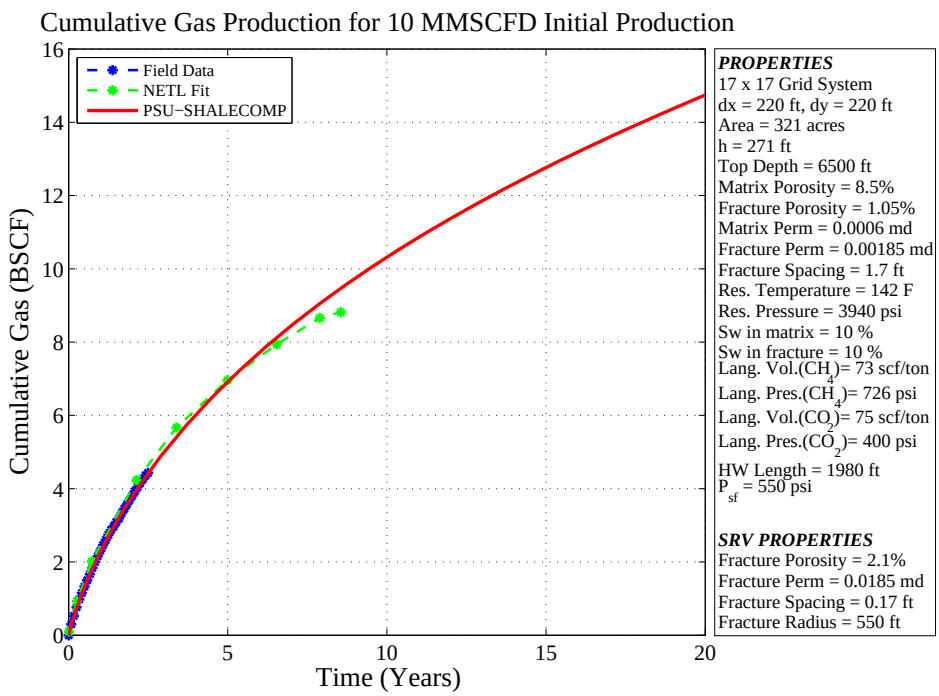


Figure 5.22. Mid-rate case 20-year cumulative production history match

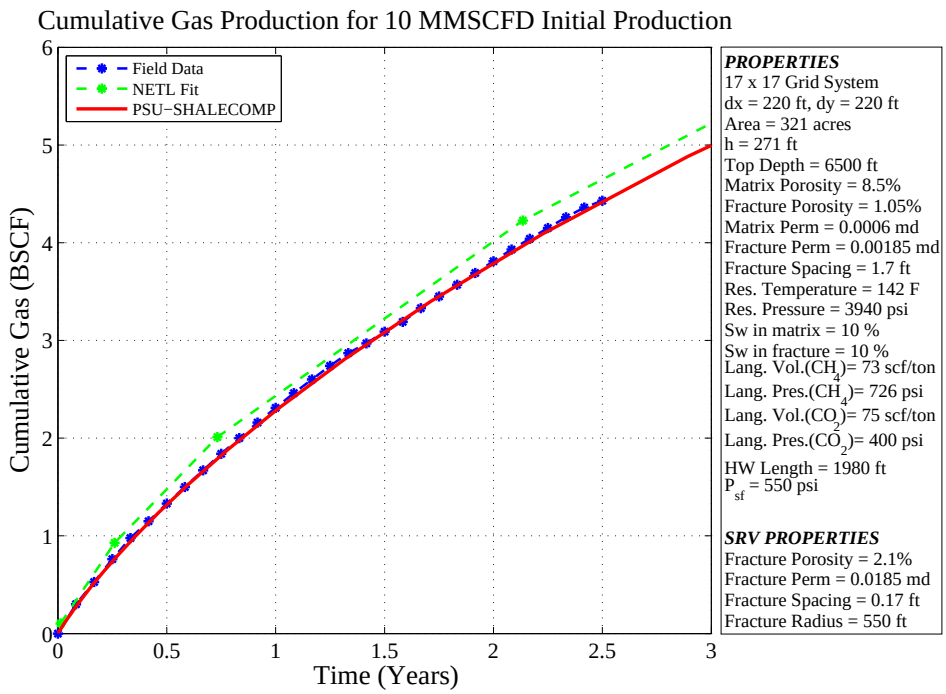


Figure 5.23. Mid-rate case 3-year cumulative production history match

The drainage area assigned in this model is rather large as a pattern area. It can be observed that the well produces almost 1 MMSFCD at the 30th year, which makes it still economical. The cumulative production (Figure 5.27) indicates that there is 17 BSCF of total CH_4 production.

The bottomhole pressure was set to 495 psi to match the initial production rate of 10 MMSCFD. The drainage area was depleted for a period of 30 years under these conditions. The average pressure of the drainage area at the end of 30 years of production was 2,970 psi (Figure 5.24). The average pressure of the *SRV* zone is 1,170 psi, and the average pressure of the unstimulated zone was 3,250 psi, with the average pressure of the well blocks at 980 psi. Such pressure distribution indicates that the reservoir can be depleted further, since the well is still capable of producing about 1 MMSCFD at the end of the 30th year (Figure 5.26). From these numbers one can conclude that:

- The average reservoir pressure is still high; the reservoir can be depleted further with the help of infill wells;
- The average pressure in the *SRV* zone is rather close to the bottomhole pressure. Therefore, most of the CH_4 comes from the *SRV* zone;

- The average pressure of the unstimulated reservoir is about 700 psi smaller than the initial reservoir pressure after 30 years of production. This observation again suggests that most of the production originates from the *SRV* zone; and

- Most of the injected CO_2 will only be stored in the *SRV* zone since the average pressure of the unstimulated reservoir is still in the neighborhood of the initial reservoir pressure. Also, formation fracturing pressure, which should not be exceeded throughout the injection period (formation fracture pressure is assumed as 5,000 psi in these simulations) constrains the volume of CO_2 injected.

CO_2 injection possibilities were investigated for the mid-rate case. Since the reservoir is almost 6 times larger than the reservoir of the low-rate case, well-block pressures reach high values after a much longer period of injection (15 years of injection was accomplished in this application). A total of 11 BSCF of CO_2 was injected (Figure 5.27).

At the 30th year, the producer was altered to an injector to inject CO_2 at 1.5 MMSCFD. The simulation was stopped when the bottomhole pressure reached 5,000 psi. At this point in time (about 15th year of injection); the average pressure of the drainage area was about 3,210 psi; the average pressure of the *SRV* was 3,650 psi; the average pressure of unstimulated zone was 3,195 psi and the average pressure of the well blocks was 4,900 psi (Figure 5.25). Again from these pressure values one can conclude that:

- The average pressure of the unstimulated reservoir is 50 psi smaller than the 30th year of depletion period. This indicates that either a very small amount of CO_2 or no CO_2 flow through the unstimulated parts of the reservoir after 15 year of injection since the permeability is in the nano-darcy range; and

- The average pressure of the *SRV* zone is 3,650 psi, which is rather close to the initial reservoir pressure. Therefore, hydraulically fractured horizontal wells in shale formations are good candidates to sequester CO_2 since their ultra-tight characteristics make them good source to store CO_2 in the long term.

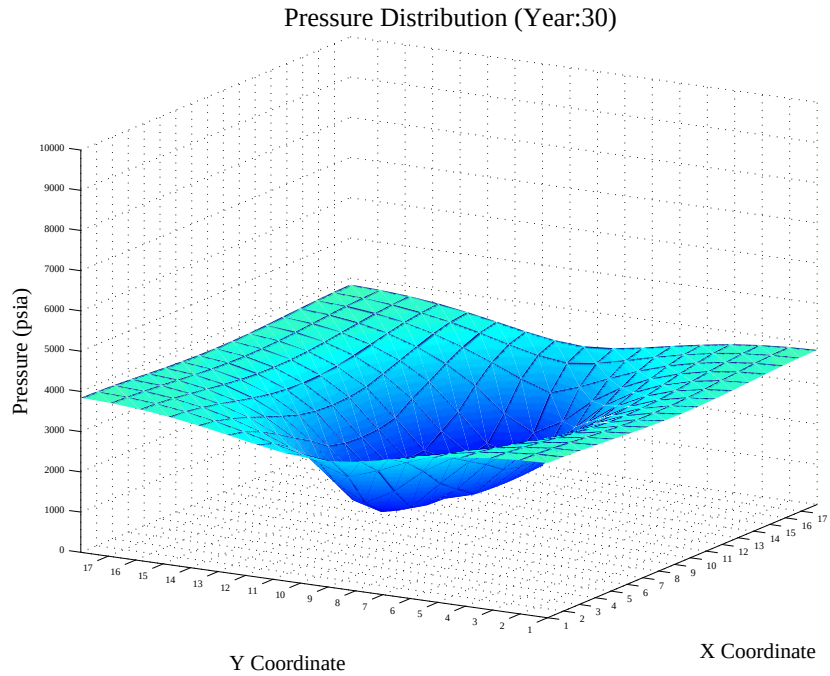


Figure 5.24. Mid-rate pressure distribution at 30th year

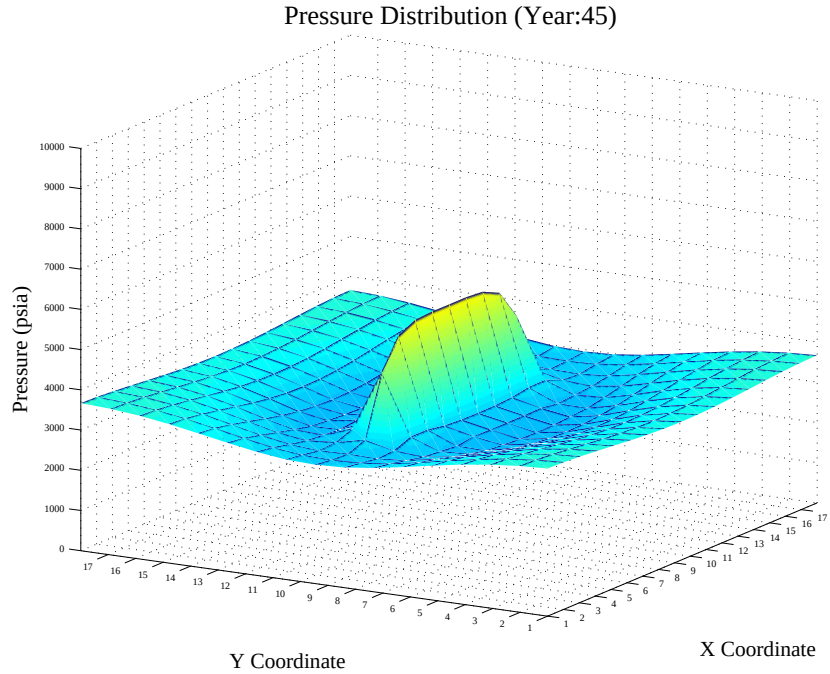


Figure 5.25. Mid-rate pressure distribution at 45th year

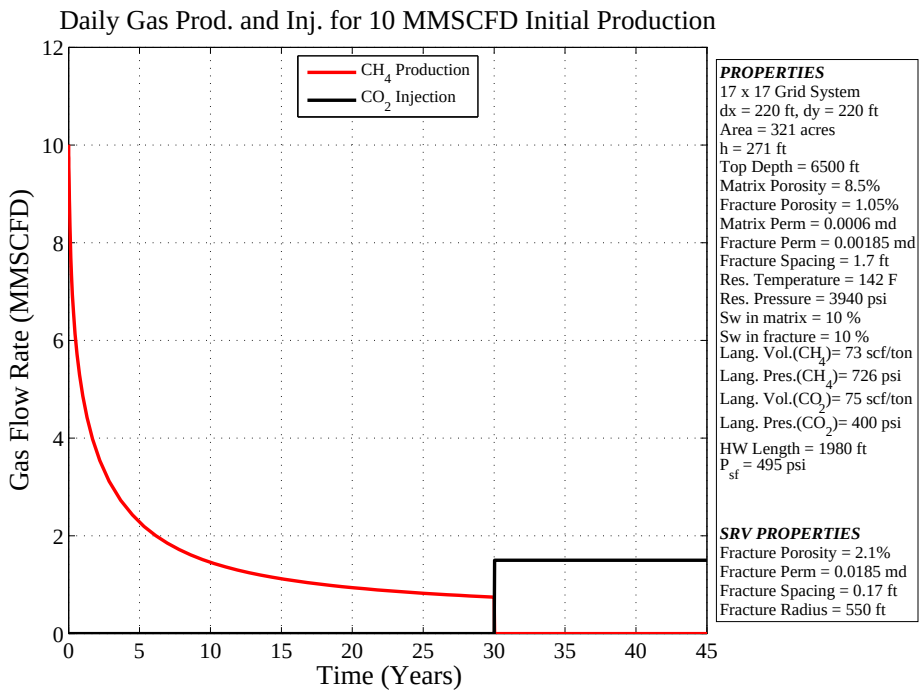


Figure 5.26. Mid-rate daily production and injection performances

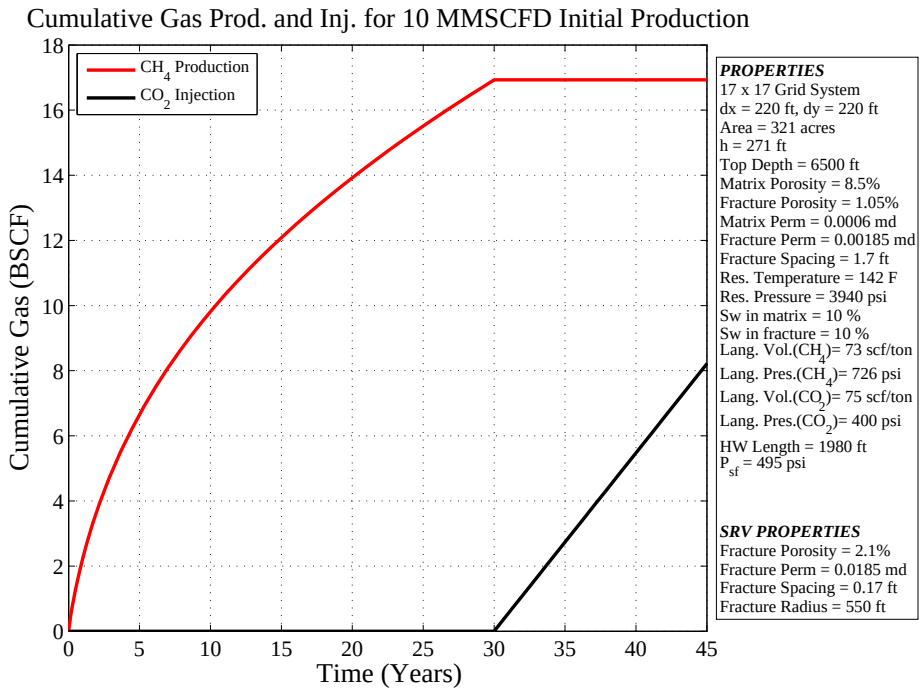


Figure 5.27. Mid-rate cumulative production and injection performances

5.1.3 High-rate Case

The reservoir area for this history match was determined to be 484 acres. The horizontal wellbore length (L_{hw}) and hydraulic fracture dimensions were adjusted to match the proposed initial production rate of 20 MMSCFD. Figure 5.28, Figure 5.29, Figure 5.30 show the top views of SRV-ϕ_f, SRV-k_f and SRV-Δx_s for high-rate, respectively. It can be seen that stimulated reservoir zones around the horizontal wellbores is rather larger to meet the initial production rate.

Figure 5.31, Figure 5.32, Figure 5.33 indicate the daily flow rate and the cumulative production of CH_4 over the simulation period. It can be seen that PSU-SHALECOMPs results had a near-perfect match against the normalized field data using the SRV concept.

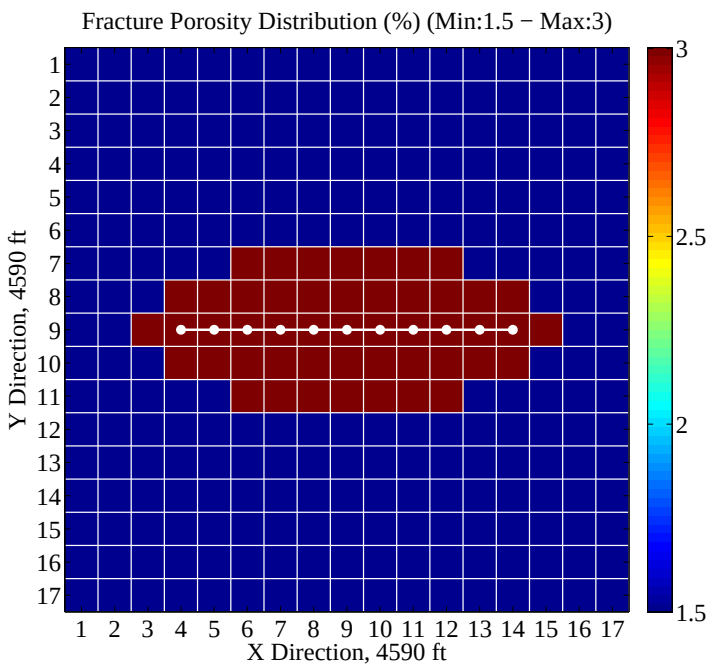


Figure 5.28. Fracture porosity values for high-rate case

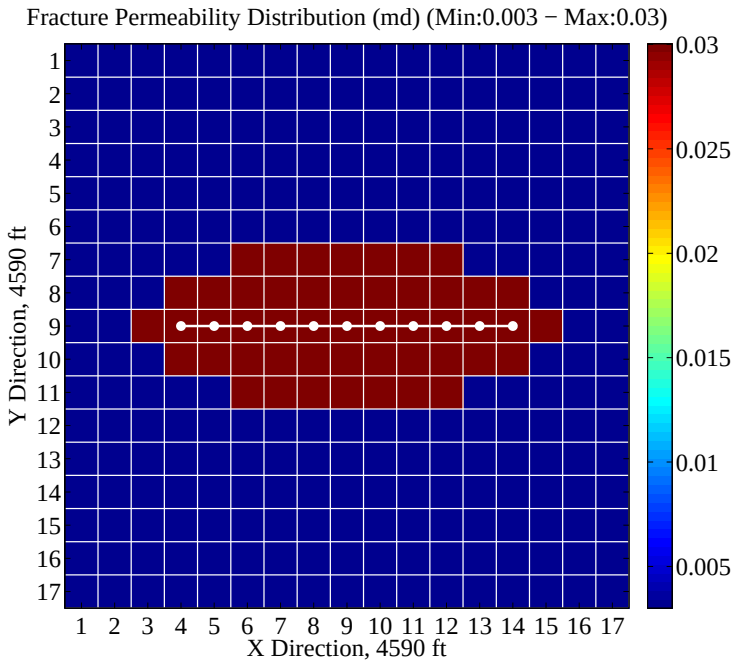


Figure 5.29. Fracture permeability values for high-rate case

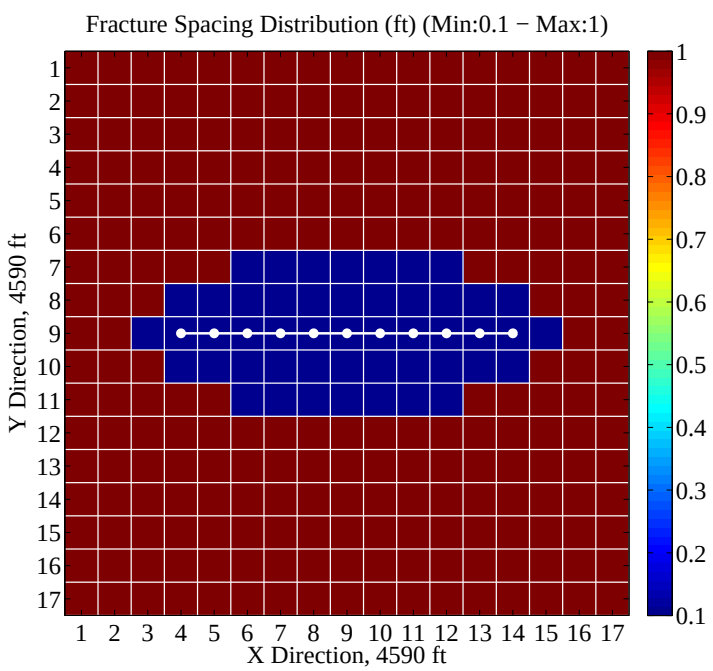


Figure 5.30. Fracture spacing values for high-rate case

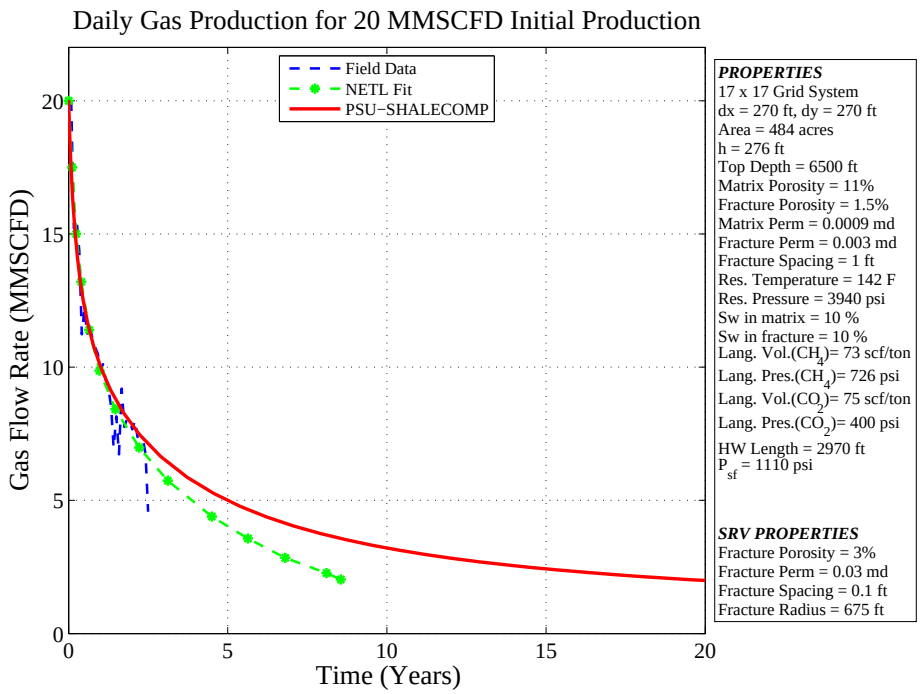


Figure 5.31. High-rate case daily production history match

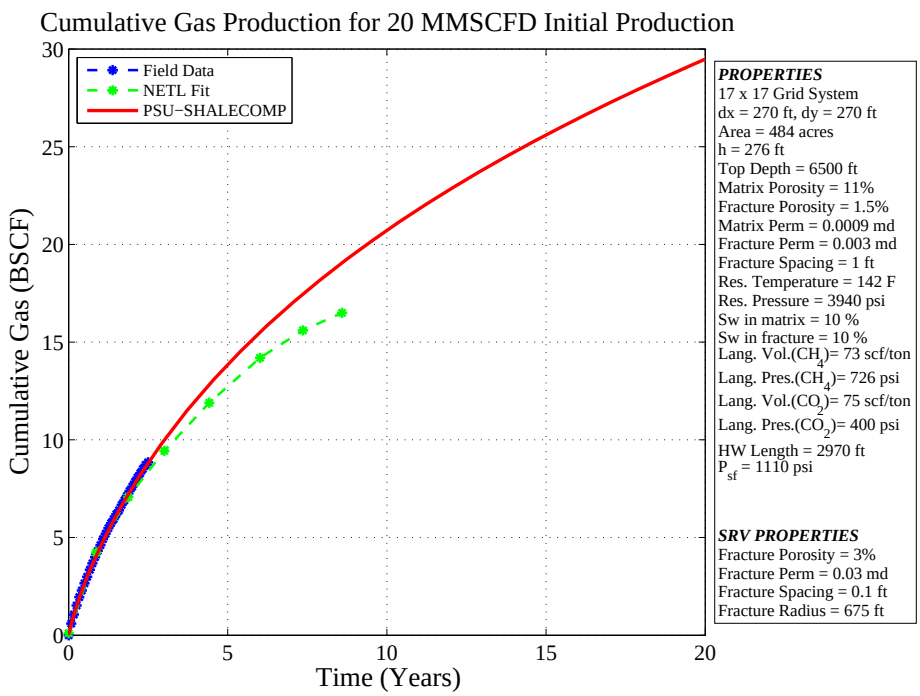


Figure 5.32. High-rate case 20-year cumulative production history match

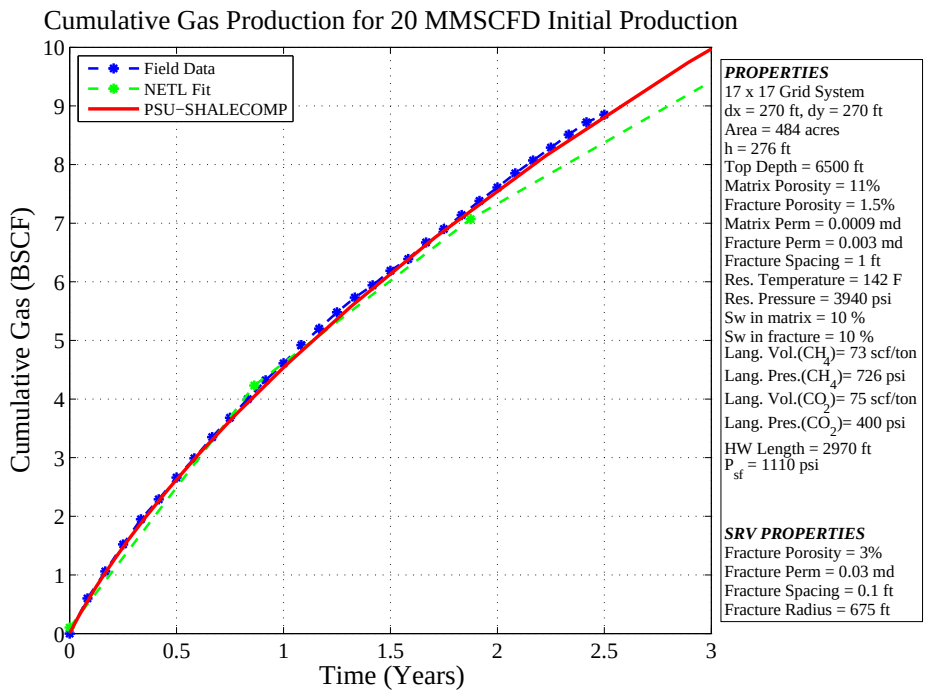


Figure 5.33. High-rate case 3-year cumulative production history match

This model is rather large in terms of area. It can be seen that the well will produce nearly 2 MMSCFD at the end of the 30th year, making it highly economical. The cumulative production chart indicates that there are 32 BSCF of total CH_4 production and 27 BSCF of total CO_2 injection during this case simulation. The simulation was stopped at the end of the 51st year as the pressure constraint was reached.

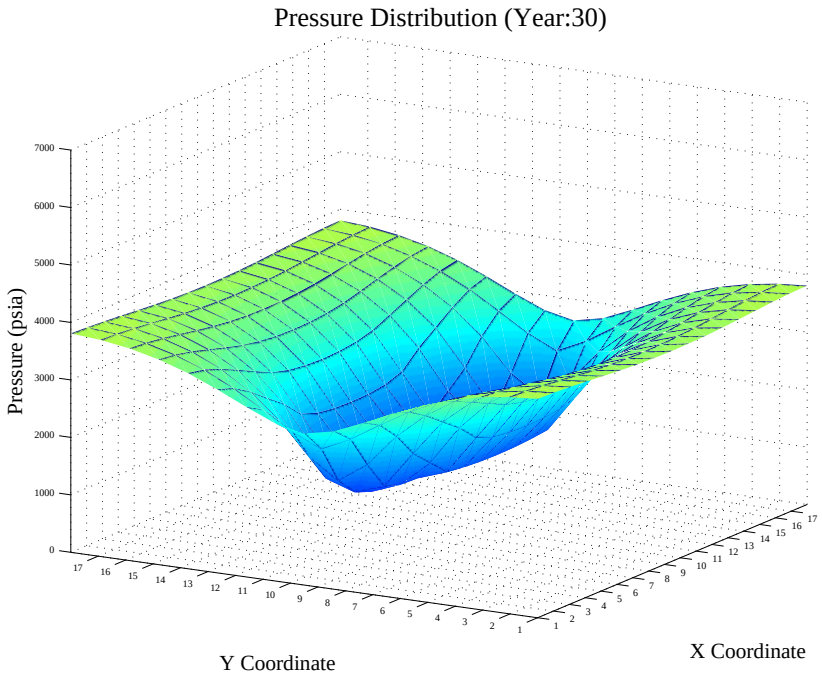


Figure 5.34. High-rate pressure distribution at 30th year

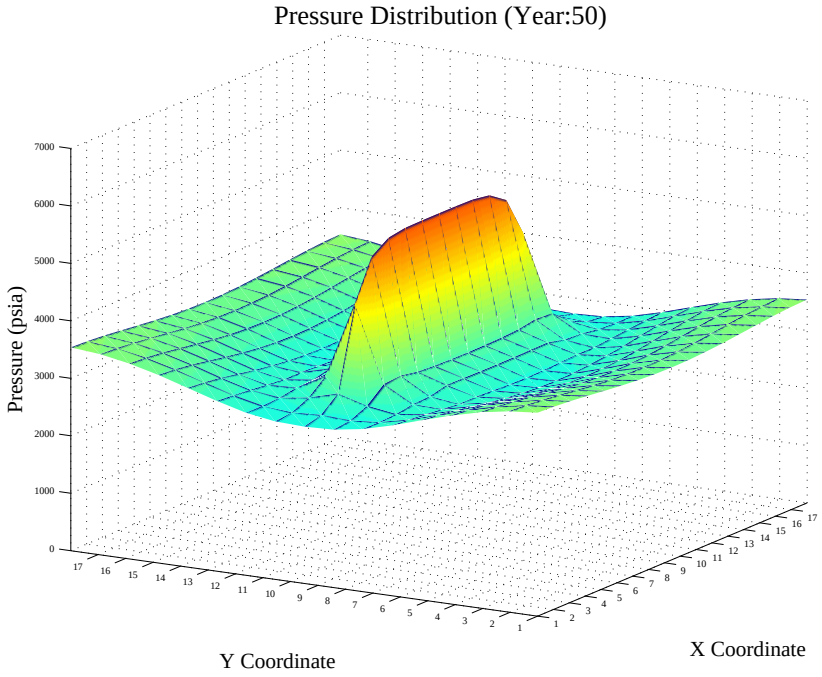


Figure 5.35. High-rate pressure distribution at 50th year

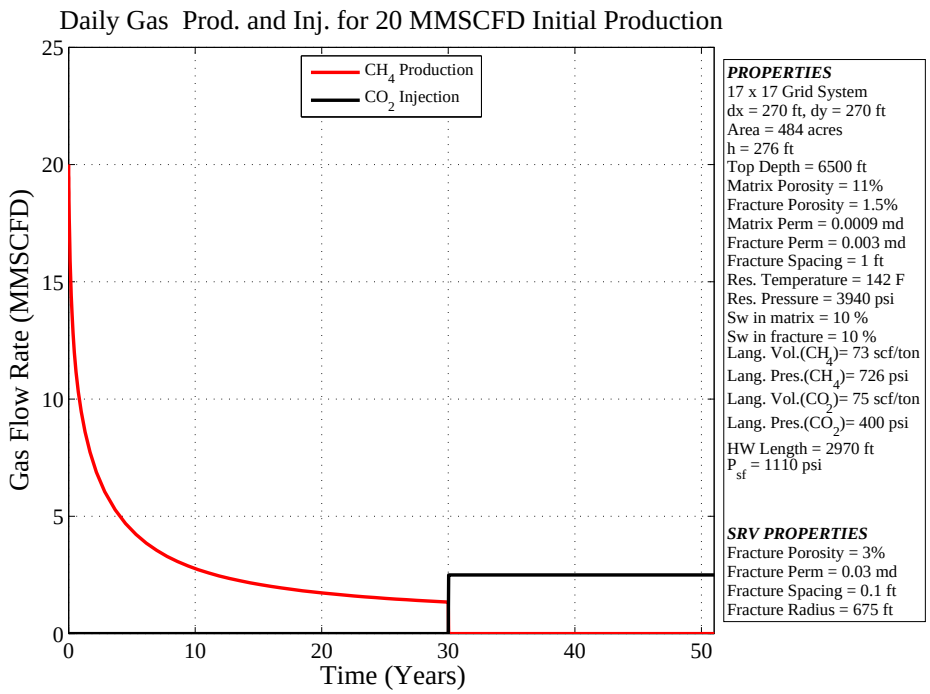


Figure 5.36. High-rate daily production and injection performances

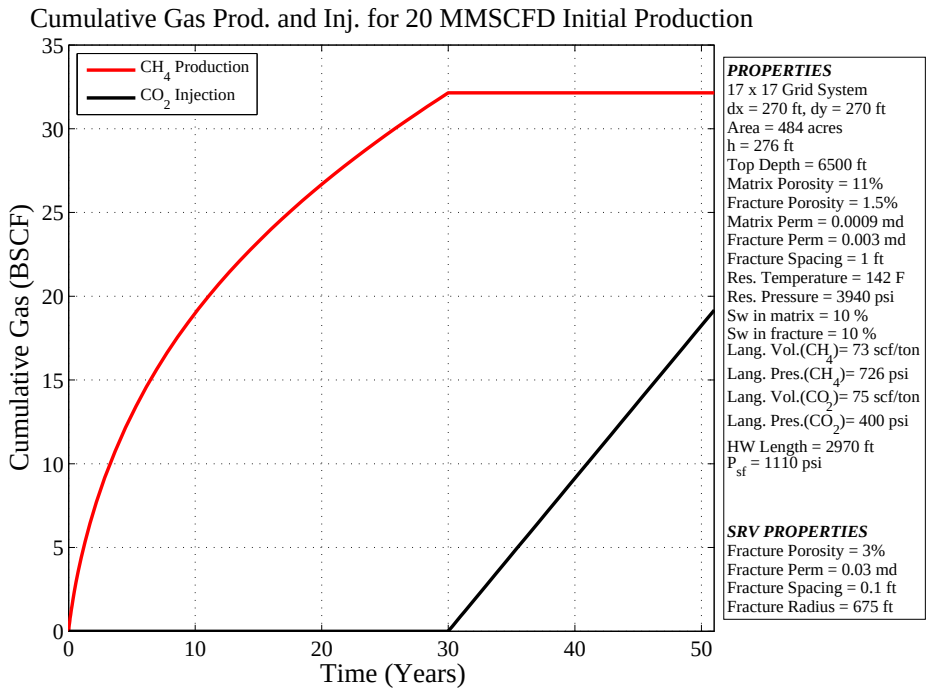


Figure 5.37. High-rate cumulative production and injection performances

Without hydraulic fracturing, volumetric flow rate of CO_2 in the unstimulated zone is quite small. The mole fraction of CO_2 in a neighboring unstimulated grid-block to a stimulated grid-block is only 5% after 30 years of injection (Figure 5.38, Figure 5.39, Figure 5.40).

From these case studies it can be concluded that to provide a good history match for the low-rate case (1 MMSCFD initial production rate), the lowest values need to be selected for thickness, fracture and matrix porosity values, and fracture and matrix permeability values from the ranges that are provided by the DOE while the highest value must be selected for fracture spacing. Drainage area, L_{hw} and the SRV values should also be kept comparatively small as compared to mid-rate and high-rate cases.

Although the PSU-SHALECOMP simulator matched the normalized field data effectively, the low-rate case should not be considered as a practical scenario for production of CH_4 and injection of CO_2 because the drainage area (53 acres), horizontal wellbore length (500 feet) and SRV values were required to be unrealistically small. Accordingly, mid-rate and high-rate cases are considered to be more realistic scenarios for shale reservoirs. Accordingly, mid-rate and high-rate cases are used in most of the ongoing investigations.

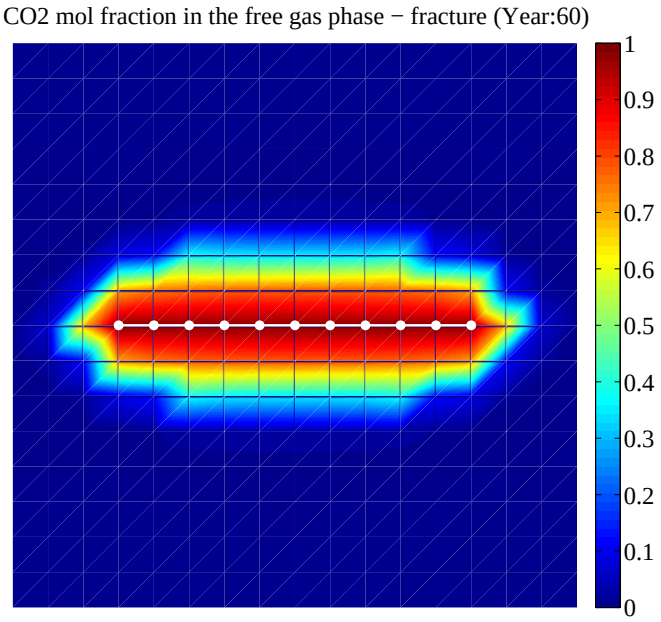


Figure 5.38. CO_2 mole frac. in the free gas phase - fracture

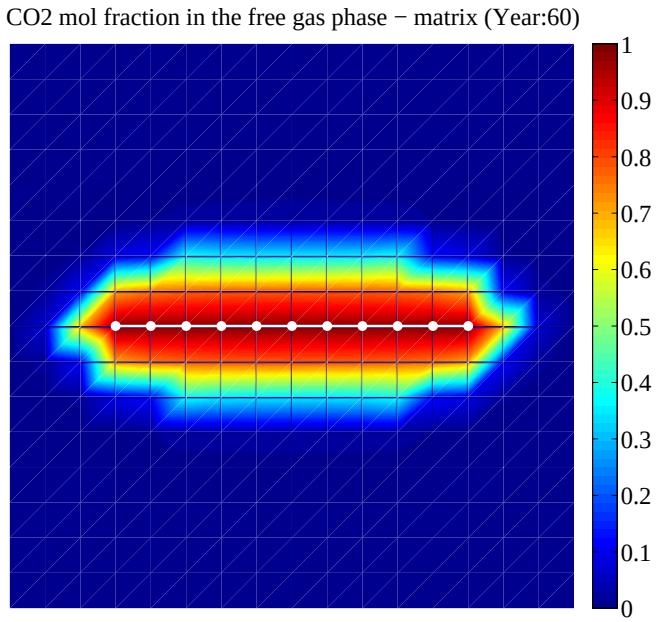


Figure 5.39. CO_2 mole frac. in the adsorbed phase - matrix

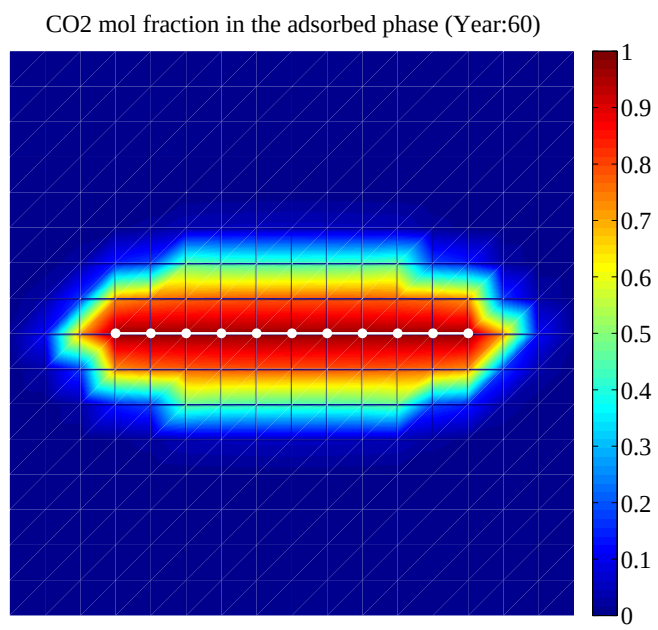


Figure 5.40. CO_2 mole fraction in the adsorbed phase

Chapter 6

Results and Discussions

This chapter discusses the results obtained for different reservoir parameters and wellbore designs made by the use of PSU-SHALECOMP and *SRV* zone approach. These investigations involve the following cases:

- Monte Carlo simulation studies to find out the probability of original gas in place (OGIP), cumulative CH_4 production and CO_2 injection values
- Altered injection starting times
- Investigation of different adsorption capacities
- Cyclic pressure pulsing possibilities
- Investigation of different *SRV* parameters
- Altered CO_2 injection rates
- Investigation on CO_2 Breakthrough Times

6.1 Monte Carlo Simulation Study

Monte Carlo simulation is an alternative to both deterministic estimation and scenario approach, and it is used to find that presents three cases: worst, likely and most. A Monte Carlo simulation initiates with a model. For instance, one form of a volumetric model for gas in place is selected.

The define the volumetric model, area, thickness, porosity, water saturation and formation volume factor is needed as input parameters that produce an output parameter, which is original gas in place (OGIP) in this study [42].

Once a range specified for each parameter, then a set of numbers needed to be generated within the given ranges randomly for every single parameter. Every single data set does result in an output value. A Monte Carlo simulation consist of hundreds or thousands of repeated trials so the output values of these data sets are stored, which is 2,000 realizations in this study. The next phase is grouping these outputs in a histogram or a cumulative distribution function. Commonly, these histograms are in triangular, uniform, normal, and lognormal form. However, there are less common types exist that are beta, gamma, Weibull, and Pareto [42]. Triangle forms are often seen in CBM and shale gas reservoirs. The advantage of triangular forms is the ability of adapting because they can be symmetric or skewed either left or right [43]. Lognormal distributions are the most common form that fits most of the volumetric model inputs. If all of the inputs have lognormal form of distribution without truncation, and independent of one another, the product can be obtained analytically [44].

In this study, *SRV* fracture porosity (*SRV*-ϕ_f), *SRV* fracture permeability (*SRV*-k_f), *SRV* fracture spacing (*SRV*-Δx_s), and Langmuir volume of CO_2 (V_{L-CO_2}) are not independent; they are dependent on fracture porosity (ϕ_f), fracture permeability (k_f), fracture spacing (Δx_s), and Langmuir volume of CH_4 (V_{L-CH_4}), respectively. It is observed that if there is dependency between some of the input parameters, it creates significant lognormality. To reiterate, there is a dependency between fracture permeability (k_f) and *SRV* fracture permeability (*SRV*-k_f), i.e, *SRV*-k_f is dependent on k_f and always larger than k_f because the formation is hydraulically fractured. Thus, *SRV* zone has larger permeability. This creates additional lognormality in the histograms such as cumulative CH_4 production and cumulative CO_2 injection histograms, which are highly dependent on the input parameters that affect the dynamic properties (fluid flow) of the reservoir.

Two Monte Carlo simulation studies were conducted as a total of 2,000 simulation runs were made for randomly generated thickness, matrix porosity, fracture porosity, *SRV* fracture porosity, matrix permeability, fracture permeability, *SRV* fracture permeability, fracture spacing, *SRV* fracture spacing, Langmuir volume constants for CH_4 and CO_2, and Langmuir pressure constants for CH_4 and CO_2. In all of the realizations the well is put on production for 30 years.

In the first Monte Carlo simulation (Study-A), a specified injection rate of 1.5 MMSCFD is utilized. Injection stopping criteria of Study-A is the bottomhole pressure that is 6,000 psi. The second Monte Carlo simulation (Study-B) study is conducted for a specified injection pressure of 6,000 psi. Injection stopping criteria of Study-B is the injection rate that is 500,000 SCFD.

Table 6.1 show the parameters that are used for Study-A and Study-B. Table 6.2 show the values that are varied for these studies. The values in Table 5.2 and 5.3 are used for relative permeability values.

Table 6.1. Reservoir and wellbore design parameters for Monte Carlo studies
Source: NETL - US Department of Energy

Parameter	Value	Unit
Grid size on X direction (L_x)	200*25	ft
Grid size on Y direction (L_y)	150*13	ft
Area (A)	224	acres
Depth (D)	6,500	ft
Reservoir Temperature (T_i)	142	F
Reservoir Pressure (P_i)	3,940	psi
Water Saturation in Fracture ($S_{w,f}$)	0.1	%
Horizontal Wellbore Length (L_{hw})	3,000	ft
Hydraulic Fracture Length (L_f)	750	ft
Production Constraint ($P_{sf-prod}$)	14.7	psi
Study-A Injection Constraint (q_{sf-inj})	1.5	MMSCFD
Study-A Injection Stopping Criteria ($P_{sf-inj-STOP}$)	6,000	psi
Study-B Injection Constraint (P_{sf-inj})	6,000	psi
Study-B Injection Stopping Criteria ($q_{sf-inj-STOP}$)	500,000	SCFD

Table 6.2. Varied parameters for Monte Carlo studies

Source: NETL - US Department of Energy

Parameter	min	max	Unit
Thickness (h)	100	300	ft
Matrix Porosity (ϕ_m)	6	11	%
Fracture Porosity (ϕ_f)	0.6	1.5	%
SRV Fracture Porosity (*SRV*-ϕ_f)	1.2*ϕ_f	1.5*ϕ_f	%
Matrix Permeability (k_m)	0.0003	0.0009	md
Fracture Permeability (k_f)	0.0007	0.0030	md
SRV Fracture Permeability (*SRV*-k_f)	2*k_f	10*k_f	md
Fracture Spacing (Δx_s)	0.9	2.5	ft
SRV Fracture Spacing (*SRV*-Δx_s)	0.4*Δx_s	0.8*Δx_s	ft
Water Saturation in Matrix ($S_{w,m}$)	6	13	%
Langmuir Volume of CH_4 (V_{L-CH_4})	50	250	scf/ton
Langmuir Pressure of CH_4 (P_{L-CH_4})	200	1,000	psi
Langmuir Volume of CO_2 (V_{L-CO_2})	2* V_{L-CH_4}	6* V_{L-CH_4}	scf/ton
Langmuir Pressure of CO_2 (P_{L-CO_2})	200	1,000	psi

6.1.1 Study-A

The results of Monte Carlo simulation for a specified injection rate of 1.5 MMSCFD study indicate that the uncertainty for OGIP is quite large, varying between 20 BCF to 100 BCF (Figure 6.1) over the total acreage of 224 acres. Lognormal fit is the best fit to OGIP distribution. Similar to OGIP distribution, the original gas in place that exists in the *SRV* zone also investigated due to the fact that majority of the production exploited from this zone. It is found out that the *SRV*-OGIP distribution follows the same trend as OGIP frequency (Figure 6.2) and has a range from 5 BSCF to 20 BCSF. The stopping criteria for these simulations is the fracturing pressure of 6,000 psi. Therefore, the simulations stop when the bottomhole pressure reached 6,000 psi.

The cumulative CH_4 production frequency figure has a lognormal distribution indicating that the highest probability for 30 years of CH_4 production is in the range of 5 BCF to 35 BCF (Figure 6.3). Figure 6.4 shows the cumulative CO_2 injection frequency that has also lognormal

distribution. The frequency of cumulative CO_2 injection histogram show that the range is in 2 BCF to 40 BCF and highly lognormal. The frequency of total injection time of CO_2 histogram (Figure 6.5) show that the range varies from 2 years to 50 years of injection period.

Figures 6.6, 6.7, 6.8, 6.9, 6.10 show the probability distributions for OGIP, *SRV*-OGIP, cumulative CH_4 production, cumulative CO_2 injection and total CO_2 injection time values. Figure 6.6 indicates that P_{90}, P_{50} and P_{10} values are 33.6, 55.5 and 81.6 BSCF for OGIP, respectively. Figure 6.7, which gives more information about possible CH_4 production, indicates that P_{90}, P_{50} and P_{10} values are 6.1, 10.3 and 15.4 BSCF for *SRV*-OGIP, respectively. Figure 6.8 shows that P_{90}, P_{50} and P_{10} values are 11.1, 17.6 and 26.3 BSCF, respectively. Figure 6.9 shows P_{90}, P_{50} and P_{10} values for CO_2 injection probabilities that are 3.7, 8.4 and 20.3 BSCF, respectively. Figure 6.10 shows P_{90}, P_{50} and P_{10} values for total CO_2 injection time probabilities that are 5.1, 11.5 and 27.7 years, respectively, for given CO_2 injection constraint that is 1.5 MMSCFD.

Table 6.3 summarizes Study-A. P_{90}, P_{50} and P_{10} values for OGIP, *SRV*-OGIP, cumulative CH_4 production, cumulative CO_2 injection and total CO_2 injection time can be found in the following table. This shows that about 30% of the OGIP can be produced in 30 years of time and about 50% of produced CH_4 can be replaced with injected CO_2 in 11.5 years of injection time with 1.5 MMSCFD of CO_2 injection rate for the P_{50} case.

Table 6.3. P_{90}, P_{50} and P_{10} values of Study-A

Probability	P90	P50	P10
OGIP (BSCF)	33.6	55.5	81.6
SRV-OGIP (BSCF)	6.1	10.3	15.4
Cumulative CH_4 production (BSCF)	11.1	17.6	26.3
Cumulative CO_2 injection (BSCF)	3.7	8.4	20.3
Total CO_2 injection time (years)	5.1	11.5	27.7

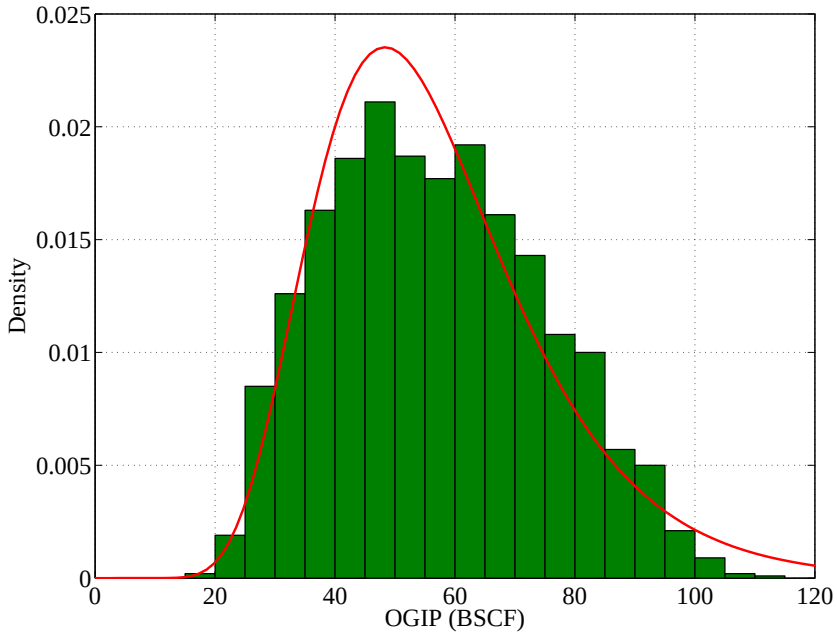


Figure 6.1. OGIP histogram results of Study-A frequency functions

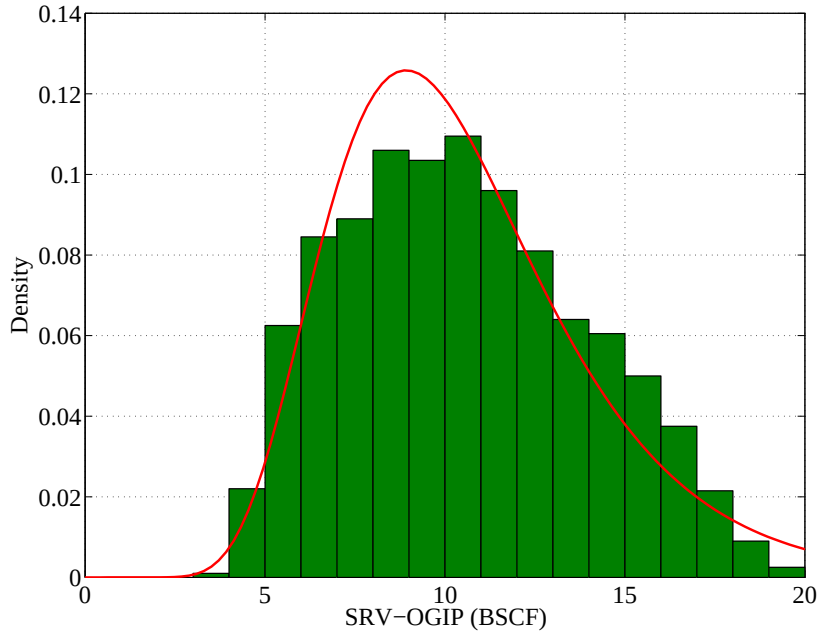


Figure 6.2. *SRV*-OGIP histogram results of Study-A frequency functions

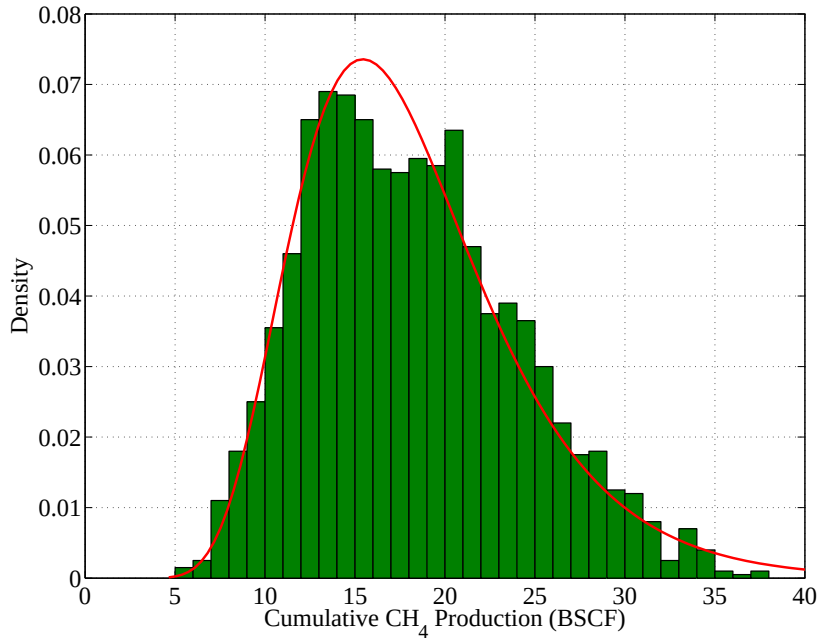


Figure 6.3. Cumulative CH_4 production histogram results of Study-A frequency functions

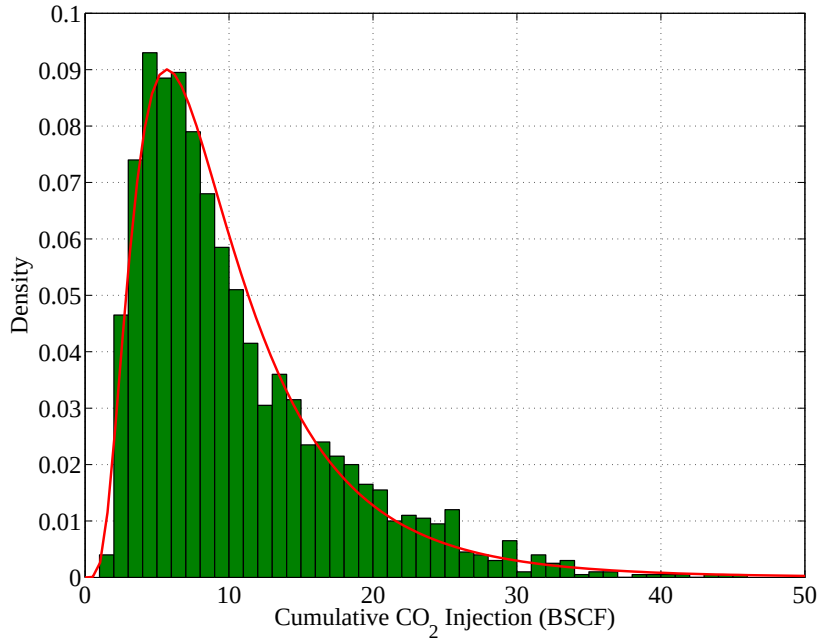


Figure 6.4. Cumulative CO_2 injection histogram results of Study-A frequency functions

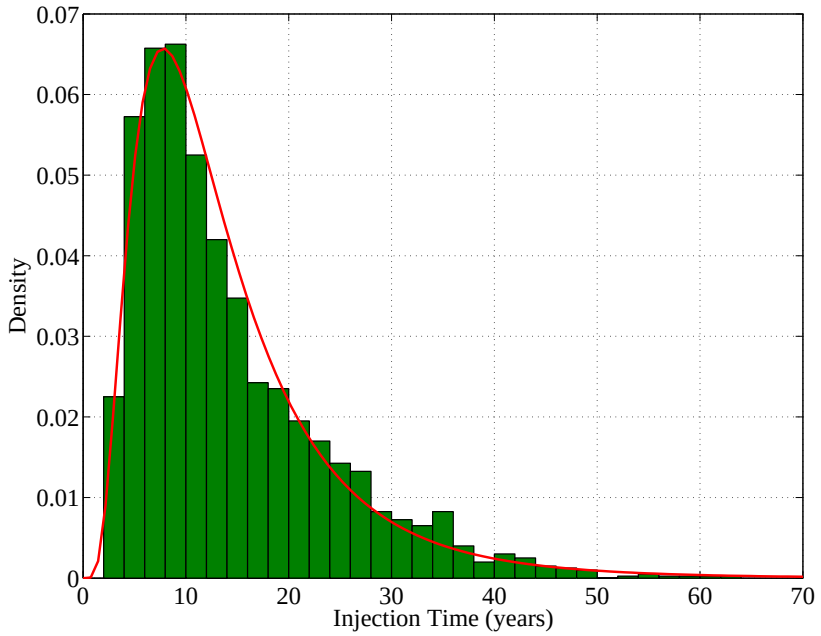


Figure 6.5. Total injection time histogram results of Study-A frequency functions

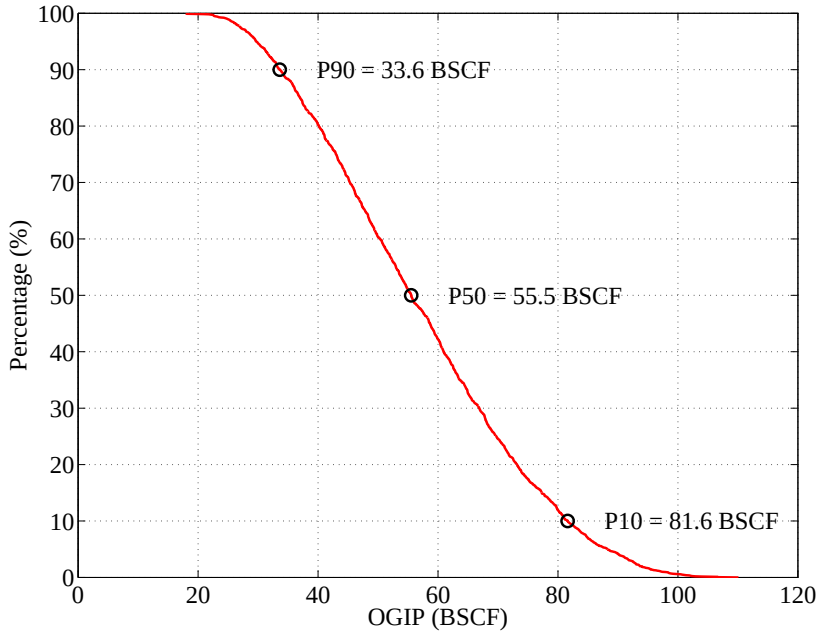


Figure 6.6. OGIP distribution function results of Study-A

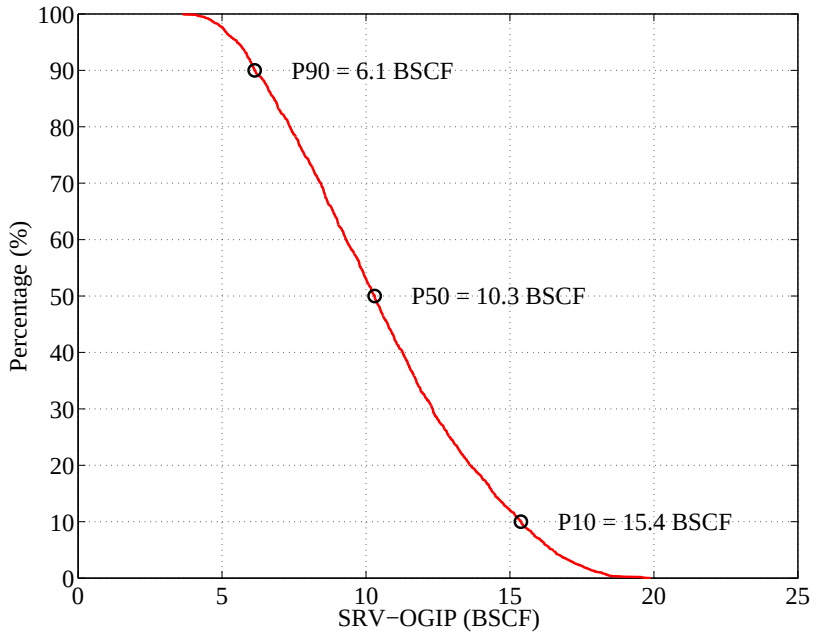


Figure 6.7. *SRV*-OGIP distribution function results of Study-A

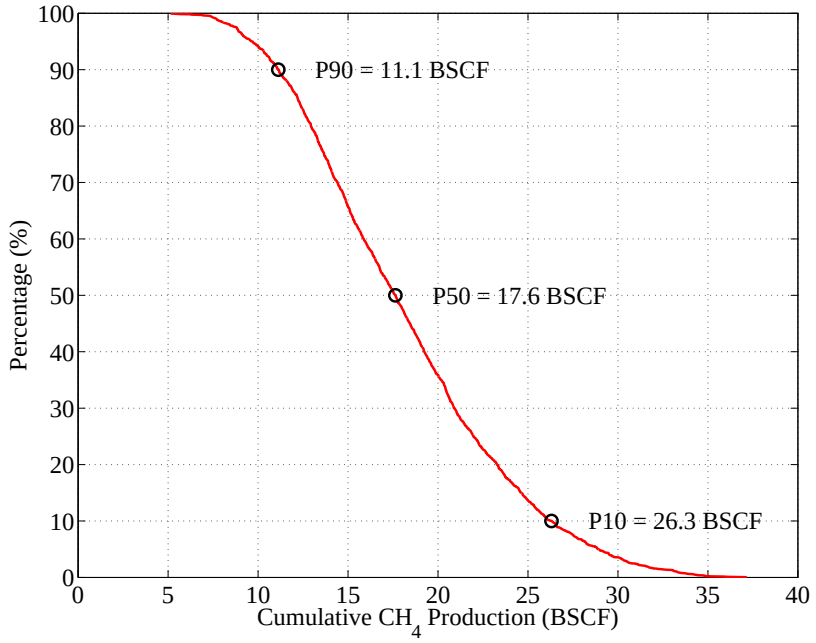


Figure 6.8. Cumulative CH_4 production distribution function results of Study-A

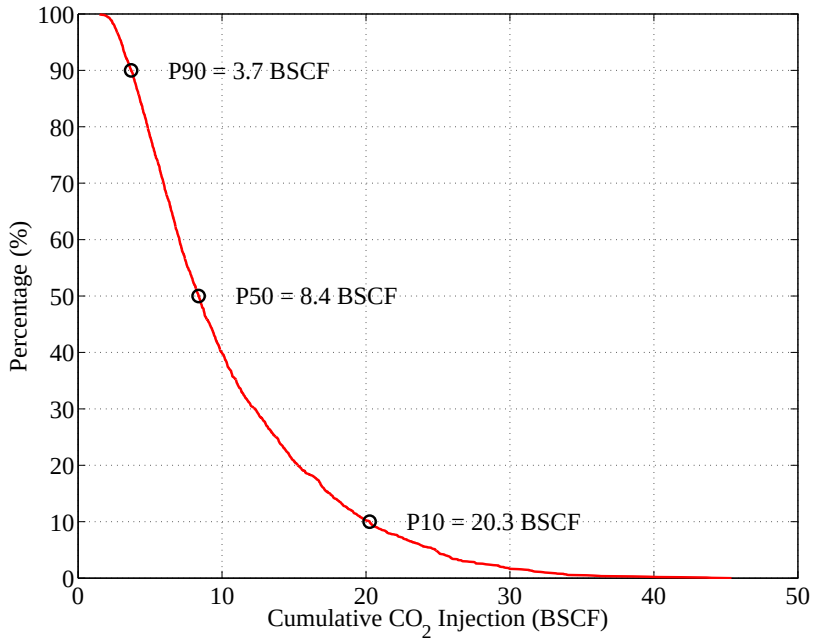


Figure 6.9. Cumulative CO_2 injection distribution function results of Study-A

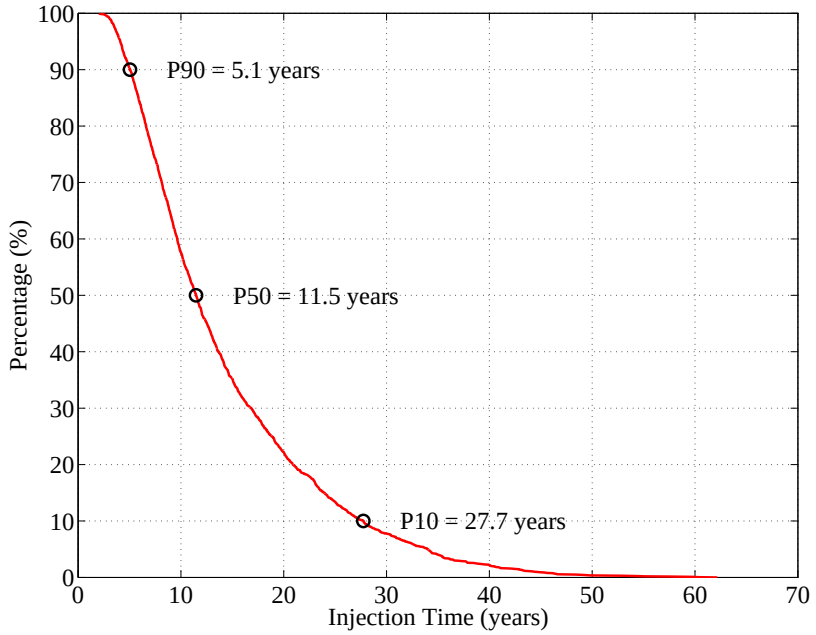


Figure 6.10. Total injection time distribution function results of Study-A

6.1.2 Study-B

In the second part of the Monte Carlo study, which is done for a specified injection pressure of 6,000 psi, random combinations of thickness, matrix porosity, fracture porosity, *SRV* fracture porosity, matrix permeability, fracture permeability, *SRV* fracture permeability, fracture spacing, *SRV* fracture spacing, Langmuir volume constants for CH_4 and CO_2, and Langmuir pressure constants for CH_4 and CO_2 are considered. In this study, injection stopping criteria is set as an injection rate of CO_2 of 500,000 SCFD. A total of 2,000 realizations are considered. Table 6.1 and Table 6.2 show the input data used and the data ranges that are used in these simulation runs.

Figure 6.11 shows histogram of Study-B frequency functions that has lognormal distribution and has a range from 20 to 110 BSCF. Figure 6.12 shows histogram of Study-B frequency functions that has lognormal distribution and has a range from 5 to 20 BSCF. The cumulative CH_4 production frequency figure has a lognormal distribution indicating that the highest probability for 30 years of CH_4 production is in the range of 5 BCF to 30 BCF (Figure 6.13). Figure 6.14 shows the cumulative CO_2 injection frequency that has also lognormal distribution. The frequency of cumulative CO_2 injection histogram show that the range is in 1 BCF to 32 BCF and also has a lognormal fit. The frequency of total injection time of CO_2 histogram (Figure 6.15) show that the range varies from 2 years to 70 years of injection period, which is the end of simulations, 30 years of production and 70 years of total injection time.

Figures 6.16, 6.17, 6.18, 6.19, 6.20 show the probability distributions for OGIP, cumulative CH_4 production and cumulative CO_2 injection values for Study-B. Figure 6.16 indicates that P_{90}, P_{50} and P_{10} values are 31.6, 49.9 and 76.3 BSCF for OGIP, respectively. Figure 6.17, which gives more information about possible CH_4 production, indicates that P_{90}, P_{50} and P_{10} values are 5.9, 9.3 and 14.4 BSCF for *SRV*-OGIP, respectively. Figure 6.18 shows that P_{90}, P_{50} and P_{10} values are 10.2, 15.6 and 22.2 BSCF, respectively. Figure 6.19 also shows P_{90}, P_{50} and P_{10} values for CO_2 injection probabilities that are 3.4, 11.1 and 22.1 BSCF, respectively. Figure 6.20 shows P_{90}, P_{50} and P_{10} values for total CO_2 injection time probabilities that are 9.9, 31.2 and 57.8 years, respectively, for given CO_2 injection constraint that is 6,000 psi.

Table 6.4 summarizes Study-B. P_{90}, P_{50} and P_{10} values for GIP, *SRV*-OGIP, cumulative CH_4 production, cumulative CO_2 injection and total CO_2 injection time can be found in the following

table. This shows that about 31% of the OGIP can be produced in 30 years of time and about 71% of produced CH_4 can be replaced with injected CO_2 in 11.5 years of injection time with 1.5 MMSCFD of CO_2 injection rate for the P_{50} case.

Table 6.4. P_{90}, P_{50} and P_{10} values of Study-B

Probability	P90	P50	P10
OGIP (BSCF)	31.6	49.9	76.3
SRV-OGIP (BSCF)	5.9	9.3	14.4
Cumulative CH_4 production (BSCF)	10.2	15.6	22.2
Cumulative CO_2 injection (BSCF)	3.4	11.1	22.1
Total CO_2 injection time (years)	9.9	31.2	57.8

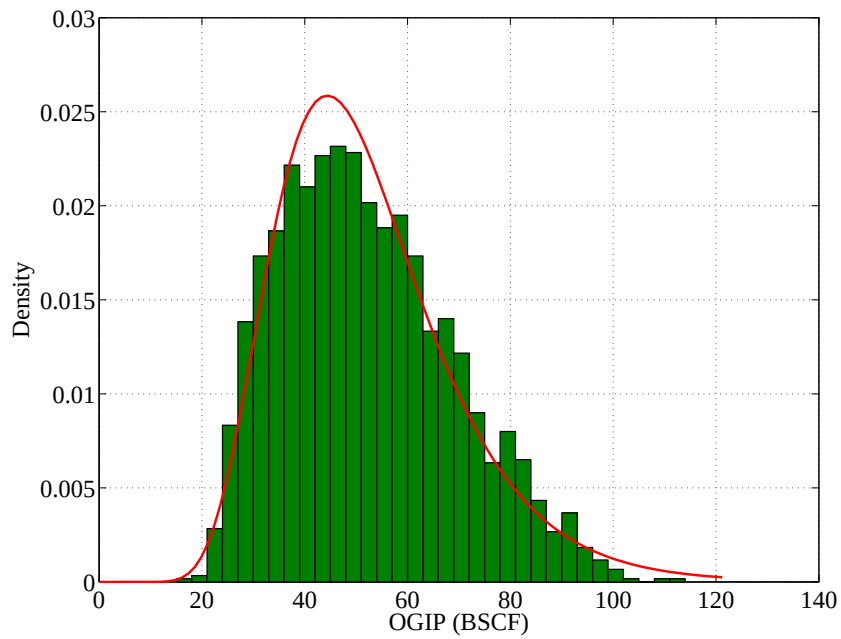


Figure 6.11. OGIP histogram results of Study-B frequency functions

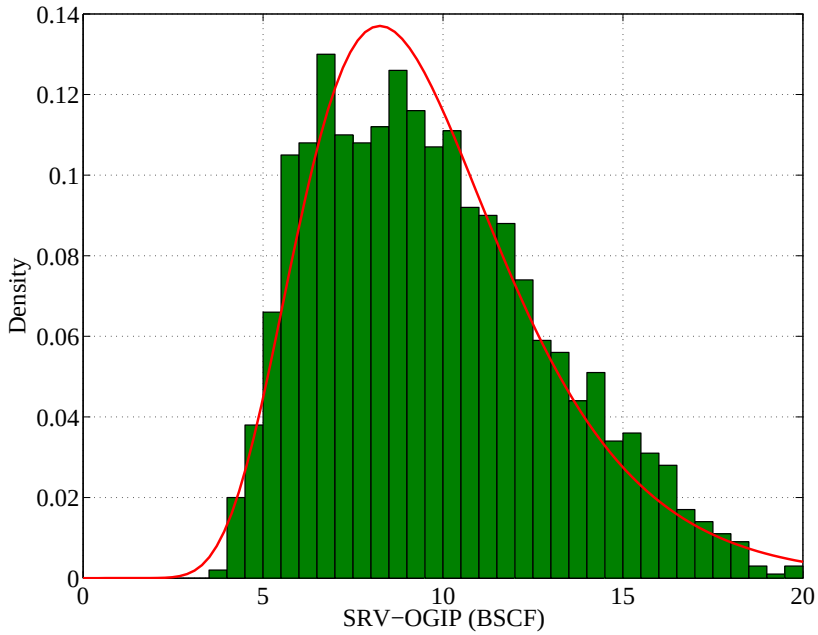


Figure 6.12. *SRV*-OGIP histogram results of Study-B frequency functions

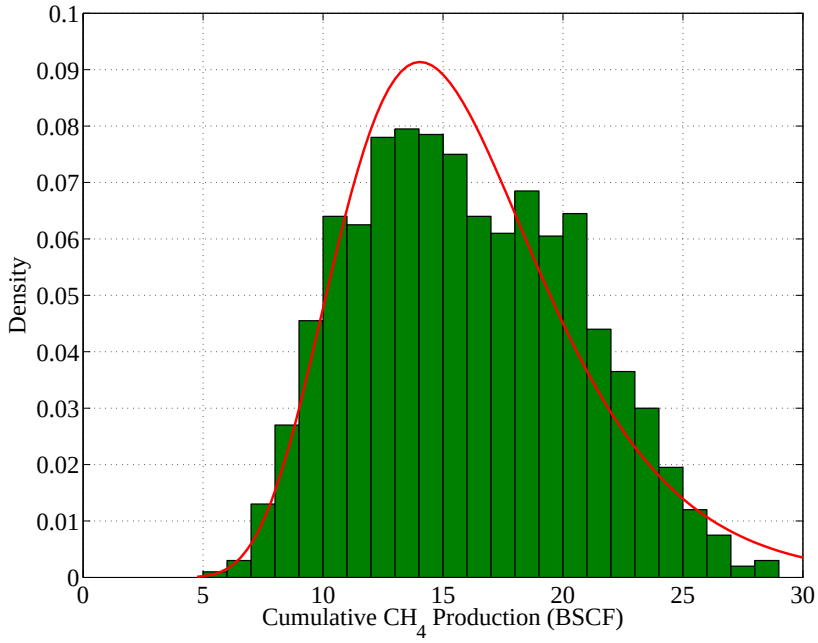


Figure 6.13. Cumulative CH_4 production histogram results of Study-B frequency functions

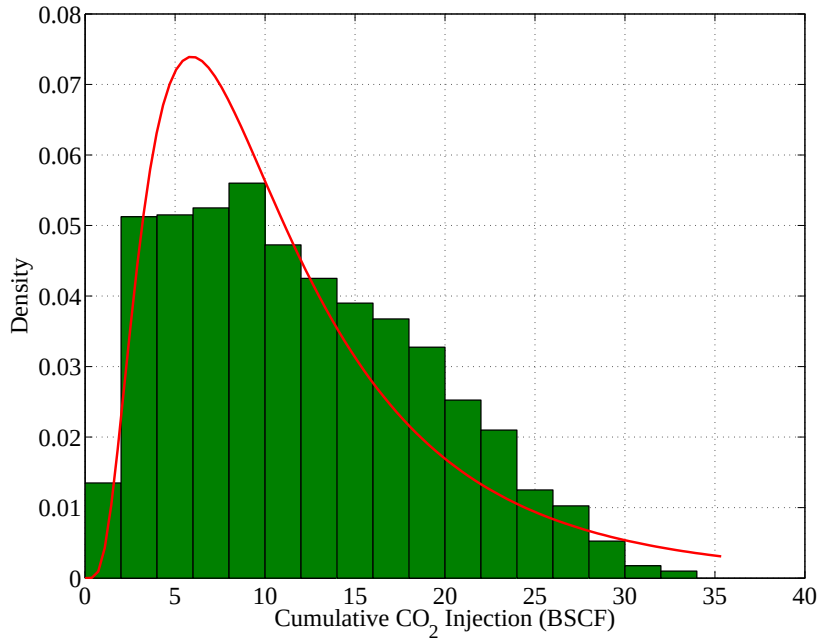


Figure 6.14. Cumulative CO_2 injection histogram results of Study-B frequency functions

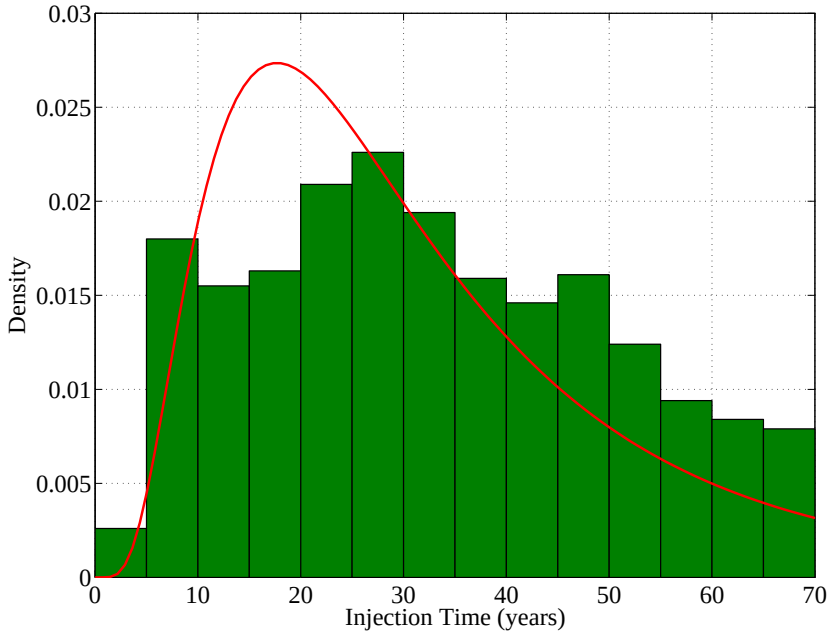


Figure 6.15. Total injection time histogram results of Study-B frequency functions

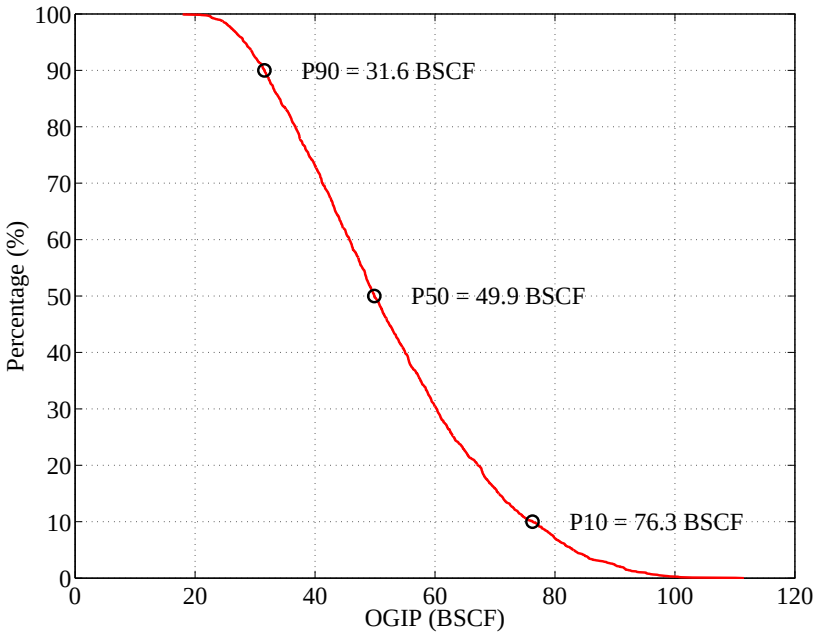


Figure 6.16. OGIP distribution function results of Study-B

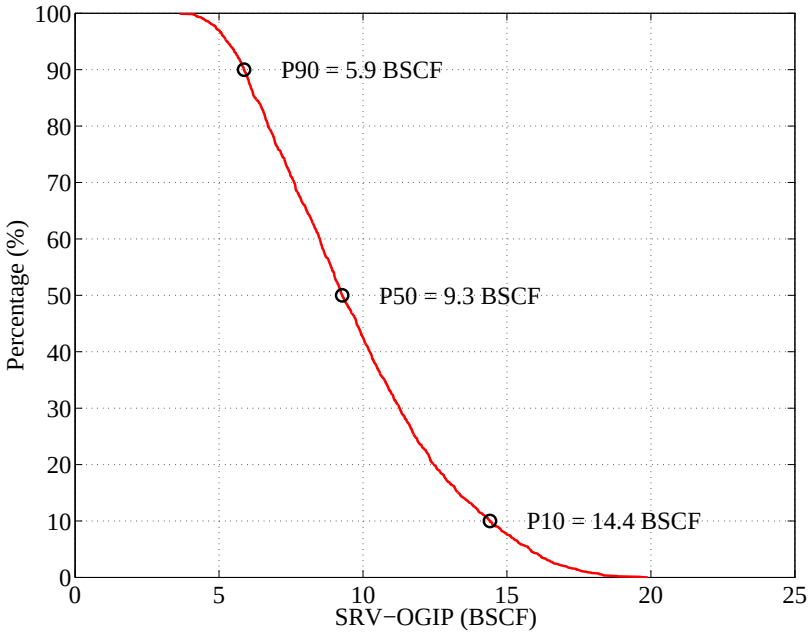


Figure 6.17. *SRV*-OGIP distribution function results of Study-B

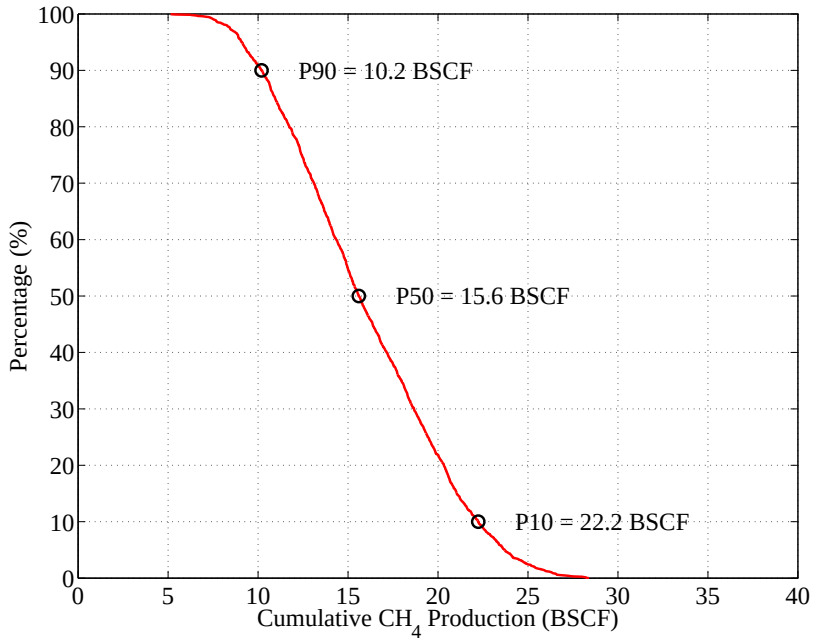


Figure 6.18. Cumulative CH_4 production distribution function results of Study-B

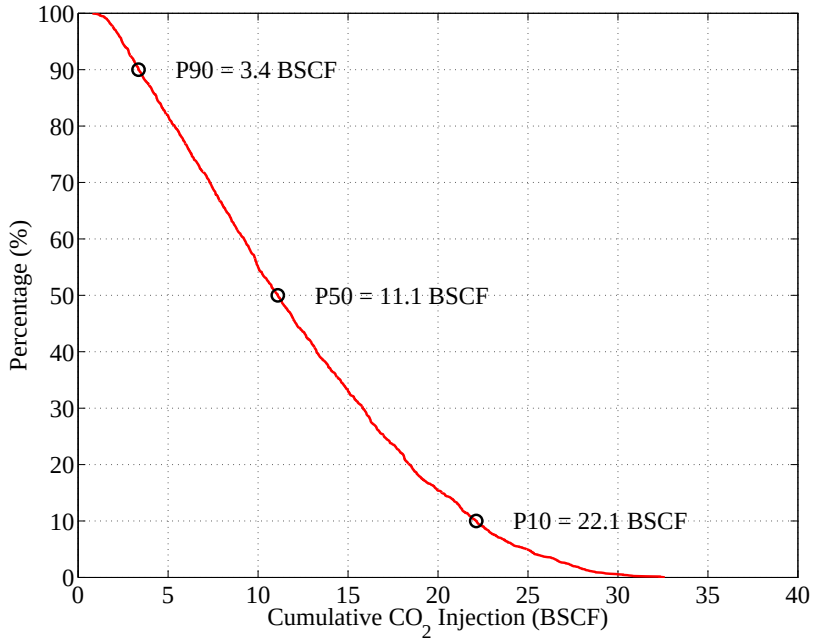


Figure 6.19. Cumulative CO_2 injection distribution function results of Study-B

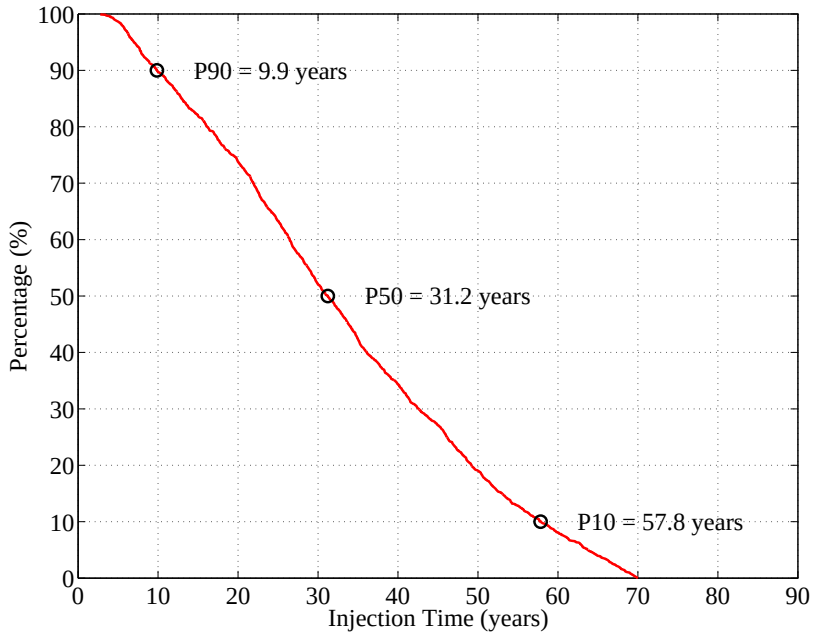


Figure 6.20. Total injection time distribution function results of Study-B

6.2 Investigation on the Duration of the Production and Injection Times

In this section of the study, injection starting times are altered. The cases investigated have 5 years of production increments starting from 0 to 50 years. Therefore 11 cases are investigated. Table 6.5 show the parameters that are used for Study-A and Study-B. Table 6.6 show the values that are varied for these studies. The values in Table 5.2 and 5.3 are used for relative permeability values.

Table 6.5. Reservoir and wellbore design parameters

Model Parameters		Model Parameters	
Grid System	17 x 17	Matrix Permeability (md)	0.0006
X Dimension (ft)	4,443	Fracture Permeability (md)	0.002
Y Dimension (ft)	4,443	Fracture Spacing (ft)	2
Drainage Area (acres)	453	Lang. Vol. of CH_4 (scf/ton)	73
Thickness (ft)	130	Lang. Pres. of CH_4 (psi)	726
Depth (ft)	6,500	Lang. Vol. of CO_2 (scf/ton)	97
Res. Pressure (psi)	3,900	Lang. Pres. of CO_2 (psi)	400
Res. Temperature (F)	142	Hor. Wellbore Length (ft)	2,875
Sw in Matrix (%)	6	Production Constraint (psi)	14.7
Sw in Fracture (%)	0.1	*SRV* Fracture Perm. (md)	0.02
Matrix Porosity (%)	8.5	*SRV* Fracture Spacing (ft)	0.2
Fracture Porosity (%)	2	*SRV* Fracture Porosity (%)	4

Table 6.6. Varied parameters for different production and injection times

Injection Starting Time (years)		Injection Starting Time (years)	
Case 1	0	Case 7	30
Case 2	5	Case 8	35
Case 3	10	Case 9	40
Case 4	15	Case 10	45
Case 5	20	Case 11	50
Case 6	25		

Figure 6.21 shows the total production times of each of the cases. It can be seen that there is no production in Case 1. Therefore the injection starts from the beginning of the simulation without depleting the reservoir. The cases shown here have 5 years of production increments starting from 0 to 50 years. In Case 11, total CH_4 production time is 50 years. It is expected to see larger CO_2 injection rates as the reservoirs are depleted more.

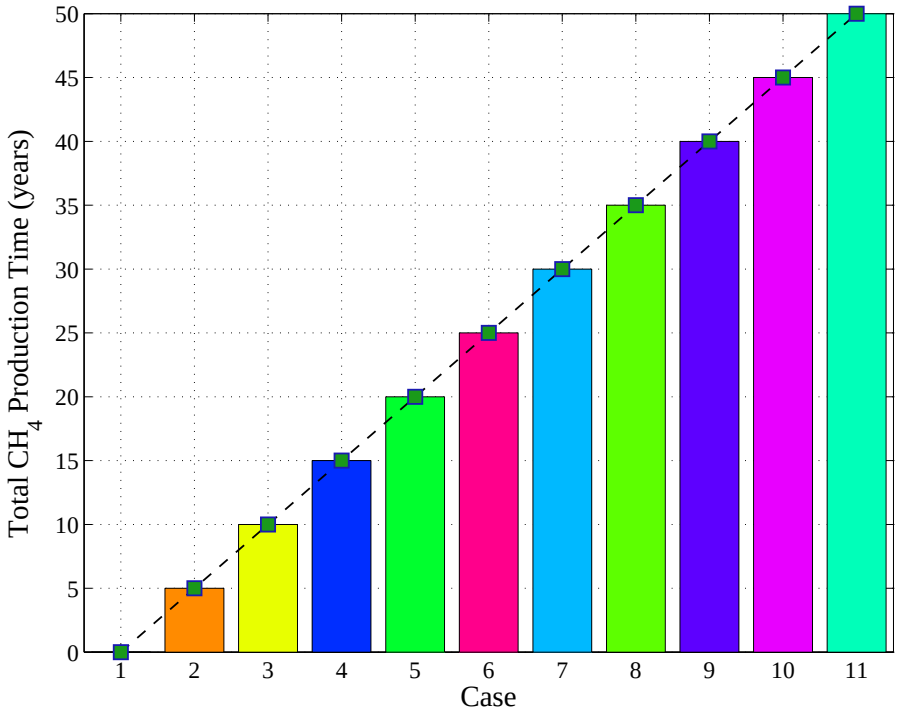
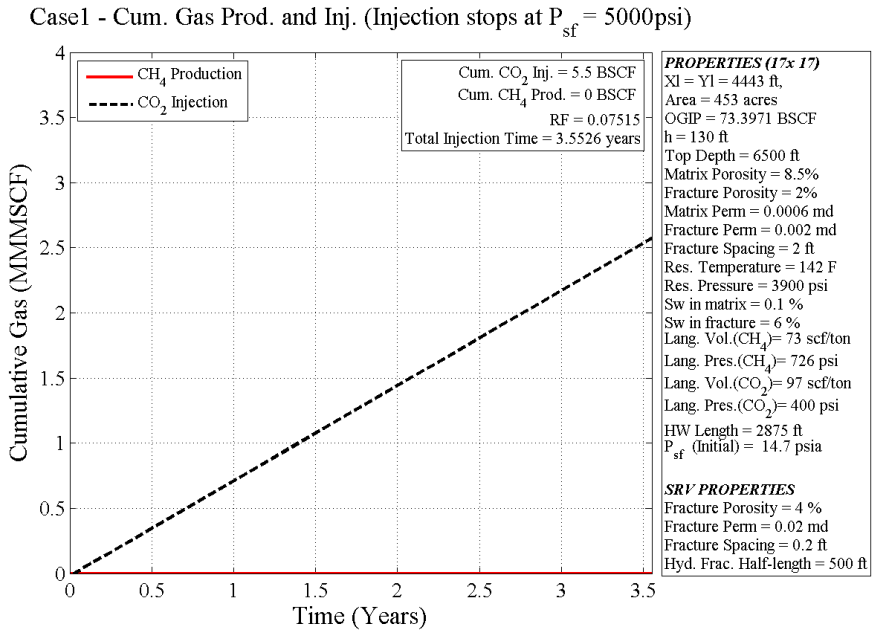
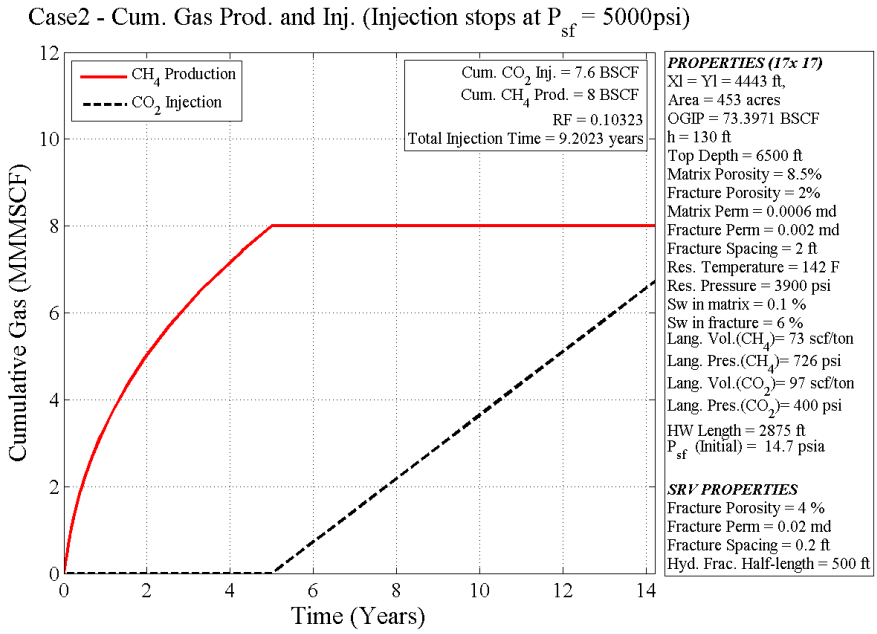


Figure 6.21. Total CH_4 production times

The cumulative CH_4 production and cumulative CO_2 injection values for these cases are compared (refer Figure 6.22). It is seen that as expected longer production times have significant impact on CH_4 production. However, cumulative CO_2 injection values show that although the reservoir has been depleted more and have smaller reservoir pressure, because of the tight permeability characteristics of shale formations, sandface pressure values reach higher pressures in a relatively short period of time and prevent more CO_2 to be injected.

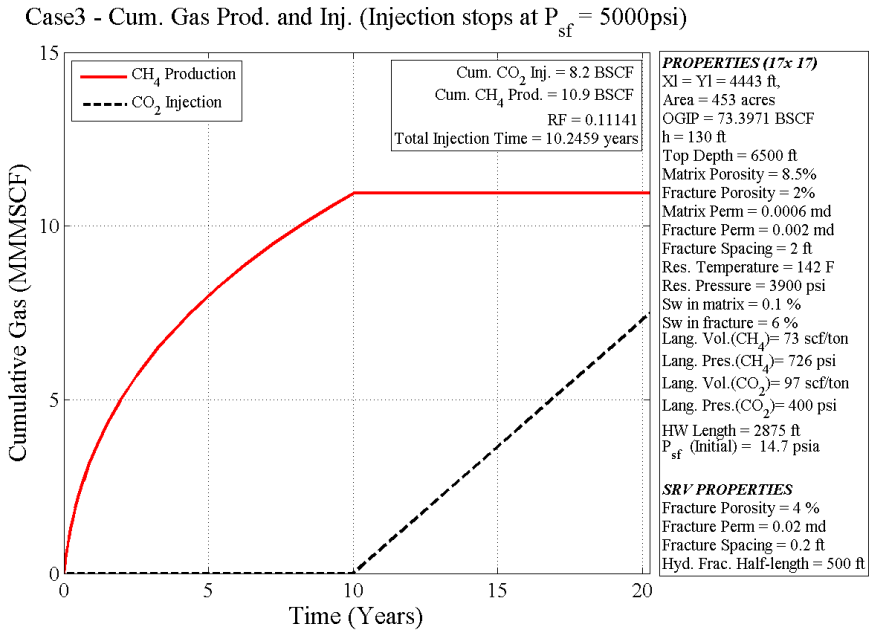


(a) Case 1

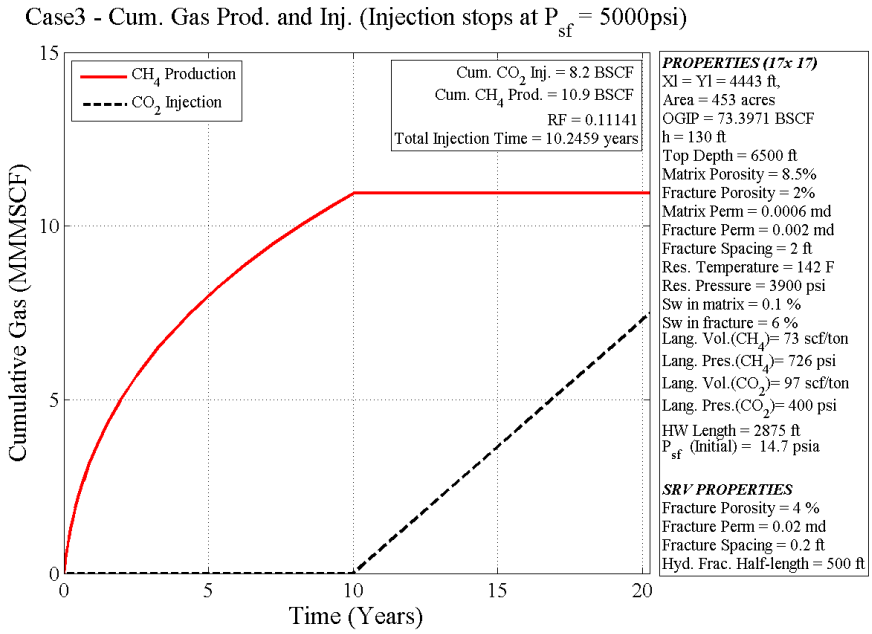


(b) Case 2

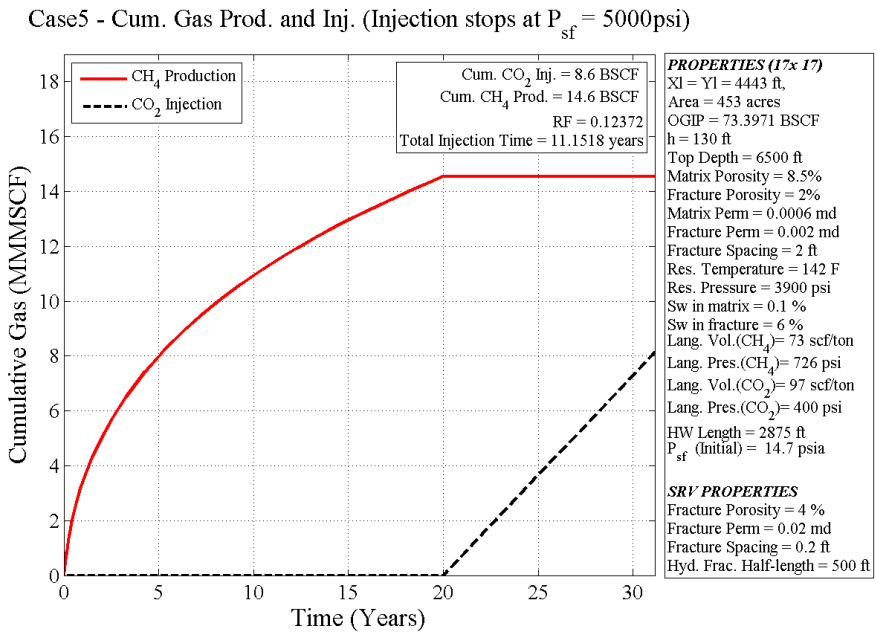
Figure 6.22. Cumulative production profiles of altered production time study



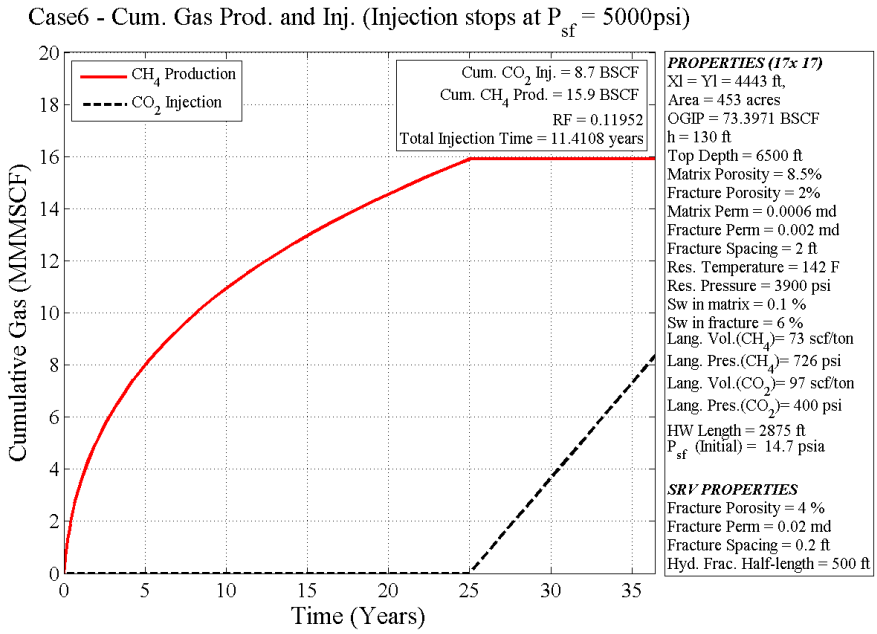
(c) Case 3



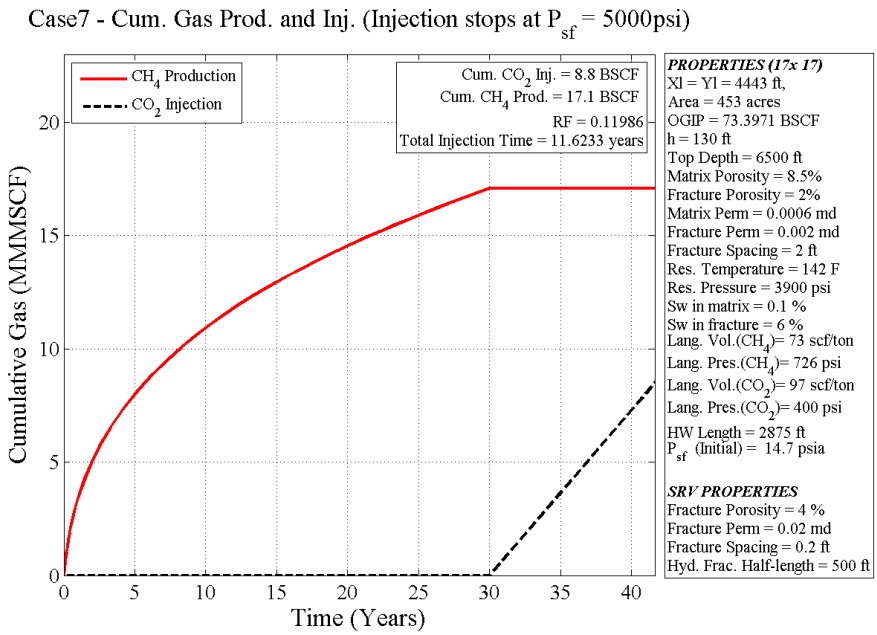
(d) Case 4



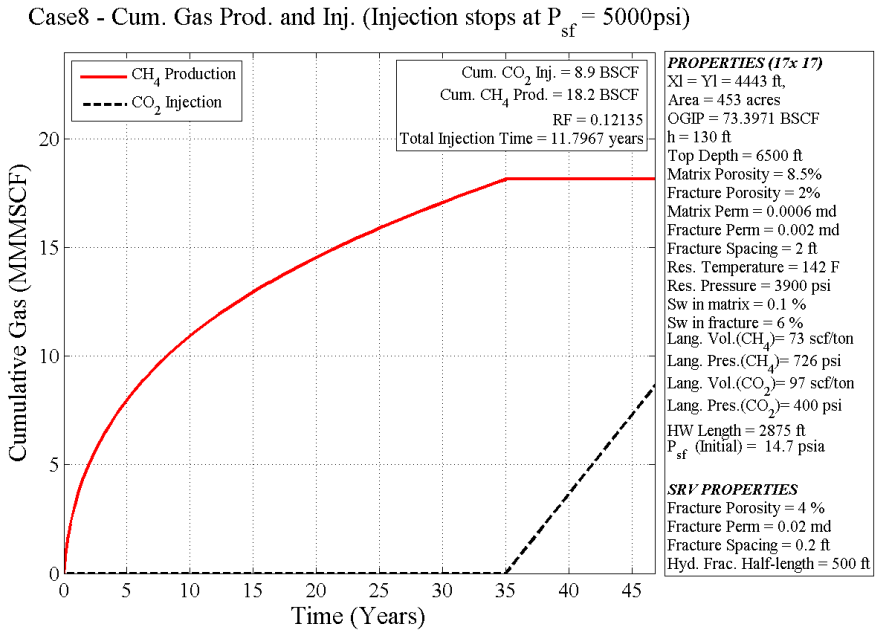
(e) Case 5



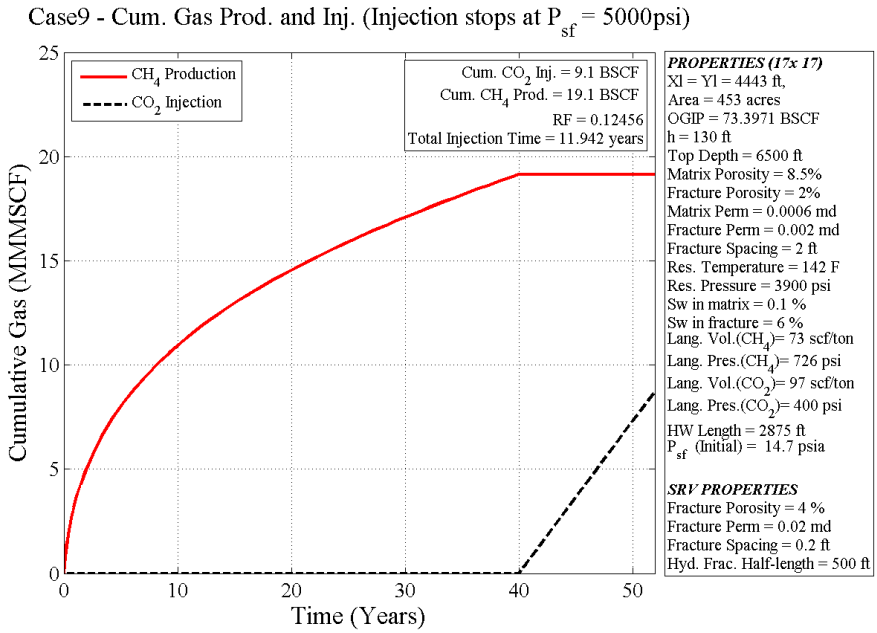
(f) Case 6



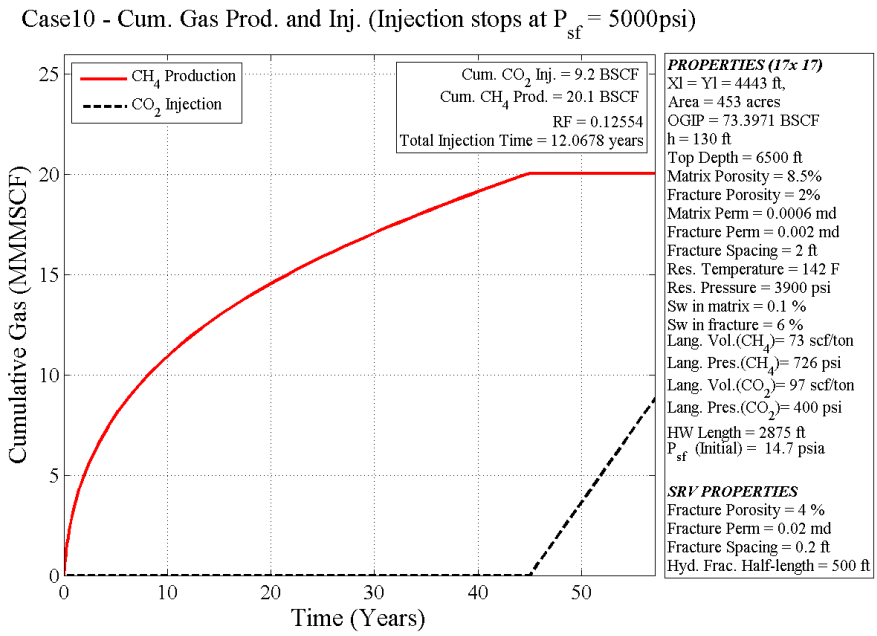
(g) Case 7



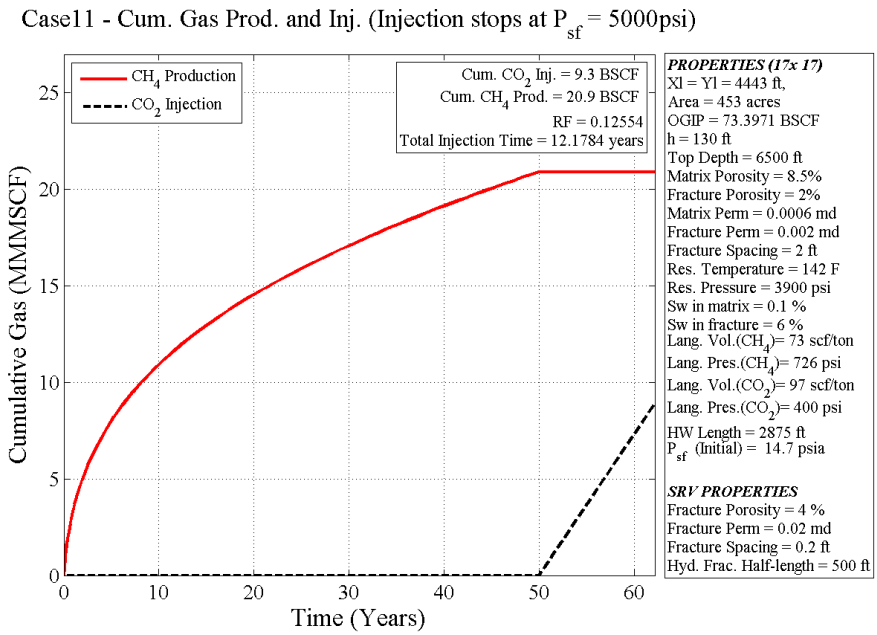
(h) Case 8



(i) Case 9



(j) Case 10



(k) Case 11

Figure 6.18 and Figure 6.19 display the cumulative CH_4 production and cumulative CO_2 injection values for the cases studied. It can be seen that longer production times have significant impact on CH_4 production. However, cumulative CO_2 injection values show that although the reservoirs have produce more and have smaller reservoir pressure, because of the tight permeability characteristics of shale formations, cumulative CO_2 injection values are rather close to each other.

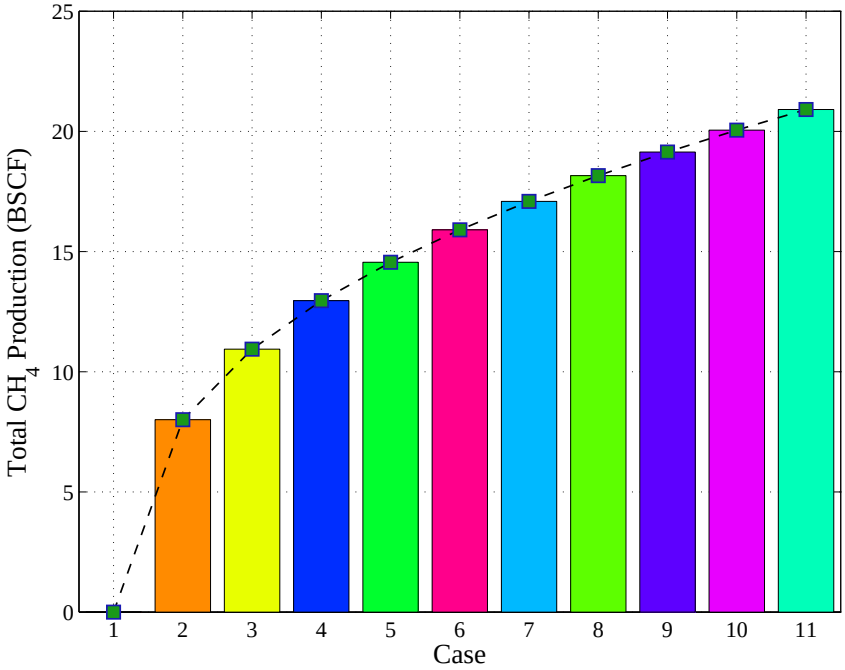


Figure 6.18. Cumulative CH_4 production comparison

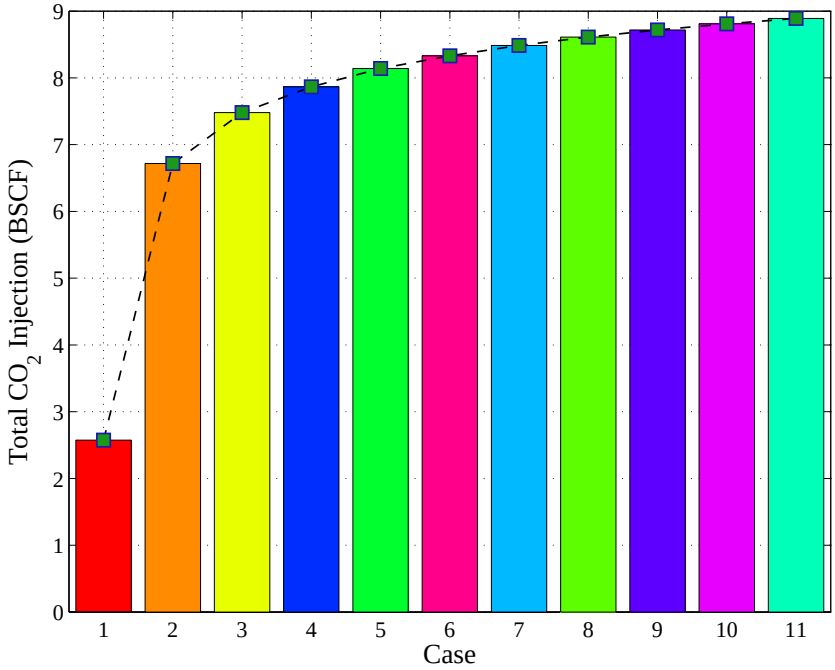


Figure 6.19. Cumulative CO_2 injection comparison

Figure 6.20 shows total injection times. The simulations are stopped when the bottomhole pressures reach 5,000 psi in every case to avoid casing bursts and creating new undesirable fractures. It can be seen that there is only two years of total injection difference between Case 3 and Case 11. There is 40 years of total production period between these two cases. However, there is no significant injection period increase between these two cases. Therefore, cyclic injection possibilities need to be investigated to find out whether it would be possible inject more CO_2.

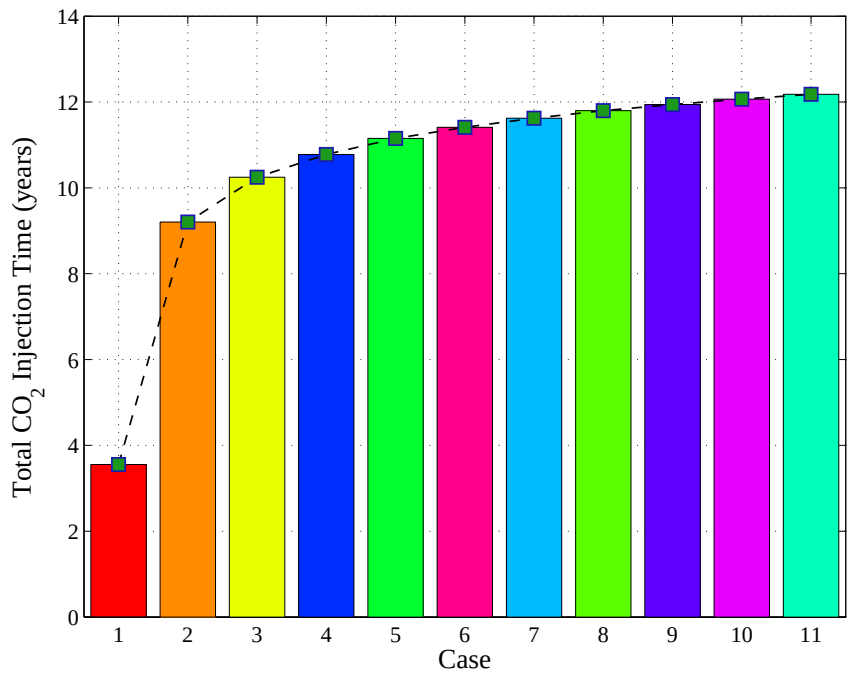


Figure 6.20. Years of CO_2 injection comparison

Figure 6.20 shows total injected CO_2 versus total produced CH_4. In Case 1, there is no CH_4 production. Therefore, total injected CO_2 versus total produced CH_4 ratio is infinite. In Case 2, the ratio is about 84%, which means that 84% of CH_4 can be replaced by CO_2. However, in this case, the reservoir is depleted only 5 years. For instance, Case 7 is depleted for 30 years and the ratio is approximately 50%. It is considered that higher ratios can be achieved by cyclic pressure pulsing technique because higher adsorption values can be obtained by the matrix since sorption model is pressure and time dependent.

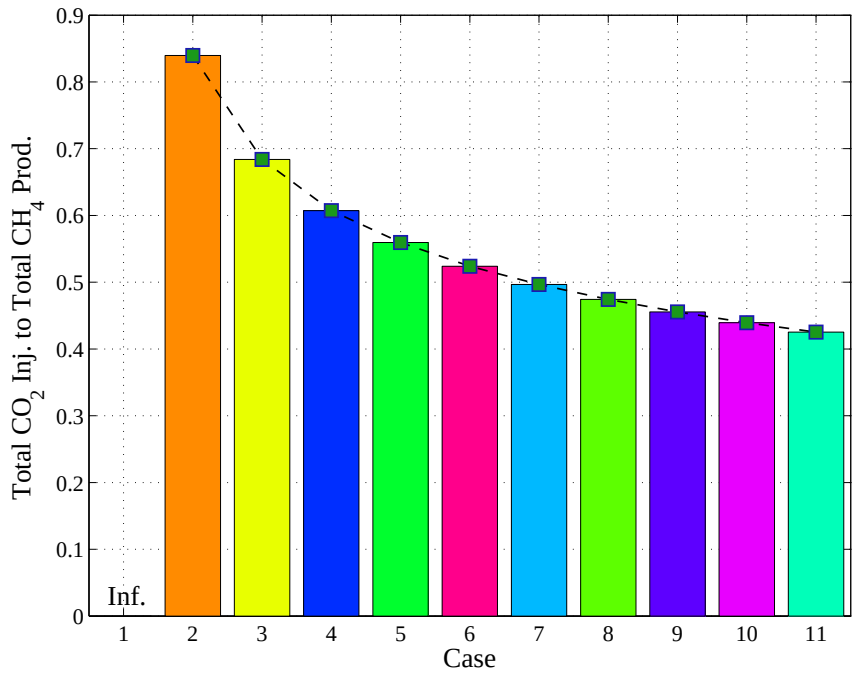


Figure 6.21. Total CO_2 injection to total CH_4 ratio

6.3 Investigation on Adsorption Capacity of CO_2

In this section of the study, an investigation on the effect of different CO_2 Langmuir volume values is conducted in two parts. The first part contains different CO_2 Langmuir volume values according to Dr. Nuttall's [7] study which was done in 2005 and published by Kentucky Geological Survey indicates that at 400 psia, CO_2 adsorption exceeds CH_4 adsorption by a factor of 5. The second part includes the Langmuir Pressure and Langmuir Volume constants provided by NETL and Weatherford in 2012.

6.3.1 Nuttall's Study

An investigation on the effect of different CO_2 Langmuir volume values is conducted for 10 different values. Nuttall in 2005 summed up his work about Langmuir volumes of CH_4 and CO_2 as follows [7]:

> "Adsorption capacity reported as measured Langmuir volumes ranges from 37 to 2,078 standard cubic feet CO_2 per ton of shale (scf/ton) at Langmuir pressures ranging from 243 to 14,284 psia. These values represent the range of values for coefficients of the selected Langmuir model. At a constant pressure of 400 psia, the CO_2 adsorption capacity ranges from 14 to 136 scf/ton with a median value of 40 scf/ton. Methane adsorption capacity ranges from 2 to 38 scf/ton with a median value of 8 scf/ton. At 400 psia, CO_2 adsorption exceeds CH_4 adsorption by a factor of 5."

Depending on this study, Langmuir volume of CO_2 is multiplied to the magnitude from 1 to 10. Langmuir pressure values are kept as 400 psi. Injections stops at when P_{bh} reaches 5,000 psi.

In this investigation, same reservoir parameters and wellbore design are used as it is used in Chapter 6.2. These properties can be found in Table 6.5, Table 5.2 and 5.3. Table 6.7 shows the values that are varied for these studies.

Figure 6.23, Figure 6.22 and Figure 6.24 show the top views of *SRV*-ϕ_f, *SRV*-k_f and *SRV*-Δx_s for this investigation, respectively. Stimulated reservoir zones can be seen around the horizontal wellbores on these figures as well.

Table 6.7. Adsorption isotherms for Nuttall's Study investigation

	Adsorption isotherms			
	CH_4		CO_2	
	V_L (scf/ton)	P_L (psi)	V_L (scf/ton)	P_L (psi)
Case 1	73	400	73	400
Case 2	73	400	146	400
Case 3	73	400	219	400
Case 4	73	400	292	400
Case 5	73	400	365	400
Case 6	73	400	438	400
Case 7	73	400	511	400
Case 8	73	400	584	400
Case 9	73	400	657	400
Case 10	73	400	730	400

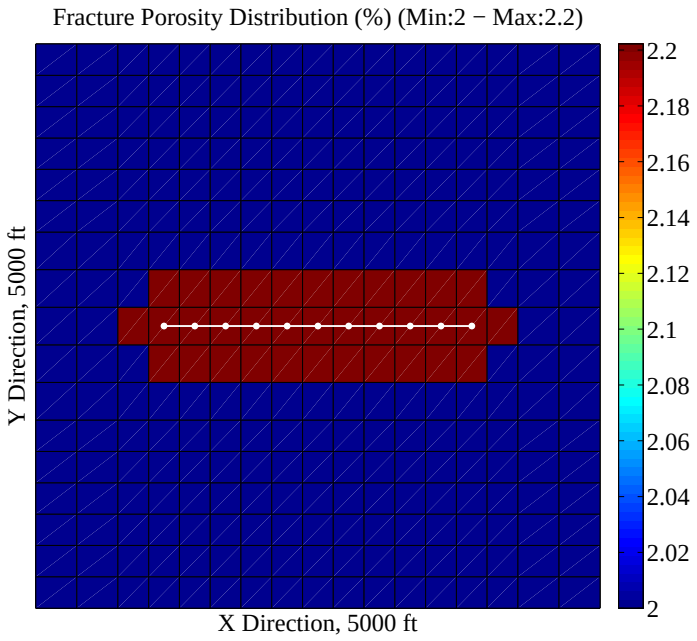


Figure 6.22. Nuttall's study fracture permeability values

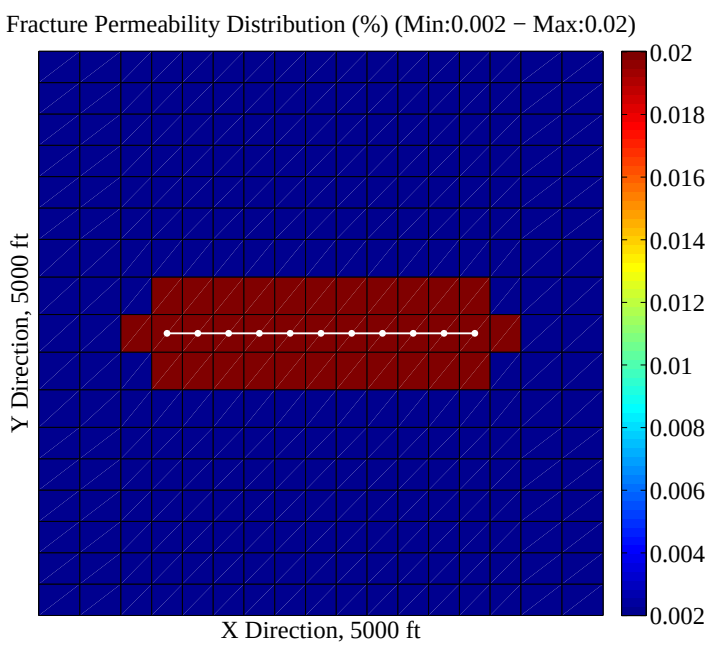


Figure 6.23. Nuttall's study fracture porosity values

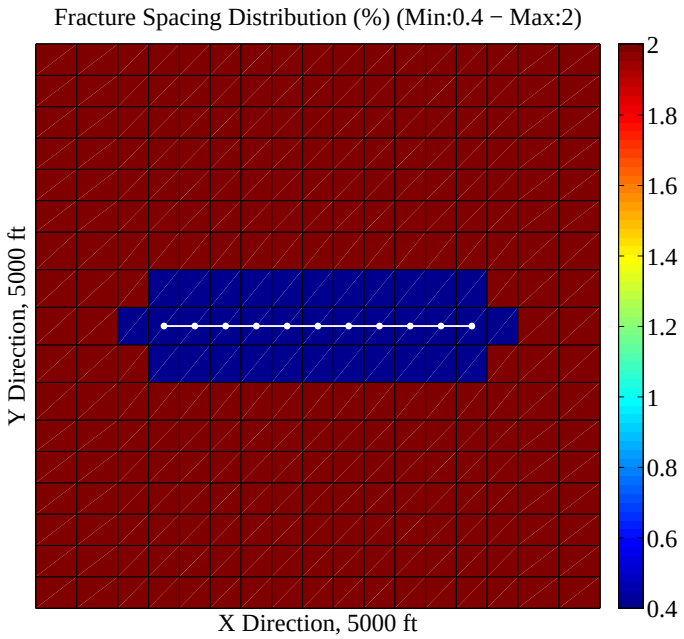


Figure 6.24. Nuttall's study fracture spacing values

Figures below show the production performance of the fifth case. In this case, Langmuir Volume of CO_2 (V_{L-CO_2}) is taken as five times larger than Langmuir Volume of CH_4 (V_{L-CH_4}), which is specifically mentioned by Nuttall. Thus, this case is considered as the most important case. It is found out that approximately 16.4 BSCF of CH_4 is produced from the reservoir in 30 years of time in Case 5. Also, approximately 11.7 years of injection is achieved in Case 5, with a total volume of 8.6 BSCF. The results also indicates that 2 MMSCFD of total CO_2 is injected to the reservoir, indicating that 52% of CH_4 can be replaced by the injected CO_2.

Figure 6.27 and Figure 6.28 show the total production of CH_4 and total injection of CO_2. Langmuir Volume and Langmuir Pressure constants of CH_4 are kept the same. Therefore, cumulative injection values of CH_4 is the same for all of the models. However, Langmuir Volume and Langmuir Pressure constants of CO_2 are increased in each of the models, resulting in 6.5 BSCF to 10.2 BSCF of cumulative CO_2. In Case 5, 8.6 BSCF of CO_2 can be injected.

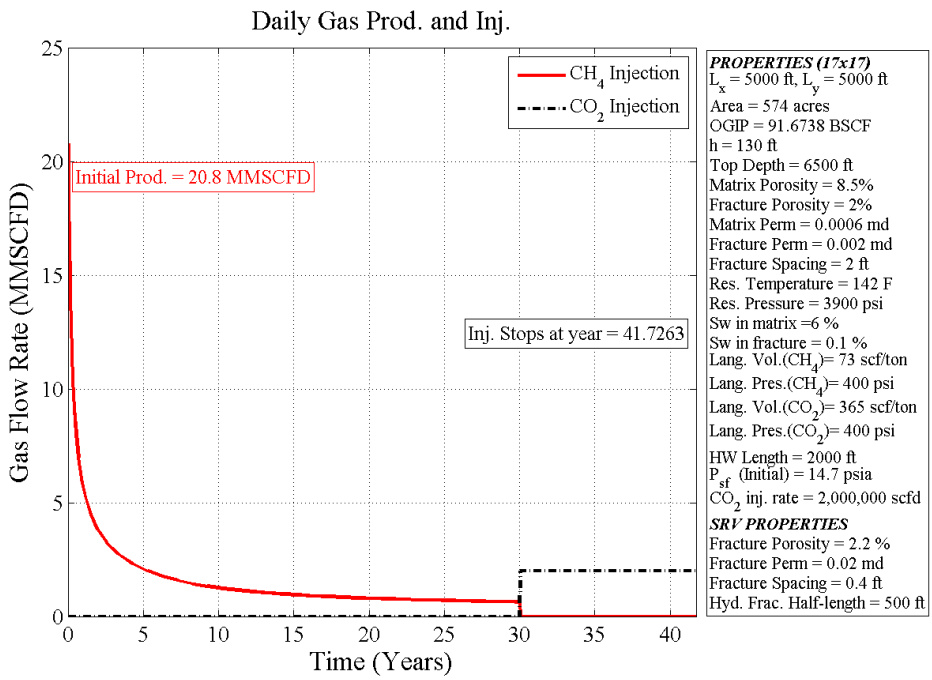


Figure 6.25. Daily flowrate performance of the fifth case

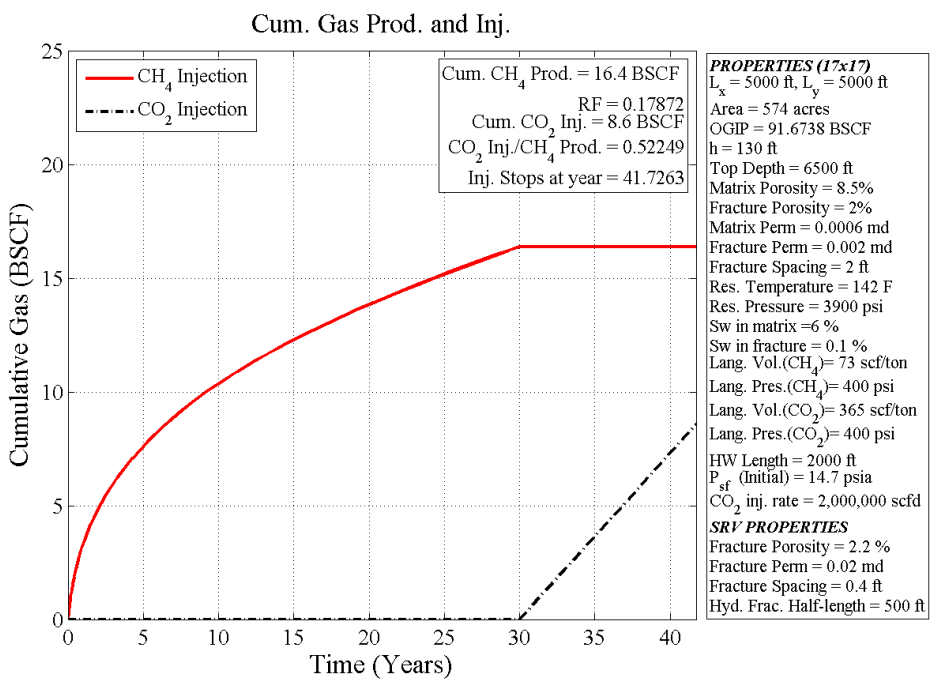


Figure 6.26. Cumulative production performance of the fifth case

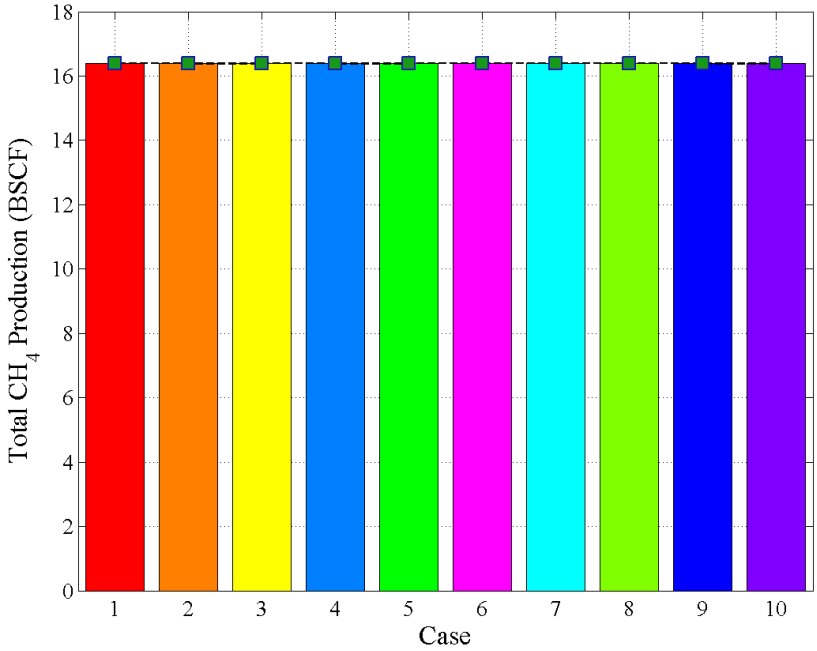


Figure 6.27. Nuttall's cumulative CH_4 production comparison

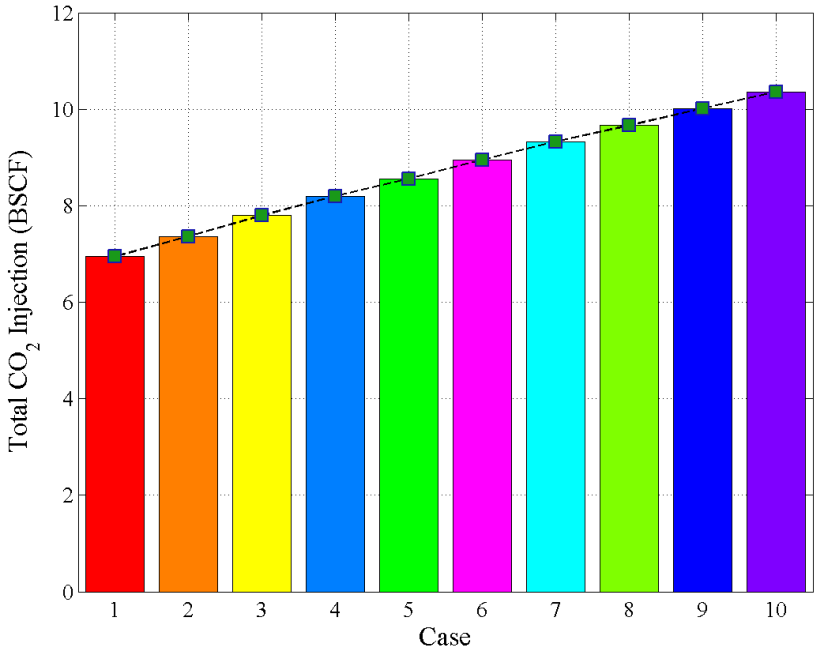


Figure 6.28. Nuttall's cumulative CO_2 injection comparison

Figure 6.29 and Figure 6.30 show the total injection time of CO_2 and the ratio of total CO_2 injection to total CH_4 production. It can be seen that as the Langmuir Volume constant increases, total CO_2 injection time also increases significantly. The difference between Case 1 and Case 10 is almost 5 years. In Case 5, total injection time is about 12 years. Larger Langmuir Volume values also result in larger values of total CO_2 injection to total CH_4 production ratios. Almost 63% of produced CH_4 can be replaced with injected CO_2. In Case 5, this ratio is approximately 52%.

Figure 6.31 and Figure 6.32 show the total adsorption of CO_2 and its ratio to total CO_2 injected. Cumulative adsorption values vary from 0.5 BSCF to 5 BSCF, which is considerably a large range. In Case 10, almost half of the total injection is adsorbed. In Case 5, total adsorption is about 3 BSCF and the ratio is 35%. In other words, 35% of injected CO_2 is adsorbed by the rock.

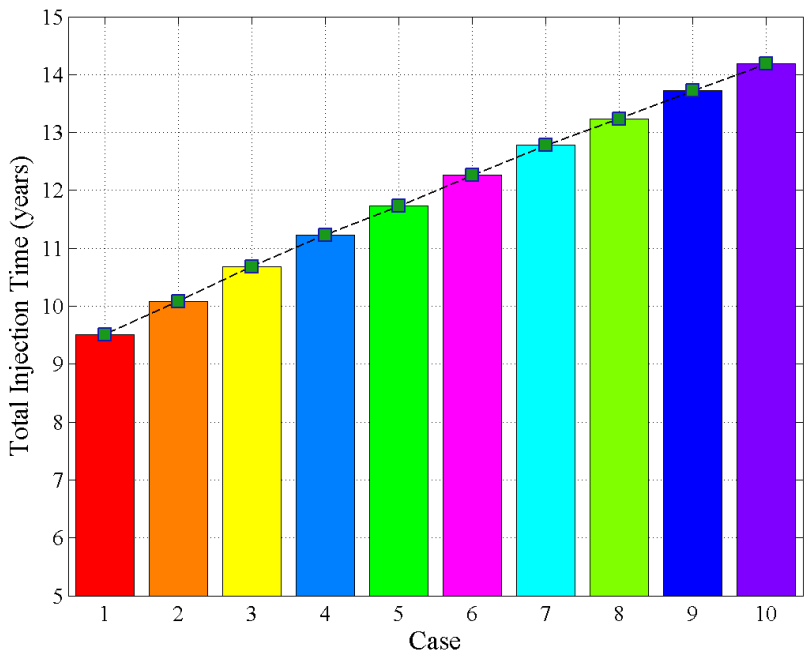


Figure 6.29. Nuttall's total CO_2 time comparison

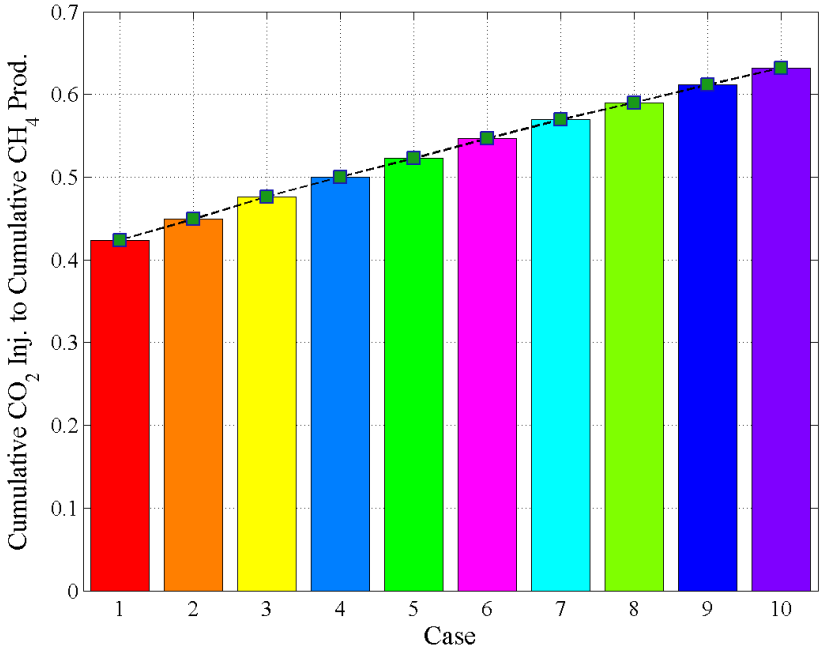


Figure 6.30. Nuttall's cumulative CO_2 inj. to cumulative CH_4 prod. comparison

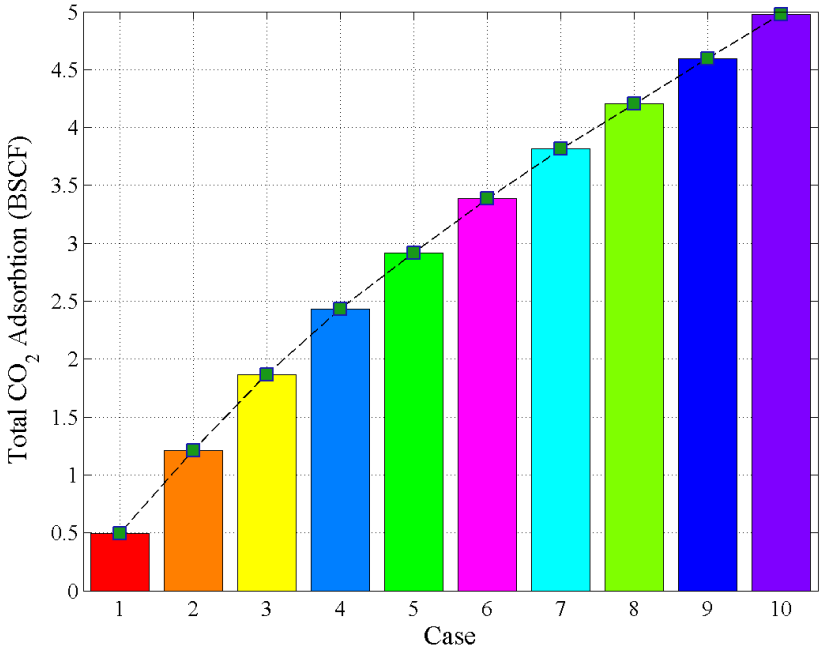


Figure 6.31. Nuttall's total CO_2 adsorption comparison

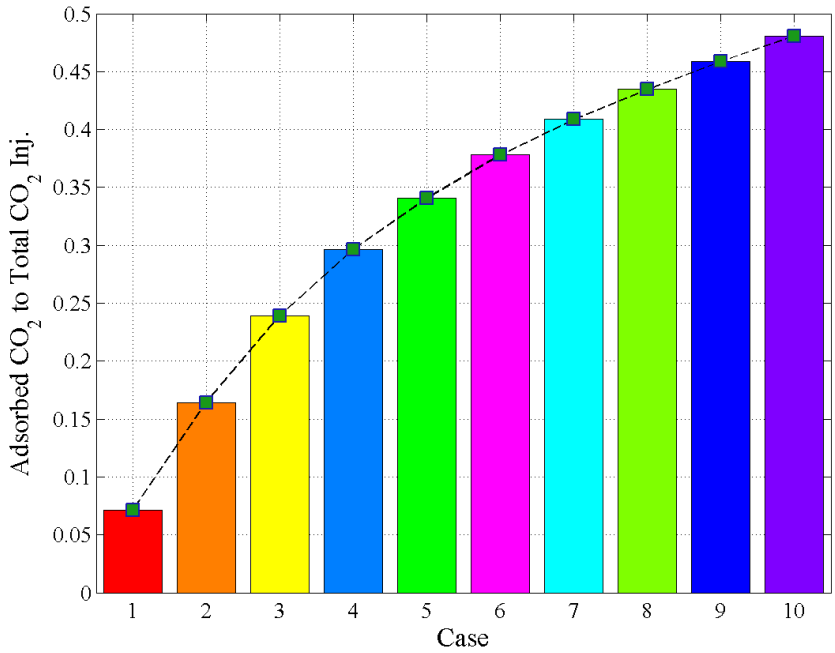


Figure 6.32. Nuttall's adsorbed CO_2 to total CO_2 injection comparison

6.3.2 Weatherford's Data Investigation

An investigation is initiated using the Langmuir Pressure and Langmuir Volumes that are provided by Weatherford. Langmuir pressures and volumes for five different samples were investigated by keeping the rest of the reservoir and wellbore parameters the same as in Nuttal's study. Total volumes of injected CO_2 values are compared. The injections are terminated when P_{sf-inj} reaches 5,000 psi. Also, total adsorbed amounts of CO_2 were examined. It was observed that adsorption vs. free gas ratios can go up to 20 percent, which is higher than what has been typically observed in previous studies. Some of the experimental data for Langmuir pressures and volumes are considered large as they were obtained from powdered samples of Marcellus shale.

In this investigation, same reservoir parameters and wellbore design are used as it is used in Chapter 6.2. These properties can be found in Table 6.5, Table 5.2 and 5.3. Table 6.8 shows the values that are varied for these studies.

Table 6.8. Adsorption isotherms for Weatherford's Data investigation

		Adsorption isotherms	
		CH_4	CO_2
F1	scf/ton	37.23	89.22
	psi	3426.1	897.67
F2	scf/ton	22.88	84.23
	psi	4252.19	2748.78
F3	scf/ton	32.37	135.83
	psi	1344.01	1346.22
F4	scf/ton	113.96	163.87
	psi	7436.49	1350.30
F5	scf/ton	20.37	61.65
	psi	3088.98	582.52

Figure 6.23, Figure 6.22 and Figure 6.24 show the top views of *SRV*-ϕ_f, *SRV*-k_f and *SRV*-Δx_s for adsorption parameters that are selected on Weatherford's Data Investigation, respectively. Stimulated reservoir zones can be seen around the horizontal wellbores on these figures as well.

Figure 6.33 and Figure 6.34 show a sample production performance of the Sample - F1. Because the samples are crushed, it is thought that Langmuir Volume values are larger then usual since the surface areas of the samples are increased larger Langmuir pressure constants are observed. Approximately 10 years of injection is achieved in Sample - F1, for a total CO_2 volume of 7.2 BSCF. During this study, 2 MMSCFD of CO_2 is injected indicating that 44% of CH_4 can be replaced by the injected CO_2.

Figure 6.35 and Figure 6.36 show the total production of CH_4 and total injection of CO_2 for five different samples. Total CH_4 production is about the same for all of the samples. The samples have similar injected CO_2 values as well. However, Figure 6.36 shows that F4, F3 and F1 with slightly higher cumulative injections.

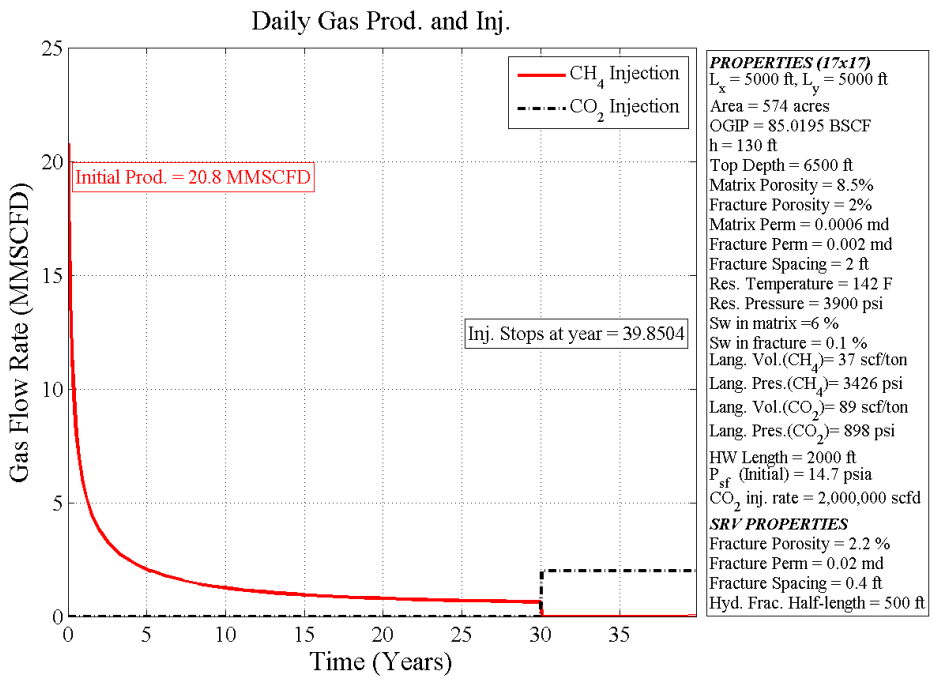


Figure 6.33. Daily flowrate performance of F1 case

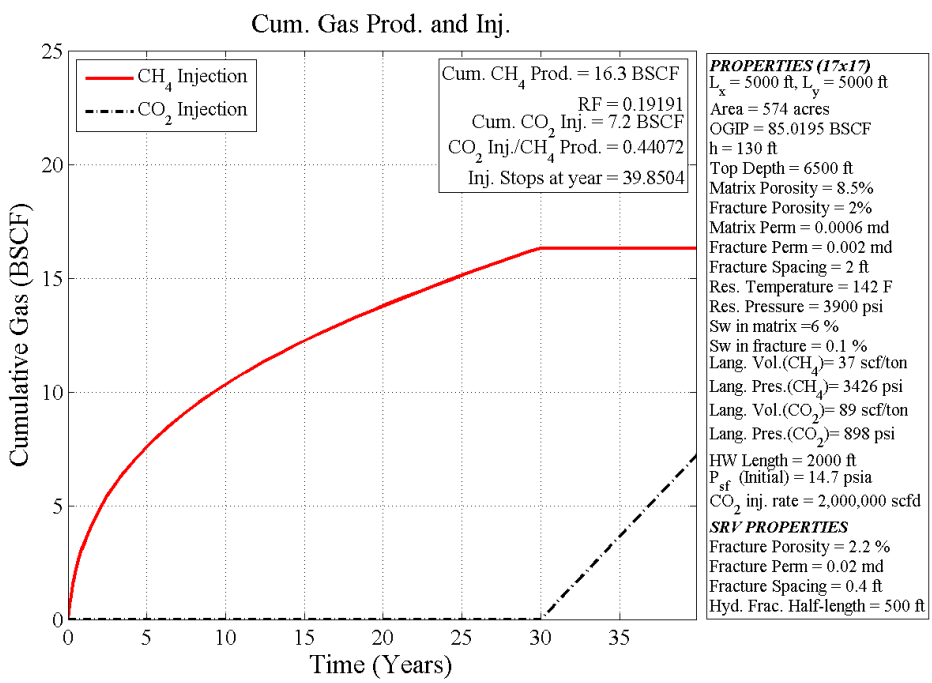


Figure 6.34. Cumulative production performance of F1 case

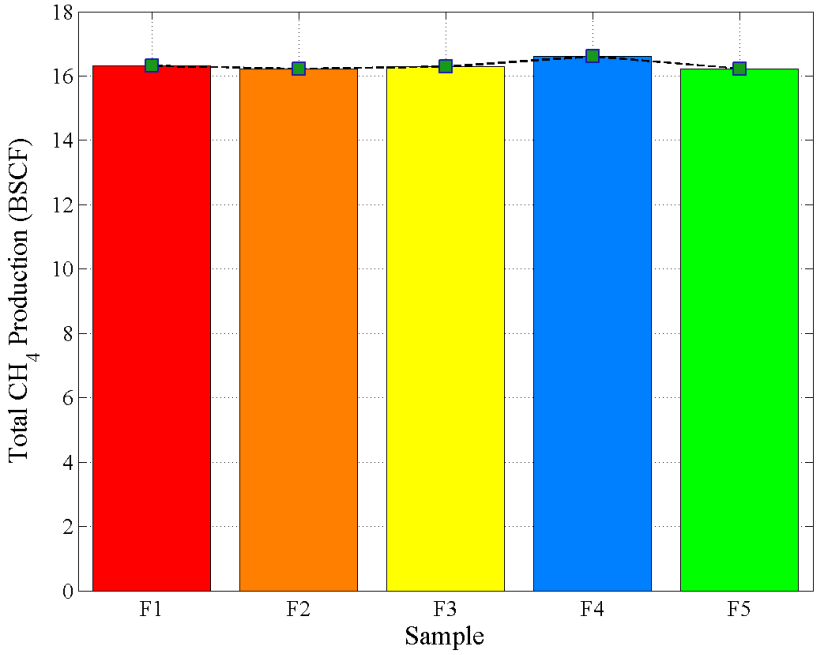


Figure 6.35. Weatherford's data cumulative CH_4 production comparison

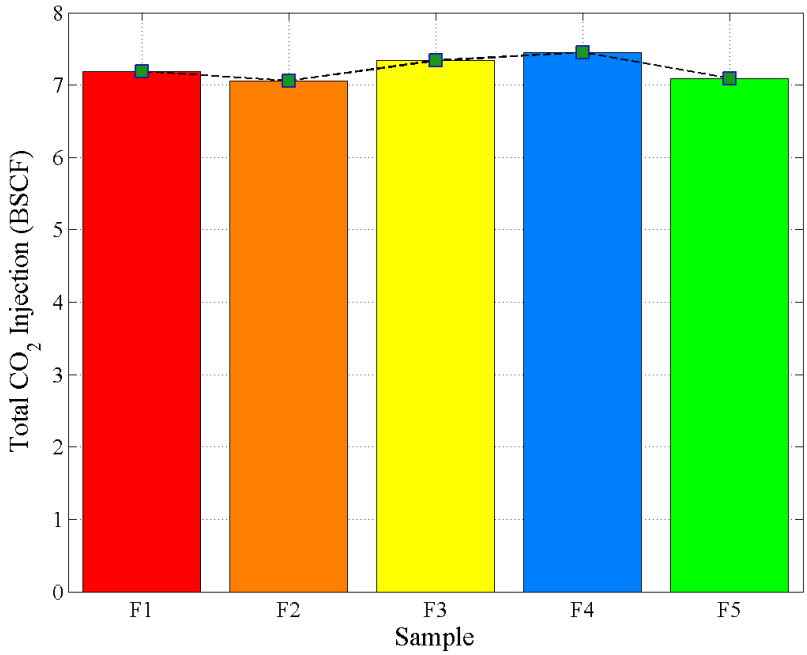


Figure 6.36. Weatherford's data cumulative CO_2 injection comparison

Figure 6.37 and Figure 6.38 show the total injection time of CO_2 and the ratio of total CO_2 injection to total CH_4 production. Total injection times are about 10 years for all of the cases. The ratio of total CO_2 injection to total CH_4 production values vary between 43% to 45%

Figure 6.39 and Figure 6.40 show the total adsorption of CO_2 and its ratio to total CO_2 injected. Cumulative adsorption values varies between 0.5 BSCF to 1.2 BSCF. Figure 6.40 shows the adsorbed CO_2 vs. total CO_2 ratios. It can be seen that F4 can adsorb almost 16% of the total injected gas at 5,000 psia of sandface pressure. F4 would be a better CO_2 sequestration candidate than F2 and F5.

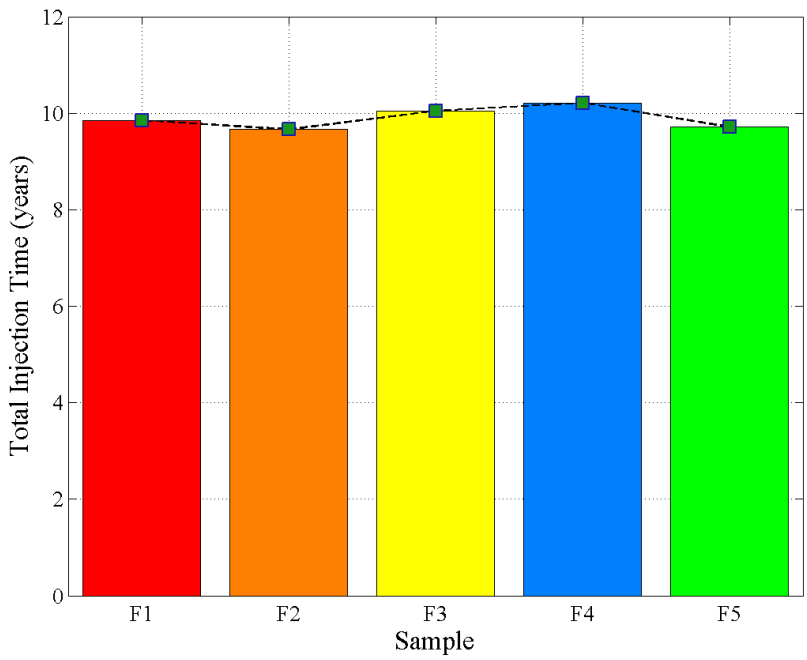


Figure 6.37. Weatherford's data total CO_2 time comparison

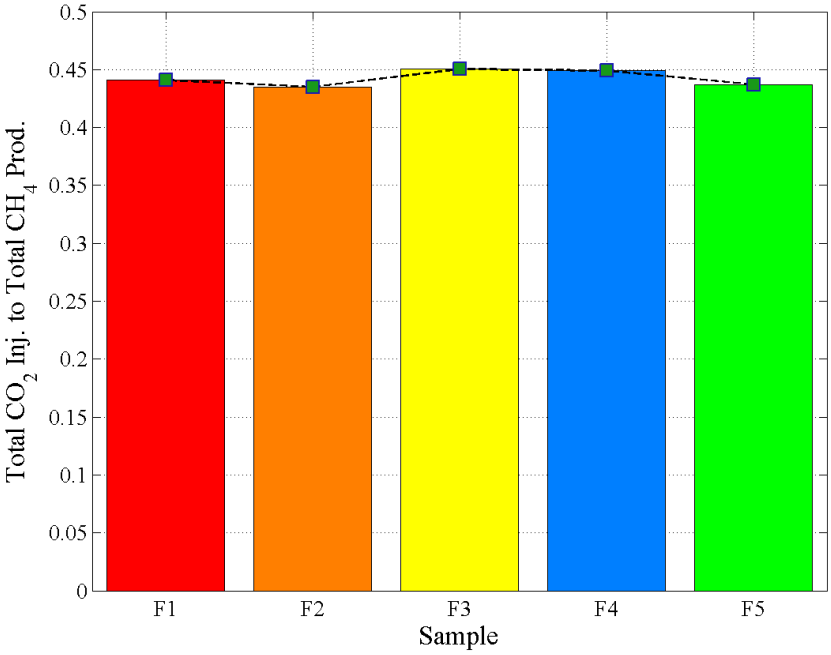


Figure 6.38. Weatherford's data cumulative CO_2 inj. to cumulative CH_4 prod. comparison

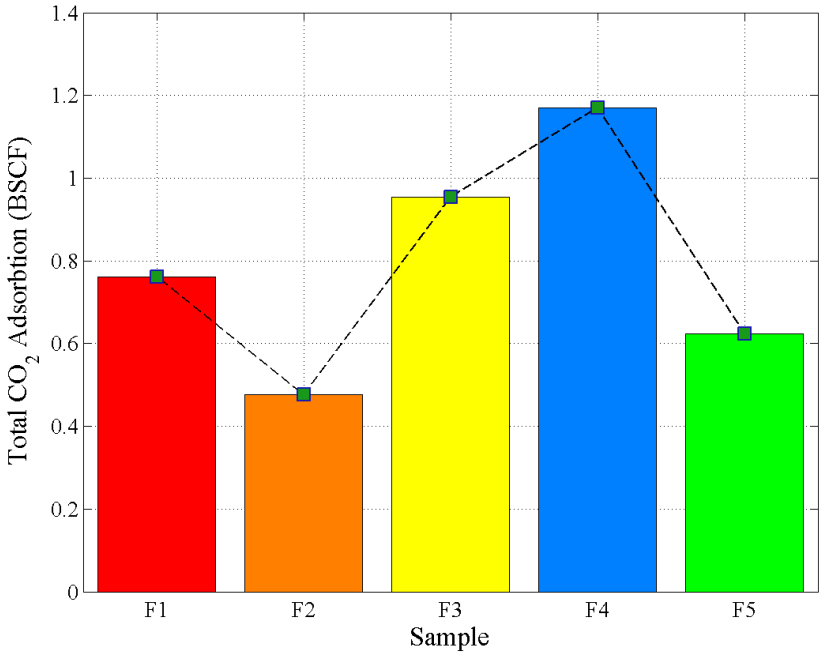


Figure 6.39. Weatherford's data total CO_2 adsorption comparison

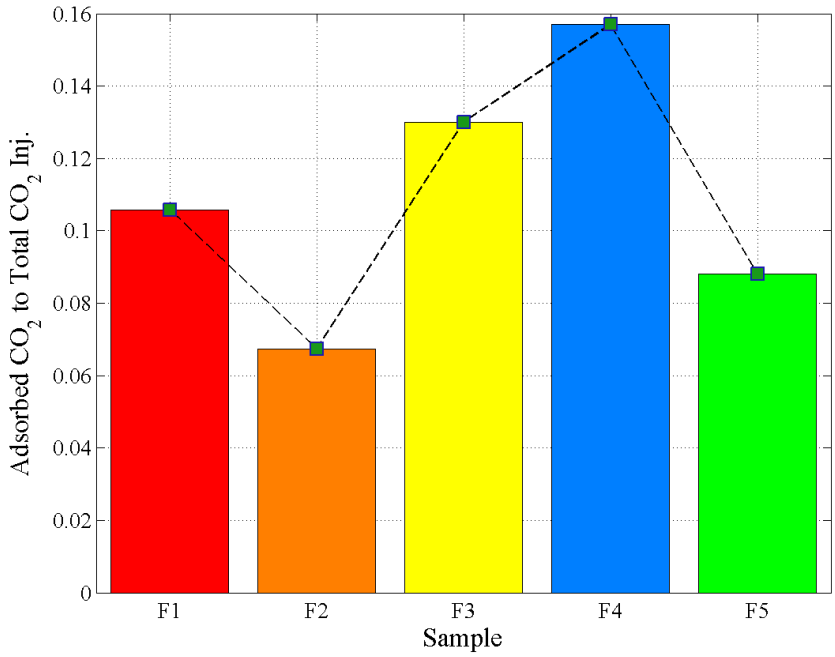


Figure 6.40. Weatherford's data adsorbed CO_2 to total CO_2 injection comparison

6.4 Investigation on Cyclic Pressure Pulsing

As it is discussed in the previous subsection, more CO_2 can be injected in depleted shale reservoirs due to the fact that the Langmuir volume values of CO_2 are about 5 times larger than the Langmuir volume values of CH_4 [7]. In that specific case, almost 52% of produced CH_4 is replaced by the injected CO_2. 3 BSCF of CO_2 is adsorbed over 12 years of injection period, which is 35% of 8.6 BSCF of total CO_2 injected. It is considered that after reaching high pressures because of CO_2 injection, the injectors could be shut down and let the CO_2 to be adsorbed by the matrix. Also, the pressure in the *SRV* zone would be reduced since the reservoir would want to reach its equilibrium pressure, which would create more room for CO_2 injection.

In this investigation, same reservoir parameters and wellbore design are used as it is used in Chapter 6.2. These properties can be found in Table 6.5, Table 5.2 and 5.3.

There are two different cases investigated. In the first case, 5 years of retention time is applied, which means that when the P_{sf-inj} reaches 5,000 psi, the well is stopped for 5 years. In

the second case, more retention time is given to the reservoir to see if there is more adsorption occurs. For that reason, retention time is taken as 10 years.

6.4.1 Cyclic Pressure Pulsing with 5-year Shut-in Period

In this case, fracturing pressure (P_{sf-inj} or P_{frac}) is taken as 5,000 psi. Therefore, once the bottomhole pressure during an injection cycle reaches 5,000 psi, the simulation shuts-in the injection for a period of 5 years (1825 days) and then resumes CO_2 injection. There are three cycles of shut-in and four cycles of injection periods considered in all of the cases. Figure 6.41 and Figure 6.42 show the production performances observed in the first case.

Table 6.9 shows total number of injections, cumulative CO_2 injection values and the ratio of total injected CO_2 versus total produced CH_4. A total number of 6,227 days of injection is achieved after three cycles of shut-in period, which gives 28% of additional CO_2 volume injection into the reservoir.

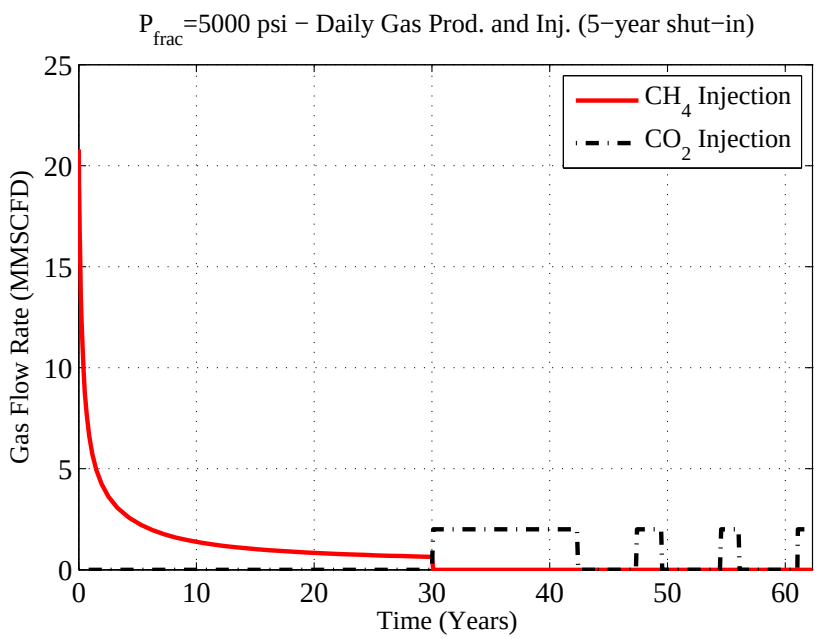


Figure 6.41. 5-year shut-in daily flowrate performance

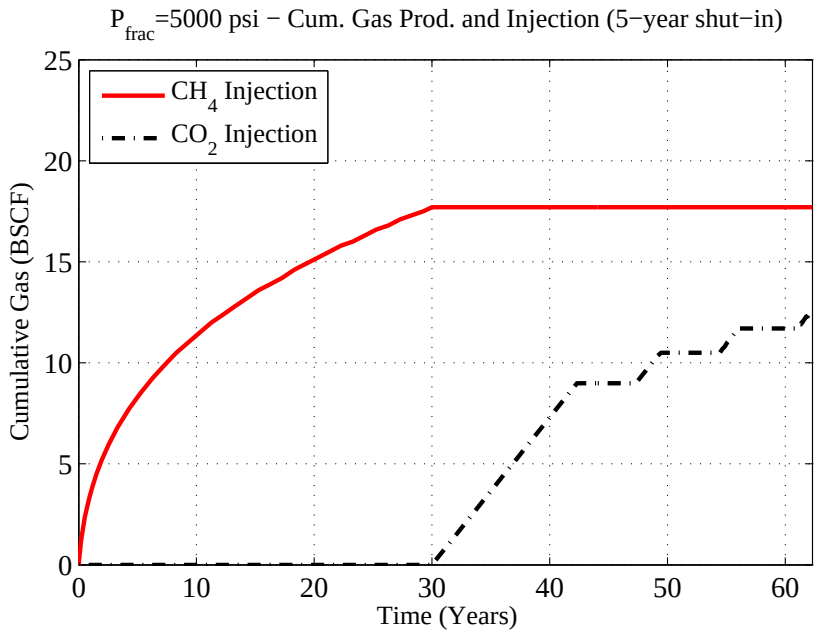


Figure 6.42. 5-year shut-in cumulative production performance

Table 6.9. 5-year shut-in total injection days and cumulative CO_2 injection

	Total Injection Days	Cumulative CO_2 Injection (BSCF)	CO_2 Inj./CH_4 Prod.
1st injection period	4,492.8	8.99	0.51
2nd injection period	745.6	1.51	0.09
3rd injection period	537.0	1.20	0.07
4th injection period	451.5	9.00	0.05
Total	6,226.9	12.6	0.71

Figure 6.43 shows the pressure distributions of bottomhole, well block and the furthest grid-block from the well-head. As it can be seen from the red line, bottomhole pressure, which is not allowed to violate the fracturing pressure in this case, shuts the well in once it reaches 5,000 psi for 5 years. CO_2 injection starts after 5th year. Although the bottomhole fluctuates throughout the injection cycles, the pressure at the wellblock keeps increasing after the 30th year.

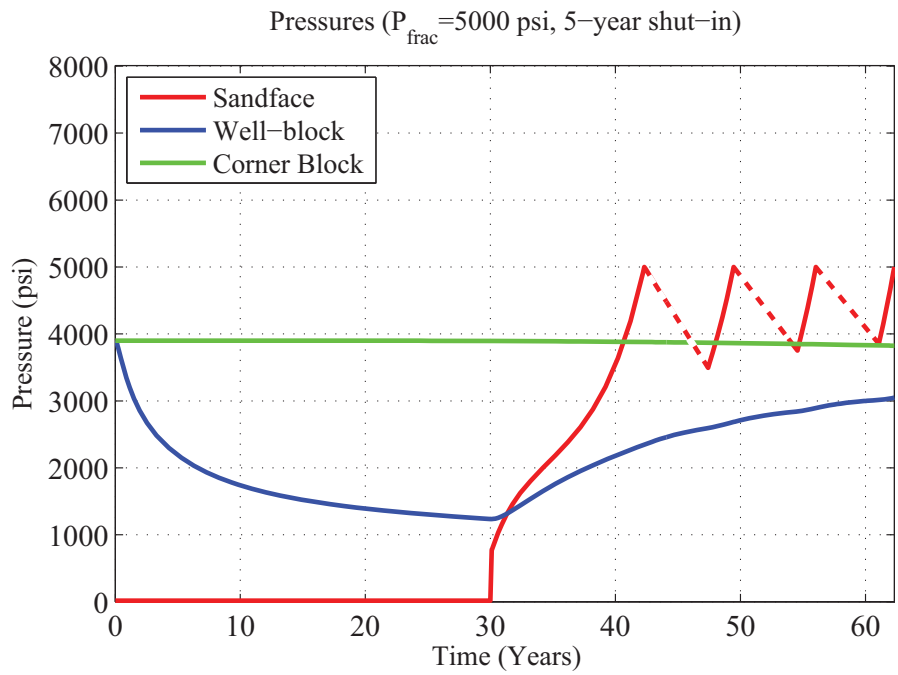


Figure 6.43. 5-year shut-in pressure distributions

Cyclic pressure pulsing provides almost five years of additional injection time without exceeding the hydraulic fracturing pressure. It also makes possible the injection of 3.5 BSCF of additional CO_2 into the formation, which is about 28% of the total volume achieved at the end of the first injection period. Four injection cycles with 5-year of shut-in period bring 20% increase in 'CO_2 injection - CH_4 production' ratio. It can be seen from the green line that the pressure decrease at the corner grid-block in the first 30-years of production is very small. It also keeps decreasing on the next 30 years of cyclic pressure pulsing period (because of small flow from high pressure region to lower pressure region in the reservoir).

6.4.2 Cyclic Pressure Pulsing with 10-year Shut-in Period

In this case, fracturing pressure (P_{frac}) is taken as 5,000 psi again. However, the simulation shut-in period is increased to 10 years (3,650 days) and CO_2 injection starts after 10 years of shut-in period. Figure 6.41 and Figure 6.42 show the production performances observed in the second case.

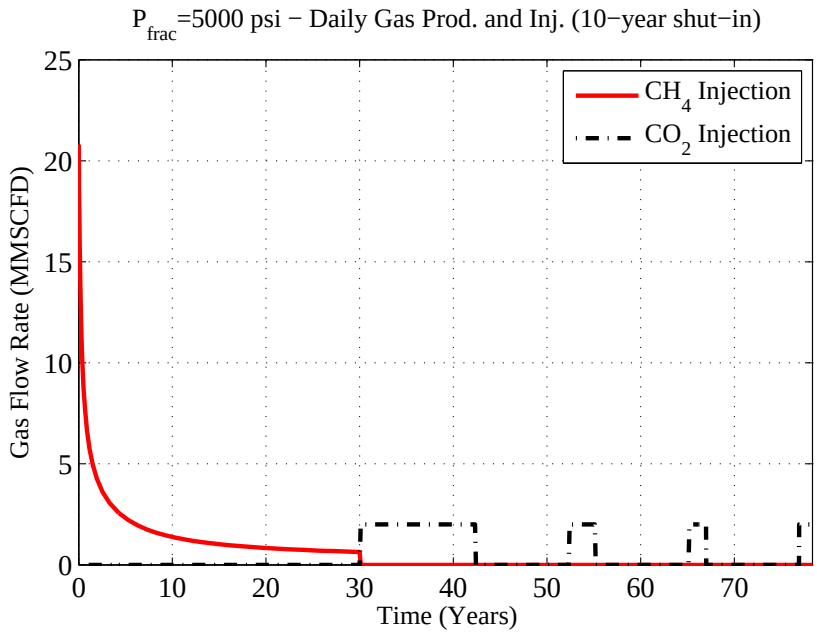


Figure 6.44. 10-year shut-in daily flowrate performance

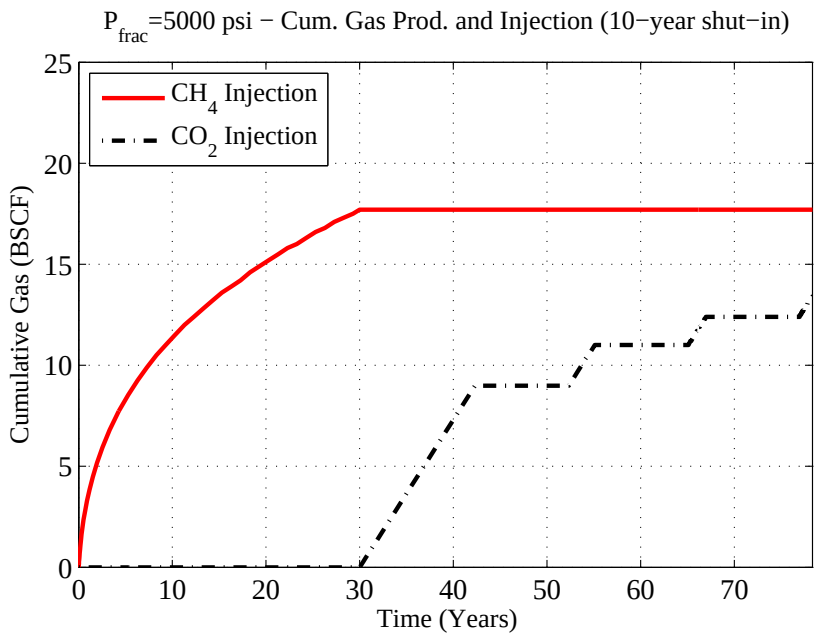


Figure 6.45. 10-year shut-in cumulative production performance

Table 6.10 shows total number of injections, cumulative CO_2 injection values and the ratio of total injected CO_2 versus total produced CH_4. A total number of 6,639 days of injection can

be achieved after three cycles of shut-in period, which allows 33% of additional CO_2 volume injection into the reservoir.

Table 6.10. 10-year shut-in total injection days and cumulative CO_2 injection

	Total Injection Days	Cumulative CO_2 Injection (BSCF)	CO_2 Inj./CH_4 Prod.
1st injection period	4,492.8	8.99	0.51
2nd injection period	983.7	2.01	0.11
3rd injection period	643.5	1.40	0.08
4th injection period	519.2	1.00	0.06
Total	6,639.2	13.4	0.76

Figure 6.46 shows the pressure distributions of bottomhole, well block and the furthest grid-block from the well-head. As it can be seen from the red line, bottomhole pressure, which is considered as fracturing pressure in this case, shuts the well in once it reaches 5,000 psi for 10 years. CO_2 injection starts after 10th year. Although the bottomhole fluctuates throughout the injection cycles, the pressure at the wellblock keeps increasing after the 30th year.

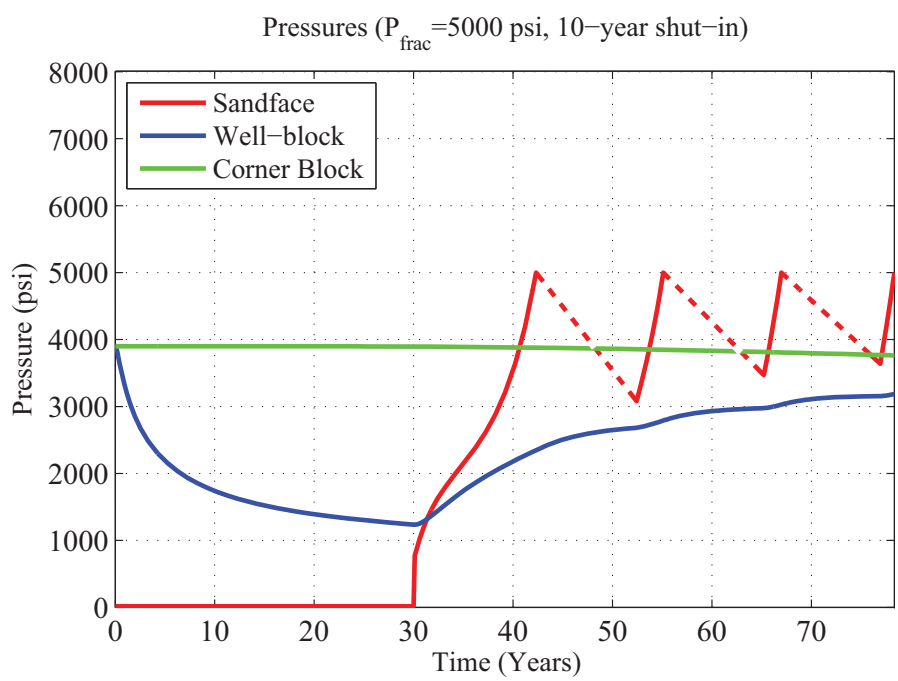


Figure 6.46. 10-year shut-in pressure distributions

Cyclic pressure pulsing accomplishes almost six years of additional injection time without exceeding the hydraulic fracturing pressure. During that time an additional 4.5 BSCF of CO_2 injection into the formation is achieved (which corresponds to 33% additional injection volumes). Four injection cycles with 10-year of shut-in period in every cycle creates a 25% increase in 'CO_2 injection - CH_4 production' ratio. It can be seen from the green line that, the pressure decrease at the corner grid-block in the first 30-years of production is very small. It also keeps decreasing on the next 30 years of cyclic pressure pulsing period. As a result, significantly more CO_2 can be injected with a cyclic pressure pulsing method if the infrastructure (injection pumps, pipelines etc.) is still available for injection for the next injection cycles.

6.5 Investigation on Different *SRV* Parameters

In this section, an investigation on different *SRV* parameters is conducted. The investigations includes three sub-sections, which are different *SRV* fracture permeability (*SRV*-k_f) values, different *SRV* fracture porosity (*SRV*-ϕ_f) values, and different *SRV* fracture spacing (SRV-Δx_s) values, respectively, to see the impact of these parameters in *SRV* zone approach.

6.5.1 Different *SRV* Fracture Permeability Values for Mid-rate Case

An investigation on the performance efficiency of the process for different *SRV* fracture permeability (*SRV*-k_f) values is conducted using 5 different cases. The same mid rate production model described in the previous chapter is considered as the base model for this investigation. Table 6.11 show the parameters that are used for this section. Table 6.12 show the values that are varied for these investigation. The values in Table 5.2 and 5.3 are used for relative permeability values.

Table 6.11. Reservoir and wellbore design parameters for different *SRV*-k_f

Model Parameters		Model Parameters	
Grid System	25 x 25	Matrix Permeability (md)	0.0006
X Dimension (ft)	4,411	Fracture Permeability (md)	0.00185
Y Dimension (ft)	4,411	Fracture Spacing (ft)	2.1
Drainage Area (acres)	447	Lang. Vol. of CH_4 (scf/ton)	73
Thickness (ft)	271	Lang. Pres. of CH_4 (psi)	726
Depth (ft)	6,500	Lang. Vol. of CO_2 (scf/ton)	75
Res. Pressure (psi)	3,940	Lang. Pres. of CO_2 (psi)	400
Res. Temperature (F)	142	Hor. Wellbore Length (ft)	3,000
Sw in Matrix (%)	10	Production Constraint (psi)	14.7
Sw in Fracture (%)	0.1	CO_2 inj. rate (MMSCFD)	1.5
Matrix Porosity (%)	8.5	*SRV* Fracture Spacing (ft)	0.2
Fracture Porosity (%)	1.05	*SRV* Fracture Porosity (%)	4

Different *SRV* fracture permeability values were investigated for the mid-rate case. Five different *SRV* fracture permeability values (0.00185, 0.00925, 0.0185, 0.02775, and 0.037 md) are taken into account in this investigation. *SRV* fracture permeabilities are increased by magnitudes of 1, 5, 10, 15, and 20 of natural fracture permeability values.

Table 6.12. Varied parameters for different *SRV*-k_f

SRV-k_f	
Case 1	0.00185
Case 2	0.00925
Case 3	0.01850
Case 4	0.02775
Case 5	0.03700

Figure 6.5.1, Figure 6.48 and Figure 6.49 show the top views of *SRV*-ϕ_f, *SRV*-k_f and *SRV*-Δx_s for this section, respectively. Stimulated reservoir zones can be seen around the horizontal wellbores on these figures. It can be seen that this *SRV* zone model is finer than the previous studies.

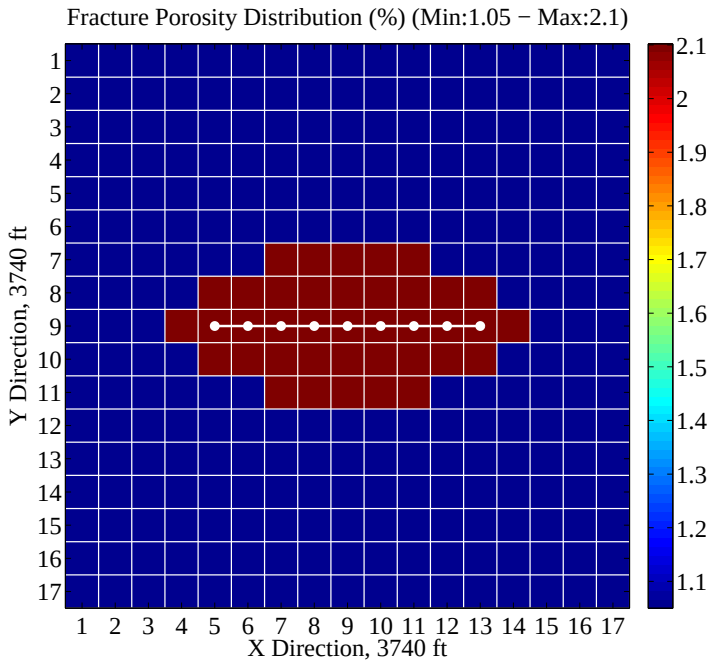


Figure 6.47. Fracture porosity values of investigation on different SRV-k_f

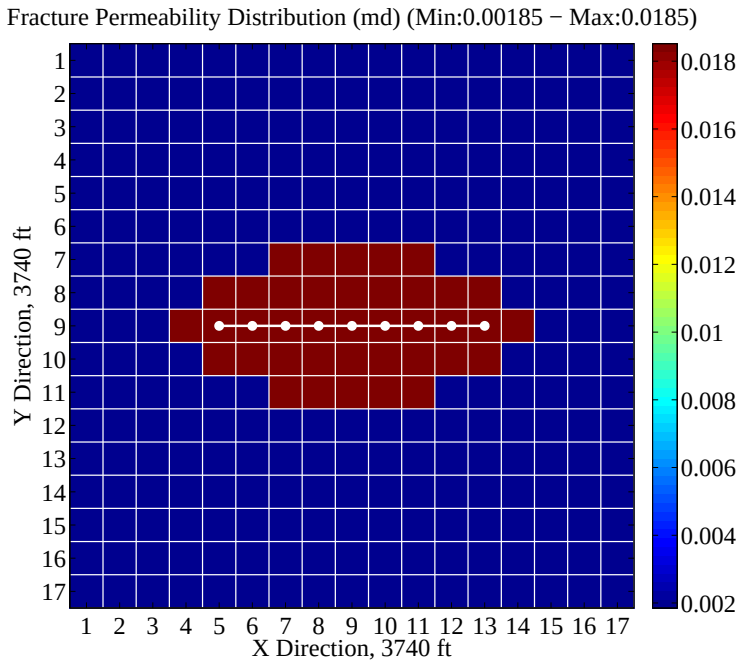


Figure 6.48. Fracture permeability values of investigation on different SRV-k_f

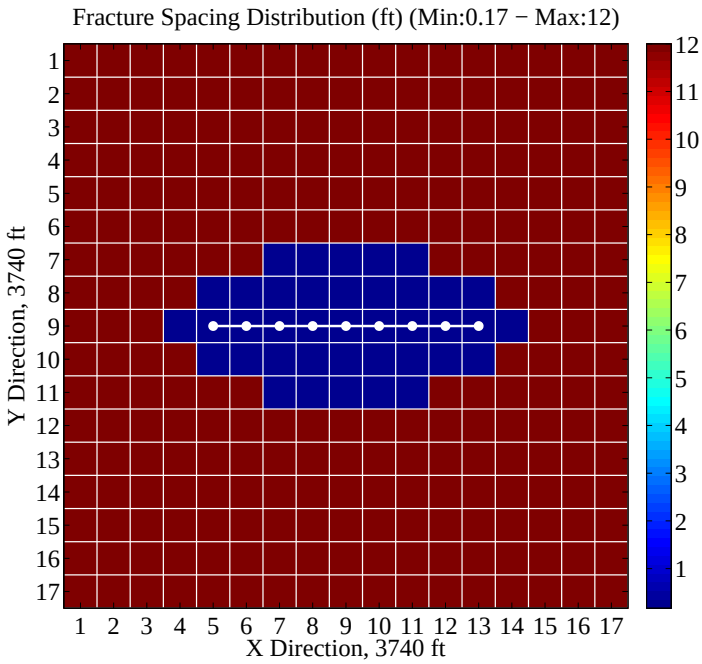


Figure 6.49. Fracture spacing values of investigation on different SRV-k_f

Figure 6.50 and Figure 6.51 show the production/injection performances of the process for different SRV fracture permeability values. In this investigation, production time is taken as 30 years. Injection constraint is specified flowrate, which is 1.5 MMSCFD; sandface pressures are compared after 10 years of injection. It is observed that it is essential to obtain higher fracture permeabilities within the SRV zone to be able to effectively produce CH_4 and inject CO_2. The charts below show the production/injection performances of the process for different SRV fracture permeability values. This indicates that fracture permeability has a major impact on production and injection performances. Figure 6.50 shows that if fracture permeability values can be increased by the magnitute of 5, about 3 times larger production values can be obtained in 30 years. Figure 6.51 shows that sandface pressure after 10 years of injection in Case 1 is more than 2 times larger than Case 2 for the same amount of injected CO_2. Again, acquiring larger SRV-k_f values is very important on the performances of CO_2 sequestration operations.

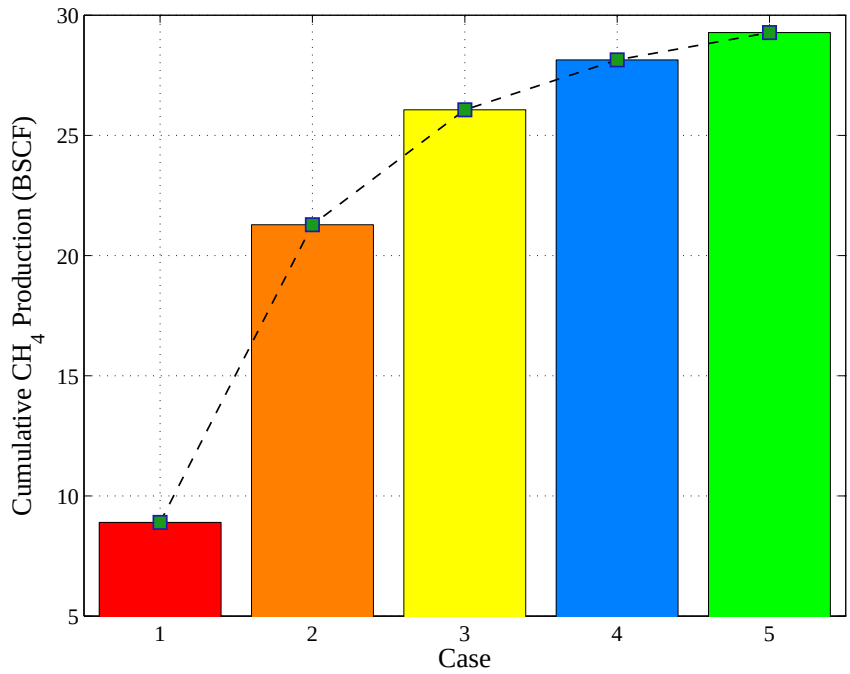


Figure 6.50. Cumulative CH_4 production

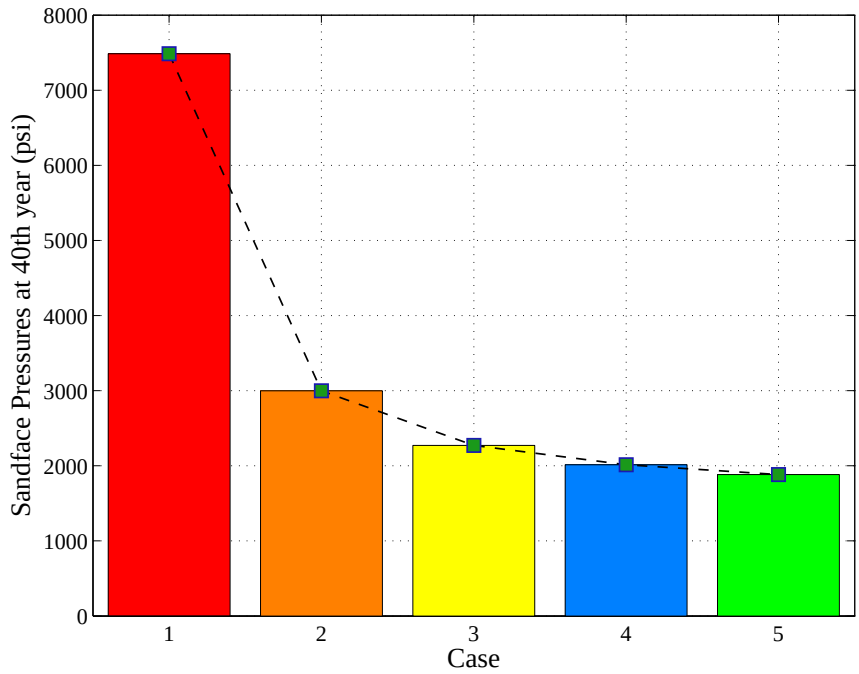


Figure 6.51. Sandface pressures after 10 years of injection

6.5.2 Different *SRV* Fracture Porosity Values for Mid-rate Case

An investigation on the effect of different *SRV* fracture porosity values for production/injection performance was conducted. *SRV* fracture porosities were increased by magnitudes of 1.2, 1.5, 1.8, 2.1, and 2.4 of natural reservoir fracture porosities. The same mid rate production model described in the previous chapter is considered as the base model for this investigation. Table 6.13 show the parameters that are used for this section. Table 6.14 show the values that are varied for these investigation. The values in Table 5.2 and 5.3 are used for relative permeability values. Figure 6.5.1, Figure 6.48 and Figure 6.49 show the top views of *SRV*-ϕ_f, *SRV*-k_f and *SRV*-Δx_s for this section, respectively.

Table 6.13. Reservoir and wellbore design parameters for different *SRV*-ϕ_f

Model Parameters		Model Parameters	
Grid System	25 x 25	Matrix Permeability (md)	0.0006
X Dimension (ft)	4,411	Fracture Permeability (md)	0.00185
Y Dimension (ft)	4,411	Fracture Spacing (ft)	2.1
Drainage Area (acres)	447	Lang. Vol. of CH_4 (scf/ton)	73
Thickness (ft)	271	Lang. Pres. of CH_4 (psi)	726
Depth (ft)	6,500	Lang. Vol. of CO_2 (scf/ton)	75
Res. Pressure (psi)	3,940	Lang. Pres. of CO_2 (psi)	400
Res. Temperature (F)	142	Hor. Wellbore Length (ft)	3,000
Sw in Matrix (%)	10	Production Constraint (psi)	14.7
Sw in Fracture (%)	0.1	CO_2 inj. rate (MMSCFD)	1.5
Matrix Porosity (%)	8.5	*SRV* Fracture Spacing (ft)	0.2
Fracture Porosity (%)	1.05	*SRV* Fracture Perm. (md)	0.0185

Table 6.14. Varied parameters for different SRV-ϕ_f

SRV-ϕ_f (%)	
Case 1	1.2
Case 2	1.5
Case 3	1.8
Case 4	2.1
Case 5	2.4

Figure 6.52 and Figure 6.53 show the production/injection performances for different SRV fracture porosity values. It is clear that fracture porosity has a relatively small, almost negligible impact on cumulative production. Figure 6.53 shows the bottomhole injection pressure values encountered for different SRV fracture porosity values. Larger SRV fracture porosity values have significantly lower bottomhole pressure values, which in turn, increases the duration of the CO_2 injection period, which leads to larger injection values of CO_2. Therefore, obtaining larger SRV-k_f values is key parameter to reach larger CO_2 injection values.

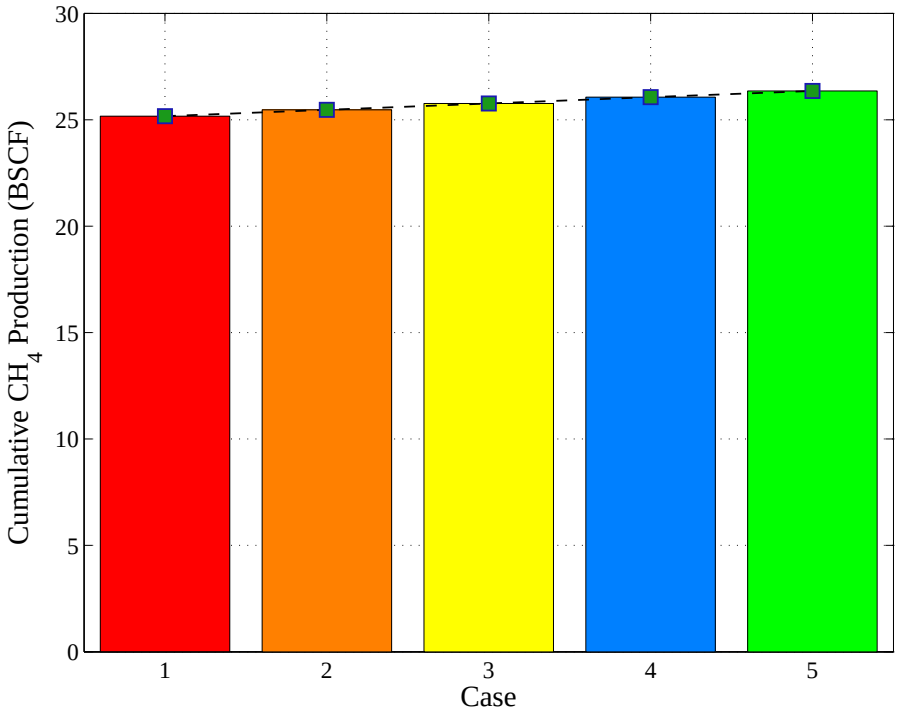


Figure 6.52. Cumulative CH_4 production

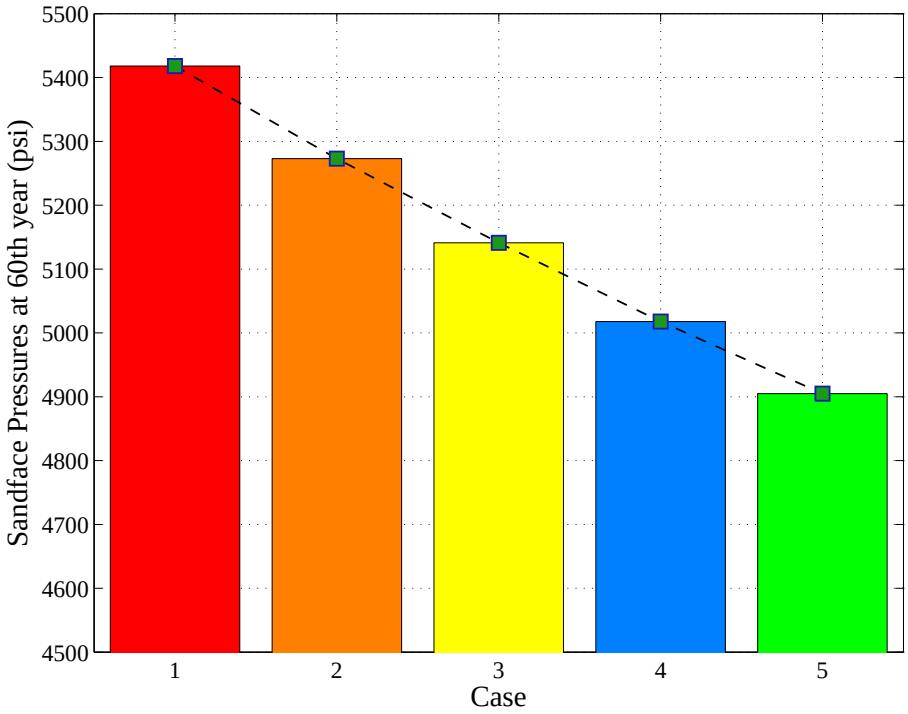


Figure 6.53. Sandface pressures after 30 years of injection

6.5.3 Different *SRV* Fracture Spacing Values for Mid-rate Case

A detailed investigation on the effect of different *SRV* fracture spacing values is conducted for 9 different fracture spacing values. The same mid-rate model described in the previous sub-section is considered as the base model for this investigation. Table 6.15 show the parameters that are used for this study. The values in Table 5.2 and 5.3 are used for relative permeability values. Figure 6.5.1, Figure 6.48 and Figure 6.49 show the top views of *SRV*-ϕ_f, *SRV*-k_f and *SRV*-Δx_s for this section, respectively.

Table 6.15. Reservoir and wellbore design parameters for different *SRV*-Δx_s

Model Parameters	
Grid System	25 x 25
X Dimension (ft)	4,411
Y Dimension (ft)	4,411
Drainage Area (acres)	447
Thickness (ft)	271
Depth (ft)	6,500
Res. Pressure (psi)	3,940
Res. Temperature (F)	142
Sw in Matrix (%)	10
Sw in Fracture (%)	0.1
Matrix Porosity (%)	8.5
Fracture Porosity (%)	1.05

Model Parameters	
Matrix Permeability (md)	0.0006
Fracture Permeability (md)	0.00185
Fracture Spacing (ft)	2.1
Lang. Vol. of CH_4 (scf/ton)	73
Lang. Pres. of CH_4 (psi)	726
Lang. Vol. of CO_2 (scf/ton)	75
Lang. Pres. of CO_2 (psi)	400
Hor. Wellbore Length (ft)	3,000
Production Constraint (psi)	14.7
CO_2 inj. rate (MMSCFD)	1.5
SRV Fracture Porosity (%)	2.1
SRV Fracture Perm. (md)	0.0185

Table 6.16. Varied parameters for different *SRV*-Δx_s

SRV-Δx_s (ft)	
Case 1	2.0
Case 2	1.8
Case 3	1.6
Case 4	1.4
Case 5	1.2

SRV-Δx_s (ft)	
Case 6	1.0
Case 7	0.8
Case 8	0.6
Case 9	0.4

Figure 6.54 and Figure 6.55 show a sample production performance for the second case observed in the detailed investigation on *SRV*-Fracture Spacing. In this study, fracturing pressure (P_{frac}) is taken as 6,000 psi. Therefore, once the bottomhole pressure during an injection cycle reaches 6,000 psi, the simulation shuts-in the injection. Approximately 32 BSCF of CH_4 is produced from the reservoir in 30 years of time in Case 2. Approximately 14.3 years of injection is achieved in Case 2. 2 MMSCFD of total CO_2 is injected to the reservoir, which results in almost 20 years of total CO_2 injection.

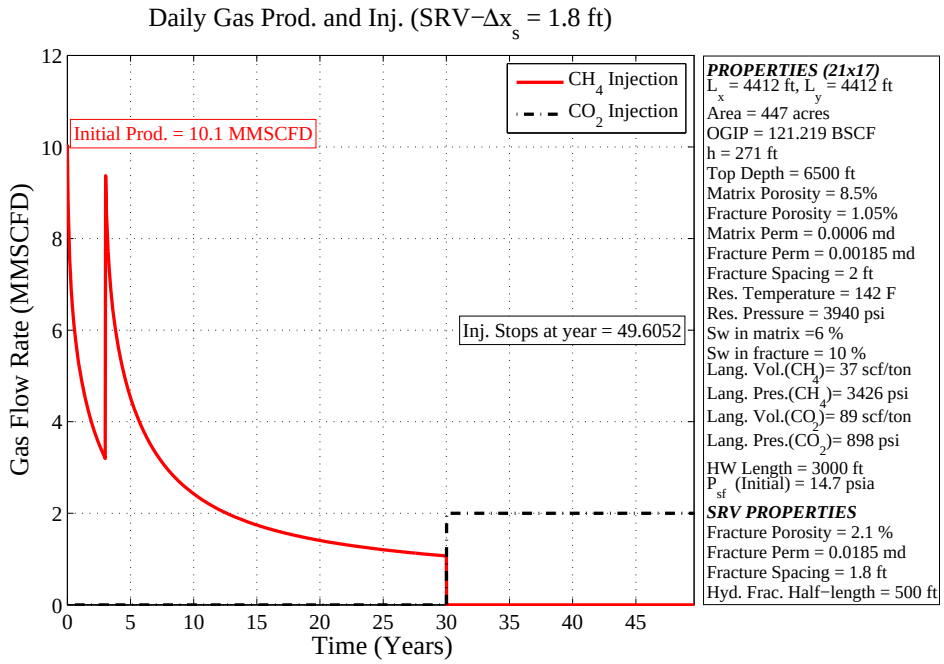


Figure 6.54. Daily flowrate performance of the second case

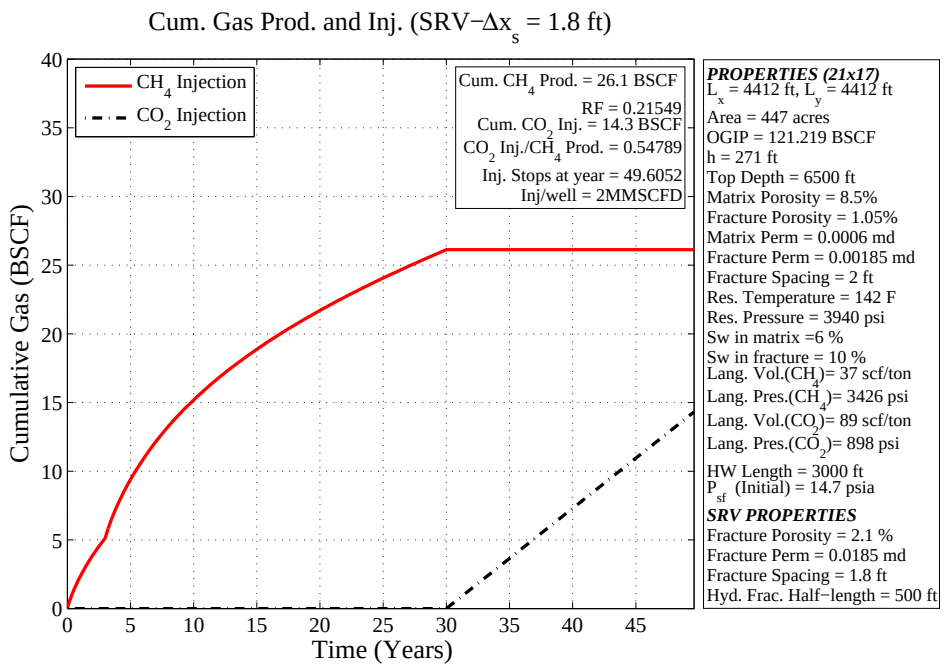


Figure 6.55. Cumulative production performance of the second case

Figure 6.56 and Figure 6.57 show the total injection time for all of the cases. Simulations stop when the bottomhole pressures reaches to 6,000 psi. It can be seen that as the SRV-fracture spacing values reduce, total injection time increase. The difference between Case 1 and Case 9 is approximately 3.5 years. Fracture spacing has a significant impact on total CO_2 injection.

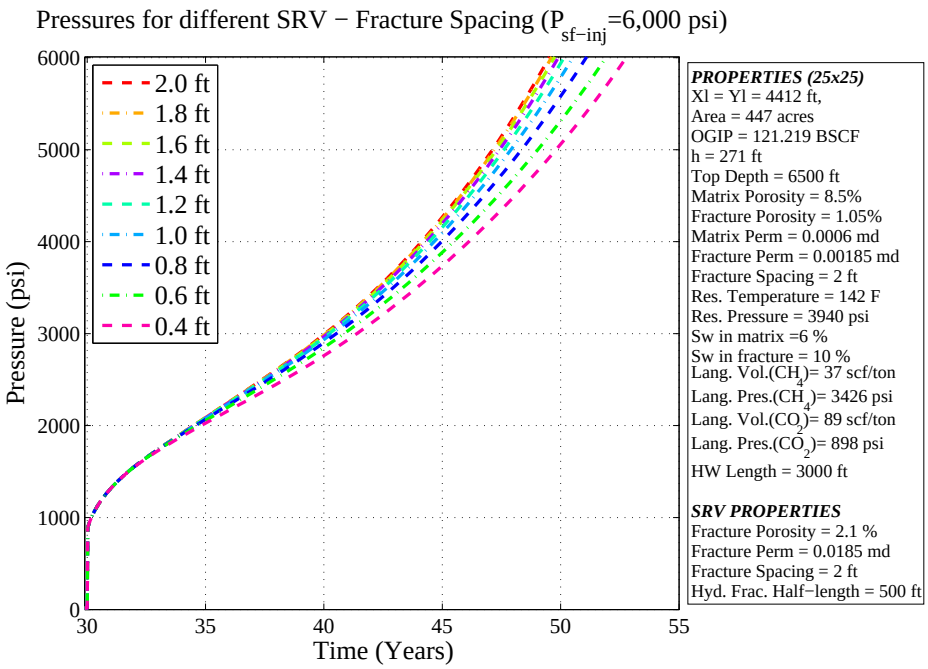


Figure 6.56. Pressures for different SRV-Δx_s

Figure 6.58 and Figure 6.59 show the total CO_2 injected. It can be seen that there is more than 2 BSCF of total CO_2 difference between Case 1 and Case 9. As the SRV-Δx_s values get smaller, more CO_2 can be adsorbed by the shale matrix, since the surface area of the stimulated reservoir volume zone gets increased because of hydraulic fracturing operations. Figure 6.59 also shows the total CO_2 adsorbed by the reservoir, mostly in the SRV zone. It can be seen that more the 250 MMSCF of CO_2 is adsorbed by the shale formation.

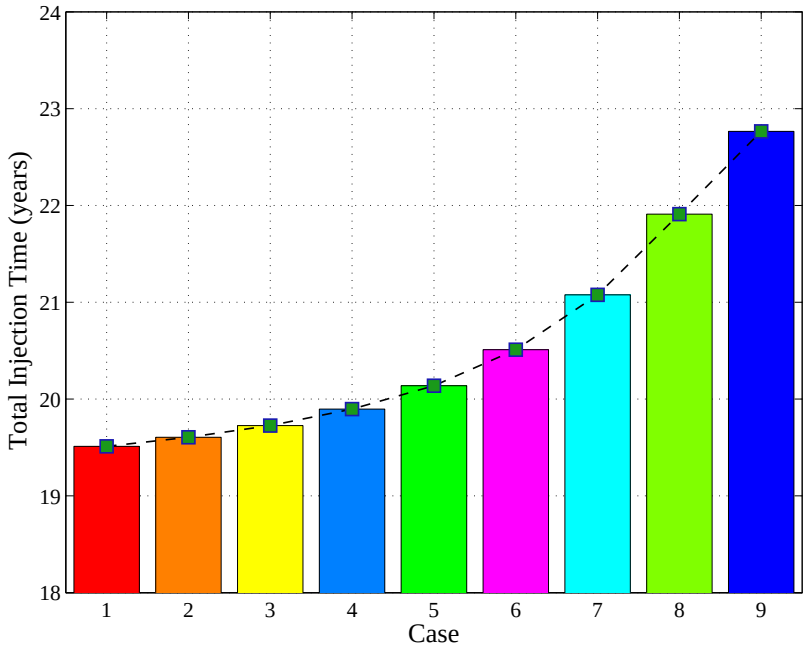


Figure 6.57. Total CO_2 injection time for different fracture spacing in *SRV* zone

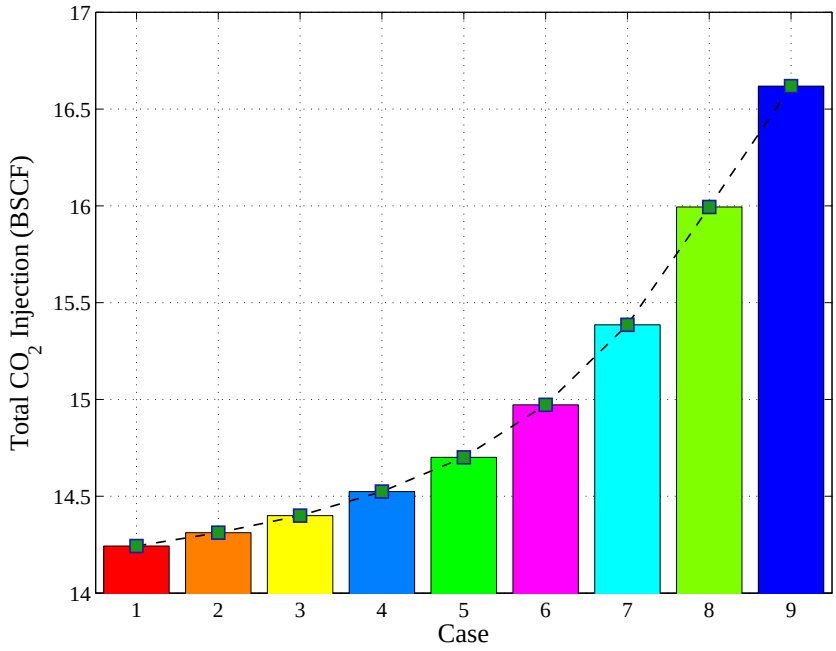


Figure 6.58. Cumulative CO_2 injections for different fracture spacing in *SRV* zone

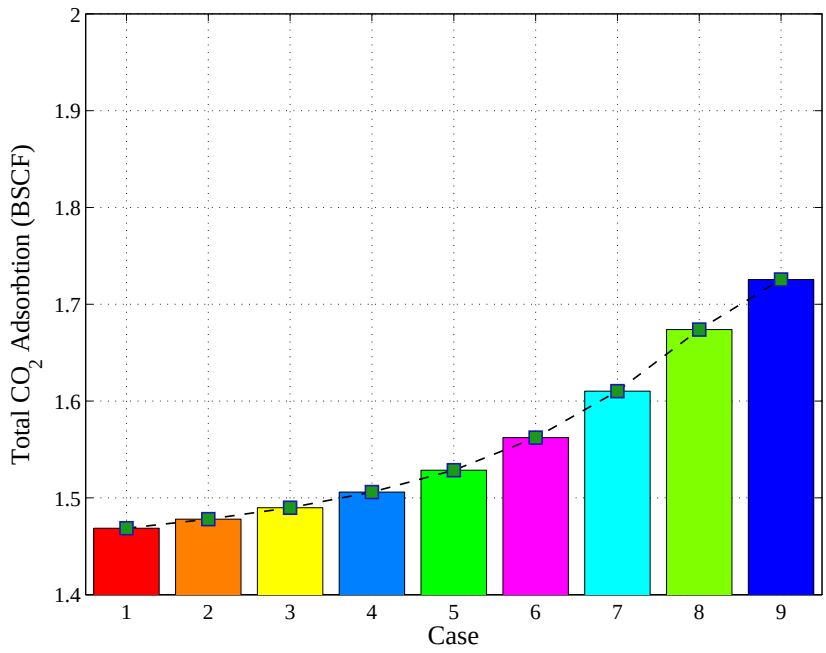


Figure 6.59. Cumulative CO_2 adsorbed for different SRV-Δx_s

6.6 The effects of varying the CO_2 injection rates

An investigation of 8 different injection rates is carried out using the PSU-SHALECOMP. The injection rates for the model are designed between 0.5 MMSCFD to 4 MMSCFD. The runs have a bottomhole constraint of 6,000 psi. Table 6.17 show the parameters that are used for this section. The values in Table 5.2 and 5.3 are used for relative permeability values.

Table 6.17. Reservoir and wellbore design parameters for varied CO_2 injection rates

Model Parameters		Model Parameters	
Grid System	25 x 25	Matrix Permeability (md)	0.0006
X Dimension (ft)	4,411	Fracture Permeability (md)	0.00185
Y Dimension (ft)	4,411	Fracture Spacing (ft)	2
Drainage Area (acres)	447	Lang. Vol. of CH_4 (scf/ton)	73
Thickness (ft)	271	Lang. Pres. of CH_4 (psi)	726
Depth (ft)	6,500	Lang. Vol. of CO_2 (scf/ton)	75
Res. Pressure (psi)	3,940	Lang. Pres. of CO_2 (psi)	400
Res. Temperature (F)	142	Hor. Wellbore Length (ft)	3,000
Sw in Matrix (%)	10	Production Constraint (psi)	14.7
Sw in Fracture (%)	0.1	*SRV* Fracture Porosity (%)	2.1
Matrix Porosity (%)	8.5	*SRV* Fracture Perm. (md)	0.0185
Fracture Porosity (%)	1.05	*SRV* Fracture Spacing (ft)	0.5

Eight different cases are taken into account, which can be found in Table 6.15 show the parameters that are used for this section.

Table 6.18. Varied parameters for different CO_2 injection rates

Injection Rates (MMSCFD)		Injection Rates (MMSCFD)	
Case 1	0.5	Case 5	2.5
Case 2	1.0	Case 6	3.0
Case 3	1.5	Case 7	3.5
Case 4	2.0	Case 8	4.0

Figure 6.60, Figure 6.61 and Figure 6.62 show the top views of *SRV*-ϕ_f, *SRV*-k_f and *SRV*-Δx_s for this section, respectively. Stimulated reservoir zones can be seen around the horizontal wellbores on these figures. The number of grid blocks in the model was increased from 17 to 25 to have a better computational accuracy in the results.

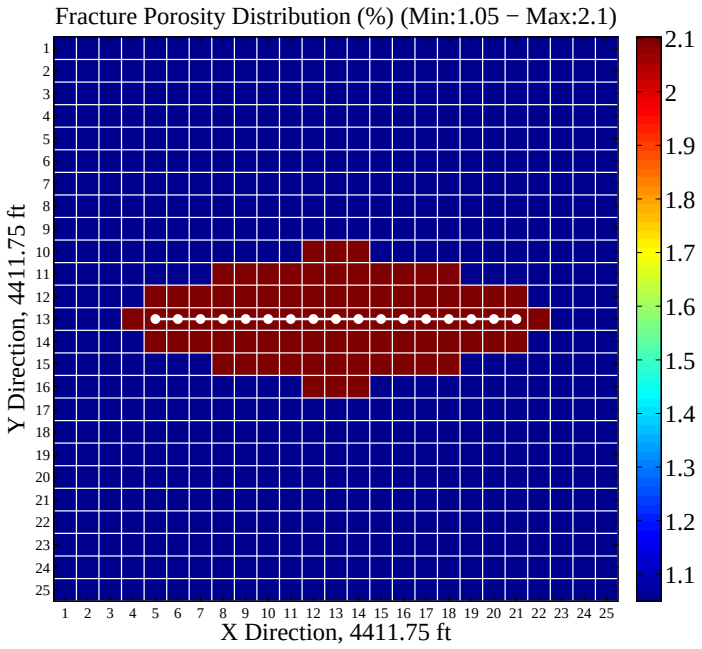


Figure 6.60. Fracture porosity values for investigation on varied CO_2 injection rates

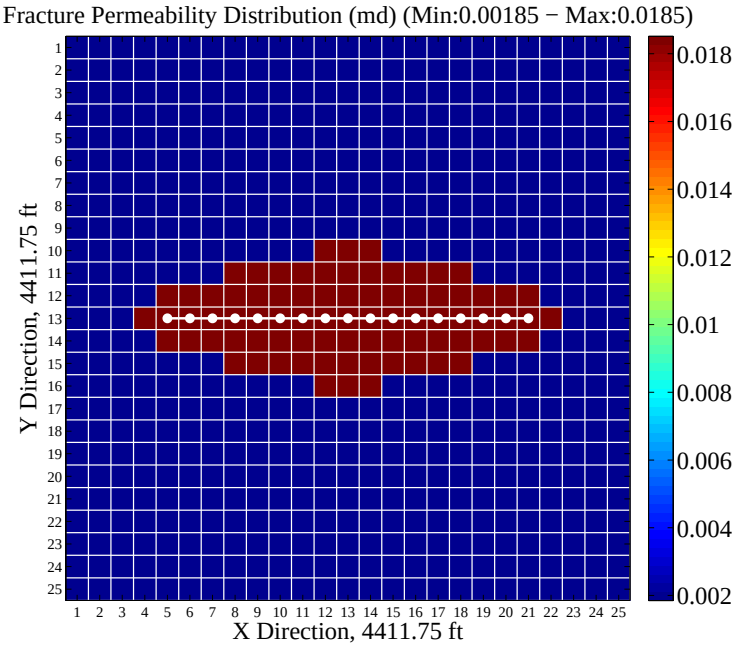


Figure 6.61. Fracture permeability values for investigation on varied CO_2 injection rates

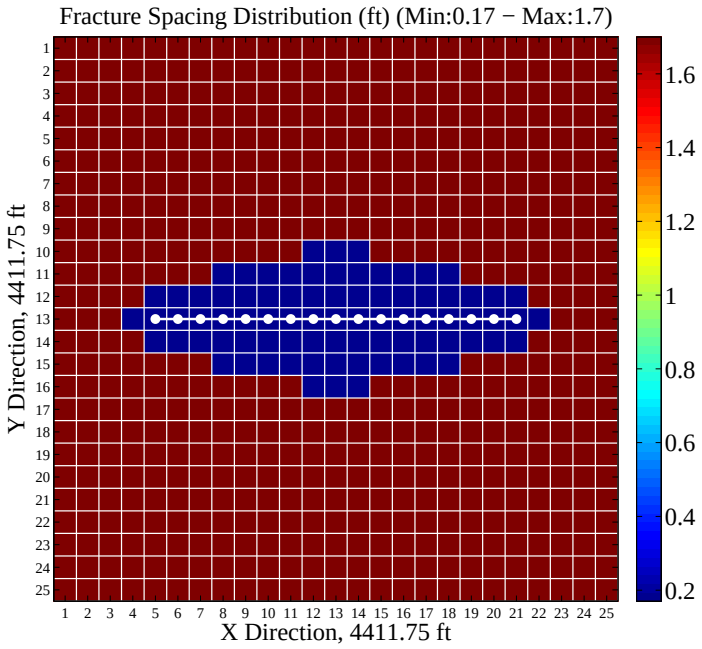


Figure 6.62. Fracture spacing values for investigation on varied CO_2 injection rates

Figure 6.63 and Figure 6.64 show production/injection performances for the eight different injection rates investigated. In the runs, all of the reservoir parameters are kept the same. Higher injection rates have shorter injection periods due to the imposed bottomhole pressure constraint. The flow dynamics of the injected CO_2 and the reservoirs response is investigated until the imposed limit of 6,000 psi is reached at the injection point.

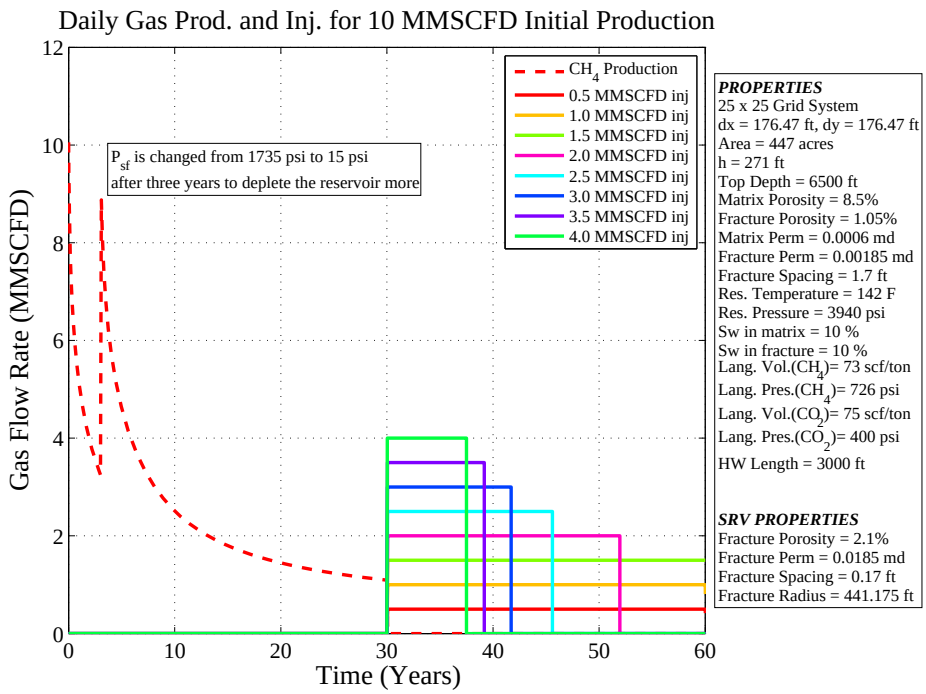


Figure 6.63. Daily flowrate performances for different CO_2 injection rates

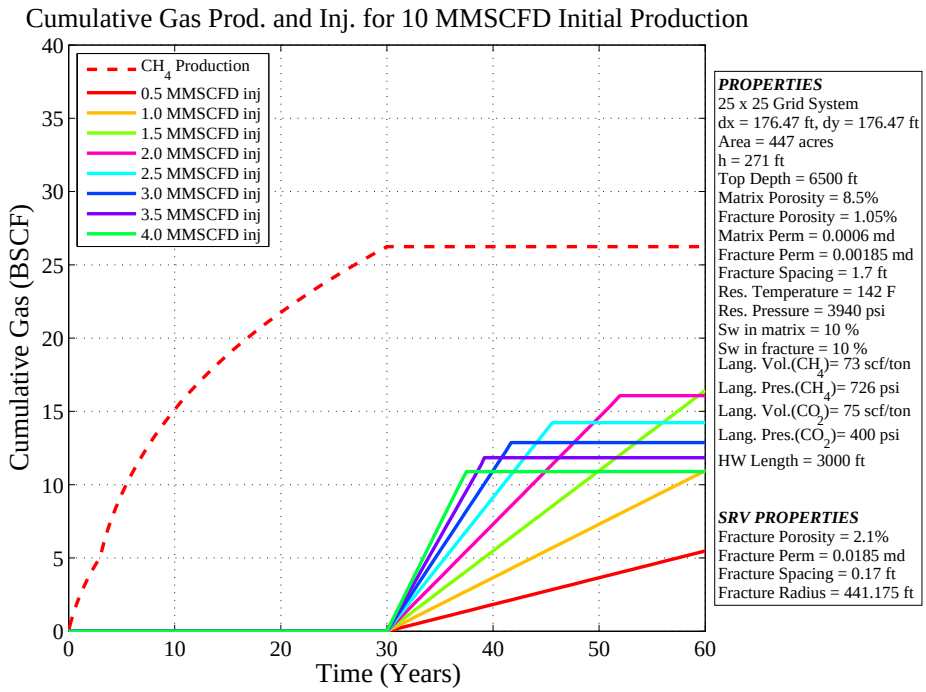


Figure 6.64. Cumulative production performances for different CO_2 injection rates

Bottomhole pressure is set to 6,000 psia to observe the cumulative CO_2 injection values when pressure reaches 6,000 psia at the injection point. High injection rates lead to early pressure increases while lower cumulative CO_2 injection values are observed (refer Figure 6.65) In the case of low injection rates it is possible inject much larger volumes of CO_2, but injection times to achieve these large volumes will be much longer (under a bottomhole pressure constraint of 6,000 psia). These behaviors can be seen in Figure 6.65 and Figure 6.66.

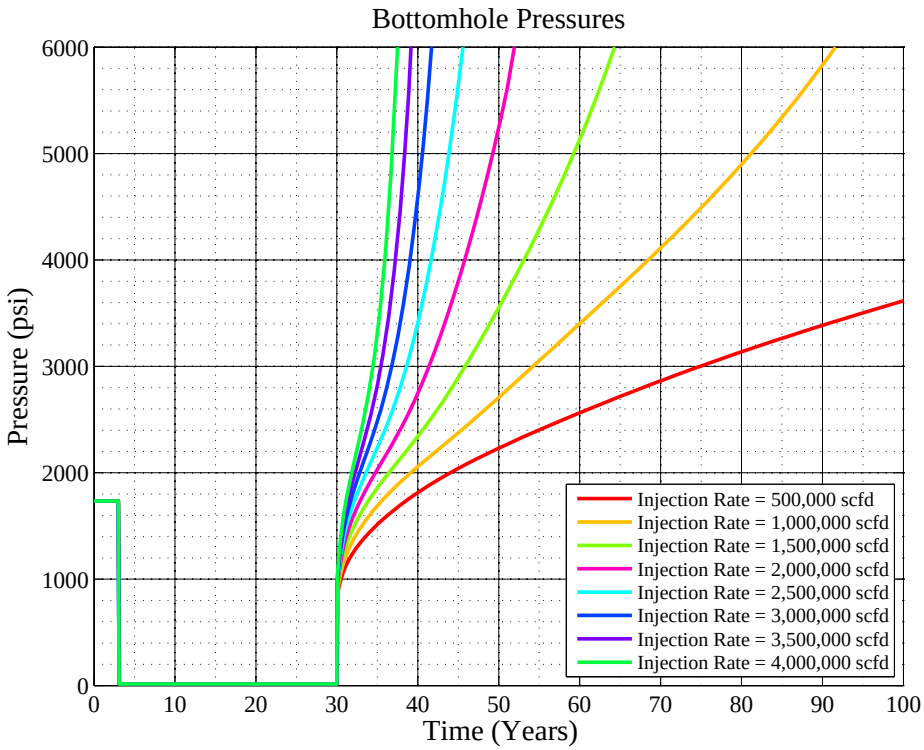


Figure 6.65. Bottomhole pressure versus time figure for different CO_2 injection rates

Figure 6.67 shows the ratios between CO_2 in the adsorbed and free gas phases for each of the injection cases investigated. Larger ratios are observed with higher injection rates. This is attributed to higher pressures achieved over a larger volume of the reservoir in the case of high injection rates (in spite of less volumes of CO_2 injected).

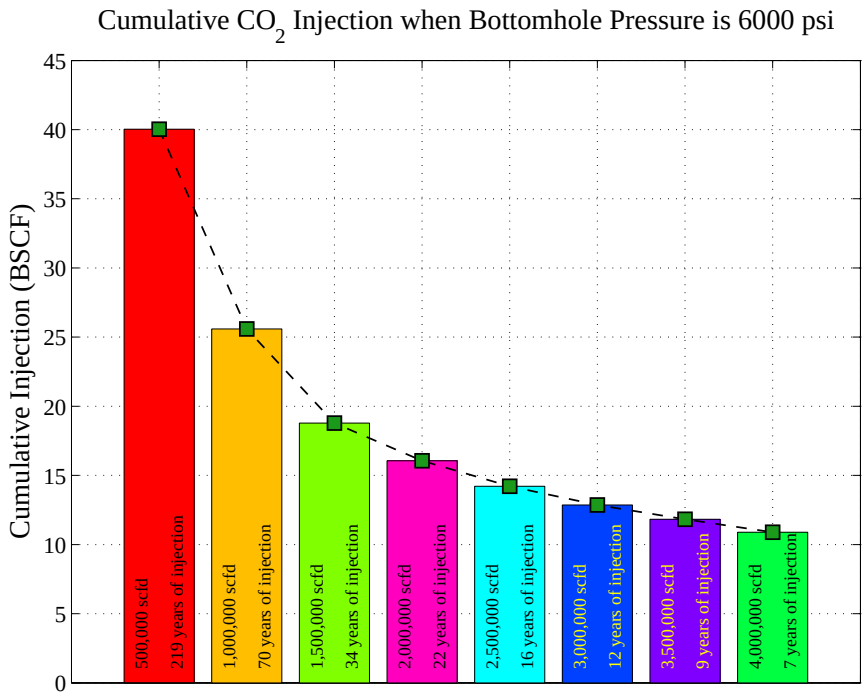


Figure 6.66. Cumulative production comparison for different CO_2 injection rates

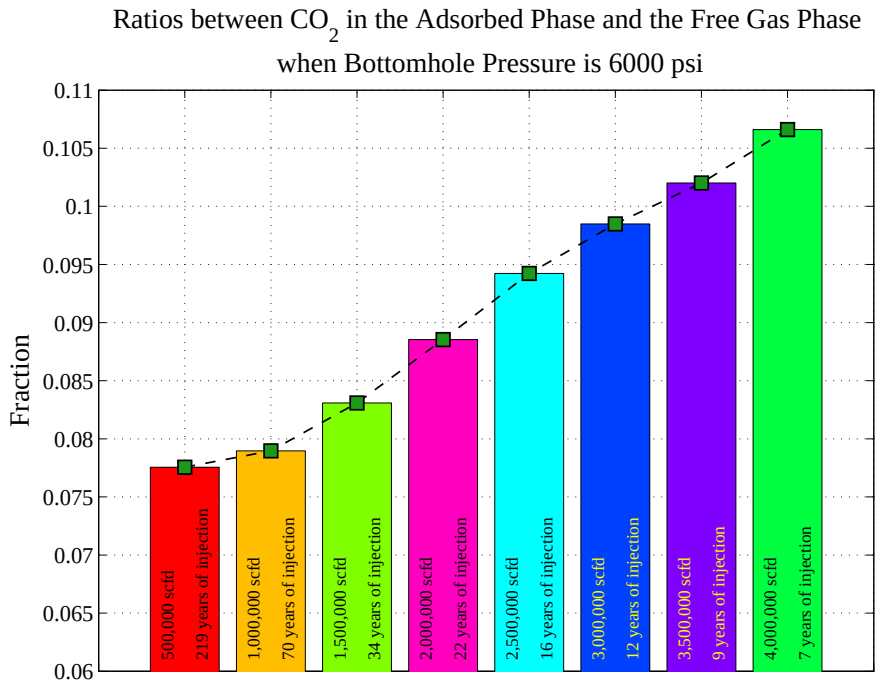


Figure 6.67. Adsorbed phase vs free gas phase of CO_2

As expected, injection operations with higher injection rates result in larger and more rapid pressure increases in the block hosting the well and also at the injection face of the shale formation.

When implementing high injection rates, if the injected CO_2 is not given enough residence time while flowing through the sections of the *SRV* zone and also through the unstimulated reservoir sections, it will not be adsorbed effectively by the matrix depending upon the level of the limiting bottomhole pressure imposed at the injection well.

Lower injection rates can be more economical because of higher cumulative injection values and lower pumping costs. High injection rates also may cause undesired fractures to initiate and propagate through neighboring formations.

As it is discussed before, cyclic repressurization of a depleted shale gas reservoir by CO_2 injection can help to increase the efficacy of the industrial CO_2 sequestration. Along the same lines, infill production/injection well drilling at locations which are not influenced by the injection operation is another option in converting a depleted shale gas reservoir to a CO_2 storage reservoir.

6.7 An Investigation on CO_2 Breakthrough Times

As it is discussed in previous sections, it is almost impossible to inject any fluid into ultratight systems such as shale formations unless extensive stimulation around the injectors is achieved. However, because of favorable Langmuir Volume and Langmuir Pressure constants of CO_2 as applicable to shale formations and potential of encountering large thicknesses, it is still viable to inject large volumes of CO_2 without exceeding the physical limits of the injection pressure.

Two investigations on CO_2 breakthrough times are carried out. The first one investigates the possibility of enhancing CH_4 production by injection CO_2 from a neighboring well, the injector produces for 30 years and it is altered to an injector. In this case, it is considered that the *SRV* zones have connectivity between wells, in other terms the *SRV* zones are connected with "frac-hits". The second part of the investigation also covers the possibility of enhancing CH_4 production by injection CO_2. However, in this case, there are unstimulated zones exist between *SRV* zones.

Table 6.19 show the parameters that are used for this section. The values in Table 5.2 and 5.3 are used for relative permeability values. Specified flowrate of the injection period is set as 1 MMSCFD. Only difference between the two investigations is the distance between the *SRV* zones.

6.7.1 *SRV* zones with Fracture Connectivities

In this sub-section, possible hydraulically fractured zone connectivities between neighboring wells is modeled. These connectivities can be seen in the following figures. Figure 6.68, Figure 6.69, Figure 6.70 show the fracture porosity, fracture permeability and fracture spacing distributions pertaining to the hydraulic fractures throughout the reservoir.

Figure 6.71, Figure 6.72, Figure 6.73 show the production and injection performances of the center and the side wells. 20 year of CO_2 injection is applied into a shale reservoir which is depleted for a period of 30 years. Nearly, 30 BSCF of CH_4 is produced in 30 years and 13 BSCF of CO_2 injected in 20 years. First CO_2 production at the center well is seen after 5 years of injection. Also, a small increment in CH_4 production is observed.

Table 6.19. Reservoir and wellbore design parameters for varied CO_2 injection rates

Model Parameters	
Grid System	15 x 15
X Dimension (ft)	3,750
Y Dimension (ft)	3,750
Drainage Area (acres)	322
Thickness (ft)	130
Depth (ft)	6,500
Res. Pressure (psi)	4,000
Res. Temperature (F)	142
Sw in Matrix (%)	10
Sw in Fracture (%)	0.1
Matrix Porosity (%)	10
Fracture Porosity (%)	1

Model Parameters	
Matrix Permeability (md)	0.0009
Fracture Permeability (md)	0.0020
Fracture Spacing (ft)	2
Lang. Vol. of CH_4 (scf/ton)	73
Lang. Pres. of CH_4 (psi)	726
Lang. Vol. of CO_2 (scf/ton)	75
Lang. Pres. of CO_2 (psi)	400
Hor. Wellbore Length (ft)	3,000
Production Constraint (psi)	14.7
SRV Fracture Porosity (%)	2
SRV Fracture Perm. (md)	0.02
SRV Fracture Spacing (ft)	0.5

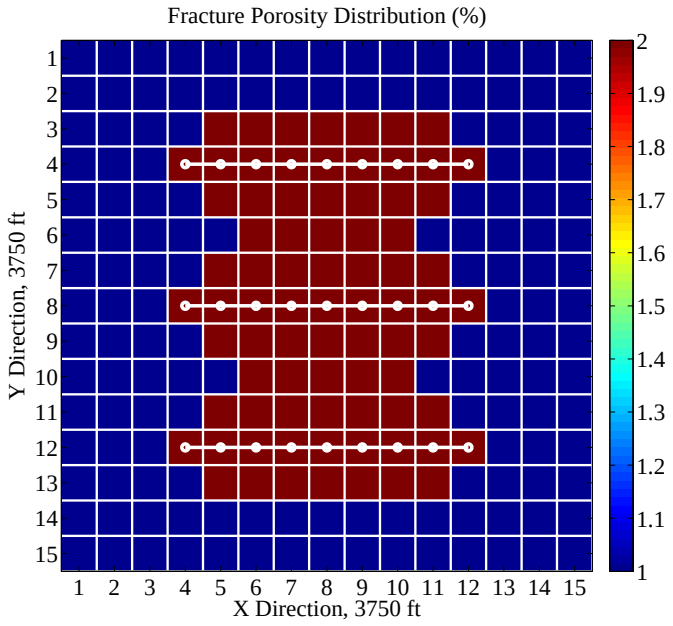


Figure 6.68. Fracture porosity values for the investigation on CO_2 breakthrough times with fracture connectivities

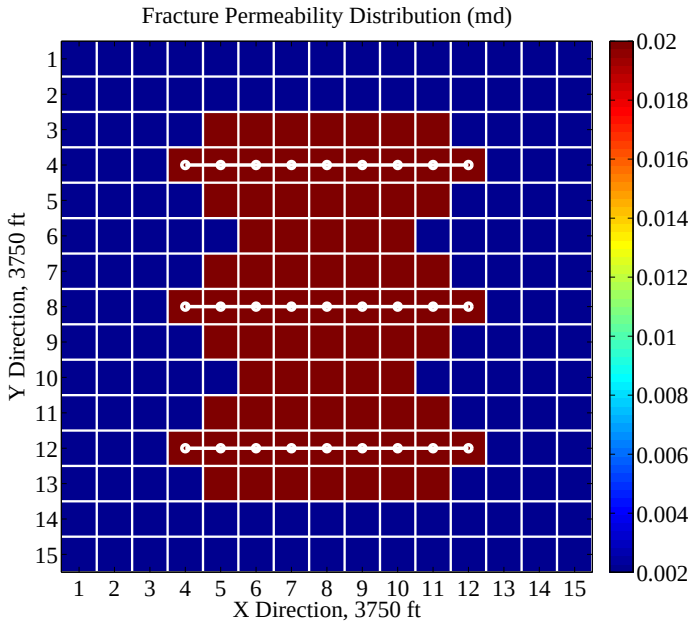


Figure 6.69. Fracture permeability values for the investigation on CO_2 breakthrough times with fracture connectivities

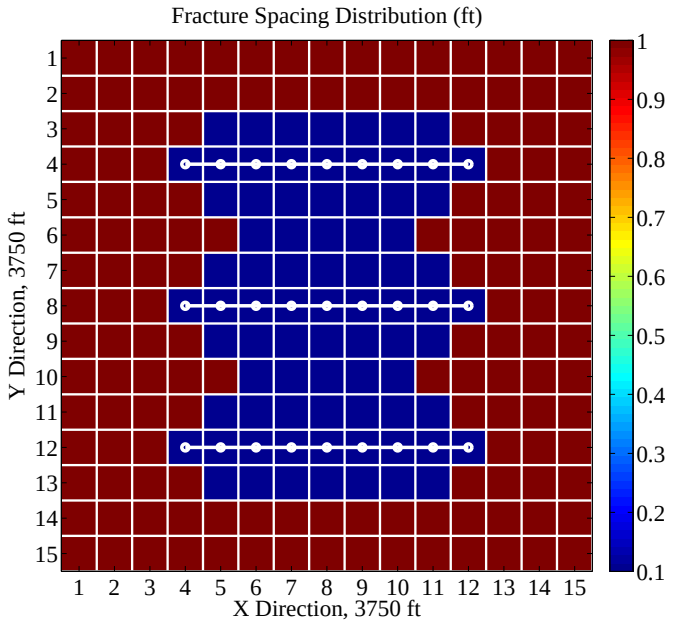


Figure 6.70. Fracture spacing values for the investigation on CO_2 breakthrough times with fracture connectivities

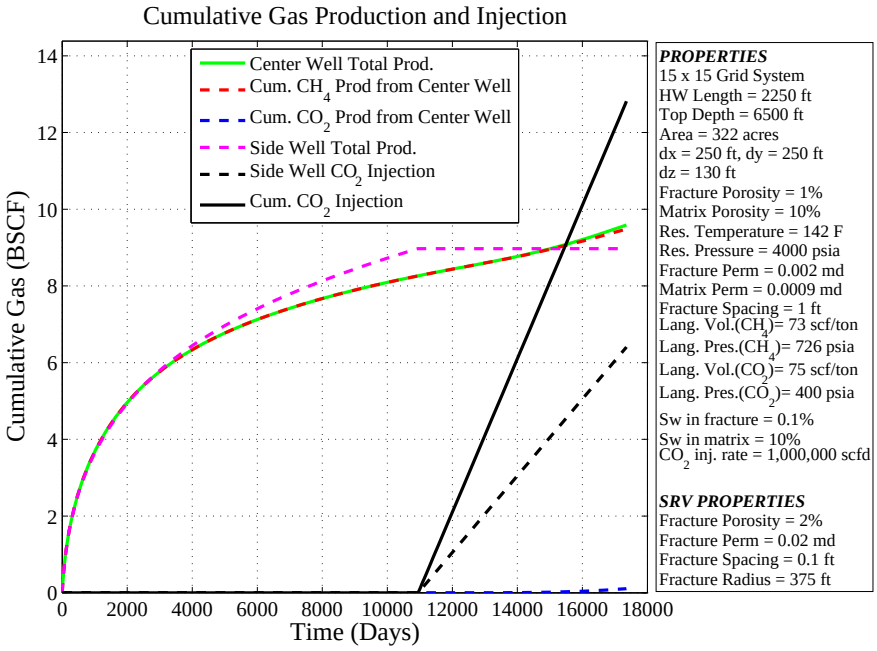


Figure 6.71. Cumulative production and injection performances of the investigation on CO_2 breakthrough times with fracture connectivities

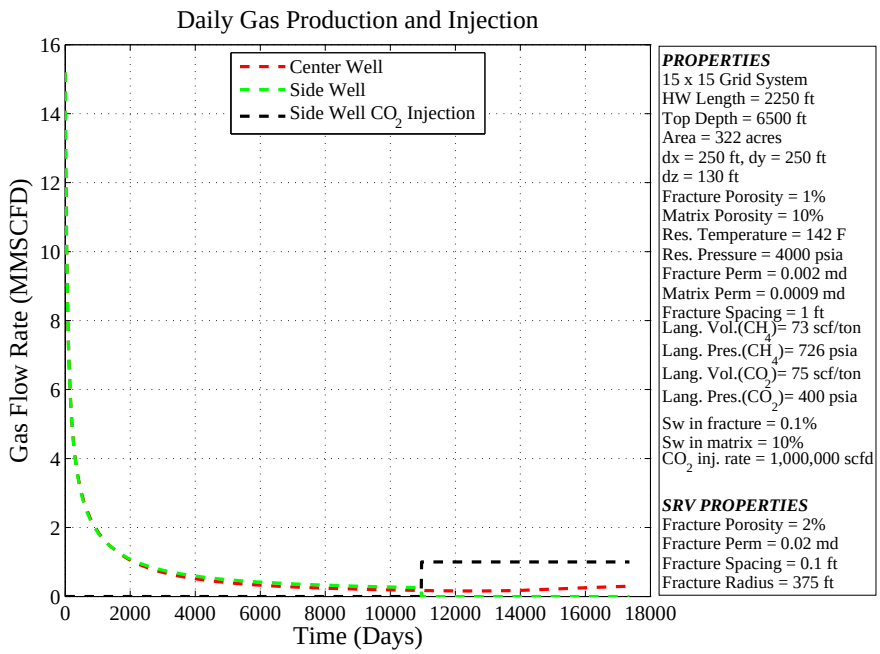


Figure 6.72. Daily production and injection performances of the investigation on CO_2 breakthrough times with fracture connectivities

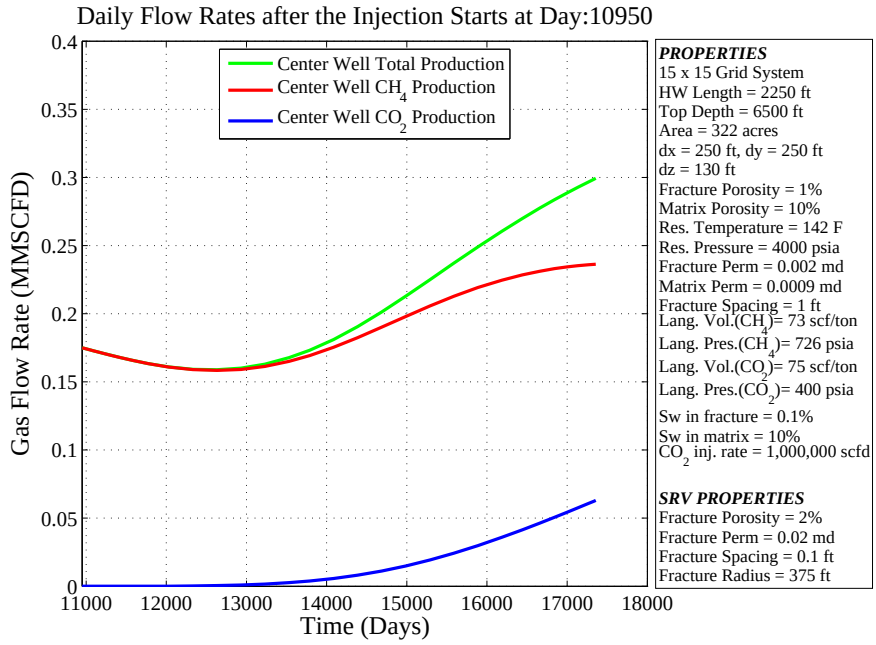


Figure 6.73. Zoomed in daily production and injection performances of the investigation on CO_2 breakthrough times with fracture connectivities

Figure 6.73 is the zoomed-in version of the daily production and injection performances. It can be seen that the first CO_2 is seen at the center well, which is still a producer, after 5 years of injection from a side well. It can also be seen that there is an increase in the production at the center well about 150,000 SCFD of gas after about 20 years. However, almost half of this increment is CO_2, which comes from the CO_2 injector. Therefore, if there is fracture connectivities exist in between the wells, not only CO_2 production is observed at the production well but also the impact of CO_2 injection to the enhancement on CH_4 production is rather low. According to this production and injection profiles, enhanced gas recovery by using CO_2 injection is not recommended.

6.7.2 *SRV* zones without Fracture Connectivities

In the second part of this investigation, there is no possible hydraulically fractured zone connectivities between neighboring wells. Figure 6.74, Figure 6.75, Figure 6.76 show the fracture porosity, fracture permeability and fracture spacing distributions pertaining to the hydraulic fractures throughout the reservoir. It can be seen that there are unstimulated grid blocks in between the wells. The CO_2 production at the center well is investigated in this particular model.

Figure 6.77, Figure 6.78, Figure 6.79 show the production and injection performances of the center and the side wells. 20 year of CO_2 injection is applied into a shale reservoir which is depleted for a period of 30 years. Nearly, 30 BSCF of CH_4 is produced in 30 years and 12 BSCF of CO_2 injected in 20 years. First CO_2 production at the center well is seen after 9 years of injection. Also, there is no increment seen in CH_4 production. Thus, CO_2 injection does not enhance the CH_4 production in this model.

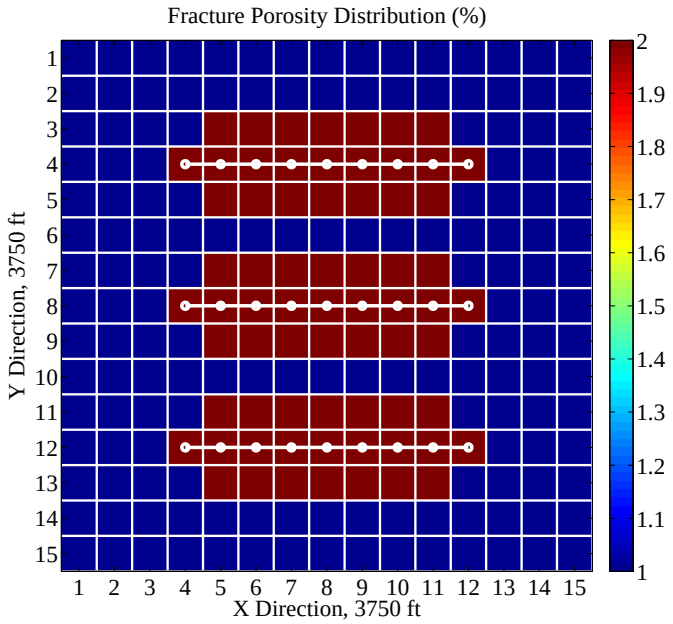


Figure 6.74. fracture porosity values for the investigation on CO_2 breakthrough times without fracture connectivities

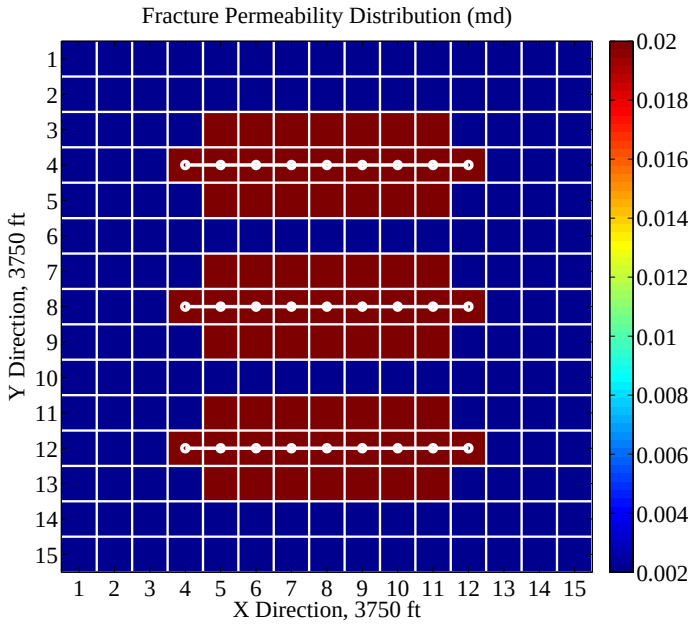


Figure 6.75. Fracture permeability values for the investigation on CO_2 breakthrough times without fracture connectivities

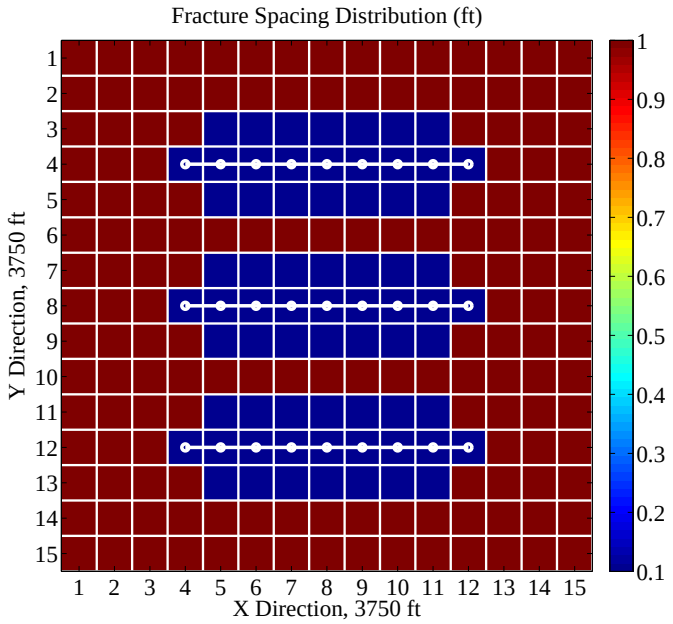


Figure 6.76. Fracture spacing values for the investigation on CO_2 breakthrough times without fracture connectivities

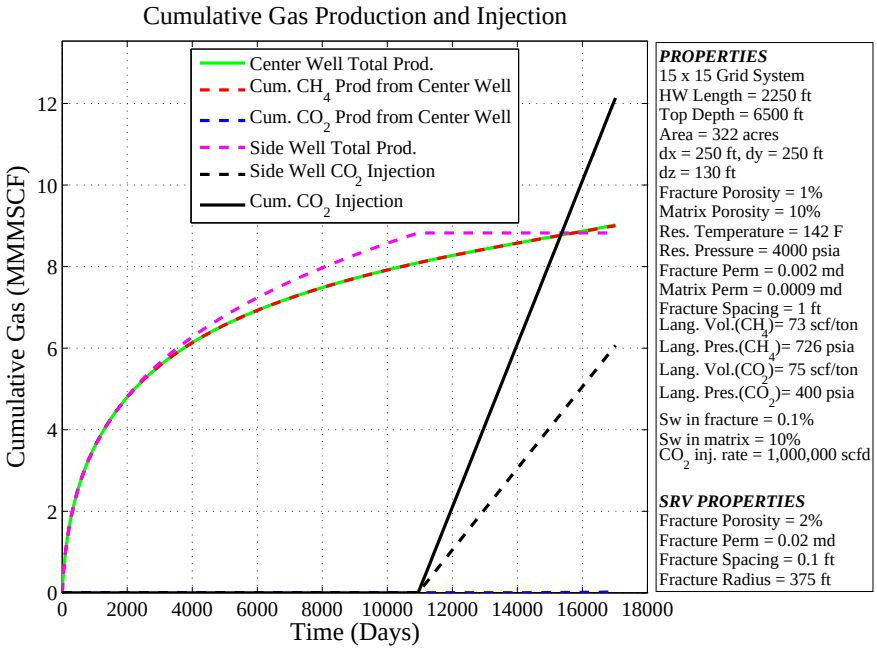


Figure 6.77. Cumulative production and injection performances of the investigation on CO_2 breakthrough times without fracture connectivities

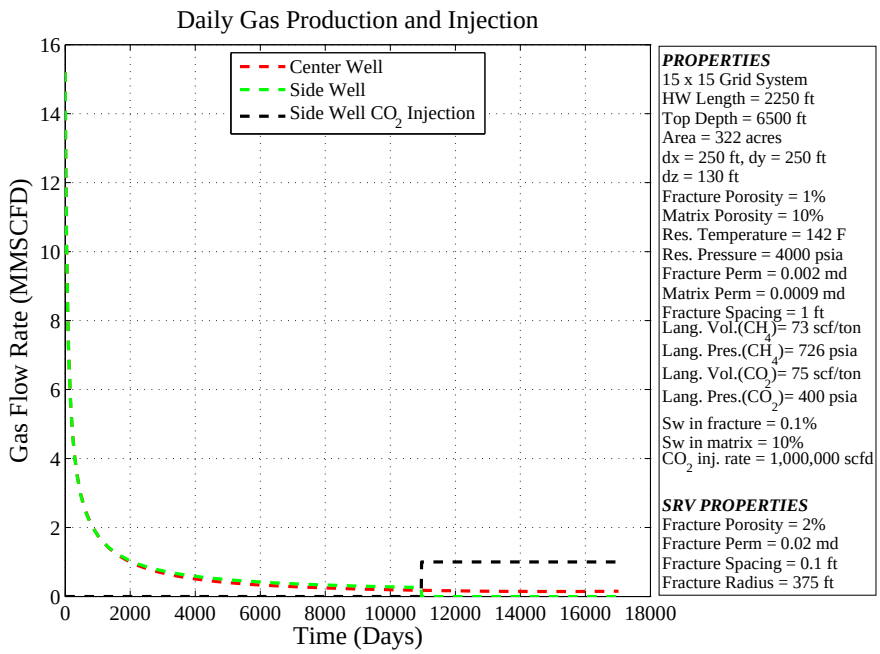


Figure 6.78. Daily production and injection performances of the investigation on CO_2 breakthrough times without fracture connectivities

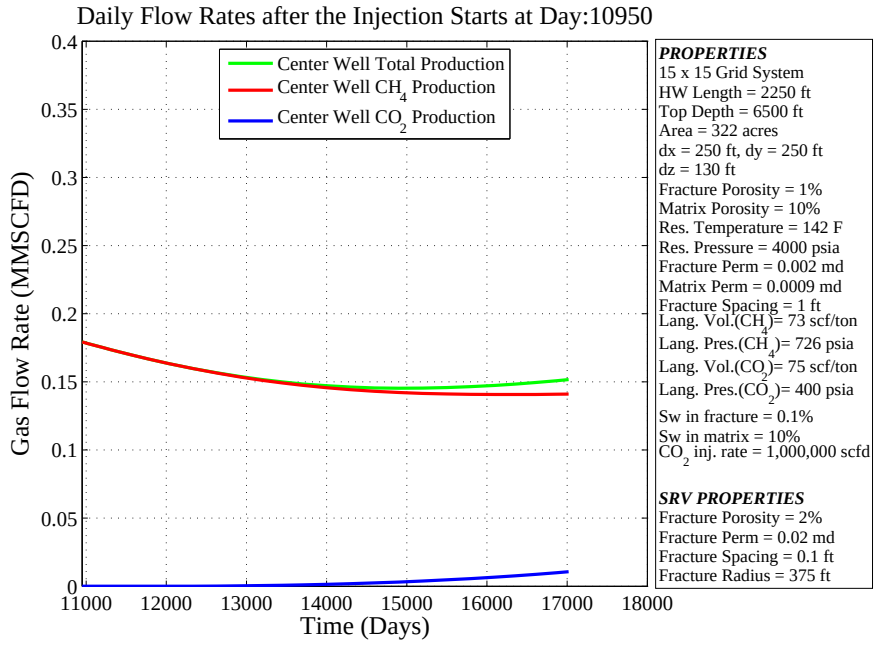


Figure 6.79. Zoomed in daily production and injection performances of the investigation on CO_2 breakthrough times without fracture connectivities

Figure 6.79 is the zoomed-in version of the daily production and injection performances. It can be seen that the first CO_2 is seen at the center well, which is still a producer, after 9 years of injection from a side well. It can also be seen that there is no increase in the production at the center well. However, although there is no increase in CH_4 production, it is stable for 3 years with a rate of 150,000 SCFD of CH_4, which is a rather low rate for a gas well.

As a result, if there is no fracture connectivities in between the wells, it is observed that CO_2 injection has a negligible impact on the enhancement of methane production. Therefore, CO_2 injection is not recommended as an enhanced gas recovery option in ultratight formations such as shale gas reservoirs. However, because of their ultratight nature in terms of permeability and their preference on CO_2 in terms of adsorption, they are considered as good candidates of CO_2 sequestration or long term storage of CO_2.

Chapter 7

Development of Artificial Neural Network Tools for Injection of Carbon Dioxide into Depleted Shale Reservoirs

For field optimization studies, reservoir simulation and the reservoir engineering techniques are used to find optimum scenarios for the production for a single well or for a field. However, finding optimum scenarios can be inefficient in terms of time and better possibilities can easily be missed due to lack of rock or fluid properties or some uncertainties with the available field data. In this part of the study, ANN technology is utilized to overcome these inefficiencies and uncertainties.

ANNs can be utilized to model complex nonlinear functions with large numbers of variables. Because ANN learns from the structure of the data, they can be utilized in any situation that input and output values are related. Previous studies by [45], [4], [46], [47], [48] show where ANN technology is applicable to hydrocarbon recovery and also different injection scenarios. The published results proves the strength of the ANN technology.

In this section of the study, eight ANN tools are developed for hydraulically fractured horizontal wellbores, which is defined by *SRV* approach, in shale gas reservoirs. The principal objective

is obtaining monthly production profiles for a given reservoir with a data set including length of horizontal wellbore that is also the major axis of the *SRV* (L_{hw}), length of fracture, which is considered as the minor axis of the *SRV* (L_f). The drainage area (L_x and L_y), reservoir thickness (h), porosity values for matrix, fracture and *SRV* fracture (ϕ_m, ϕ_f and *SRV*-ϕ_f), and matrix water saturation (S_{wm}) are included in the data set which are the major parameters that affect the original gas in place values. The permeability values for matrix, fracture and *SRV* fracture (k_m, k_f and *SRV*-k_f), fracture spacing values of the formation and the *SRV* (Δx_s and *SRV*-Δx_s), initial pressure (P_i), reservoir temperature (T_i), Langmuir volumes and pressures of both methane and carbon dioxide (V_{L-CH_4}, P_{L-CH_4}, V_{L-CO_2}, P_{L-CO_2}) are also a part of the data set, which complete the major elements that have a significant impact on the fluid flow of the reservoir.

The last components of the input data sets are the production and injection criterion and their stopping constraints. There are two production criterion that are either production sandface pressure or specified flowrate of production phase ($P_{sf-prod}$ or $q_{sf-prod}$); depending on a tool it could be either of them that models the production phase. The stopping constraint is the production period (t_{prod}), which has a range between 20 years to 50 years and adds a large complexity to the ANN tool developments during their training procedure. There are also two criterion for the injection phase that are injection sandface pressure or specified flowrate of injection (P_{sf-inj} or q_{sf-inj}); depending on a tool, either of them can be selected as the injection scenario. If P_{sf-inj} is selected for the injection period, then the stopping criterion is the stopping injection flowrate ($q_{sf-inj-stop}$). However, if q_{sf-inj} is selected for the injection period, in this case, the stopping criterion is the stopping bottomhole pressure ($P_{sf-inj-stop}$).

Four different ANN tool are developed for combinations of different production and injection types. These combinations consist of production sandface pressure ($P_{sf-prod}$), specified production flowrate ($q_{sf-prod}$), injection sandface pressure (P_{sf-inj}) and specified production flowrate (q_{sf-inj}). Also, by using the same data sets, 4 inverse ANN tools are developed by introducing the reservoir parameters, production and injection profiles to the tools to predict horizontal wellbore and hydraulic fracture design parameters.

Figure 7.1 is a simple illustration of the followed process of gathering results by the use of a developed ANN tool. In this study, the tools are trained successfully in a way that they can

predict production profiles and injection profiles of any given data set in seconds without using any simulator.

To develop a tool that can predict a set of results in small margin of errors, one should generate enough number of data sets. Some of the data sets are needed to be removed out of the training set due to the fact that they deliver unreasonable or unfeasible data sets to the tool and provide misinformation during the training thus, they influence the quality of the developed tool adversely. For instance, a data set that has a shorter horizontal wellbore length with a very large *SRV* zone that produces unfeasibly small amount of gas is needed to be removed. The cleaning process should be done very carefully, which is one of the most important steps of developing an ANN tool. Another important step is to structure the ANN training, which is the major reason of the success of this development. Almost 100,000 ANN designs are tested to find the best structure for these eight ANN tool by using the Pennsylvania State University UNIX clusters. In other words, almost every possible design is tested in the development of the tool and the best designs that have the smallest error margins are selected as tools. The protocol of structuring an ANN training can be find in the Appendix C.

Figure 7.1. ANN tool protocol

Figure 7.2 shows the procedure of development of the ANN tool. To solve this problem, MATLAB is employed in various steps. PSU-SHALECOMP simulator is employed to obtain production data. These production data of each of the data sets are used in the ANN training step. In the ANN training step, input values of each of the data sets are included to their production data.

Some of the data sets are used for testing purposes to check the quality of the developed tool. In testing step, the production data is compared with the predicted data that is generated by the ANN tool. One should decide whether the developed tool is strong or not by checking these errors.

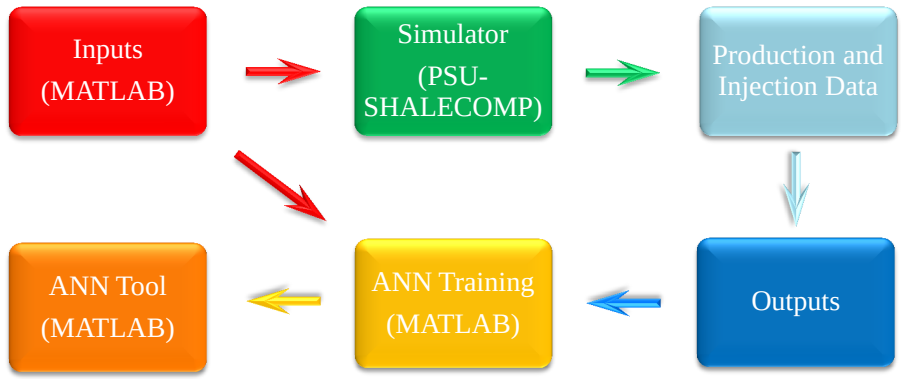


Figure 7.2. Protocol followed to design an ANN for a given problem

7.1 Psf-Psf ANN Tools

The first tool produces methane with a given sandface pressure, it can also be called as production bottomhole pressure ($P_{sf-prod}$ or $P_{bh-prod}$); and injects carbon dioxide with a given sandface pressure after a production period, it can also be called as injection bottomhole pressure (P_{sf-inj} or P_{bh-inj}). Therefore, the first tool is named as Psf-Psf forward tool (Tool-1). The second tool predicts length of horizontal wellbore (L_{hw}), length of fracture (L_f), drainage area (L_x and L_y), fracture permeability of *SRV* (*SRV*-k_f), fracture porosity of the *SRV* (*SRV*-ϕ_f), fracture spacing values of the *SRV* (*SRV*-Δx_s) with given reservoir properties, CH_4 production and CO_2 injection profiles. In this particular way, the tool is named as Psf-Psf design tool (Tool-2) in this study.

7.1.1 Tool-1: Psf-Psf Forward ANN Tool

The developed tool is trained by 24 input values that defines a shale reservoir which produces with a given sandface pressure ($P_{sf-prod}$) injects with also a sandface pressure (P_{sf-inj}). The injection stops when the injection flowrate ($q_{inj-STOPING}$) reaches a value that makes the injection operation unfeasible.

To reiterate, the tool is trained with length of horizontal wellbore that is also the major axis of the *SRV* (L_{hw}), length of fracture, which is considered as the minor axis of the *SRV* (L_f) drainage area (L_x and L_y), reservoir thickness (h), permeability values for matrix, fracture and *SRV* fracture (k_m, k_f and *SRV*-k_f), porosity values for matrix, fracture and *SRV* fracture (ϕ_m, ϕ_f and *SRV*-ϕ_f), fracture spacing values of the formation and the *SRV* (Δx_s and *SRV*-Δx_s), matrix

water saturation (S_{wm}), reservoir temperature (T_i), initial pressure (P_i), Langmuir volumes and pressures for both methane and carbon dioxide (V_{L-CH_4}, P_{L-CH_4}, V_{L-CO_2}, P_{L-CO_2}) and production period (t_{prod}). Table 7.1 shows these input values and their minimum and maximum values, which define the limits of the tool. Therefore, the tool can operate successfully if the input values are given within these ranges. Figure 7.3 show the design of the developed ANN tool for the Psf-Psf forward case (Tool-1). It can be seen that the design has 36 neurons, 97 neurons, 48 neurons in the first, second and the third hidden layers, respectively. The tool predicts 49 neurons, which include injection time (t_{inj}), 12 production flowrate values for CH_4 and 12 injection values for CO_2, that results in 24 functional links that support the training to produce better results.

The tool can predict results with an error of 4.44% in average. For the Psf-Psf forward case (Tool-1), 30 data sets are tested. Figure 7.4a, Figure 7.4b, Figure 7.4c and Figure 7.4d show plots for four of the testing data sets for Psf-Psf forward tool (Tool-1). The errors for these four cases are 3.61%, 5.82%, 2.34% and 5.03%. It can be seen that, the tool predicts the desired values rather successfully.

7.1.2 Tool-2: Psf-Psf Design ANN Tool

The design tool is developed by introducing the reservoir parameters, production and injection profiles to the tool to predict horizontal wellbore and hydraulic fracture design parameters. It uses the same reservoir parameters that can be found in Table 7.1. Figure 7.5 show the design of the developed ANN tool for the Psf-Psf design tool (Tool-2). It can be seen that the design has 19 neurons, 68 neurons, 52 neurons in the first, second and the third hidden layers, respectively. The tool predicts 21 neurons that includes length of horizontal wellbore (L_{hw}), length of fracture (L_f), drainage area (L_x and L_y), fracture permeability of *SRV* (*SRV*-k_f), fracture porosity of the *SRV* (*SRV*-ϕ_f), fracture spacing value of the *SRV* (*SRV*-Δx_s) for a given system.

The tool can predict results with an error of 9.91% in average. For the Psf-Psf design tool (Tool-2), 30 data sets are tested. Figure 7.6a, Figure 7.6b, Figure 7.6c and Figure 7.6d show plots for four of the testing data sets for Psf-Psf design tool (Tool-2). The errors for these four cases are 11.09%, 10.43%, 11.19% and 9.90%.

Although the average error seem to be very close to the target of 10% error, the cumulative CH_4 production and the cumulative CO_2 errors produce smaller results in ANN design tools,

which is considered as more realistic way of analyzing errors. In this case, the average cumulative CH_4 production error is 7.28% and the cumulative CO_2 error is 16.13%, which leads 11.70% of error in average.

Table 7.1. Input data and its ranges for Tool-1 (Psf-Psf forward tool) and Tool-2 (Psf-Psf design tool)

	Minimum Value	Maximum Value	Unit
L_{hw}	2,000.52	4,999.27	ft
L_f	200.248	999.915	ft
L_x	1.2*L_{hw}	1.599*L_{hw}	ft
L_y	1.2*L_f	1.999*L_f	ft
h	100.034	299.928	ft
ϕ_m	5.0008	9.9993	%
ϕ_f	0.5002	1.9999	%
SRV-ϕ_f	1.2001*ϕ_f	1.4999*ϕ_f	%
k_m	1e-06	0.0001	md
k_f	0.000101	0.001099	md
SRV-k_f	2.00361*k_f	11.9978*k_f	md
Δx_s	0.9	2.999	ft
SRV-Δx_s	0.4*Δx_s	0.799*Δx_s	ft
S_{wf}	5.003	13.997	%
V_{L-CH_4}	50.09	249.734	scf/ton
P_{L-CH_4}	200.365	999.881	psi
V_{L-CO_2}	2.002* V_{L-CH_4}	5.999* V_{L-CH_4}	scf/ton
P_{L-CO_2}	200.788	999.748	psi
P_i	3,000.82	7,999.85	psi
T_i	120.016	199.999	F
$P_{sf-prod}$	0 *P_i+14.7	0.499*P_i+14.7	psi
t_{prod}	7,306.09	18,242.4	days
P_{frac}	1.1*P_i	1.499*P_i	psi
$q_{sf-inj-STOPING}$	200,662	596,099	SCFD

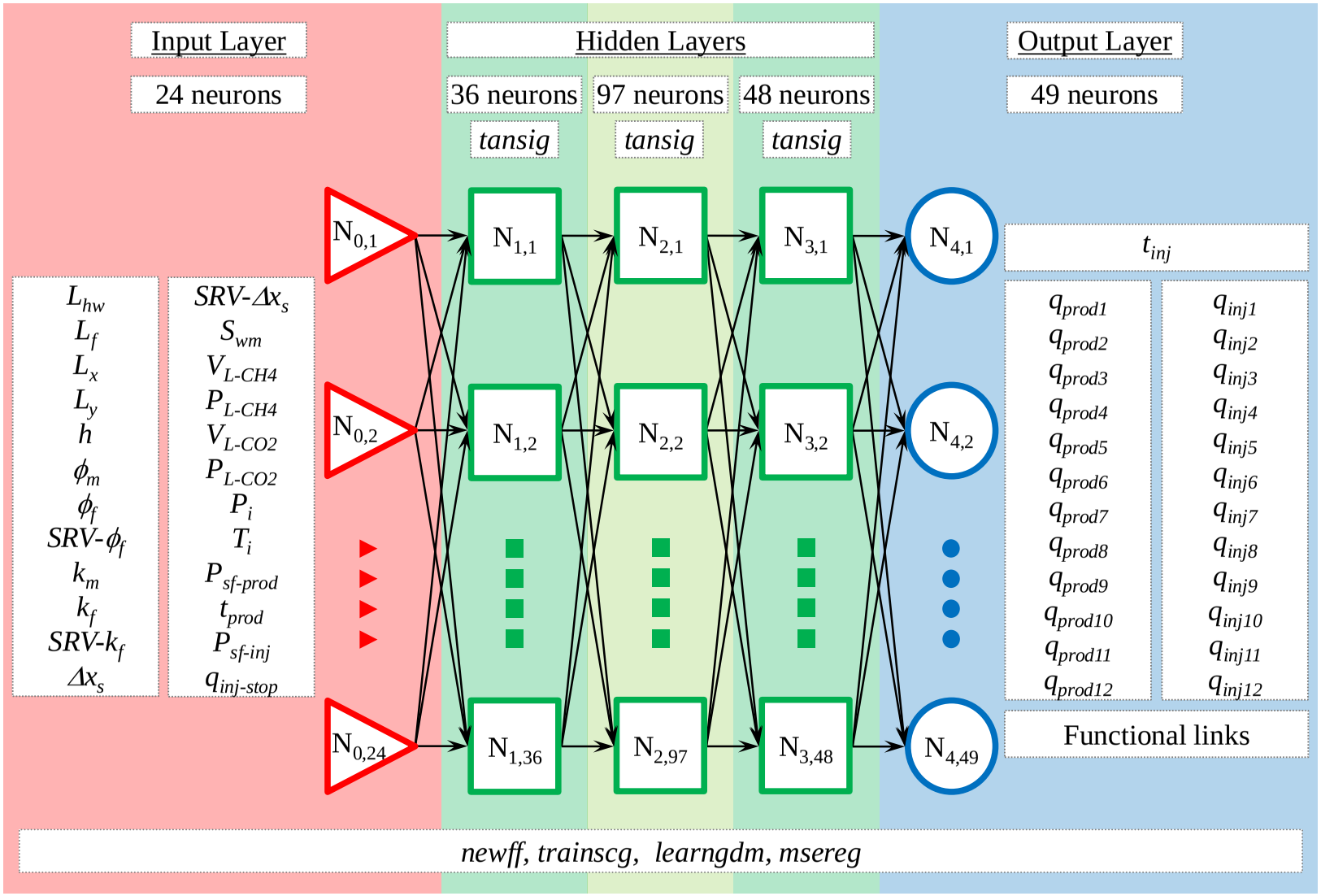
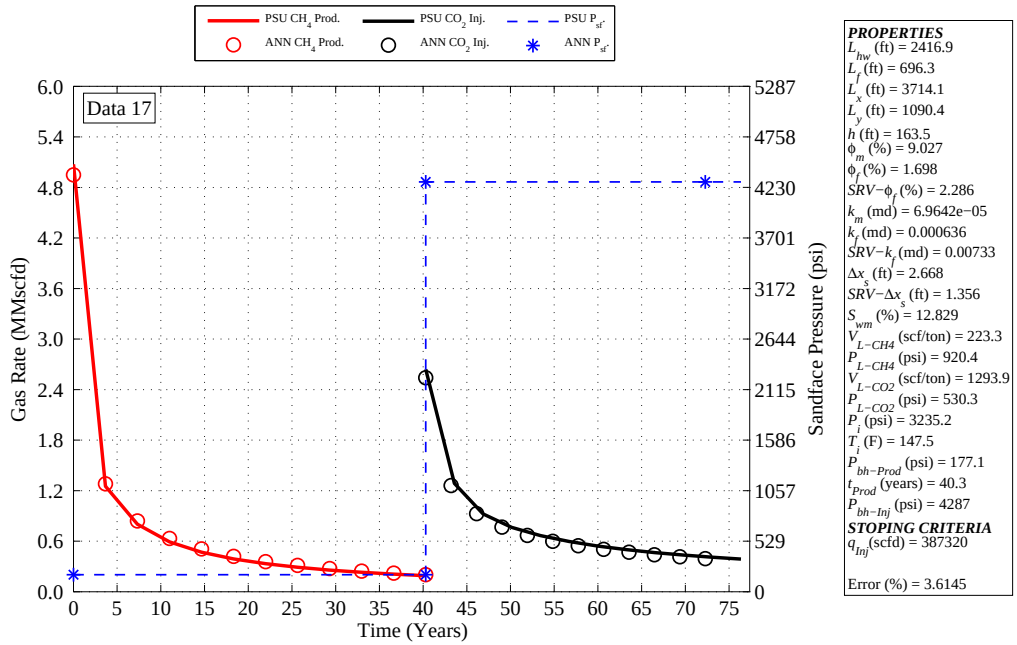
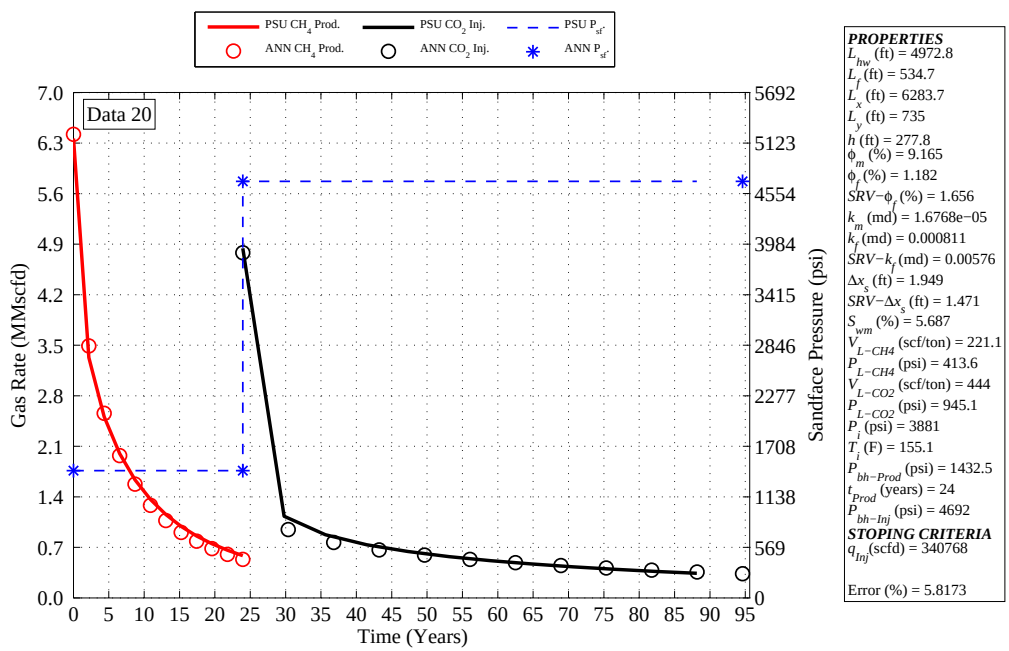


Figure 7.3. The ANN structure for Psf-Psf forward tool

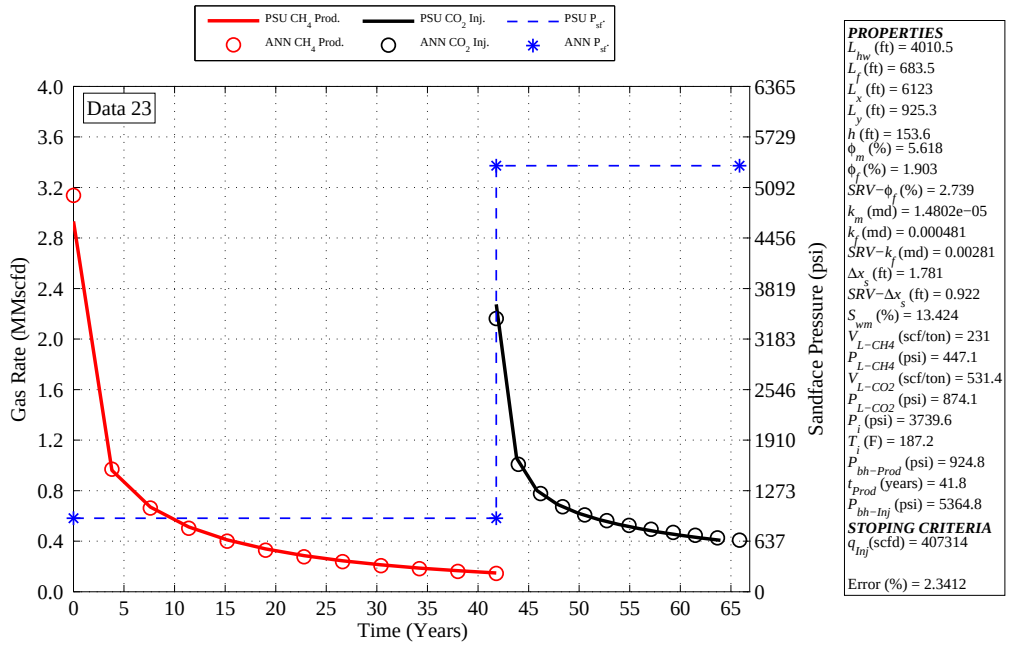


(a) Case 1

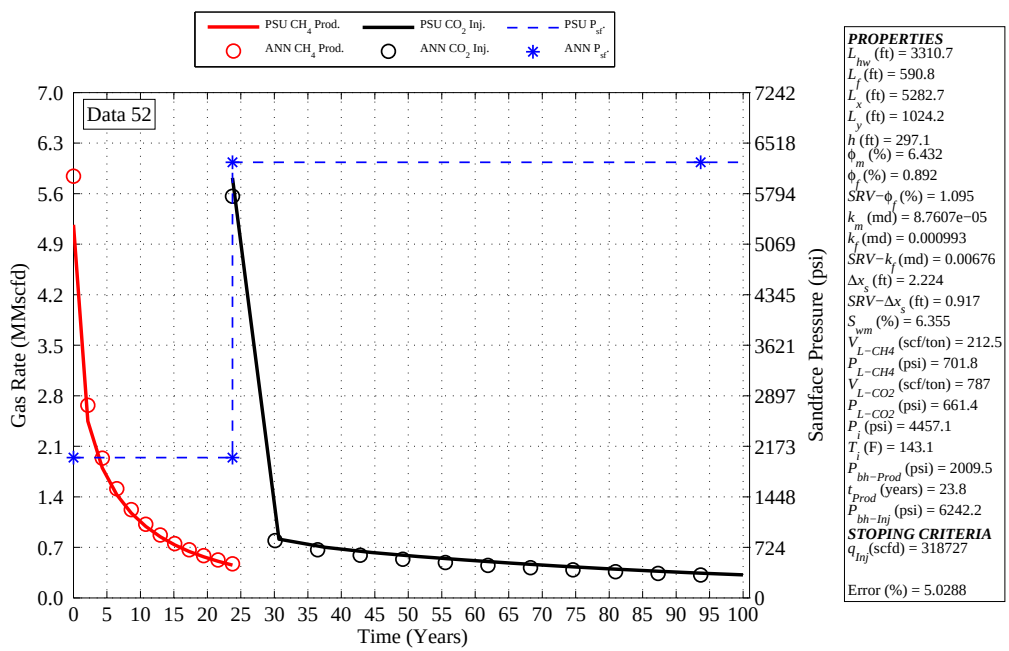


(b) Case 2

Figure 7.4. Predictions for Psf-Psf forward tool (Tool-1)



(c) Case 3



(d) Case 4

Figure 7.4. (continued) Predictions for Psf-Psf forward tool (Tool-1)

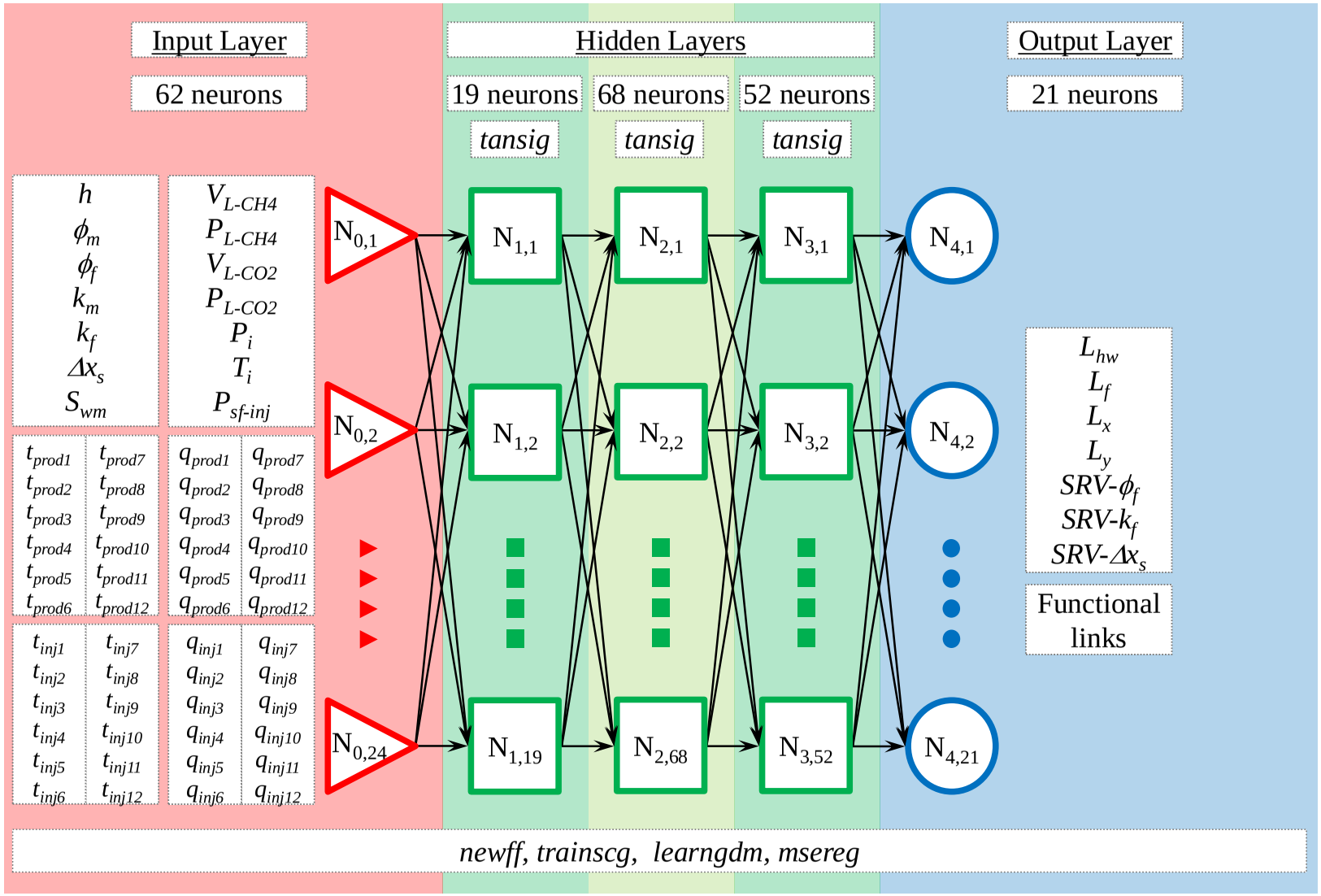
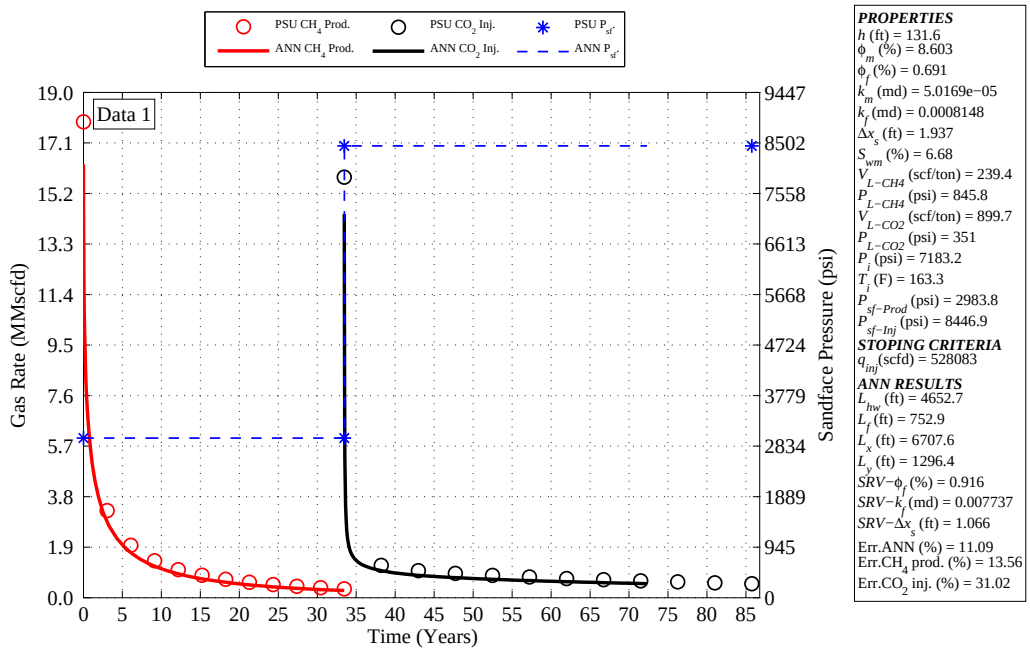
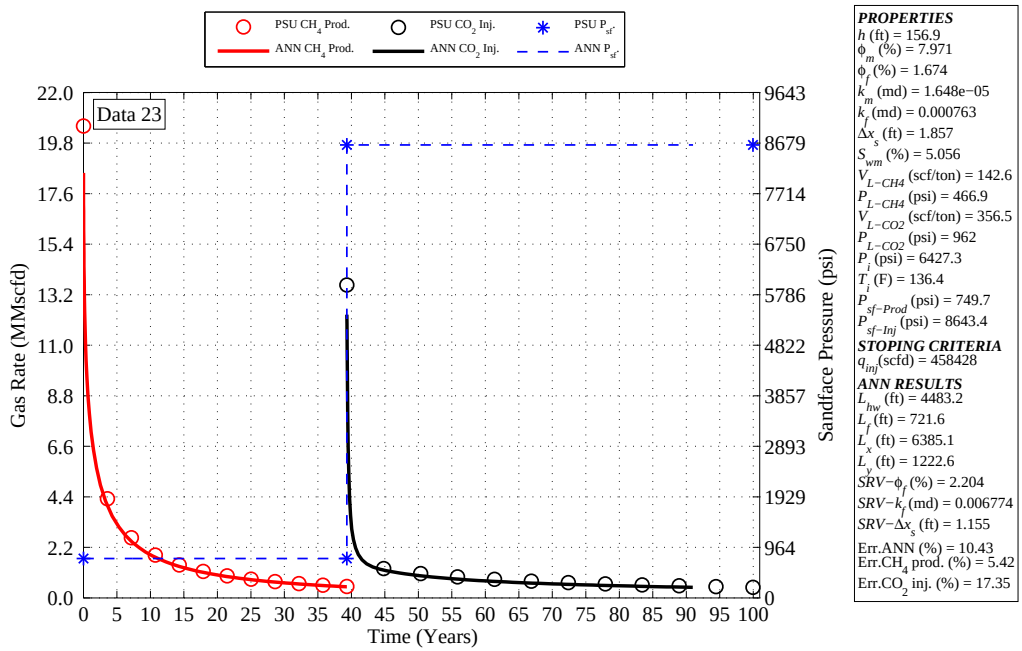


Figure 7.5. The ANN structure for Psf-Psf design tool

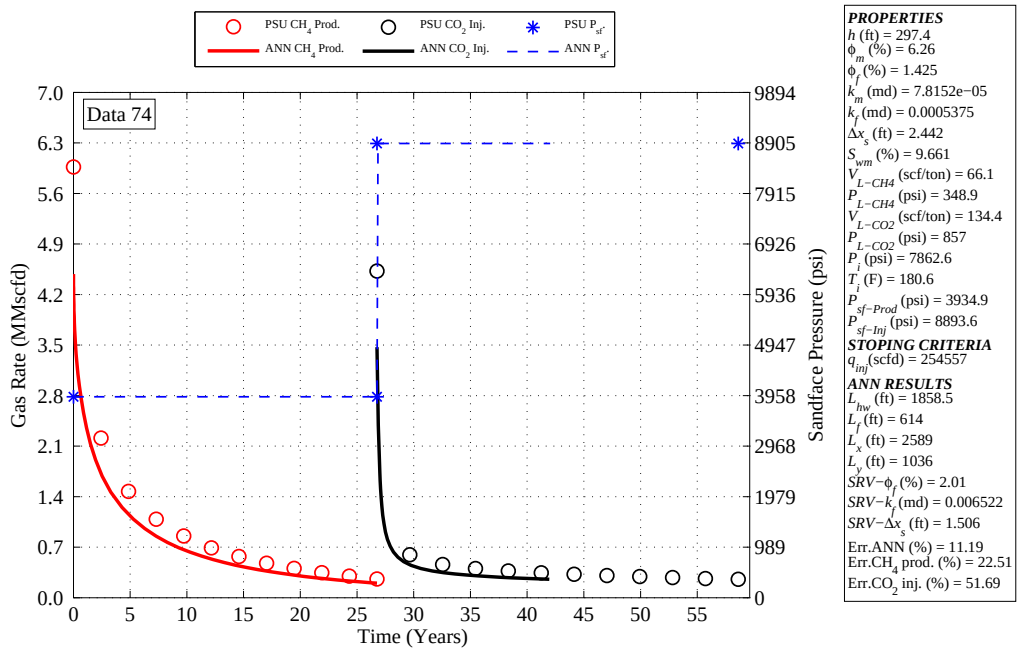


(a) Case 1

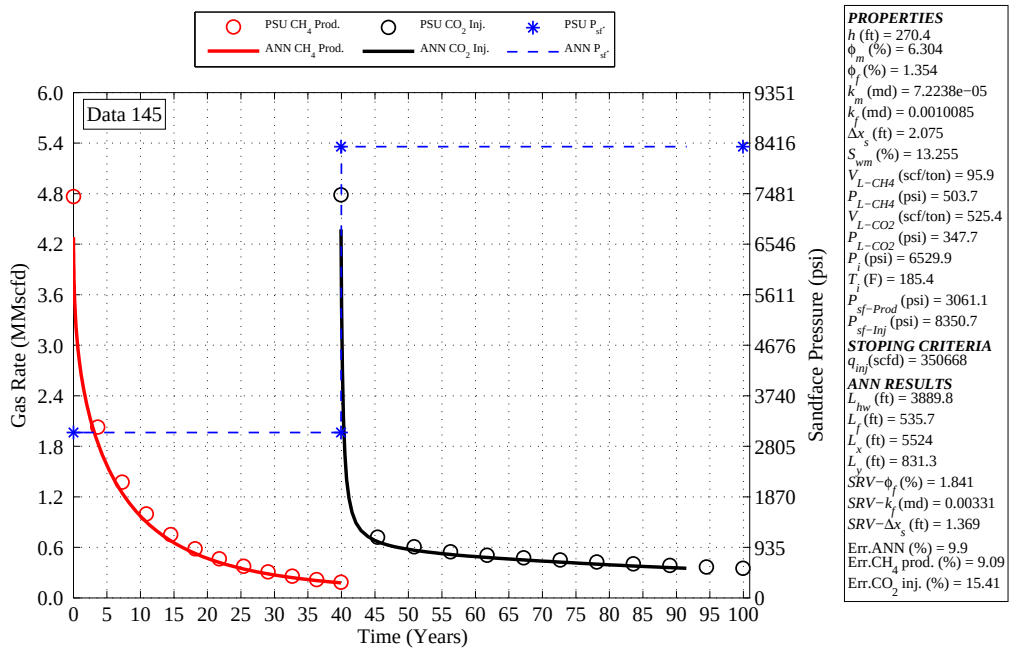


(b) Case 2

Figure 7.6. Predictions for Psf-Psf design tool (Tool-2)



(c) Case 3



(d) Case 4

Figure 7.6. (continued) Predictions for Psf-Psf design tool (Tool-2)

7.2 Psf-qsf ANN Tools

The third tool produces methane with a given sandface pressure ($P_{sf-prod}$) and injects carbon dioxide with a specified injection rate after a production period (q_{sf-inj}). Therefore, the third tool is named as Psf-qsf forward tool (Tool-3). The forth tool predicts the wellbore design and hydraulic fracture properties for given reservoir with its CH_4 production and CO_2 injection sandface pressure profiles. The fourth tool is named as Psf-qsf design (Tool-4).

7.2.1 Tool-3: Psf-qsf Forward ANN Tool

This tool is also trained by 24 input values that defines a shale reservoir which produces with a given sandface pressure ($P_{sf-prod}$) injects with a constant injection rate (q_{sf-inj}). The injection stops when the bottomhole pressure ($P_{sf-STOPING}$) reaches a value that is also considered as the fracturing pressure of the formation (P_{frac}).

Table 7.2 shows the input values and their minimum and maximum values, which define the limits of the tool. Figure 7.7 show the design of the developed ANN tool for the Psf-qsf forward tool (Tool-3). It can be seen that the design has 43 neurons, 70 neurons, 22 neurons in the first, second and the third hidden layers, respectively. The tool also predicts 49 neurons, which include injection time (t_{inj}), 12 production flowrate values for CH_4 and 12 injection sandface pressure values, which results in additional 24 functional links that support the training to produce better results.

The tool can predict results with an error of 3.83% in average. For the Psf-qsf forward tool (Tool-3), 30 data sets are tested. Figure 7.8a, Figure 7.8b, Figure 7.8c and Figure 7.8d show plots for four of the testing data sets for Psf-qsf forward tool (Tool-3). The errors for these four cases are 3.35%, 9.35%, 2.91% and 5.35%.

7.2.2 Tool-4: Psf-qsf Design ANN Tool

This tool is rather similar to the Psf-Psf design tool (Tool-2) except the injection of CO_2 is operated by constant injection rate. It is trained with the same reservoir parameters as Psf-qsf forward tool (Tool-3) is trained, which can be found in Table 7.2. Figure 7.9 show the design of the developed ANN tool for the Psf-qsf design tool (Tool-4). It can be seen that the design has 19 neurons, 80 neurons, 60 neurons in the first, second and the third hidden layers, respectively.

The tool predicts 21 neurons that are L_{hw}, L_f, L_x, L_y, h, *SRV*-k_f, *SRV*-ϕ_f, *SRV*-Δx_s and 14 additional functional links for a given system.

The tool can predict results with an error of 9.81% in average. For the Psf-qsf design tool (Tool-4), 30 data sets are tested. Figure 7.10a, Figure 7.10b, Figure 7.10c and Figure 7.10d show plots for four of the testing data sets for Psf-qsf design tool (Tool-4). The errors for these four cases are 8.81%, 14.39%, 8.83% and 16.85%.

Although the average error seem to be very close to the target of %10 error, the cumulative CH_4 production and the cumulative CO_2 errors produce smaller results in ANN design tools, which is considered to lead more realistic way of analyzing errors. In this case, the average CH_4 cumulative CH_4 production error is 3.22% and the cumulative CO_2 error is 8.62%, which leads 5.92% of error in average.

Table 7.2. Input data and its ranges for Tool-3 (Psf-qsf forward tool) and Tool-4 (Psf-qsf design tool)

	Minimum Value	Maximum Value	Unit
L_{hw}	2,000.52	4,999.27	ft
L_f	200.784	999.915	ft
L_x	1.2*L_{hw}	1.599*L_{hw}	ft
L_y	1.2*L_f	1.999*L_f	ft
h	100.034	299.928	ft
ϕ_m	5.0008	9.9993	%
ϕ_f	0.5007	1.9999	%
SRV-ϕ_f	1.2001*ϕ_f	1.4998*ϕ_f	%
k_m	1e-06	0.0001	md
k_f	0.000102	0.001099	md
SRV-k_f	2.00361*k_f	11.9978*k_f	md
Δx_s	0.901	2.999	ft
SRV-Δx_s	0.4*Δx_s	0.799*Δx_s	ft
S_{wf}	5.002	13.998	%
V_{L-CH_4}	50.136	249.989	scf/ton
P_{L-CH_4}	200.365	999.881	psi
V_{L-CO_2}	2* V_{L-CH_4}	5.999* V_{L-CH_4}	scf/ton
P_{L-CO_2}	200.148	999.494	psi
P_i	3,000.82	7,999.85	psi
T_i	120.016	199.999	F
$P_{sf-prod}$	0 *P_i+14.7	0.499*P_i+14.7	psi
t_{prod}	7,300.48	18,242.4	days
q_{sf-inj}	501,416	3,999,710	SCFD
$P_{sf-inj-STOPING}$	1.00089*P_i	1.499*P_i	psi

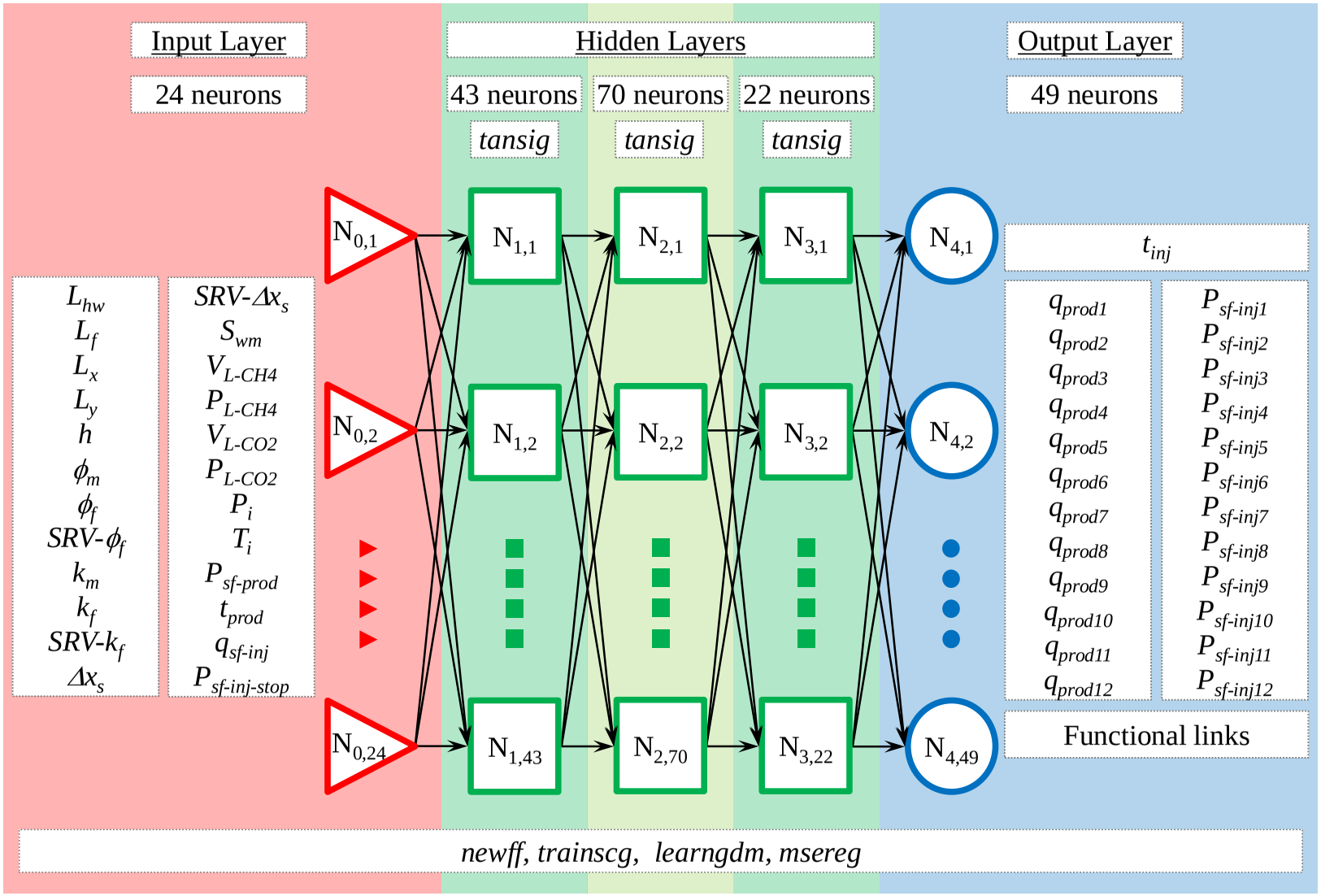
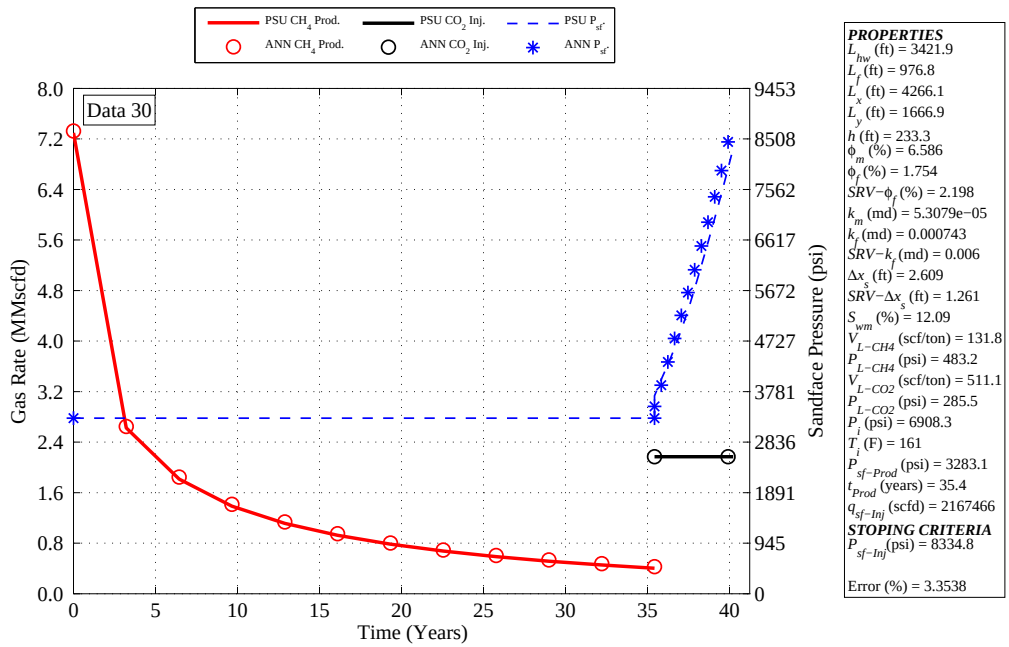
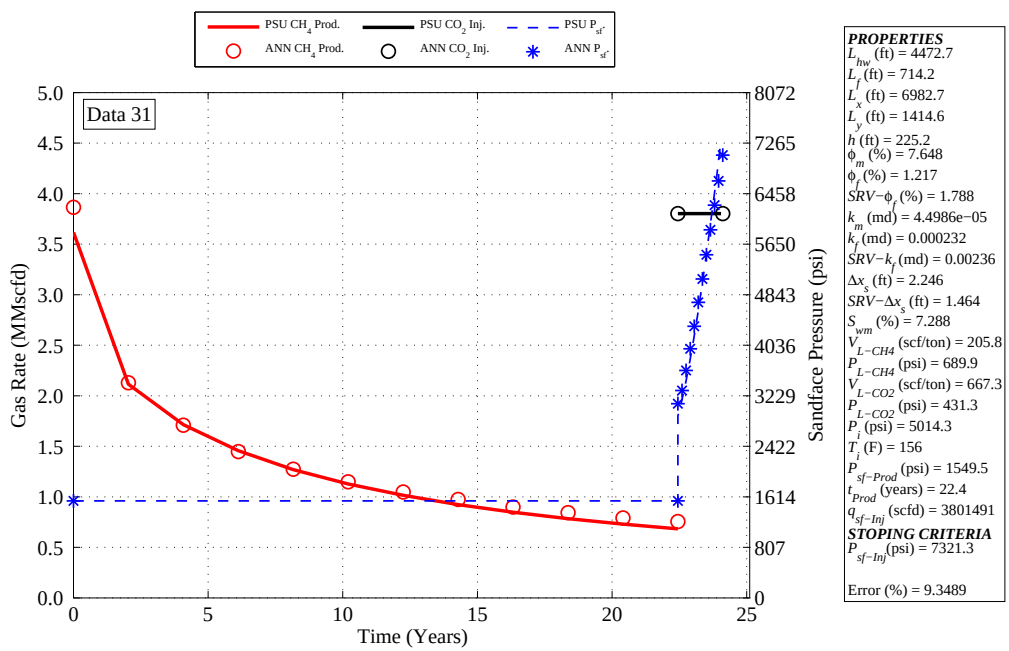


Figure 7.7. The ANN structure for Psf-qsf forward tool

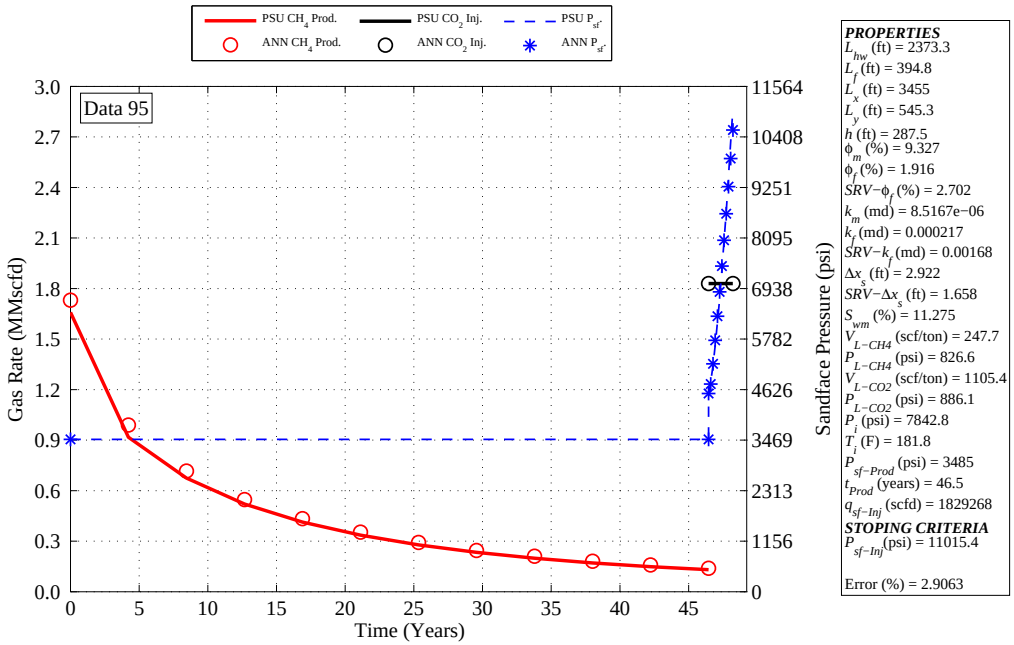


(a) Case 1

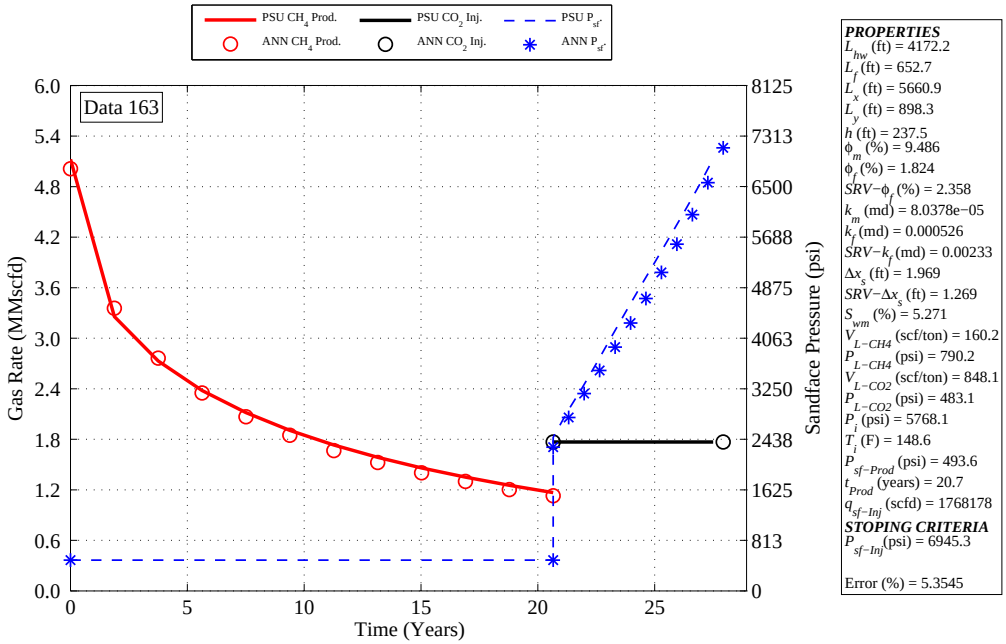


(b) Case 2

Figure 7.8. Predictions for Psf-qsf forward tool (Tool-3)



(c) Case 3



(d) Case 4

Figure 7.8. (continued) Predictions for Psf-qsf forward tool (Tool-3)

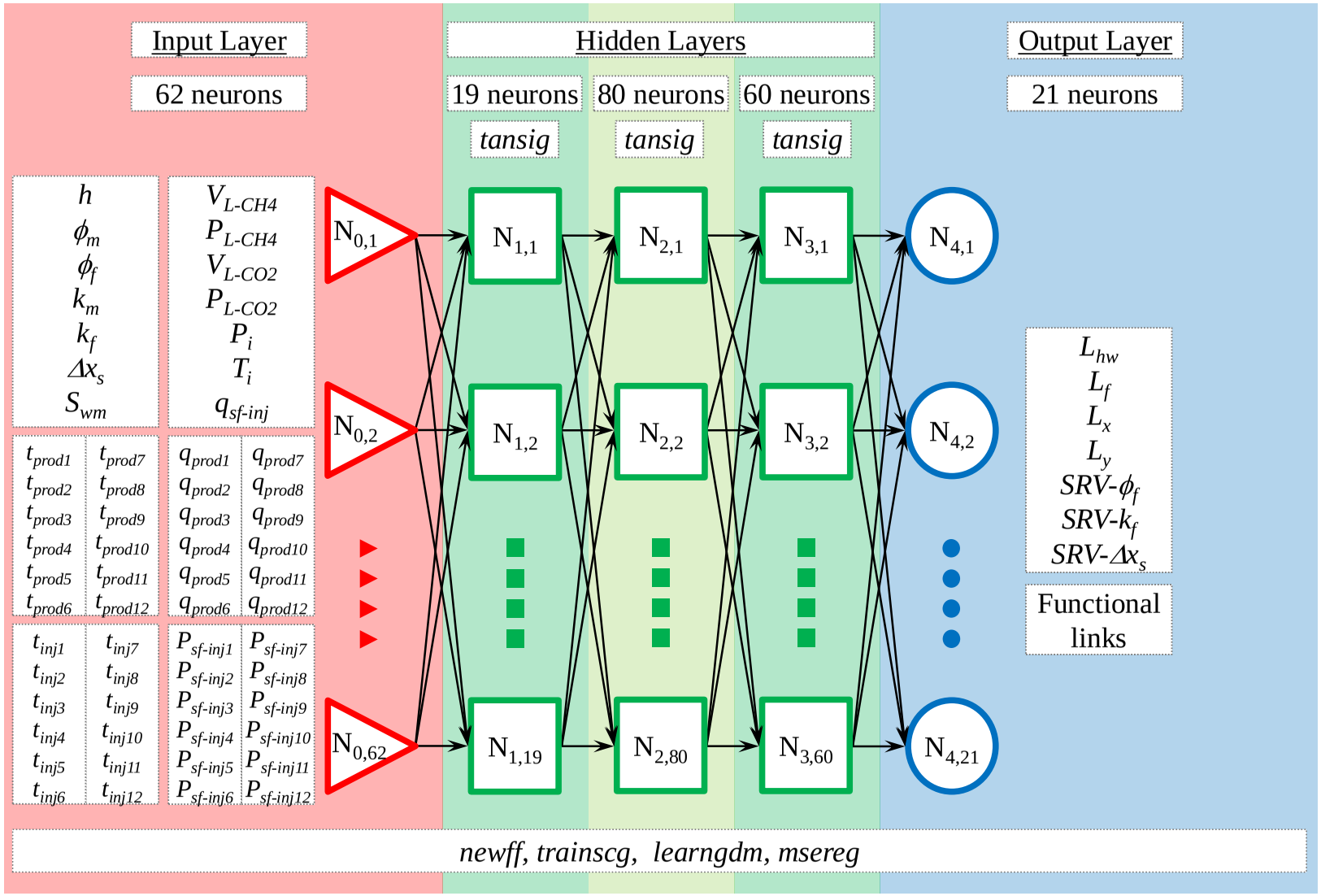
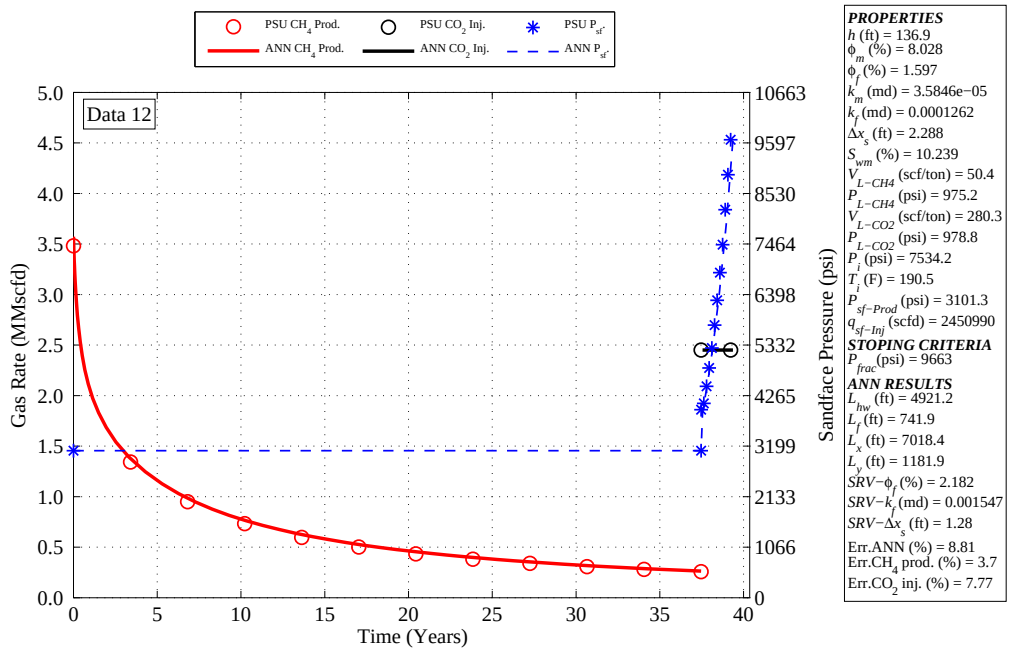
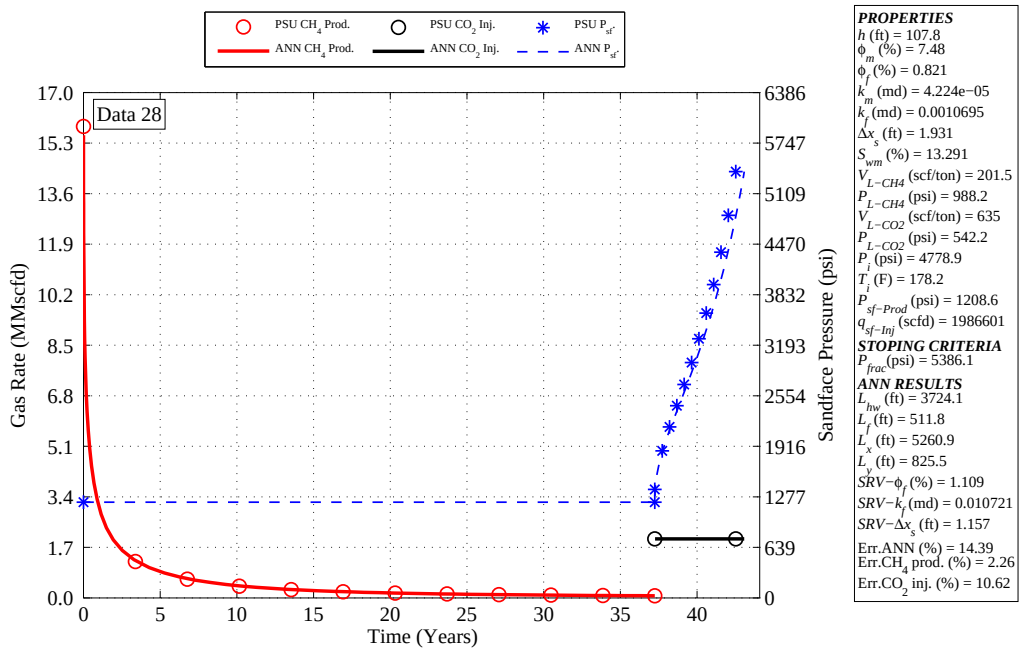


Figure 7.9. The ANN structure for Psf-qsf design tool

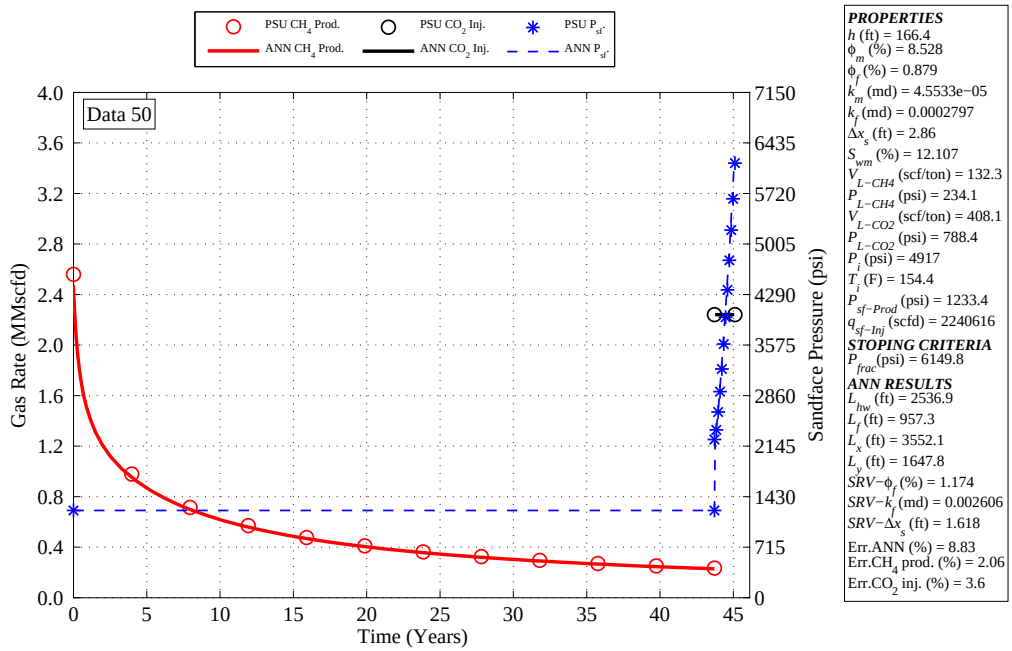


(a) Case 1

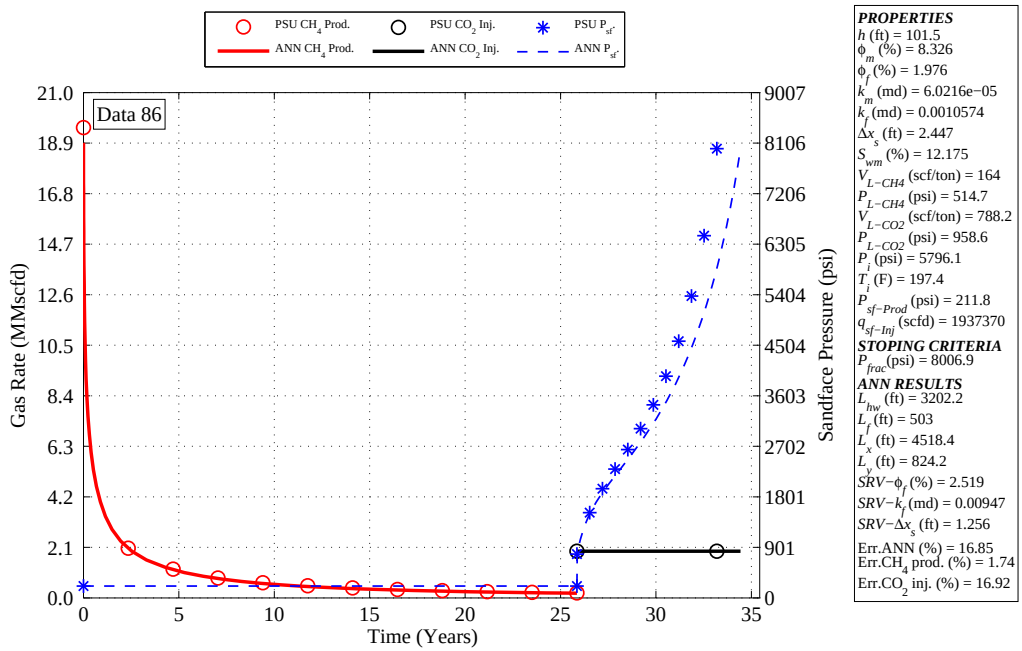


(b) Case 2

Figure 7.10. Predictions for Psf-qsf design tool (Tool-4)



(c) Case 3



(d) Case 4

Figure 7.10. (continued) Predictions for Psf-qsf design tool (Tool-4)

7.3 qsf-Psf ANN Tools

The fifth tool is more complex than the previous forward cases. It produces methane with a constant flowrate, initially. However, the production time (t_{prod}) in shale formations are rather long so in these models. Therefore, the amount of gas that exist in the drainage area and/or the parameters that affect its flowing characteristics cannot support the production that is set by a specified flowrate for long period of production periods and the models switch the production conditions to specified pressure of 14.7 psi once the sandface pressure reaches 14.7 psi, which makes the production period more complex to train for ANNs. The injection period is the same as the Psf-Psf forward tool (Tool-1) that is specified sandface pressure (P_{sf-inj}), the tool is named as qsf-Psf forward tool (Tool-5).

The sixth tool predicts length of horizontal wellbore (L_{hw}), length of fracture (L_f), drainage area (L_x and L_y), fracture permeability of *SRV* (*SRV*-k_f), fracture porosity of the *SRV* (*SRV*-ϕ_f), fracture spacing values of the *SRV* (*SRV*-Δx_s) with given reservoir properties, CH_4 production and CO_2 injection flowrate profiles and the tool is named as qsf-Psf design tool (Tool-6) in this study.

7.3.1 Tool-5: qsf-Psf Forward ANN Tool

The developed tool is again trained by 24 input values that is similar to the previous forward tools. The basic differences are the production is set by a constant flowrate and injection constraint is the sandface pressure (P_{sf-inj}). The injection stops when the injection flowrate ($q_{inj-STOPING}$) reaches a certain value that is considered as low enough to make the operation unfeasible.

Table 7.3 shows these input values and their minimum and maximum values, which define the limits of the tool. Figure 7.11 show the design of the developed ANN tool for the qsf-Psf forward tool (Tool-5). It can be seen that the design has 19 neurons, 101 neurons, 61 neurons in the first, second and the third hidden layers, respectively. The tool predicts 63 output values, which include time of specified flowrate ($t_{qsf-prod}$), time of maximum flowrate of 14.7 psi specified pressure ($t_{Psf-prod,14.7,max}$), injection time (t_{inj}), 12 production flowrate values for CH_4 and 12 injection flowrate values of CO_2, also, the output layer includes 26 functional links that support the training to produce better results.

The tool can predict results with an error of 5.07% in average. For the qsf-Psf forward tool (Tool-5), 30 data sets are tested. Figure 7.12a, Figure 7.12b, Figure 7.12c and Figure 7.12d show plots for four of the testing data sets for qsf-Psf forward tool (Tool-5). The errors for these four cases are 4.25%, 9.01%, 5.88% and 3.24%, respectively.

7.3.2 Tool-6: qsf-Psf Design ANN Tool

The design tool are developed by introducing the reservoir parameters, production and injection profiles to the tool to predict horizontal wellbore and hydraulic fracture design parameters. It uses the same reservoir parameters that can be found in Table 7.3. Figure 7.13 show the structure of the developed ANN tool for the qsf-Psf design tool (Tool-6). It can be seen that the design has 18 neurons, 50 neurons, 20 neurons in the first, second and the third hidden layers, respectively. The tool predicts 25 neurons that includes length of horizontal wellbore (L_{hw}), length of fracture (L_f), drainage area (L_x and L_y), fracture permeability of *SRV* (*SRV*-k_f), fracture porosity of the *SRV* (*SRV*-ϕ_f), fracture spacing value of the *SRV* (*SRV*-Δx_s) for a given system.

The tool can predict results with an error of 8.30% in average. For the qsf-Psf design tool (Tool-6), 30 data sets are tested. Figure 7.14a, Figure 7.14b, Figure 7.14c and Figure 7.14d show plots for four of the testing data sets for qsf-Psf design tool (Tool-6). The errors for these four cases are 8.90%, 9.13%, 5.76% and 9.64%.

In the sixth case, the average CH_4 cumulative CH_4 production error is 3.34% and the cumulative CO_2 error is 10.26%, which leads 6.35% of error in average.

Table 7.3. Input data and its ranges for Tool-5 (qsf-Psf forward tool) and Tool-6 (qsf-Psf design tool)

	Minimum Value	Maximum Value	Unit
L_{hw}	2,000.86	4,998.36	ft
L_f	202.252	999.351	ft
L_x	1.2*L_{hw}	1.599*L_{hw}	ft
L_y	1.202*L_f	1.997*L_f	ft
h	100.226	299.704	ft
ϕ_m	5.0008	9.995	%
ϕ_f	0.5022	1.9999	%
SRV-ϕ_f	1.2014*ϕ_f	1.4993*ϕ_f	%
k_m	1e-06	0.0001	md
k_f	0.000101	0.001097	md
SRV-k_f	2.00797*k_f	11.9926*k_f	md
Δx_s	0.902	2.998	ft
SRV-Δx_s	0.401*Δx_s	0.799*Δx_s	ft
S_{wf}	5.003	13.998	%
V_{L-CH_4}	50.329	249.734	scf/ton
P_{L-CH_4}	201.971	998.142	psi
V_{L-CO_2}	2.006* V_{L-CH_4}	5.99* V_{L-CH_4}	scf/ton
P_{L-CO_2}	201.968	999.081	psi
P_i	3,004.92	7,997.14	psi
T_i	120.016	199.999	F
$q_{sf-prod}$	1,018,365	4,994,210	SCFD
t_{prod}	7306.09	18,233.2	days
P_{frac}	1.1*P_i	1.499*P_i	psi
$q_{sf-inj-STOPING}$	200,429	597,457	SCFD

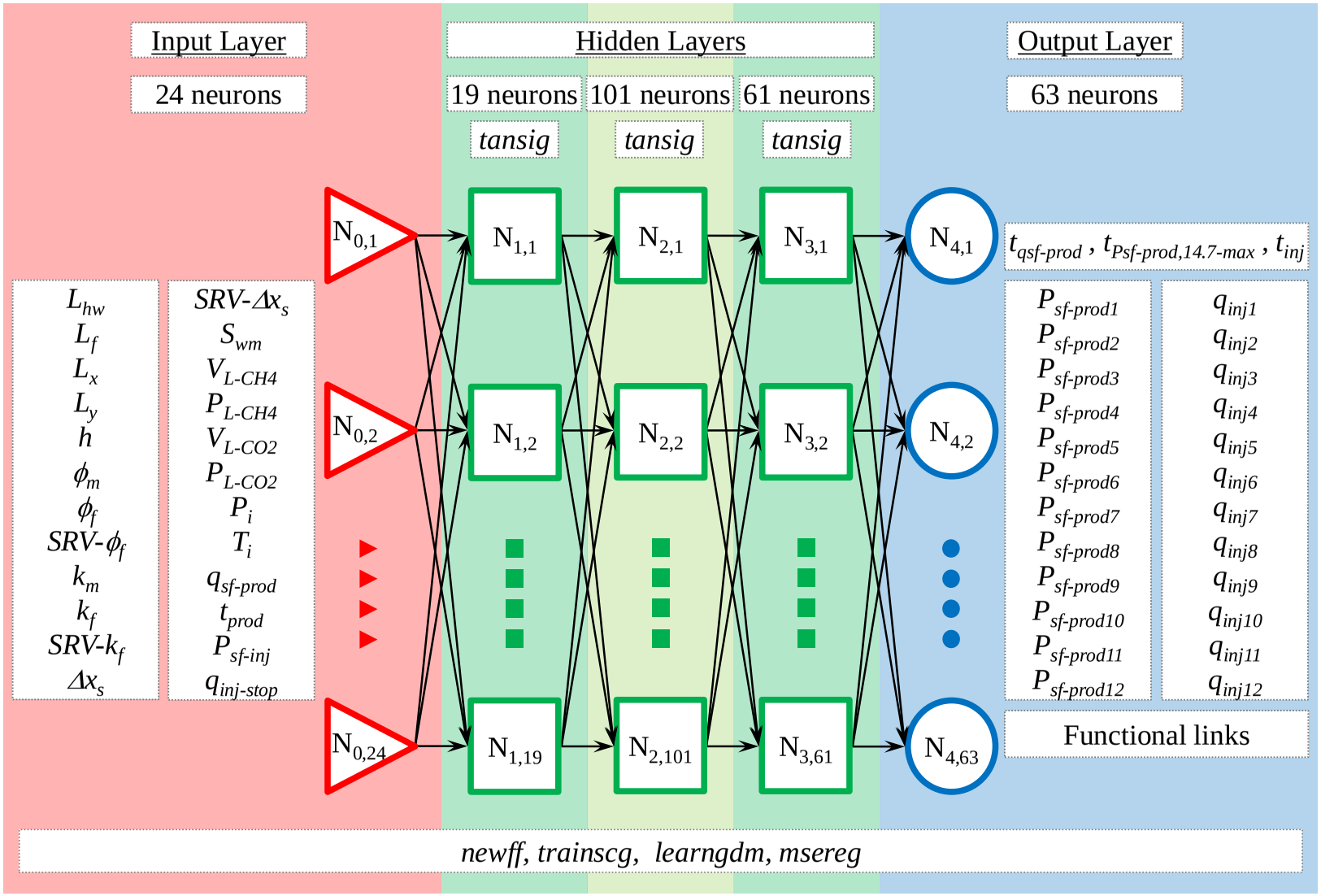
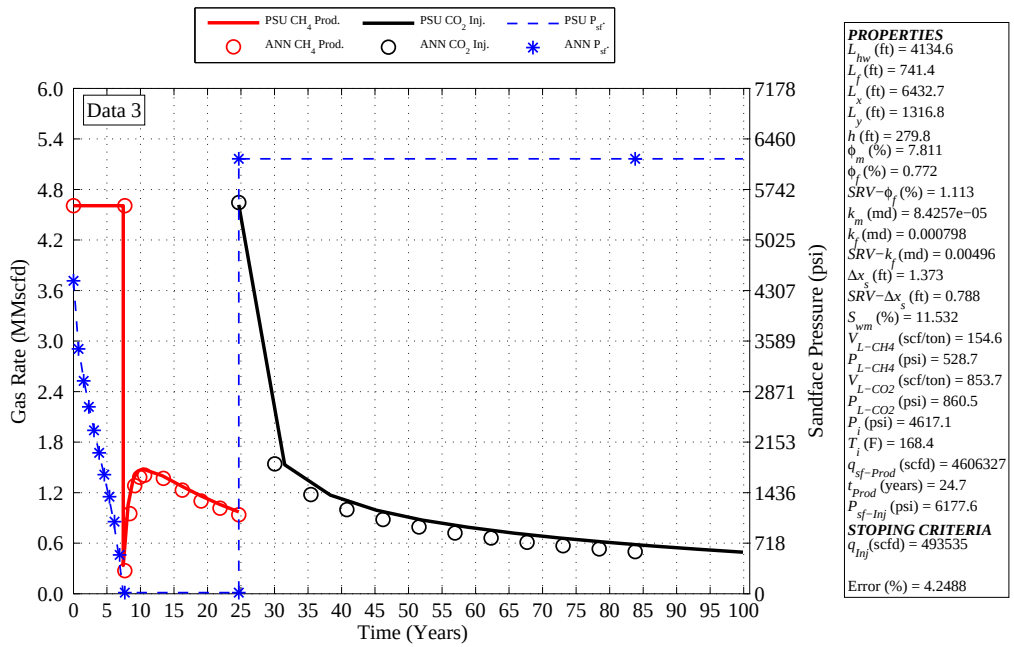
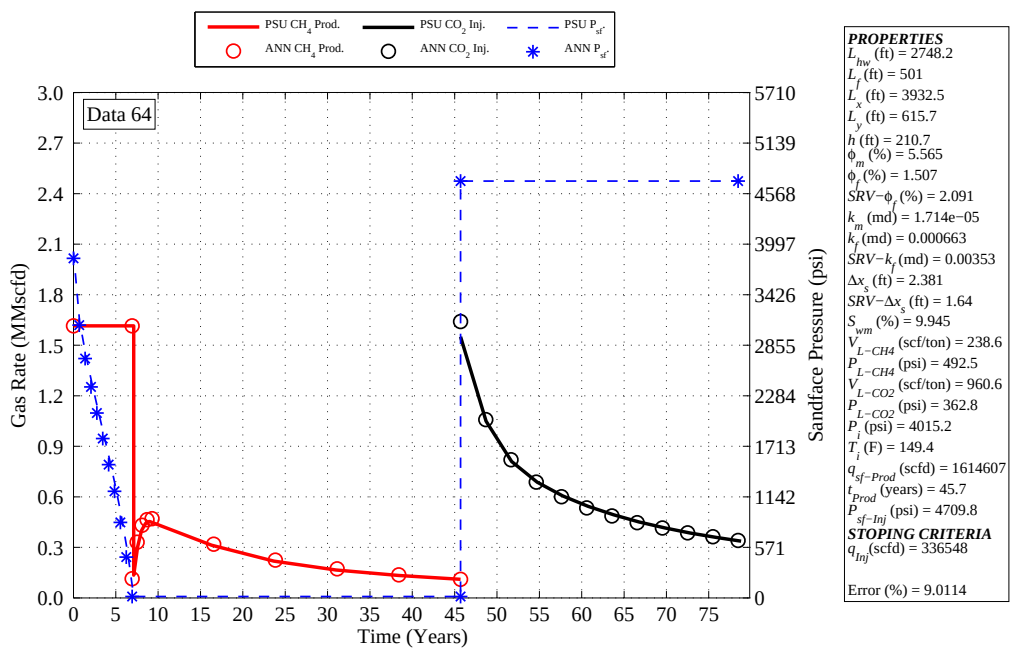


Figure 7.11. The ANN structure for qsf-Psf forward tool

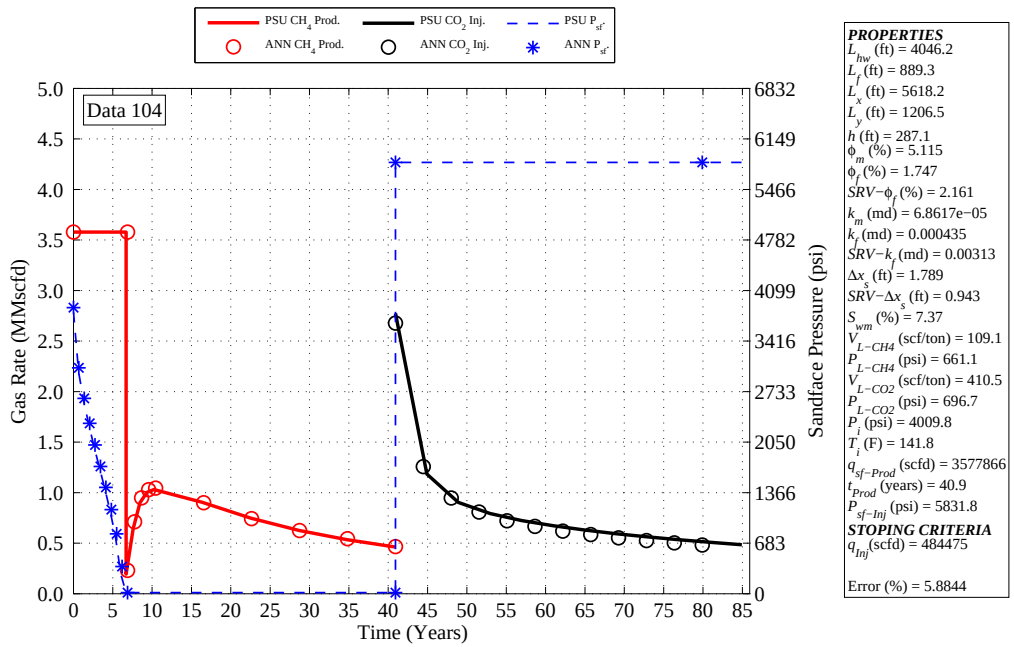


(a) Case 1

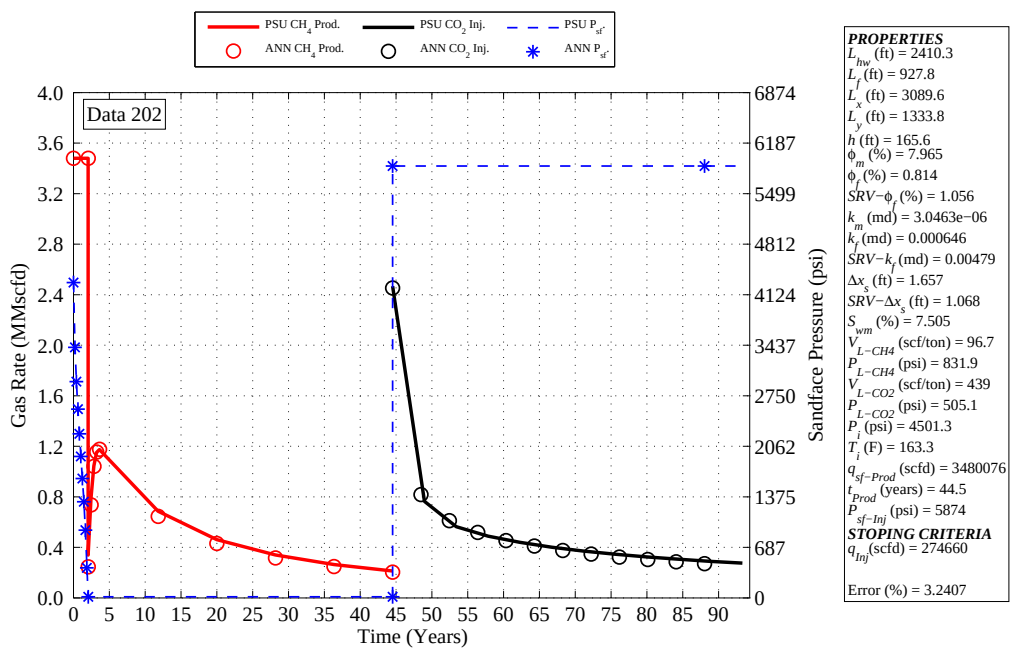


(b) Case 2

Figure 7.12. Predictions for qsf-Psf forward tool (Tool-5)



(c) Case 3



(d) Case 4

Figure 7.12. (continued) Predictions for qsf-Psf forward tool (Tool-5)

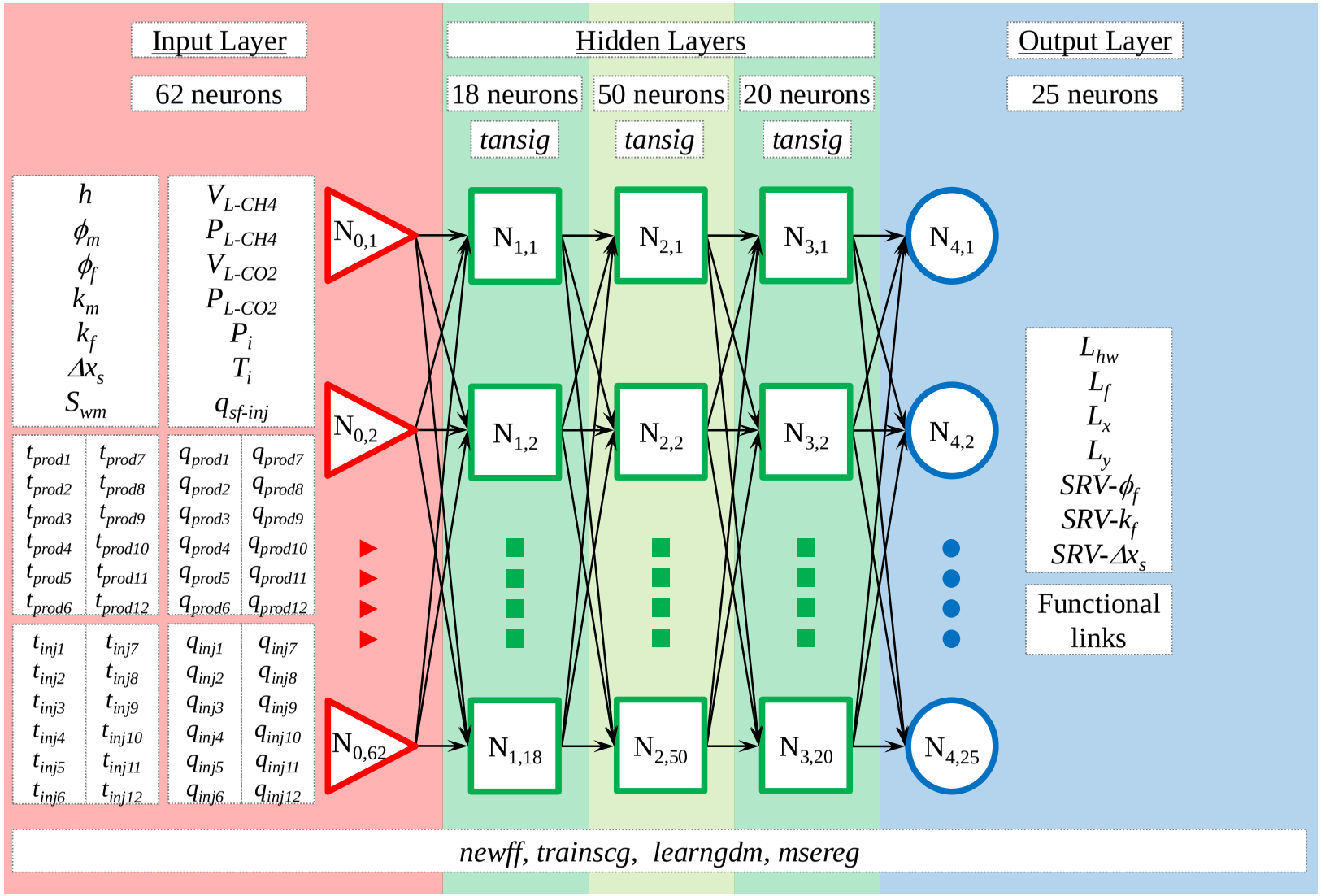
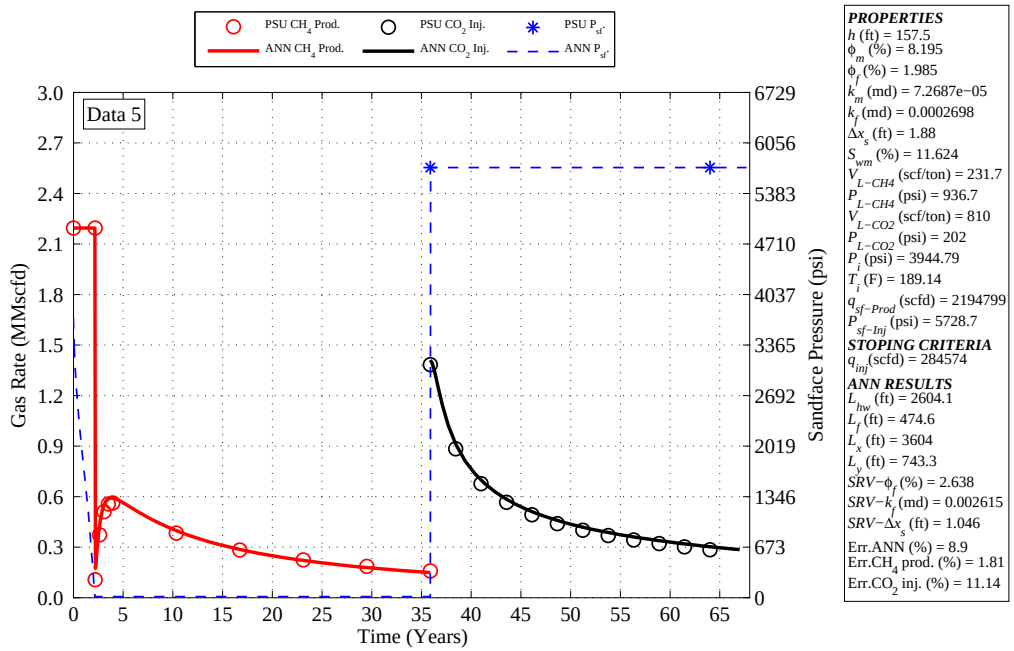
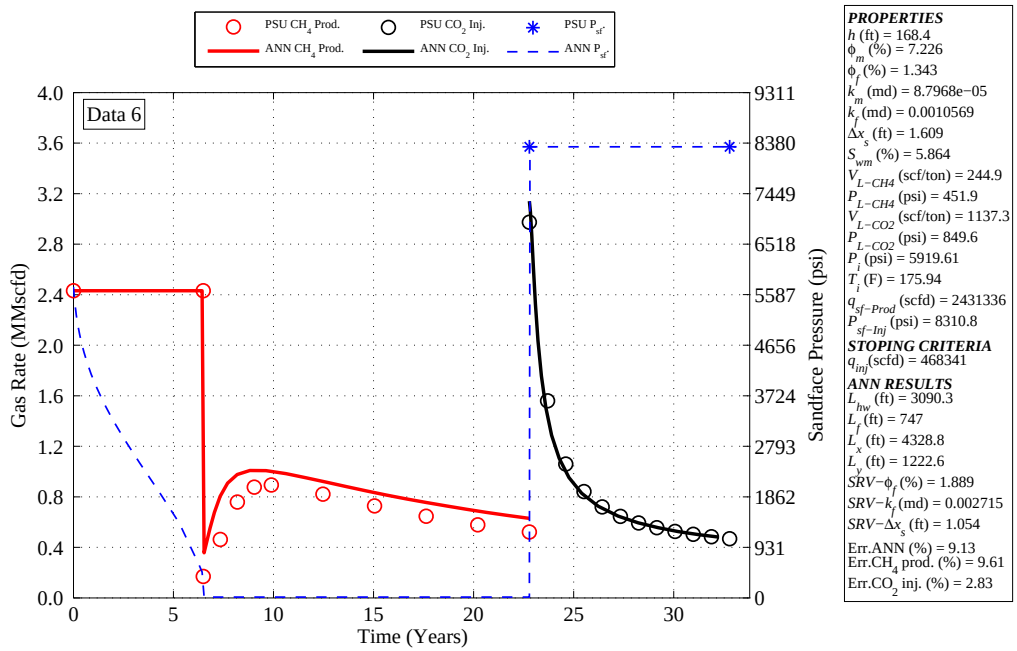


Figure 7.13. The ANN structure for qsf-Psf design tool

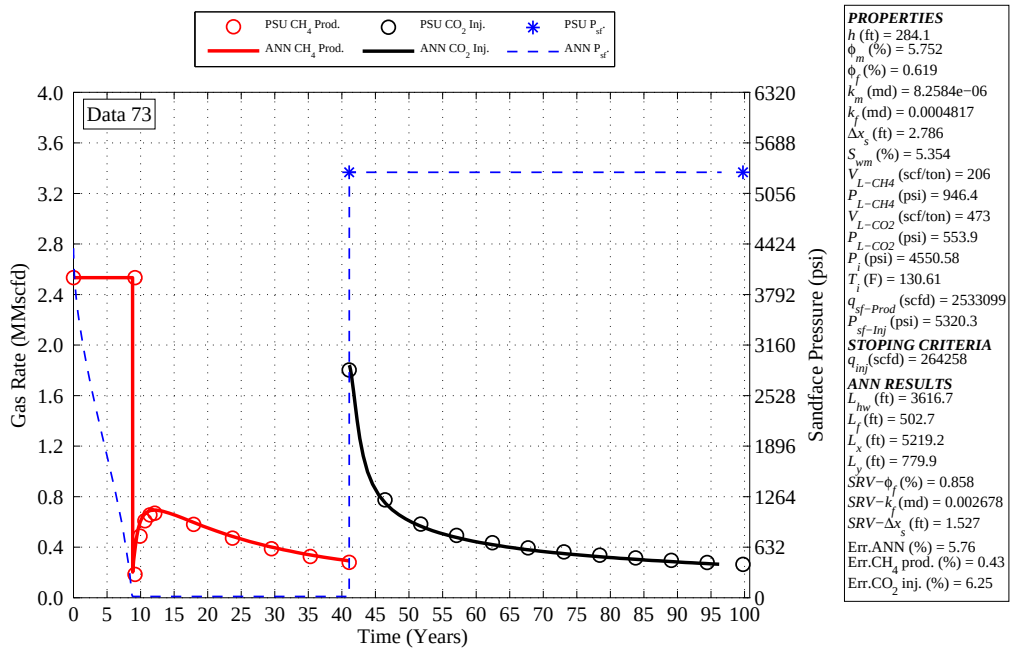


(a) Case 1

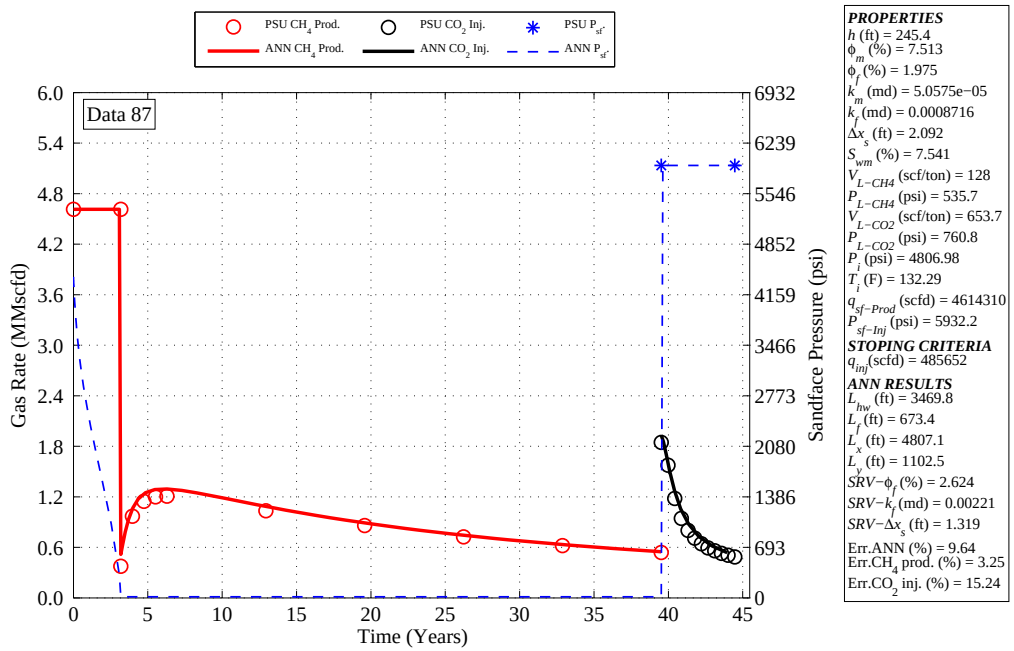


(b) Case 2

Figure 7.14. Predictions for qsf-Psf design tool (Tool-6)



(c) Case 3



(d) Case 4

Figure 7.14. (continued) Predictions for qsf-Psf design tool (Tool-6)

7.4 qsf-qsf ANN Tools

Similar to the qsf-Psf forward tool (Tool-5), the seventh tool is rather complex than the previous forward cases. It produces methane with a constant flowrate, initially. Once the bottomhole pressure reaches 14.7 psi, the production switches to P_{sf} equals to 14.7. The injection period is the same as the Psf-qsf forward tool (Tool-3) that injects carbon dioxide with a specified injection rate after a production period (q_{sf-inj}). The tool is named as qsf-qsf forward tool (Tool-7).

The eight tool predicts length of horizontal wellbore (L_{hw}), length of fracture (L_f), drainage area (L_x and L_y), fracture permeability of *SRV* (*SRV*-k_f), fracture porosity of the *SRV* (*SRV*-ϕ_f), fracture spacing values of the *SRV* (*SRV*-Δx_s) with given reservoir properties, CH_4 production and CO_2 injection sandface pressure profiles and the tool is named as qsf-qsf design tool (Tool-8) in this study.

7.4.1 Tool-7: qsf-qsf Forward ANN Tool

The developed tool is trained by 24 input values that is similar to the previous forward tools. The basic differences are the production is set by a constant flowrate and injects with a constant injection rate (q_{sf-inj}) The injection stops when the bottomhole pressure ($P_{sf-STOPING}$) reaches a value, which is high enough that it is considered as the fracturing pressure of the formation (P_{frac}) or the limitations of the surface equipment.

Table 7.4 shows these input values and their minimum and maximum values, which define the limits of the tool. Figure 7.15 show the design of the developed ANN tool for the qsf-qsf forward tool (Tool-7). It can be seen from the figure that the ANN structure has 19 neurons, 112 neurons, 76 neurons in the first, second and the third hidden layers, respectively. The tool predicts 63 neurons, which include time of specified flowrate ($t_{qsf-prod}$), time of maximum flowrate of 14.7 psi specified pressure ($t_{Psf-prod,14.7,max}$), injection time (t_{inj}), 12 production flowrate values for CH_4 and 12 injection sandface values of CO_2, also, the output layer includes 26 functional links that support the training to produce better results.

The tool can predict results with an error of 5.23% in average. For the qsf-qsf forward tool (Tool-7), 30 data sets are tested. Figure 7.16a, Figure 7.16b, Figure 7.16c and Figure 7.16d show plots for four of the testing data sets for qsf-qsf forward tool (Tool-7). The errors for these four cases are 6.11%, 7.25%, 6.20% and 4.96%.

7.4.2 Tool-8: qsf-qsf Design ANN Tool

This tool is rather similar to the qsf-Psf design tool (Tool-6) except the injection of CO_2 is operated by constant injection rate. It is trained with the same reservoir parameters as qsf-qsf forward tool (Tool-7) is trained, which can be found in Table 7.4. Figure 7.17 show the design of the developed ANN tool for the qsf-qsf design tool (Tool-8). It can be seen that the design has 15 neurons, 30 neurons, 44 neurons in the first, second and the third hidden layers, respectively. The tool predicts 25 neurons that are L_{hw}, L_f, L_x, L_y, h, *SRV*-k_f, *SRV*-ϕ_f, *SRV*-Δx_s and additional functional links for a given system.

The tool can predict results with an error of 9.23% in average. For the qsf-qsf design tool (Tool-8), 30 data sets are tested. Figure 7.18a, Figure 7.18b, Figure 7.18c and Figure 7.18d show plots for four of the testing data sets for qsf-qsf forward tool (Tool-8). The errors for these four cases are 9.39%, 6.36%, 7.09% and 8.17%.

Although the average error seem to be very close to the target of 10% error, the cumulative CH_4 production and the cumulative CO_2 errors produce smaller results in ANN design tools, which is considered to lead more realistic way of analyzing errors. In this case, the average CH_4 cumulative CH_4 production error is 2.90% and the cumulative CO_2 error is 6.92%, which leads 4.91% of error in average.

Table 7.4. Input data and its ranges for Tool-7 (qsf-qsf forward tool) and Tool-8 (qsf-qsf design tool)

	Minimum Value	Maximum Value	Unit
L_{hw}	2,001.76	4,998.36	ft
L_f	202.252	999.915	ft
L_x	1.2*L_{hw}	1.599*L_{hw}	ft
L_y	1.202*L_f	1.997*L_f	ft
h	100.226	299.67	ft
ϕ_m	5.0008	9.995	%
ϕ_f	0.5022	1.9999	%
SRV-ϕ_f	1.2012*ϕ_f	1.4993*ϕ_f	%
k_m	1e-06	0.0001	md
k_f	0.000102	0.001097	md
SRV-k_f	2.00797*k_f	11.9926*k_f	md
Δx_s	0.902	2.998	ft
SRV-Δx_s	0.401*Δx_s	0.799*Δx_s	ft
S_{wf}	5.002	13.998	%
V_{L-CH_4}	50.329	249.734	scf/ton
P_{L-CH_4}	202.92	998.142	psi
V_{L-CO_2}	2.006* V_{L-CH_4}	5.99* V_{L-CH_4}	scf/ton
P_{L-CO_2}	201.968	999.081	psi
P_i	3,004.92	7,997.14	psi
T_i	120.016	199.999	F
$q_{sf-prod}$	1,018,365	4,990,330	SCFD
t_{prod}	7,306.09	18,233.2	days
q_{sf-inj}	501,416	3,997,280	SCFD
$P_{sf-inj-STOPING}$	1.03241*P_i	1.499*P_i	psi

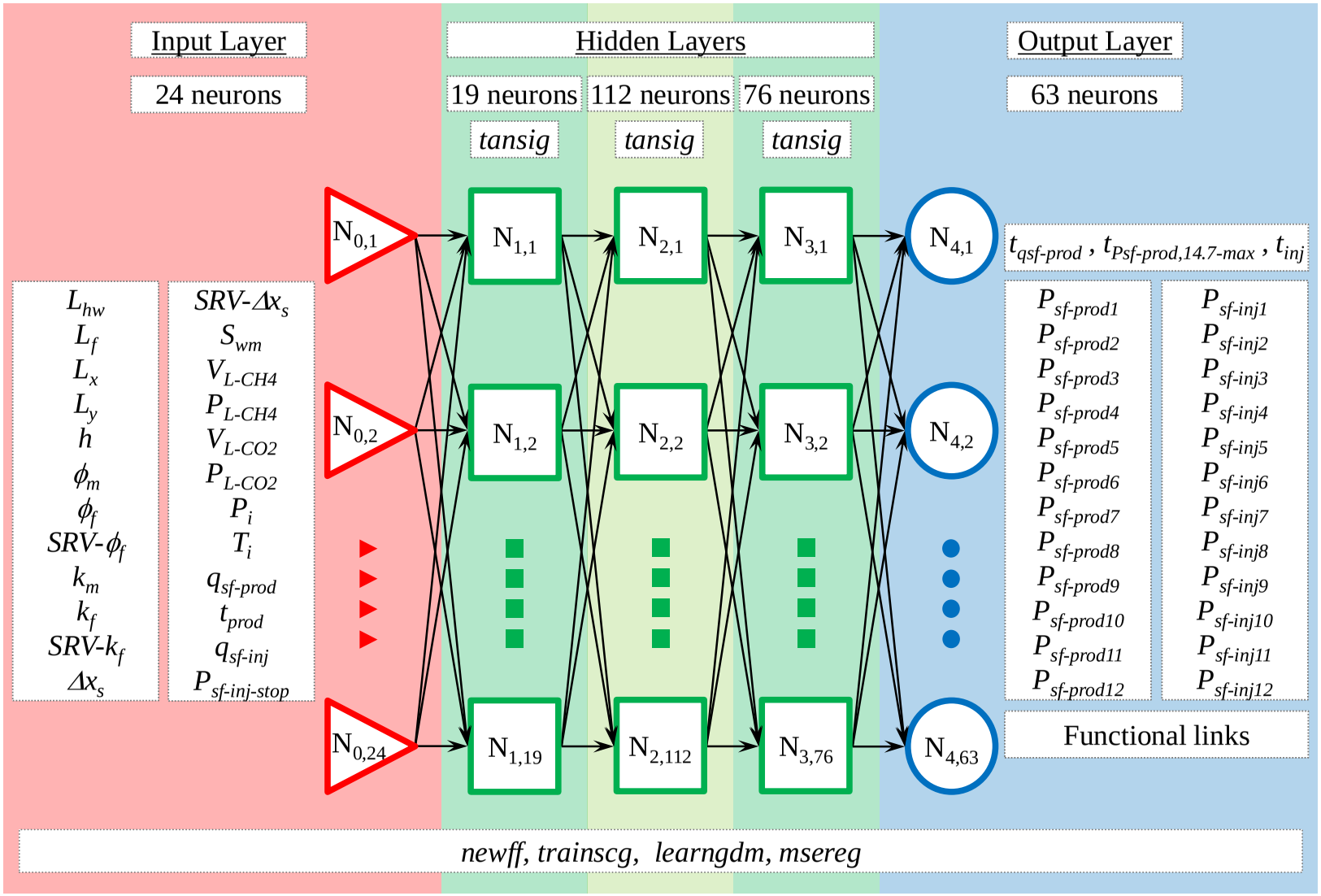
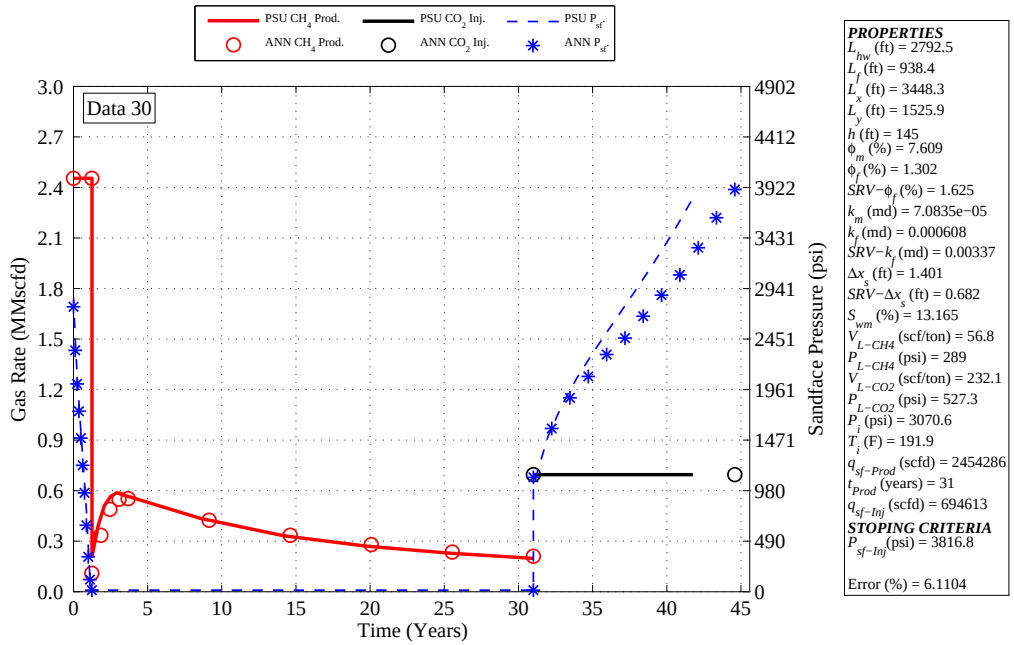
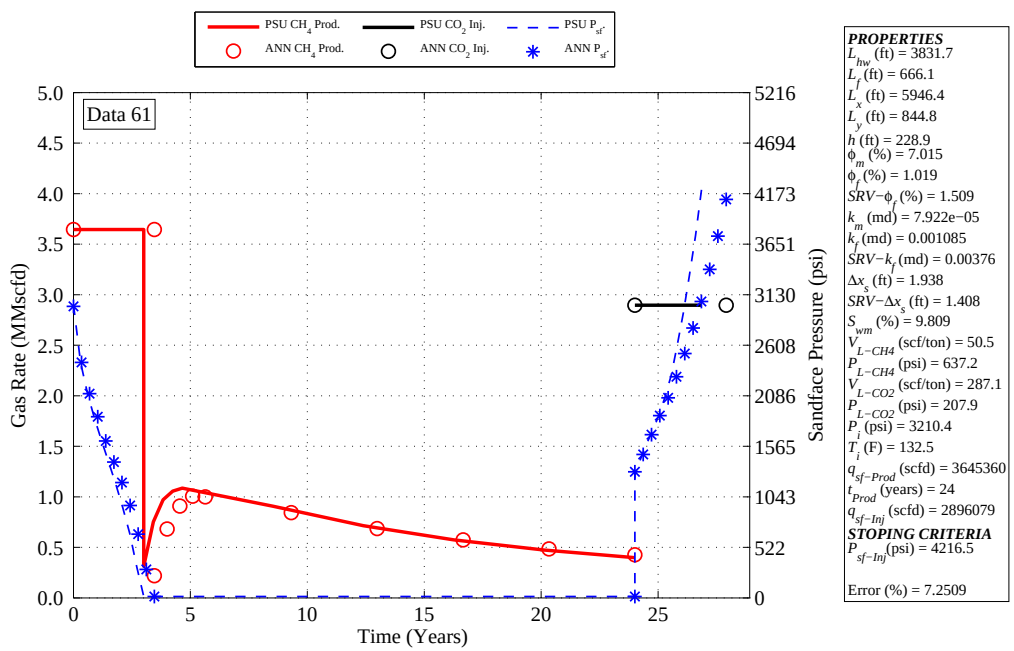


Figure 7.15. The ANN structure for qsf-qsf forward tool

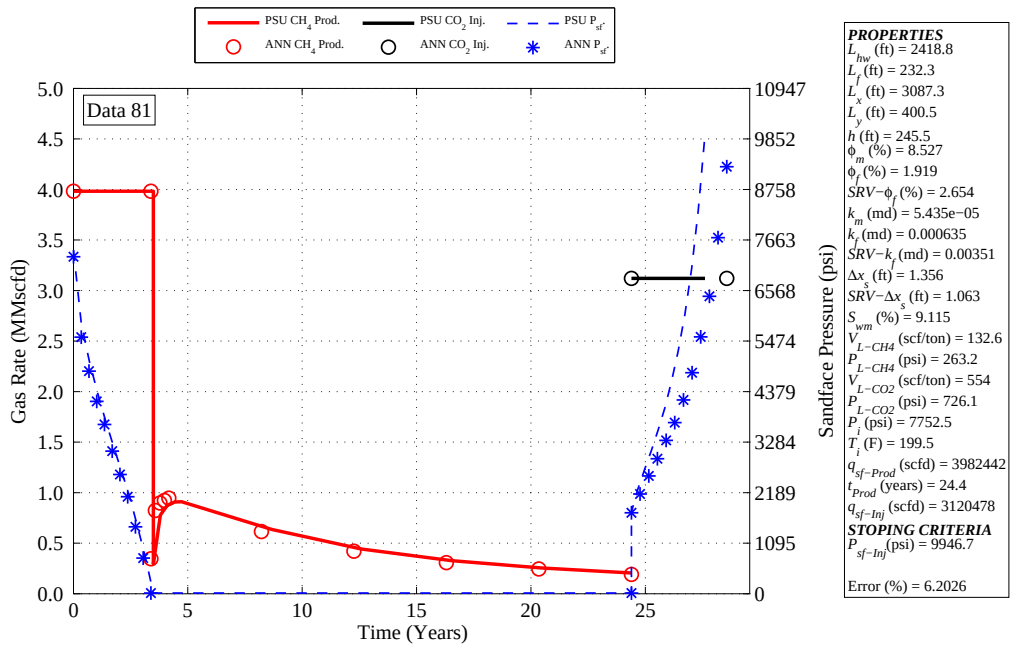


(a) Case 1

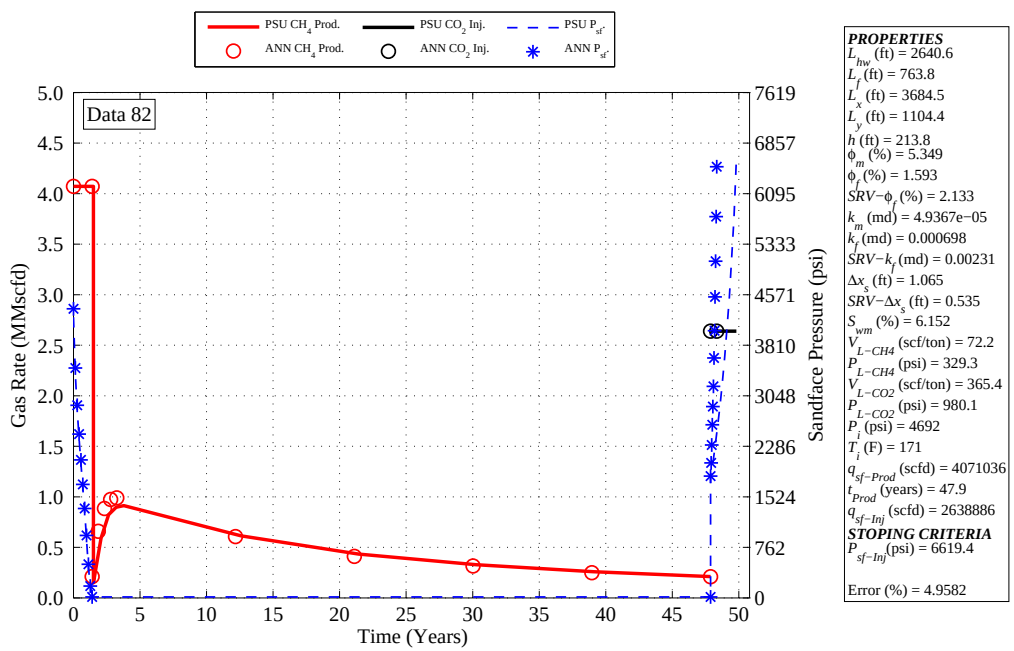


(b) Case 2

Figure 7.16. Predictions for qsf-qsf forward tool (Tool-7)



(c) Case 3



(d) Case 4

Figure 7.16. (continued) Predictions for qsf-qsf forward tool (Tool-7)

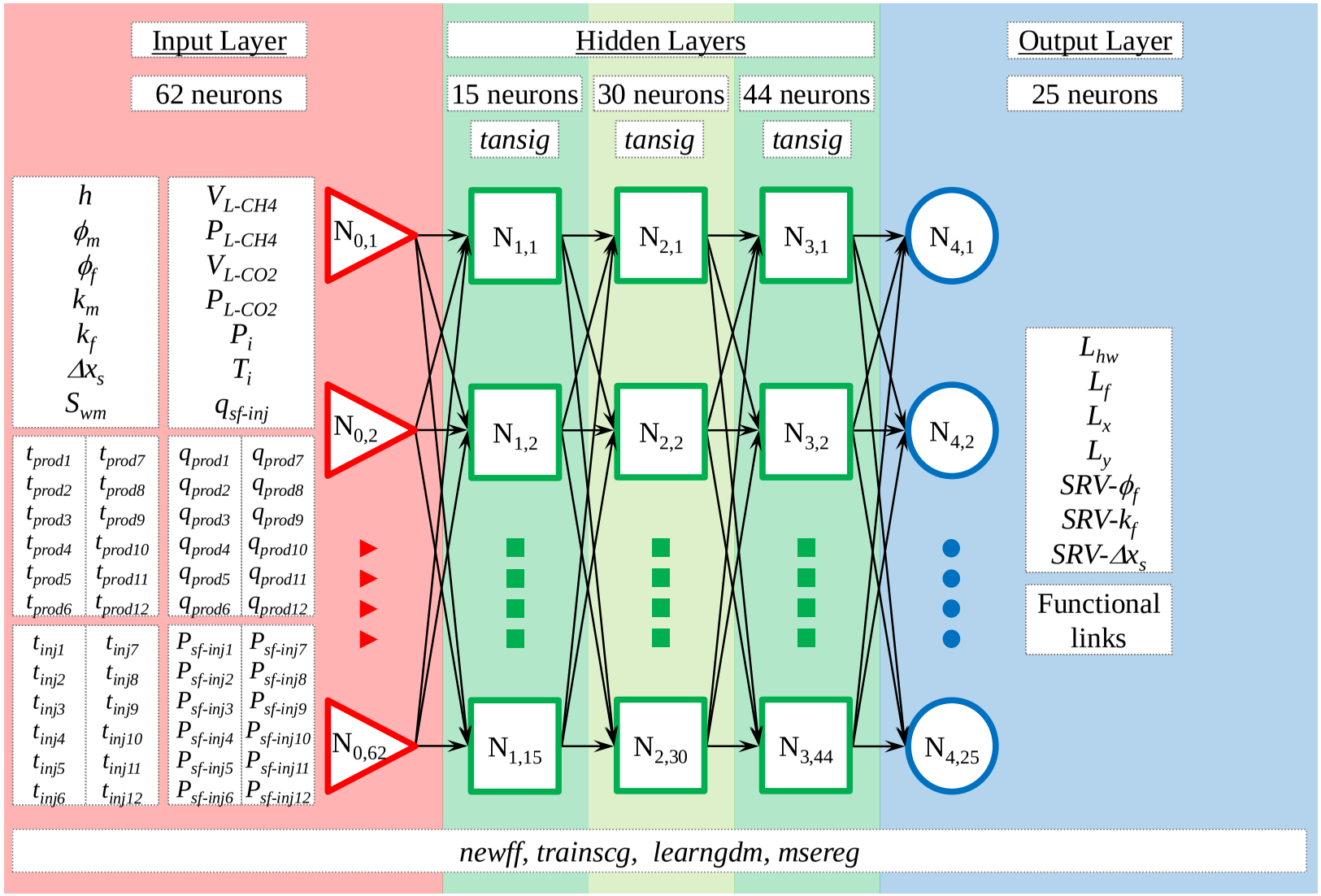
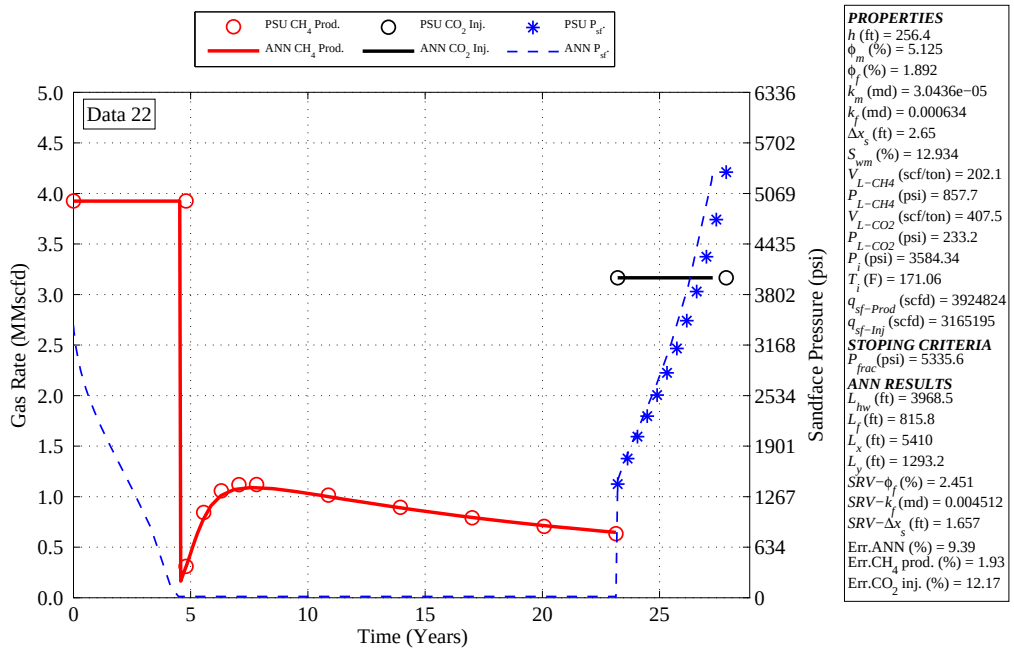
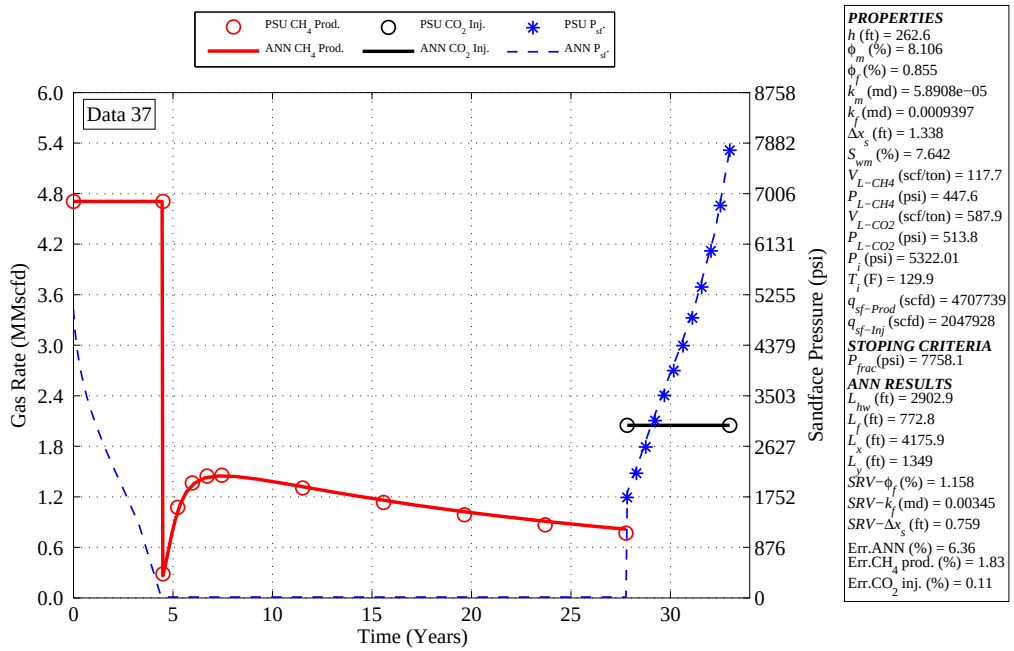


Figure 7.17. The ANN structure for qsf-qsf design tool

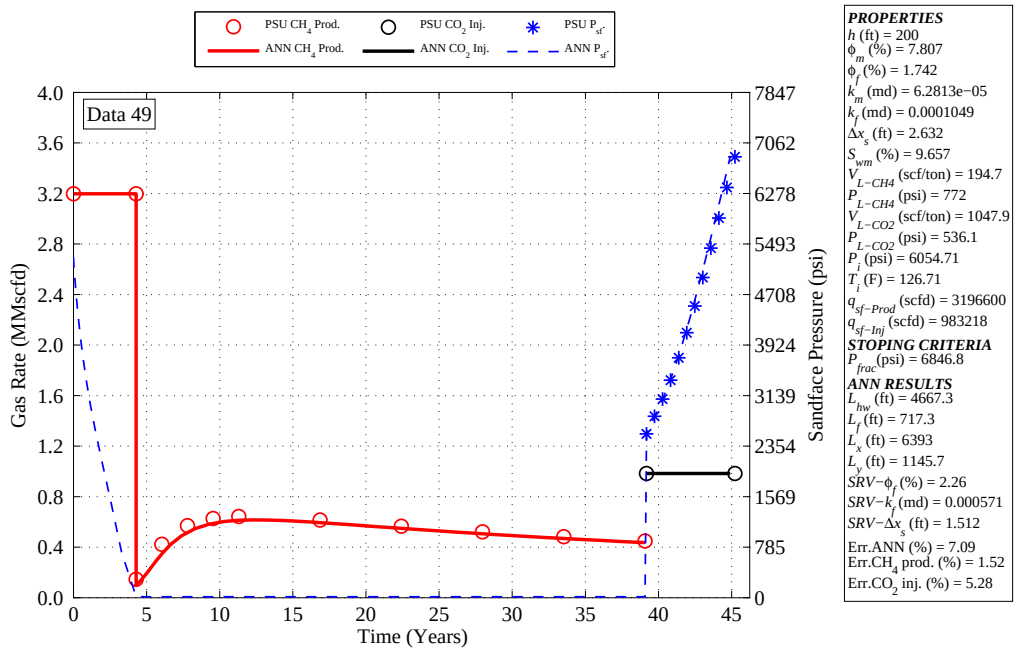


(a) Case 1

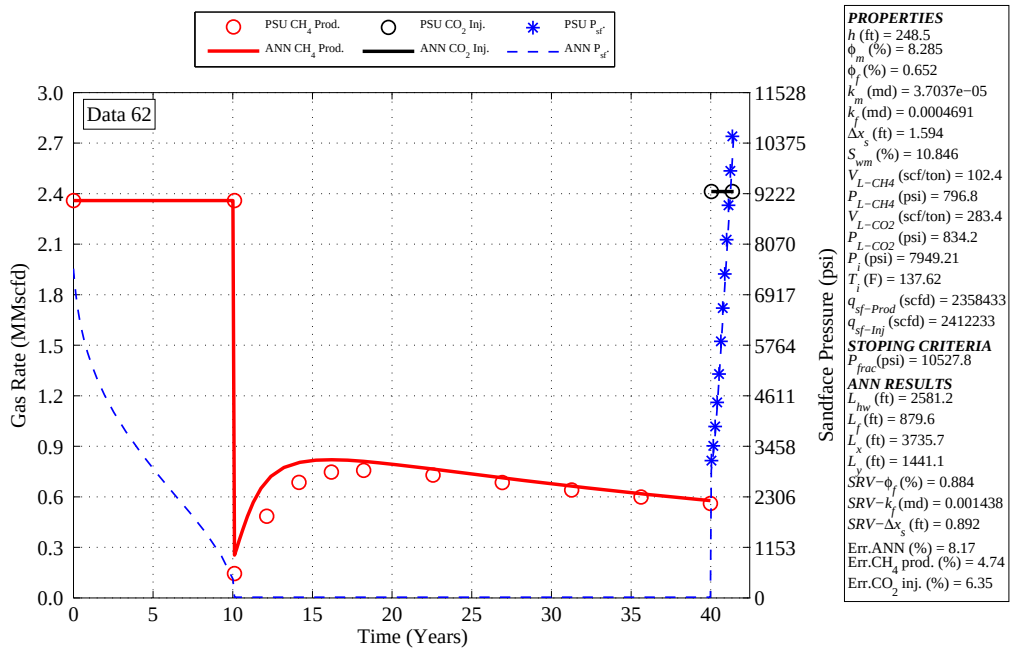


(b) Case 2

Figure 7.18. Predictions for qsf-qsf design tool (Tool-8)



(c) Case 3



(d) Case 4

Figure 7.18. (continued) Predictions for qsf-qsf design tool (Tool-8)

Chapter 8

Summary

This dissertation presents the possibility of industrial carbon dioxide (CO_2) storage in shale gas reservoirs. It is investigated numerically by using one of the most advanced computational simulators in the oil and gas industry, PSU-SHALECOMP, which is a compositional dual porosity, dual permeability, multi-phase reservoir simulator. The simulator treats the shale gas reservoir as a dual porosity, dual permeability system consisting of a shale matrix and a fracture network. It is also capable of investigating the effects of water presence in the micropore structure and those of matrix shrinkage and swelling in relation to CO_2 injection and production operations. In numerical experiments designed, mainly Marcellus shale reservoir, rock and fluid properties are entered to examine potential injection rates of CO_2 and final CO_2 capacities via single and multiple horizontal well systems.

The research objectives include the following goals:

- Evaluation of the potential for management of CO_2 from industrial sources through storage in depleted Marcellus shale gas wells,
- Investigation of the potential to use injected CO_2 to enhance production of remaining gas through mechanisms similar to those used in enhanced coalbed methane (CH_4) production,
- To predict deliverability/injectivity rates that can be achieved as a function of project implementation parameters,
- Investigation of CO_2 breakthrough at production wells,

- To define and implement a computationally inexpensive stimulated reservoir volume (SRV) model which has the ability to generate a similar behavior of an equivalent discrete fracture network model,

This chapter summarizes the observations that were made for possible carbon dioxide injection scenarios into depleted shale gas reservoirs for either long-term storage or in sequestration (Part 1). It also includes the summary of the artificial neural network tools that are trained and developed as an alternative tool to predict the production and injection behavior of hydraulically fractured horizontal wells in shale gas reservoir (Part 2).

8.1 Part 1

The first part of the study can be summarized as follows:

- It is re-proved that implementation of the horizontal borehole technology and hydraulic fracturing are the two most important factors that will increase the efficacy of methane production and carbon dioxide injection processes.

- It is observed that a significantly large percentage of the produced gas originates from the fractured zone so as significantly large percentage of the injected gas will end up occupying the pore spaces in the fractured zone.

- Injection of carbon dioxide into undepleted shale gas reservoirs is not promising because of its ultra-tight permeability characteristics (both in terms of carbon dioxide storage and in terms of enhanced gas recovery).

- Injection of carbon dioxide into shale gas reservoirs that have produced approximately 30% of the initial gas in place is promising (the numerical investigations indicated that this will correspond around 30 years of production cycle). It is observed that when 30% of shale gas production is achieved, up to 70% of the depleted gas volume is expected to be replaced by carbon dioxide.

- If the SRV zones of the production and injection wells are not in direct communication (no frac-hits between injector and producer), it is not expected to see carbon dioxide

breakthrough at the producing well. It is also investigated that contribution of carbon dioxide in enhancing the shale gas recovery is negligible.

- The storage capacity of the depleted shale gas reservoir can be increased by injecting carbon dioxide at a rather low rate. A low rate injection of carbon dioxide will increase its residence time in the flow domain increasing its chances for adsorption.

- In numerical investigations with *SRV* zones, it is uniformly observed that rather than fracture porosity, fracture permeability plays more dominant role in increasing the project life for carbon dioxide injection.

- One of the most critical observation is monitoring the reservoir pressure throughout the injection period. The reservoir pressure should not exceed the initial reservoir pressure because of the environmental concerns. A shale gas reservoir is capable of sequestering any type of fluid for a long time due to the fact that it has ultratight permeability unless the reservoir pressure is kept below its initial reservoir pressure.

8.2 Part 2

This part summarizes the observations that were made for the artificial neural network tool that is trained and developed as an alternative tool to predict the production and injection behavior of hydraulically fractured horizontal wells in shale gas reservoirs.

- In order to have a well trained ANN tool, the data set should have well distributed numbers in a given range for each parameter. MATLAB software is utilized to obtain parameters for input layer of ANN. By using these input values, PSU-SHALECOMP simulator is employed to get production values. The results of numerical simulation runs provide values for the output layer of the ANN tool.

- The second part of the study proves that ANN methodologies are very powerful tools if it the randomly generated input values have good distributions.

- Produced results that are the output values, which are used in trainings are collected from stable simulators.

- Also, data cleaning is significantly important in the process of developing a tool. Data sets should be analyzed in detail and some of the data sets should be removed from the training sets if they are in extreme conditions. For instance, a data set has a horizontal wellbore that is rather long that produces extremely low, which makes this particular data set unfeasible. This well would be plugged and abandoned in real life so it should not be included in the training.

- The forward tools that are developed in the second part of this research can produce results within a range of 3.83% to 5.23% which is considered as significantly low for a rather complex ANN development.

- The design tools that are developed can produce results within a range of 8.24% to 9.93%. However, the overall average of CH_4 cumulative CH_4 production and the cumulative CO_2 injection errors is 7.11%.

- This ANN study represents one of the modules for ANN toolbox for hydrocarbon recovery which is being developed by the Pennsylvania State University.

It considered that additional investigations and studies can be done to improve the investigate the injection of CO_2 in shale gas formations. These recommendations are:

- In this study, water is considered as irreducible. Further investigations are needed to be done to see the impact of water on production and injection.

- Only CO_2 injection is considered. Flue gas injection can be a cheaper solution to reduce the greenhouse effect.

- Only methane production is considered in this study. Utica Shale is coming into shale gas play and it can produce not only methane but heavier hydrocarbons. Also, some Marcellus Shale Gas wells that are located on the west portion of the basin produce heavier hydrocarbons. Further investigations may include compositional gas productions.

References

[1] F. Javapour, D. Fisher, and M. Unsworth, "Nanoscale Gas Flow in Shale Gas Sediments," *JCPT*, vol. 46, p. 55 61, October 2007.

[2] F. Javapour, "Nanopores and Apparent Permeability of Gas Flow in Mudrocks (Shales and Siltstone)," *JCPT*, vol. 48, p. 16 21, August 2009.

[3] N. Siripatrachai and T. Ertekin, "Alternate Representations in Numerical Modeling of Multistage Hydraulically Fractured Horizontal Wells in Shale Gas Reservoirs," *SPE Western Regional Meeting*, 2012.

[4] P. Thararoop, "A neural network approach to predict well performance in conjunction with infill drilling strategies," Master's thesis, The Pennsylvania State University, 2007.

[5] DOE/EIA, *Annual Energy Outlook 2012 with Projections to 203*. Washinghton, DC: U.S. Energy Information Administration, 2012.

[6] A. Kim and F. Kissel, "Methane Formation and Migration in Coalbeds," *Bureau of Mines Bulletin*, vol. 687, pp. 18–25, 1988.

[7] B. C. Nuttall, C. F. Eble, and J. A. Drahovzal, "Analysis of Devonian Black Shales in Kentucky for Potential Carbon Dioxide Sequestration and Enhanced Natural Gas Production," tech. rep., University of Kentucky, 2005.

[8] B. Metz, O. Davidson, and H. D. Coninck, *Carbondioxide Capture and Storage*. New York City, NY: Cambridge University Press, 2005.

[9] A. Busch, S. Alles, Y. Gensterblum, D. Prinz, and et al., "Carbon Dioxide Storage Potential of Shales," *IJGGC*, April 2008.

[10] A. Hildenbrand, S. Schlomer, B. Krooss, and et al., "Gas Breakthrough Experiments on Pelitic Rocks: Comparative Study with N_2, CO_2 and CH_4," *Geofluids*, vol. 4, p. 61 80, 2004.

[11] T. M. Al-Basali, J. Zang, M. M. Sharma, and et al., "Measurement of the Sealing Capacity of Shale Caprocks," in *SPE Annual Technology Conference and Exhibition*, (Houston, TX), October 2005.

[12] P. Chiquet and D. Thibeau, "Capillary alteration of Shaly Caprocks by Carbon Dioxide," in *SPE Europec/EAGE Annual Conference*, (Madrid, Spain), June 2005.

[13] B. M. Krooss and D. Schafer, "Experimental Measurements of the Diffusion Parameters of Light Hydrocarbons in Water-saturated Sedimentary rocks. I. A new Experimental Procedure," *Org. Geochem*, vol. 11, p. 61 80, 1987.

[14] B. M. Krooss and D. Leythaeuser, "Experimental Measurements of the Diffusion Parameters of Light Hydrocarbons in Water-saturated Sedimentary rocks. II. Results and Geochemical Significance," *Org. Geochem*, vol. 12, p. 91 108, 1988.

[15] B. M. Krooss, D. Leythaeuser, and D. Schafer, "The quantification of Diffusive Hydrocarbon Losses Through Cap Rocks of Natural Gas Reservoirs - a Re-evaluation," *AAPG Bulletin*, vol. 76, p. 403 406, 1992a.

[16] B. M. Krooss and D. Leythaeuser, "Molecular Diffusion of Light Hydrocarbons in Sedimentary Rocks in Its role in migration ans Dissipation of natural Gas," *AAPG Memoir*, vol. 66, p. 173 181, 1996.

[17] D. Leythaeuser, D. Schafer, and R. G. Yukler, "Diffusion of Light Hydrocarbons through Near-Surface Rocks," *Nature*, vol. 284, p. 522 525, 1980.

[18] F. Montel, G. Caillet, and et al., "Diffusion Model for Predicting Reservoir Gas Losses," *Marine Petrol. Geol.*, vol. 10, p. 51 57, 1993.

[19] B. M. Krooss, A. Busch, S. Alles, and A. Hildenbrand, "Experimental Investigation of Molecular Diffusion of CO_2 in Coals and Shales," in *International Conference on Gas-Water-Rock Interactions Induced by Reservoir Exploitation, CO_2 Sequestration, and Other Geological Storage*, (Rueil-Malmaison, France), November 2003.

[20] A. Hildenbrand and B. M. Krooss, "CO_2 Migration Processes in argillaceous rocks: Pressure-Driven Volume Flow and Diffusion," *Jou. Geochem Expl.*, vol. 78-79, p. 169 172, 2003.

[21] A. Ghaith and W. Chen, "Oscillatory Methane Release from Shale Source Rock," *Earth-Science Reviews*, vol. 29, p. 241 248, 1990.

[22] M. Mayerhofer, E. Lolon, and N. Warpinski, "What is Stimulated Reservoir Volume?," *SPE*, 2010.

[23] U. Zimmer, "Calculating Stimulated Reservoir Volume (SRV) with Consideration of Uncertainties in Microseismic-Event Locations," in *Canadian Unconventional Resources*, (Alberta, Canada), 2011.

[24] R. Romanson and R. Pongratz, "Novel, Multistage Stimulation Processes Can Help Achieve and Control Branch Fracturing and Increase Stimulated Reservoir Volume for Unconventional Reservoirs," in *SPE*, (Austria), 2011.

[25] T. Ertekin, "PSU-COALCOMP's Performance in Compositional Coalbed Methane Simulation Comparison Study," in *3rd Workshop on Numerical Modeling of Enhanced Coalbed Methane Recovery*, (Tokyo, Japan), 2003.

[26] P. Thararoop, *Development of a Multi-Mechanistic, Dual-Porosity, Dual-Permeability Numerical Flow Model for Coalbed Methane Reservoirs Accounting for Coal Shrinkage and Swelling Effects* . PhD thesis, The Pennsylvania State University, 2010.

[27] J. Manik, T. Ertekin, and T. Kohler, "Development and Validation of a Compositional Coalbed Simulator," *JCPT*, vol. 41, no. 4, pp. 39–45, 2002.

[28] E. Aslan, *Development and Testing of an Advanced Coalbed Methane Numerical Reservoir Simulator*. PhD thesis, The Pennsylvania State University, 2013.

[29] T. Ertekin, G. R. King, and F. C. Schwerer, "Dynamic Gas Slippage: A Unique Dual-Mechanism Approach to the Flow of Gas in Tight Formations," *SPE Formation Evaluation*, pp. 43–52, February 1986.

[30] G. R. King, T. Ertekin, and F. C. Schwerer, "Numerical Simulation of the Transient Behavior of Coal-Seam Degasification Wells," *SPE Formation Evaluation*, pp. 165–183, April 1986.

[31] D. J. Remner, T. Ertekin, W. Sung, and G. R. King, "Parametric Study of the Effects of Coal Seam Properties on Gas Drainage Efficiency," *SPE Reservoir Engineering*, p. 633 646, November 1986.

[32] W. Sung, T. Ertekin, and F. C. Schwerer, "The Development, Testing, and Application of a Comprehensive Coal Seam Degasification Model," in *SPE*, (Kentucky, USA), May 1986.

[33] A. L. Myers and J. M. Prausnitz, "Thermodynamics of Mixed - Gas Adsorption," *A.I.Ch.E.*, vol. 11, no. 1, pp. 121–127, 1965.

[34] D. Peng and D. B. Robinson, "A New Two-Constant Equation of State," *Ind. Eng. Chem.*, vol. 15, no. 1, pp. 54–64, 1976.

[35] J. Manik, *Compositional Modelling of Enhanced Coalbed Methane Recovery.* PhD thesis, The Pennsylvania State University, 1999.

[36] T. E. Kohler and T. Ertekin, "Modelling of Undersaturated Coal Seam Gas Reservoirs," in *SPE Rocky Mountain Regional/Low-Permeability Reservoirs Symposium*, (Denver, USA), March 1995.

[37] A. Agrawal, Y. Wei, and S. Holditch, "A Technical and Economic Study of Completion Techniques in Five Emerging US Gas Shales: A Woodford Shale Example," *SPE*, 2011.

[38] A. S. Chaudhary, C. Ehlig-Economides, and R. Wattenbarger, "Shale Oil Production Performance from a Stimulated Reservoir Volume," *SPE*, 2011.

[39] N. Houston and et al., "Fracture-Stimulation in the Marcellus ShaleLessons Learned in Fluid Selection and Execution ," *SPE*, 2009.

[40] J. Ciezobka and I. Salehi, "Controlled Hydraulic Fracturing of Naturally Fractured Shales - A Case Study inthe Marcellus Shale Examining How to Identify and Exploit Natural Fractures," *SPE*, 2013.

[41] B. Kulga, "Development Of An Artificial Neural Network For Hydraulically Fractured Horizontal Wells In Tight Gas Sands ," Master's thesis, The Pennsylvania State University, 2010.

[42] J. A. Murtha, "Incorporating Historical Data Into Monte Carlo Simulation," *SPE Computer Applications*, April 1994.

[43] R. Dhir, R. R. Dern, and M. J. Mavor, "Economic and Reserve Evaluation of Coal Bed Methane Reservoirs," *JPT*, December 1991.

[44] J. A. Murtha, "Monte Carlo Simulation: Its Status and Future," *JPT*, April 1997.

[45] Y. Bansal, "Conducting in-situ combustion tube experiments using artificial neural networks," Master's thesis, The Pennsylvania State University, 2009.

[46] M. Tarman, "Development of an artificial neural network as a pressure transient analysis tool for multi-layered reservoirs with or without cross flow," Master's thesis, The Pennsylvania State University, 2005.

[47] X. Dong, "Characterization of coalbed methane reservoirs from pressure transient data: An artificial neural network approach," Master's thesis, The Pennsylvania State University, 2003.

[48] M. N. Alajmi, "Development of an artificial neural network as a pressure transient analysis tool for applications in double-porosity reservoirs," Master's thesis, The Pennsylvania State University, 2003.

Appendix A

Training and Testing Data Set

This appendix includes the training and testing data sets generated by MATLAB. First table includes data for Psf-Psf case.

Data #	L_{hw} (ft)	L_f (ft)	L_x (ft)	L_y (ft)	h (ft)	ϕ_m (%)	ϕ_f (%)	$SRV\text{-}\phi_f$ (%)	k_m (md)	k_f (md)	$SRV\text{-}k_f$ (md)	Δx_s (ft)
	$SRV\text{-}\Delta x_s$ (ft)	S_{wf} (%)	V_{L-CH_4} (scf/ton)	P_{L-CH_4} (psi)	V_{L-CO_2} (scf/ton)	P_{L-CO_2} (psi)	P_i (psi)	T_i (F)	$P_{sf-prod}$ (scfd)	t_{prod} (days)	P_{frac} (psi)	q_{sf-inj} (scfd)
1	4281.85	574.91	5643.28	1144.69	260.26	7.44	1.6	2.29	4.83e-05	0.00067	0.00169	1.1
	0.48	6.14	112.68	645.57	313.26	929.91	5326.11	126.17	529	17443.7	7681.18	451022
2	2237.94	923.01	3030.87	1514.5	209.86	9.72	0.5	0.65	8.83e-05	0.0005	0.00587	2.97
	1.2	13.4	142.87	376.5	624.91	506.78	4715.23	123.02	994	15606	5997.58	462799
3	4604.37	463.56	6630.12	891.75	139.79	8.8	0.83	1.05	8.28e-05	0.00074	0.00189	2.64
	1.72	13.08	95.9	474.72	539.79	202.28	7268.46	166.3	3588	16203.2	9010.44	306465
4	4719.1	899.78	7124.77	1696.32	218.17	9.66	1.26	1.73	2.09e-05	0.00099	0.0081	2.56
	1.34	11.9	167.75	581.32	434.13	651.27	6233.28	125.12	1028	9606.07	8495.54	487047
5	2934.89	308.96	4266.03	533.6	194.23	8.62	1.13	1.5	9.73e-05	0.00093	0.00293	2.35
	1.64	5.96	190.64	955.86	527.11	999.25	7172.76	153.11	2678	17720.2	8155.69	432973
6	3849.19	454.85	6097.87	635.85	170.28	8.54	1.57	2.28	8.63e-05	0.0003	0.00208	1.68
	1.27	10.61	52.59	859.94	219.43	783.56	7205.86	156.67	829	14530.7	8922.01	500235
7	3744.71	382.54	4797.06	755.06	181.19	9.42	1.81	2.23	6.2e-06	0.0009	0.01022	2.03
	1.32	7.92	215.19	530.67	955.69	377.76	4391.06	161.3	2128	16496.1	5053.83	321914
8	4434.47	467.83	5550.4	689.18	242.65	8.37	1.56	2.2	2.77e-05	0.00067	0.00155	2.46
	1.13	9.88	129.13	294.45	636.67	536.43	6459.85	139.77	1668	13579.7	9643.62	451760
9	3266.52	474.76	3997.5	943.96	121.19	8.48	1.93	2.83	8.12e-05	0.00074	0.00613	2.69
	1.2	13.02	106.51	522.85	239.63	490.84	5680.43	139.01	25	10912.8	8372.44	487100
10	4629.97	819.71	5992.19	1466.98	192.47	7.82	1.26	1.86	8.5e-06	0.00062	0.00684	1.43
	1.04	8.34	57.24	816.26	136.1	643.83	4366.58	184.63	1829	12356.1	6255.36	476763
11	3090.07	335.32	4121.88	548.71	148.03	8.38	1.1	1.45	7.7e-05	0.00069	0.00682	1.01
	0.81	5.6	132.05	987.58	275.57	636.45	3177.72	169.89	408	10059.5	3649.93	459360
12	4565.03	893.27	5724.49	1554.28	271.29	9.13	0.85	1.18	4.55e-05	0.00017	0.00118	1.7
	0.85	9.64	166.7	374.54	581.86	448.46	4508.89	131.6	1196	7390.75	5913.94	419961
13	2967.46	763.23	4586.73	1140.75	162.96	5.21	1.81	2.36	4.9e-05	0.00039	0.00212	1.58
	0.91	9.64	76.64	770.63	367.78	525.53	6169.68	148.4	291	8011.1	8028.89	235829
14	4634.62	710.37	6768.57	1416.48	105.53	7.87	0.73	1.07	6.37e-05	0.00039	0.00287	1.41
	0.75	10.12	140.1	365.19	487.64	705.52	7166.07	140.92	59	8095.58	8015.78	391536
15	4846.78	916.6	6110.02	1699.27	126.92	5.75	1.27	1.62	9.63e-05	0.00067	0.00261	2.51
	1.18	12.66	199.87	616.36	1013.69	933.72	3224.63	151.1	318	11077.5	3861.35	231952
16	4790.67	681.1	6894.63	1059.33	203.43	5.57	1.83	2.51	6.37e-05	0.00025	0.00146	2.67
	1.29	9.41	215.54	734.13	1052.12	629.55	3129.07	151.57	285	15668.8	3624.53	303810
17	2416.86	696.27	3714.07	1090.44	163.45	9.03	1.7	2.29	6.96e-05	0.00064	0.00733	2.67
	1.36	12.83	223.29	920.38	1293.88	530.34	3235.18	147.45	177	14710.2	4287.04	387320
18	3720.62	251.9	5560.06	501.36	157.35	6.16	1.23	1.72	5.39e-05	0.00038	0.00162	1.99
	1.12	6.69	212.98	966.71	1258.59	324.45	4257.08	121.32	1867	14779.2	5859.5	336287
19	4821.77	480.75	6060.78	869.47	260.62	8.62	0.61	0.91	9.04e-05	0.00029	0.00212	1.76
	1.07	12.42	72.29	803.14	176.43	601.43	3302.39	196.91	112	14320.9	4192.61	434182
20	4972.78	534.67	6283.73	734.98	277.8	9.17	1.18	1.66	1.68e-05	0.00081	0.00576	1.95
	1.47	5.69	221.12	413.64	443.99	945.15	3880.99	155.07	1433	8742.02	4692.05	340768
21	4185.34	391.46	5957.46	544.28	135	9.11	1.46	1.85	9.78e-05	0.00063	0.00586	1.81
	1.02	13.66	74.94	219.28	372.98	573.91	4289.97	175.08	1218	14251.1	5311.95	480674
22	2470.72	458.33	3179.87	654.41	123.34	9.59	1.68	2.38	1.5e-06	0.0011	0.00524	1.68
	1.21	9.16	85.09	933.63	229.58	746.18	7770.42	193.72	3617	13493.9	8688.46	405814
23	4010.49	683.5	6122.99	925.31	153.57	5.62	1.9	2.74	1.48e-05	0.00048	0.00281	1.78
	0.92	13.42	230.99	447.1	531.4	874.14	3739.63	187.21	925	15258.1	5364.84	407314
24	4855.9	920.43	7265.97	1654.87	195.25	9.25	1.96	2.67	4.49e-05	0.00101	0.00399	1.21
	0.49	11.84	222.08	315.37	754.74	582.04	6400.92	191.24	1746	12679.4	7639.15	454630
25	2556.2	341.11	3787.06	628.94	220.75	6.35	1.51	2.27	4.63e-05	0.0009	0.00219	1.87
	1.49	7.55	236.68	672.48	561.76	445.55	3312.84	145.68	835	9544.9	3884.95	272044
26	3434.73	951.69	5125.58	1658.28	150.71	5.71	1.36	2.04	3.45e-05	0.00043	0.00503	2.57
	1.3	13.51	197.01	360.08	748.29	861.02	5542.64	169.63	1624	9014.89	7727.13	239113
27	4163.53	246.85	6321.6	423.54	242.59	7.68	1.47	1.98	2.97e-05	0.00021	0.00079	2.08
	0.99	8.73	83.41	241.58	406.42	692.32	6108.92	146.88	535	13634.5	8967.64	479405
28	3512.52	356.28	5310.68	535.87	282.39	5.81	1.53	2.06	7.06e-05	0.00054	0.00121	2.07

	1.32	10.23	208.34	853.04	431.47	626.12	4471.18	126.23	1470	17689.2	4932.13	262184

29	4217.22	914.82	6437.52	1414.26	211.5	9.01	1.63	1.99	8.35e-05	0.00087	0.00805	2.79
	1.33	13.87	91.67	226.06	337.03	234.37	5073.23	186.32	1107	12664.5	6012.52	483401
30	2069.47	208.83	2916.42	335.03	242.42	5.58	1.45	1.96	8.93e-05	0.00057	0.00137	2.65
	1.6	9.13	243.33	764.07	516.3	556.45	4860.15	138.24	411	8187.2	6392.15	233381
31	3492.86	930.76	4983.37	1237.42	121.21	9.73	1.79	2.44	7.72e-05	0.00029	0.00315	2.11
	0.94	11.49	147.13	515.41	418.98	690.18	4649.42	165.34	748	8522.49	5120.94	203713
32	4472.71	714.24	6982.75	1414.57	225.15	7.65	1.22	1.79	4.5e-05	0.00023	0.00236	2.25
	1.46	7.29	205.81	689.85	667.34	431.32	5014.26	156	1550	8192.53	7321.32	331757
33	2171.66	555.81	3080.03	766.59	131.93	8.94	0.57	0.77	1.3e-05	0.00048	0.00359	1.76
	0.99	7.26	109.09	702.98	402.66	380.87	3560.64	180.12	1585	14747.1	4818.87	381778
34	4522.44	824.82	6791.23	1314.26	107.03	6.25	0.67	0.81	1.65e-05	0.0007	0.00341	2.8
	1.58	6.45	57.03	645.39	163.06	802.36	6697.76	194.7	409	13793.5	8578.45	370612
35	3565.3	614.8	5351.44	1100.51	213.97	9.33	1.27	1.66	9.45e-05	0.00096	0.00922	0.97
	0.43	9.48	143.09	834.82	343.83	985.14	5421.71	190.11	1029	10622.5	6156.15	329887
36	4275.57	490.99	5251.11	720.18	144.6	5.92	1.8	2.38	9.72e-05	0.00071	0.00235	2.22
	1.29	7.07	111.69	690.39	375	810.71	4768.54	179.72	993	14785.2	5923.11	341805
37	3278.67	394.51	4114.3	679.49	221.5	6.83	0.64	0.8	3.77e-05	0.00028	0.00268	2.94
	1.22	12.53	195.23	245.4	885.07	426.54	5901.35	142.11	1829	11387.6	7795.83	359813
38	4078.51	511.83	5679.89	997.12	122.01	8.46	1.7	2.38	9.65e-05	0.00098	0.00844	1.59
	0.81	12.25	78.83	389.65	183.53	246.75	5979.3	189.8	2783	18046.2	8649.08	448566
39	2299.45	695.64	3311.76	1173.19	167.96	5.58	0.64	0.84	9.64e-05	0.00031	0.00204	2.19
	1.08	7.47	85.38	554.03	283.65	753.41	6071.78	189.16	870	17686.3	8910.7	358486
40	3474.79	838.95	4340.92	1570.26	295.66	9.53	1.04	1.52	6.87e-05	0.00015	0.0017	2.73
	1.58	8.69	78.32	350.57	378.94	821.13	6962.8	120.93	2613	12750.7	9068.75	202782
41	4183.44	371.18	5951.51	584.75	154.42	8.15	1.78	2.52	6.75e-05	0.00058	0.00184	1.16
	0.55	10.07	119.67	332.95	477.56	408.55	5623.07	145.11	2800	13379.5	7901.73	475974
42	4003.25	960.42	5326.34	1643.01	146.44	9.7	1.41	1.95	2.18e-05	0.00106	0.00467	2.34
	1.4	13.17	67.18	284.61	223.74	513.69	5083	157.19	2015	11870	7056.87	474623
43	2481.9	271.69	3508.19	451.82	171.49	8.24	0.68	0.91	1.06e-05	0.00072	0.00444	2.32
	1	9.56	232.63	403.08	1371.7	613.41	6618.87	141.73	2264	14689.8	7652.33	458067
44	2815.25	508.34	4303.89	867.66	117.36	8.81	1.08	1.4	7.69e-05	0.00062	0.00506	2.65
	2.11	7.21	159.09	658.69	856.94	725.82	5207.47	154.38	2458	17872.2	5771.92	322924
45	3777.26	877.25	5197.66	1461.98	196.81	8.94	1.02	1.36	4.9e-06	0.00062	0.00628	0.98
	0.54	12.74	202.57	930.95	799.34	372.19	4281.75	199.83	763	16644.3	5585.34	557171
46	4413.09	487.13	6829.41	737.13	141.06	8.66	1.43	1.99	5.06e-05	0.00073	0.00155	1.05
	0.81	10.4	52.28	493.79	106.82	844.45	5251.42	120.29	1360	13463.5	6451.3	317105
47	2783.93	557.13	4345.12	869.54	224.92	8.12	1.99	2.81	2.82e-05	0.0004	0.00391	2.84
	1.57	13.41	62.25	409.6	347.18	795.47	7379.7	143.38	3301	10620.3	10334	268472
48	3620.89	852.52	4977.33	1685.31	256.59	8.48	0.77	1.01	6.87e-05	0.00105	0.00949	2.01
	1.53	9.76	235.83	424.93	613.88	858.74	6456.46	184.58	1725	12694.7	7149.15	552208
49	2962.91	752.04	4173.15	1183.89	284.44	7.29	1.62	2.28	1.8e-06	0.00083	0.00413	2.27
	1.77	5.69	82.04	344.92	317.72	958.85	3768.35	141.68	592	11521.6	4630.12	407702
50	4605.46	579.99	6504.63	859.79	170.79	7.89	1.85	2.33	4.58e-05	0.00076	0.00626	2.31
	1.08	8.63	62.13	686.64	184.29	302.35	7821.93	150.31	1854	17323.5	8806.99	402293
51	2895.4	248.2	3937	329.56	105	7.91	1.97	2.73	7.39e-05	0.00097	0.00233	0.92
	0.72	11.04	197.06	438.16	808.52	840.87	7745.13	182.67	2769	10282	8805.24	336747
52	3310.65	590.78	5282.67	1024.16	297.14	6.43	0.89	1.09	8.76e-05	0.00099	0.00676	2.22
	0.92	6.35	212.53	701.83	787	661.42	4457.08	143.12	2009	8671.37	6242.21	318727
53	3424.32	392.4	5015.36	488.05	129.23	6.92	0.75	0.97	1.28e-05	0.00098	0.00905	2.78
	1.44	5.55	170.54	324.2	679.39	398.6	3212.68	192.14	665	8693.17	3924.19	309449
54	2726.41	942.66	4223.15	1396.67	263.57	9.63	1.26	1.81	5.42e-05	0.0005	0.00582	1.95
	0.91	8.35	94.9	269.45	383.44	209.09	4270.62	190.92	771	10073.4	5731.67	484072
55	2741.91	487.96	3693.29	800.18	276.79	7.06	1.71	2.38	3.46e-05	0.00071	0.00261	1.59
	0.74	8.54	247.63	431.27	1187.74	435.73	3248.68	126.64	881	12931.7	4623.87	357487
56	4648.88	589.06	6722.84	976.23	231.98	5.24	1.53	2.1	2.84e-05	0.00029	0.00294	1.99
	1.34	8.55	166.6	553.96	384.31	710	5264.93	128.41	2446	8354.35	7215.47	411698
57	2783.61	900.29	3436.92	1724.02	246.62	5.01	1.87	2.3	1.8e-06	0.00091	0.00261	1.34
	0.9	12.73	183.51	720.15	950.68	934.65	6261.18	140.14	570	16444	7534.54	296085
58	2691.02	390.17	4165.5	724.29	198.3	5.47	0.98	1.46	4.87e-05	0.00076	0.00262	2.48
	1.7	5.32	109.47	516.28	242.28	810.3	3640.1	198.41	361	13967	4501.72	373032
59	3468.71	893.91	4636.47	1266.64	294	8.95	1.5	2.23	7.9e-06	0.00043	0.00454	1.19
	0.95	9.41	213.58	831.41	436.96	953.55	6229.83	122.16	2245	10978.1	8452.64	331187
60	4926.69	675.41	6301.74	1289.1	247.26	6.63	1.54	2.01	9.41e-05	0.00088	0.00252	2.18
	1.45	9.7	183.06	565.12	565.32	870.77	3754.13	138.6	520	10432.6	4251.47	409234
61	2624.42	349.62	3908.38	425.25	172.2	6.91	1.73	2.15	9.2e-05	0.0002	0.00186	1.89
	1.08	7.74	115.22	491.25	417.54	216.02	3420.94	187.9	547	12428.1	4914.26	281959
62	3580.51	846.33	5190.09	1409.52	108.67	7.48	0.9	1.13	7.39e-05	0.00089	0.00639	1.92
	1.44	9.53	151.87	716.74	790.87	578.55	4047.8	190.13	1691	15814.8	4835.47	304152
63	2738.45	434.65	3555.39	838.06	293.59	5.15	1.97	2.56	5.03e-05	0.0003	0.00364	2.04
	1.52	6.09	218.79	359.86	1255.81	836.25	5634.17	137.25	364	12122.5	6741.19	404059
64	3707.81	932.63	5791.99	1524.17	195.96	6.45	0.65	0.96	8.5e-05	0.00078	0.00565	1.52
	1.03	5.25	113.54	752.35	361.88	772.09	4845.39	133.15	835	13396.7	5475.4	291938
65	2642.58	678.36	3661.91	1114.64	158.99	8.19	0.71	0.94	2.16e-05	0.00084	0.00183	2.19
	0.97	9.84	205.85	630.82	856.85	442.48	6166.65	138.77	2708	16891.4	9235.8	328297
66	3284.1	886.79	4805.26	1297.89	190.54	7.28	0.72	0.9	6.61e-05	0.00047	0.00424	1.08
	0.78	12.31	118.06	470.34	270.36	918.56	5864.73	134.58	2017	16563	7254.42	247172
67	2994.91	512.6	4683.16	745.43	224.69	7.79	1.39	2.07	7.46e-05	0.0011	0.00713	2.62
	1.49	13.97	118.6	658.06	309.91	478.28	6209.09	171.48	1513	13689.4	8272.95	314538
68	4365.71	977.17	5587.97	1466.38	275.98	8.86	1.27	1.69	6.42e-05	0.00044	0.00097	2.18
	0.96	9.61	142.49	640.12	617.35	592.01	4907.64	165.9	106	12070.2	7292.35	349336
69	3980.12	789.23	5919.85	1564.76	161.37	7.68	1.79	2.51	8e-06	0.00018	0.00183	1.23
	0.87	11.81	136.67	813.05	293.79	815.96	6995.17	128.39	2264	17656.4	8862.56	377444
70	3326	742.58	5020.6	1251.37	115.24	9.55	2	2.83	3.98e-05	0.0002	0.00184	1.63
	0.65	12.88	249.38	520.21	631.49	765.38	3571.69	145.36	1745	17531.1	5223.29	329348
71	4283.98	922.87	5594.9	1508.56	168.93	8.14	0.56	0.7	8.73e-05	0.00026	0.0012	1.53
	0.66	10.97	243.67	406.75	798.2	300.78	4337.36	147.41	577	14629.3	6237.8	472400
72	2050.54	736.97	3214.65	1096.11	284.11	8.66	1.56	2.34	4.95e-05	0.00065	0.00536	2.99
	1.51	12.67	153.34	773.75	753.58	798.66	5935.38	148.72	2310	13718.7	8347.26	388312
73	4674.92	327.83	7100.57	447.21	115.55	6.76	1	1.29	4.94e-05	0.00103	0.00533	2.68
	2	6.32	61.7	597.69	277.47	660.79	5036.01	163.56	1780	17624.5	7164.24	325259
74	4499.26	445.84	7003.04	784.32	152.68	9.12	1.86	2.49	5.76e-05	0.00091	0.00373	1.77
	1.33	13.27	236.32	911.85	728.78	718.52	5012.07	179.38	1594	11254.5	7217.2	365196
75	3636.27	849.78	5164.71	1537.77	168.6	7.03	1.68	2.42	6.7e-05	0.00086	0.00781	2.98
	2.03	13.42	212.74	669.82	554.93	545.9	5258.06	150.17	2590	15763.1	7869	446786
76	4048.42	970.69	5336.36	1717.1	242.53	6.76	1.18	1.49	1e-05	0.00089	0.00848	1.37
	0.72	12.54	165.61	851.79	568.53	999.49	6072.8	184.14	1765	7562.42	6826.8	376666

77	4853.93	260.95	6184.91	315.83	150.09	5.8	1.93	2.51	3.37e-05	0.00044	0.00109	2.13
	0.9	10.12	86.93	724.03	407.14	296.06	6733.9	140.63	3270	16019.9	7543.36	333566
78	4345.02	250.37	5768.29	485.83	150.45	6.08	0.99	1.47	2.99e-05	0.00056	0.00398	1.72
	1.18	9.03	111.8	969.78	472.38	356.47	7197.93	123.57	3041	17774.7	8532.32	378356
79	2649.45	823.71	3728.1	1588.29	292.94	8.04	0.92	1.33	4.34e-05	0.00088	0.00362	2.06
	1.15	8.26	54.1	799.03	288.83	395.4	5423.41	168.54	1694	16618.7	8058.38	392295
80	4741.45	975.67	5881.03	1544.12	144.07	6.78	1.13	1.65	4.62e-05	0.00045	0.00298	2.77
	1.59	6.34	189	574.36	947.91	500.54	6019.91	158.38	1949	11556.9	8850.33	528287
81	2550.92	773.59	3658.84	1458.58	240.16	6.91	0.77	1.03	1.44e-05	0.00091	0.0089	1.32
	0.65	12.98	101.08	690.83	372.5	275.64	4099.87	178.13	1924	9326.18	4950.97	299241
82	4990.19	885.07	7453.01	1397.88	102.28	8.93	1.48	2.03	5.23e-05	0.00102	0.00577	1.92
	0.88	7.82	130.13	481.04	294.81	293.59	5804.38	120.2	2769	8149.9	6745.52	367527
83	3907.99	507.43	5133.96	830.2	128.12	8.06	1.33	1.97	3.95e-05	0.00053	0.00175	1.22
	0.6	5.13	229.76	214.83	478.29	713.01	4686.93	183.57	165	13894.5	6023.46	252413
84	3126.23	320.04	4719.64	586.16	143.46	9.26	0.88	1.08	5.52e-05	0.00093	0.00909	0.91
	0.37	6.41	200.48	838.28	1092	325.97	3499.07	143.9	1354	15158.5	4067.74	473009
85	3982.61	666.34	5634.77	1149.85	207.88	7.52	0.68	0.86	7.51e-05	0.00015	0.00122	1.79
	0.84	7.96	90.34	583.76	212.88	554.91	5105.2	158.33	859	17069	6582.77	219478
86	4954.38	230.67	6199.26	327.61	114.61	9.69	1.13	1.42	7.9e-06	0.00036	0.00137	1.87
	0.76	8.62	155.26	673.79	817.55	479.97	4658.88	154.03	699	8628.72	6035.55	355196
87	4909.67	407.46	6717.96	657.01	243	5.42	1.74	2.21	2.55e-05	0.0008	0.00761	2.83
	1.15	12.69	84.78	388.87	215.21	880.47	4751.92	171.23	1464	8378.82	6200.57	247034
88	4214.69	761.48	5908.32	1057.79	229.2	8.28	0.92	1.26	9.8e-05	0.00065	0.0036	2.78
	2.18	13.79	230.69	509.61	684.96	498.96	7181.22	130.94	3023	11635.7	9753.78	370527
89	4396.31	236.51	5627.37	425.89	181.31	6.14	0.61	0.74	6.28e-05	0.00107	0.00616	2.94
	2.22	13.65	122.37	237.34	531.1	380.48	6301.7	195.1	2777	16416.2	8094.17	458590
90	2504.02	380.63	3786.32	687.99	164.87	6.74	1.14	1.48	7.77e-05	0.00053	0.00631	2.29
	1.1	8.9	68.03	827.11	227.36	341.32	4241.94	171.98	394	10643.2	5333.4	493660
91	3731.88	291.86	5192.19	569.63	219.95	8.88	0.73	1.01	4.62e-05	0.00041	0.00332	1.75
	0.96	9.57	137.42	931.31	318.87	522.2	5577.43	195.27	703	9430.41	7459.15	402553
92	3076.47	805.57	4346.4	1412.17	212.68	5.78	1.71	2.56	7.3e-06	0.00064	0.00751	1.02
	0.58	7.7	89.77	592.55	464.59	702.51	3556.12	143.8	1192	8831.85	4774.76	219293
93	3586.96	992.35	4472.65	1656.34	170.07	8.54	1.59	2.31	7.86e-05	0.00058	0.00352	2.45
	1.1	6.7	77.71	728.25	372.49	446.91	4150.15	130.29	1953	9348.57	4692.43	451522
94	4685.04	687.6	6626.79	1028.62	278.59	8.2	1.3	1.81	5.89e-05	0.00045	0.00294	1.5
	0.93	9.79	235.57	227.14	586.86	634.69	5559.41	133.7	1156	14614.7	8133.38	448977
95	4012.32	648.48	6105.32	1272.66	275.3	5.8	0.59	0.79	3.14e-05	0.00066	0.0049	1.67
	1.12	10.22	118.8	972.17	371.24	702.6	5758.84	131.92	1501	16636.3	8599.64	443346
96	2652.69	983.09	3709.64	1388.51	248.46	8.29	0.65	0.88	3.7e-05	0.00047	0.00123	1.59
	1.15	10.85	102.45	796.85	283.36	834.22	7949.21	137.62	767	14592.4	10527.8	205300
97	3371.39	785.84	4836.52	1111.52	279.63	7.73	1.73	2.53	9.31e-05	0.00091	0.00709	1.13
	0.86	12.49	163.14	513.86	429.48	659.6	3626.76	157.05	853	12424.5	4245.69	354720
98	2800.27	514.59	3584	670.34	117.9	7.79	1.08	1.55	1.31e-05	0.00045	0.00472	2.23
	1.2	11.33	87.65	376.84	434.25	371.74	3021.9	172.51	558	15528.3	3912.01	399681
99	2346.39	995.66	3722.99	1345.54	100.23	9.78	1.51	2.23	2.05e-05	0.00025	0.00196	1.63
	0.77	6.6	50.33	977.33	207.76	475.82	3683.76	139.49	1284	9835.73	5360.94	457659
100	2130.8	497.21	2963.89	966.29	292.95	5.01	0.76	1.09	7.66e-05	0.0009	0.00716	1.66
	0.98	11.73	146.67	577.14	834.25	784.56	4926.58	156.62	2351	7601.44	7343.48	371782
101	2356.63	683.04	3117.95	936.85	274.76	6.23	0.87	1.26	8.36e-05	0.00015	0.00065	1.84
	1.42	5.86	84.56	673.09	322.28	955.89	7396.17	196.77	1011	18188.3	9332.74	311354
102	2194.75	762.43	3021.04	1181.48	114.35	9.61	0.73	1.05	8.91e-05	0.00073	0.00155	2.44
	1.24	11.1	216.05	820.94	913.26	268.55	5245.65	157.22	243	10502.1	6878.61	323078
103	4069.72	550.17	6097.01	1084.35	121.07	5.27	0.65	0.79	9.29e-05	0.00053	0.00392	1.88
	1.05	6.45	107.06	496.29	221.73	975.83	6709.82	195.46	1451	13842.9	8114.39	446154
104	4045.97	845.83	5728.92	1139.24	119.9	9.91	1.56	2.13	4.32e-05	0.00035	0.00398	1.89
	0.91	8.82	69.93	517.83	378.07	374.23	3987.18	130.88	365	16913	5693.19	324096
105	2495.08	930.81	3476.42	1722.71	139.93	7.01	0.58	0.75	2.42e-05	0.00093	0.00424	1.01
	0.75	7.63	61.91	563.57	151.91	529.04	4215.22	174.48	803	9756.4	6307.26	361031
106	2593.45	877.95	3871.42	1745.33	215.87	5.36	1.85	2.72	9.69e-05	0.0004	0.00418	1.15
	0.84	12.23	105.1	815.15	425.95	412.27	7684.63	132.91	1813	17360.1	9933.96	417257
107	3689.83	619.9	5526.57	923.83	126.59	7.71	0.67	0.91	8.24e-05	0.00083	0.00539	2.39
	1.81	5.78	221.48	723.56	1223.89	731.7	4736.81	131.08	2073	11562.3	5928.65	227131
108	2657.49	913.16	3411.15	1707.74	202.72	6.88	0.79	1.05	9.57e-05	0.00051	0.00314	2.16
	1.17	8.18	151.04	833.11	811.65	580.07	5827.57	151.1	2472	16624.5	8612.42	369430
109	3517.21	809.52	4240.94	1468.89	270.98	8.36	1.02	1.26	5.2e-05	0.00036	0.00241	1.7
	1.25	5.5	78.53	299.71	283.01	271.16	4401.85	135.93	1055	12514.4	5869.13	229844
110	2137.05	634.72	2756.86	976.28	257.68	9.18	1.39	2.04	1.7e-05	0.00062	0.00389	2.1
	0.93	10.02	160.82	320.93	353.82	561.95	3776.11	152.33	487	12995.3	5252.53	232347
111	3051.2	606.57	4185.22	894.45	104.79	9.54	1.53	2.12	3.26e-05	0.00109	0.01116	1.25
	0.83	8.77	224.57	477.19	700.77	359.59	4089.84	177.81	1534	13191.7	4594.48	403234
112	4141.95	944.93	5694.99	1850.31	193.62	9.22	1.35	1.83	4.02e-05	0.00107	0.00978	2.09
	1.27	12.41	207.68	661.51	845.67	738.69	5942.28	161.81	1309	8058.85	8896.52	525018
113	4159.55	430.06	6394.94	803.23	160.54	8.77	1.61	2.1	7.16e-05	0.00022	0.00167	2.59
	1.63	12.68	92.51	730.51	416.78	293.82	6161.79	183.44	321	15449.4	6795.52	276084
114	3992.22	478.98	5457.79	862.95	122.96	7.95	1.98	2.42	7.35e-05	0.00065	0.00431	1.17
	0.63	5.22	73.14	475.34	389.64	345.48	5479.08	156.9	690	9077.93	7909.67	207987
115	4062.6	417.76	5659.95	506.16	274.92	6.68	1.82	2.28	3.96e-05	0.00085	0.00488	2.45
	1.68	8.67	113.09	976.17	296.13	409.82	3939.05	180.97	656	7747.66	4774.37	497344
116	2937.49	293.92	4691.36	468.2	190.34	8.91	0.72	0.89	9.57e-05	0.00066	0.0065	2.74
	1.84	10.25	95.01	632.79	305.25	814.4	6252.59	139.14	2840	17827.7	8650.06	360324
117	2149.38	853.47	2980.2	1422.09	226.97	8.4	0.84	1.19	4.16e-05	0.00053	0.00625	1.21
	0.66	11.19	57.69	794.25	239.75	863.41	6235.51	159.97	2925	13643	7047.68	380147
118	4422.48	548.13	7064.05	988.76	285.17	5.21	0.71	0.94	9.42e-05	0.00078	0.00407	1.93
	1.08	8.63	153.54	341.94	504.07	839.2	6389.66	124.05	1712	9197.81	7407.56	302940
119	2938.16	575.46	4390.37	1103.24	299.78	5.06	1.9	2.84	6.39e-05	0.00078	0.00593	2.04
	1.24	12.45	206.28	304.25	518.74	386.03	5781.94	164.54	885	13871.1	7770.52	481319
120	3635.03	421.38	5588.37	794.72	286.08	7.08	1.98	2.47	4.9e-05	0.00033	0.00228	0.97
	0.59	10.2	50.58	221.5	245.39	215.91	7695.76	192.44	73	13697.5	9291.68	360200
121	2635	445.1	3451.56	630.16	260.07	9.31	0.71	1.05	7.46e-05	0.00083	0.00331	2.8
	1.36	7.52	75.85	654.77	221.3	651.15	5156.04	128.14	1755	9811.31	6101.36	488581
122	4660.78	350.38	5716.37	511.84	223.07	5.31	0.68	0.82	5.79e-05	0.00011	0.00095	1.56
	1.05	12.12	223.93	713.92	1099.59	773.93	4255.77	161.37	1424	8619.34	6131.26	445667
123	2827.92	608.82	3822.03	1208.06	146.58	5.41	1.45	1.81	3.94e-05	0.00045	0.00199	1.65
	0.94	12.51	233.33	560.6	591.2	587.94	3567.85	140.83	1439	14176.9	4366.96	441229
124	3306.97	662.51	5138.47	944.2	135.4	9.9	1.24	1.86	4.13e-05	0.00075	0.00849	1.51
	1.13	6.07	103.58	511.86	574.82	322.49	3535.77	132.22	1526	14497.4	4771.07	267144

125	3069.52	385.01	4466.26	634.17	295.78	8.3	1.76	2.55	9.22e-05	0.00096	0.00588	2.21
	0.94	13.94	129.62	765.56	325.61	400.95	6146.85	191.04	2326	13208.1	8605.35	383818
126	2367.02	519.52	3284.46	650.5	106.19	7.85	0.95	1.41	9.86e-05	0.00085	0.00714	1.96
	1.36	6.27	89.81	229.05	514.76	896.17	7085.18	154.5	3482	11607.1	9188.92	298418
127	2321.24	466.31	3688.92	880.08	186.15	5.38	0.77	0.95	8.34e-05	0.00102	0.00837	1.37
	0.77	13.16	210	446.22	1010.89	422.01	5315.6	161.94	1510	15422.5	6208.25	429815
128	2985.72	459.49	4062.01	691.3	230.41	9.22	0.95	1.14	6.39e-05	0.0009	0.00458	2.5
	1.74	13.07	86.26	336.94	245.01	252.31	3465.35	198.69	1374	15992.6	4279.18	377280
129	3711.37	320.44	5549.03	519.05	213.28	7.99	0.72	1	5.79e-05	0.00037	0.00279	1.42
	1.08	7.81	130.32	880.89	478.42	783.86	6254.59	151.99	1940	15213.8	8318.94	362119
130	4380.25	658.32	6054.92	1071.61	105.09	5.52	1.41	1.95	6.93e-05	0.00031	0.00144	1.97
	1.36	9.92	169	657.14	404.6	450.88	4613.72	132.12	637	16835.6	5289.56	342215
131	3663.86	911.74	5721.85	1284.95	112.28	5.76	0.65	0.98	2.38e-05	0.0008	0.00247	2.05
	1.43	13.13	82.73	858.32	405.52	265.94	6369.54	182.73	2484	13090.7	8673.15	388595
132	3031.99	523.19	4683.41	856.17	115.76	6.63	1.67	2.24	4.9e-05	0.00015	0.00168	1.43
	0.81	7.88	202.89	933.53	494.92	414.22	6443.9	172.98	2824	15898.7	9217.61	273602
133	2816.14	440.02	3455.91	692.49	278.16	6.14	1.48	1.8	9.5e-05	0.00051	0.00266	2.84
	2.06	8.94	230.1	353.99	1163.42	697.85	4290.93	178.04	533	14280.9	4844.56	358961
134	3388.09	577.58	5318.52	984.86	283.9	7.57	1.21	1.6	7.23e-05	0.00042	0.00277	1.99
	1.51	7.59	240.95	856.42	735.4	757.74	5082.31	132.06	1347	16435.6	5880.48	293825
135	3286.64	330.93	4257.25	501.24	177.26	8.03	1.83	2.39	3.68e-05	0.00104	0.00732	2.83
	1.82	11.25	137.71	311.62	304.67	697.74	7844.13	165.46	3351	10206	11193.4	267510
136	2185.95	369.48	3483.42	672.2	216.14	8.96	1.68	2.06	5.62e-05	0.00052	0.00198	1.11
	0.72	13.78	220.09	663.07	1050.6	239.4	6244.8	158.62	1630	18168	8577.06	253345
137	4221.4	788.09	6602.21	1321.9	157.73	7.63	1.87	2.53	3.24e-05	0.00081	0.00847	2.3
	1.71	8.14	80.16	728.61	467.79	244.75	5739.75	123.21	2716	15262.8	8547.89	397469
138	2559.73	429.3	3800.55	767.36	136.07	8.12	0.97	1.25	7.32e-05	0.00062	0.00282	2.36
	1.61	9.95	55.22	757.79	301.26	439.01	5227	189.54	2565	12548.3	5878.86	374336
139	4248.89	478.74	6675.66	797.89	184.75	9.56	1.61	2.06	2.64e-05	0.00075	0.00881	2.56
	1.46	10.63	140.32	359.08	818.42	830.27	6983.36	147.16	1914	16144	7959.55	456761
140	4417.71	974.31	5475.98	1730.92	196.19	7.03	0.66	0.93	7.73e-05	0.0002	0.00193	1.26
	0.59	6.96	62.9	812.03	161.62	809.16	3503.12	193.65	517	10788.7	3906.37	239845
141	3849.64	860.44	6050.06	1493.9	101.43	7.38	1.91	2.54	0.0001007	0.00052	0.00439	2.04
	1.25	13.3	196.22	629.61	467.02	836.71	4848.51	174.43	1085	11584.3	7172.47	473655
142	2242.96	761.61	3165.93	1131.53	175.42	5.02	1.55	2.27	3.71e-05	0.00094	0.00839	1.89
	0.92	7.59	72.45	500.14	387.48	664.64	5551.95	157.51	2568	11212	6125	385632
143	4228.3	787.93	5680.74	1108.16	221	8.91	1.62	2.28	5.05e-05	0.00106	0.00441	2.21
	1.72	9.04	162.02	742.02	435.05	662.79	3447.15	140.53	921	9336.46	4207.96	245781
144	2007.79	466.07	2968.95	822.01	149.06	8.38	0.86	1.11	8.1e-06	0.00084	0.00652	2.04
	1.5	8.09	129.45	502.95	371.54	368.54	4132.05	151.07	1896	17232.6	5765.73	450738
145	3906.29	375.37	4916.81	569.14	251.66	9.74	0.96	1.27	5.59e-05	0.00013	0.00105	1.44
	0.63	6.1	132.22	760.07	425.58	519.37	6312.14	154.16	1777	12757.1	9099.7	495327
146	4427.09	694.33	6167	1109.73	123.58	9.06	1.55	1.94	0.0001009	0.00064	0.00165	1.6
	1.23	7.42	100.11	339.95	238.65	621.44	5377.56	160.85	121	11084.1	6424.71	424710
147	2070.84	843.62	3244.67	1223.8	272.6	9.08	1.96	2.43	6.7e-06	0.00105	0.00269	2.46
	1.18	5.94	237.06	619.48	533.8	939.9	4682.97	134.04	1332	9370.73	6041.95	418550
148	2856.71	794.23	4520.45	1387.95	126.07	9.13	0.8	1.09	8.68e-05	0.00099	0.00491	1.8
	1.18	11.83	54.62	248.72	158.57	252.08	7491.09	197.44	3232	17071.6	10744.5	458220
149	3258.02	812.09	4224.91	1394.85	264.6	5.21	1.59	1.96	4.02e-05	0.00038	0.00376	2.85
	2.12	10.29	153.05	754.74	851.27	480.41	4823.96	177.69	1422	17524.8	6504.39	372617
150	3966.85	833.76	5140.68	1341.4	155.27	8.29	1.38	1.97	2.36e-05	0.00059	0.00291	2.2
	1.38	9.38	179.35	229.49	670.58	217.03	5627.08	131.25	2288	16857.6	7614.53	233999
151	3171.61	839.73	4075.21	1203.18	264.76	6.69	1.46	1.91	3.74e-05	0.001	0.00844	1.65
	0.72	8.4	55.59	762.26	122.77	664.97	4562.22	126.83	2149	8849.29	6150.67	344821
152	2665.29	896.88	4096.09	1475.83	279.52	9.55	0.74	0.96	9.35e-05	0.00048	0.00131	2.45
	1.95	10.89	120.94	348.13	515.41	288.32	5194.1	151.22	261	16033	7301.22	484020
153	3773.4	452.96	4988.49	617.08	119.75	6.54	1.44	1.93	3.07e-05	0.00019	0.00109	2.03
	1.51	11.5	223.31	389.5	938.4	816.74	5578.23	198.06	1588	10504.2	6401.32	365456
154	2498.91	631.12	3722.74	1215.31	100.37	7.39	1.49	2.1	9.49e-05	0.0005	0.00163	1.45
	0.9	9.35	226.12	767.37	664.09	376.81	7138.1	172.68	2727	14417.5	9553.73	326794
155	4480.49	912.76	5797.11	1555.9	120.21	8.16	1.74	2.4	7.19e-05	0.00053	0.00471	2.14
	1.21	10.24	229.27	215.81	460.56	865.28	4904.21	191.78	100	13977.8	6702.84	428228
156	3269.59	763.86	4777.88	930.02	200.92	7.93	0.91	1.24	1.9e-06	0.00048	0.00398	1.16
	0.76	7.3	72.67	224.74	180.6	315.76	7594.47	169.41	567	17537.7	8943.44	342776
157	2620	389.07	3785.05	755.45	262.52	8.48	1.12	1.57	1.12e-05	0.00023	0.00164	2.06
	1.36	11.69	200.54	844.05	1127.7	613.12	7650.21	177.35	2772	9137.08	9169.27	380961
158	2825.62	950.47	3856.08	1373.16	116.58	8.52	0.92	1.22	1.57e-05	0.00059	0.00702	1.8
	0.89	13.99	74.44	872.82	408.66	218.22	3139.45	172.4	707	16234.7	3727.2	400799
159	2581	597.01	3498.98	833.59	134.63	8.88	0.89	1.09	2.59e-05	0.00092	0.00485	1.59
	0.97	6.28	110.61	982.8	403.67	897.92	6554.53	152.44	2115	8114.43	8059.04	288292
160	2731.58	954.11	3923.8	1866.11	121.57	6.99	1.78	2.34	1.03e-05	0.0005	0.00399	1.56
	1.04	12.07	178.56	819.39	796.02	908.54	5529.85	121.29	1121	14318.1	6312.84	201833
161	2347.75	602.12	3177.31	1107.2	231.91	8.45	0.62	0.77	4.07e-05	0.001	0.01042	2.96
	1.56	12.07	59.21	303.22	216.38	448.36	3332.45	126.62	527	12682	4785.66	488768
162	2182.98	990.98	2757.07	1729.97	258.94	6.19	1.09	1.5	8.65e-05	0.00102	0.00301	1.7
	1.12	10.55	118.22	324.44	349.93	291.43	6816.32	167.41	1452	8112.19	8019.36	486857
163	2520.8	686.15	3284.82	885.75	125.44	6.69	1.17	1.69	8e-05	0.0007	0.00533	1.82
	0.75	9.31	95.15	468.36	300.57	910.9	4067.23	167.28	1462	13959	4836.46	359100
164	3224.62	315.49	4207.53	543.88	224.95	5.97	1.23	1.74	9.21e-05	0.00059	0.00272	1.13
	0.73	9.69	198.95	695.81	760.97	812.76	5546.74	179.54	2665	13214.9	6718.65	202294
165	3938.72	754.49	5304.24	1022.36	221.89	6.07	1.43	1.81	3.59e-05	0.00092	0.00184	2.63
	1.54	12.85	136.72	384.99	805.78	249.28	4637.22	142.66	1595	8061.28	5298.51	224264
166	4862.91	273.68	7647.4	348.85	141.54	9.49	1.03	1.34	8.2e-05	0.00074	0.00436	2.51
	1.44	9.28	158.07	489.72	514.05	426.07	4275.65	184.32	1588	12243.5	5896.04	394719
167	2675.76	857.83	3958.26	1639.72	295.42	7.08	1.33	1.74	2.58e-05	0.00093	0.00478	2.18
	0.88	9.81	174.43	210.68	440.18	383.59	4371.86	169.29	1707	10031.9	5749.45	494075
168	2793.96	585.16	3895.26	1122.76	100.19	9.35	1.22	1.62	9.76e-05	0.00091	0.00511	2.86
	1.73	12.99	140.64	286.3	358.07	553.7	7698.16	125.49	3185	9488.36	11542.2	248447
169	2565.68	230.91	3741.43	433.97	189.19	7.57	1.77	2.39	5.97e-05	0.00068	0.00476	1.55
	1.09	7.65	134.7	618.09	508.14	560.08	6475.9	121.88	2312	14478	8114.57	280424
170	4478.33	445.72	5999.9	811.14	160.32	5.27	1.88	2.47	7.64e-05	0.00029	0.00134	1.23
	0.83	5.33	243.44	671.05	1391.38	387.5	5158.65	188.49	1709	17454.9	7533.75	351496
171	2462.5	686.61	3642.13	891.6	129.09	5.05	1.79	2.39	5.77e-05	0.00032	0.00113	1.36
	0.83	11.41	84.36	916.98	307.2	749.39	5215.58	143.16	235	13502	7789.55	457442
172	2839.35	647.95	4225.13	1266.93	148.97	7.81	0.96	1.25	4.4e-05	0.00026	0.00265	1.98
	1.08	7.4	200.95	676.57	940.06	278.19	3616.74	146.16	34	12012.6	4012.13	379734

173	4827.19	953.58	6014.63	1657.63	130.97	9	1.04	1.29	4.7e-06	0.00096	0.00807	2.38
	1.61	7.67	134.45	450.48	716.76	611.87	3044.08	143.78	724	9932.37	4341.34	444311
174	3405.82	880.22	4431.99	1494.41	131.06	7.13	1.9	2.37	8.56e-05	0.00049	0.00429	0.95
	0.71	13.84	110.67	208.65	380.54	810.51	5129.22	149.86	1535	14619.5	6426.78	382878
175	4654.13	381.19	7249	677.71	150.37	6.04	1.93	2.72	7.37e-05	0.0006	0.00609	0.97
	0.65	7.85	191.45	774.4	1124.67	885.98	3105.05	179.1	967	10956.9	4502.37	270642
176	2830.43	863.28	3935.51	1136.64	120.75	9.09	1.79	2.16	7.59e-05	0.00033	0.00343	1.22
	0.68	10.5	175.67	266.07	639.44	553.4	4774.49	173.61	448	7607.85	5259.94	302266
177	3807.06	401.7	5751.5	568.35	288.22	6.36	1.7	2.46	2.98e-05	0.00091	0.00482	1.37
	0.77	10.17	71.24	839.38	305.16	836.42	3790.93	131.75	163	10193.4	5252.36	437031
178	3570.48	633.2	4848.05	1014.6	182.38	7.62	1.2	1.64	7.31e-05	0.00109	0.00482	2.53
	1.91	10.04	231.41	269.04	910.25	227	7786.72	133.51	2831	8235.53	9878.01	243184
179	2837.57	959.4	4226.5	1155.01	136.4	9.13	0.76	0.92	8.02e-05	0.00084	0.00882	2.59
	1.85	13.65	156.01	271.01	582.58	372.31	3088.82	145.03	1101	13226.7	3419.8	374161
180	3737.4	667.92	5310.25	1260.08	194.69	9.7	1.76	2.56	7.78e-05	0.00037	0.00381	2.39
	1.65	6.58	124.62	910.53	264.52	699.87	6247.23	188.29	2610	8491.07	7394.65	337788
181	3891.84	302.56	5742.55	554.19	112.79	5.56	1.46	1.8	7.72e-05	0.00093	0.003	1.89
	1.03	5.76	62	605.82	356.13	529.74	4696.63	159.65	2296	17758.8	7020.56	326108
182	2612.95	731.14	3614.43	1417.42	274.3	9.02	1.72	2.32	8e-05	0.00072	0.00822	1.88
	1.01	13.91	55.25	384.43	325.54	708.72	5324.19	152.85	347	10904.8	5883.62	456070
183	4967.37	829.49	7454.9	1398.61	278.73	5.17	0.66	0.9	1.74e-05	0.00043	0.00209	2.96
	2.19	8.17	92.17	864.41	349.74	768.29	6372.93	128.52	361	17312.3	7894.76	412948
184	2713.3	518.93	3734.86	922.44	281.66	8.22	0.7	0.91	8.5e-05	0.00023	0.0012	1.53
	0.64	13.79	80.48	550.28	314.12	346.22	5603.32	153.66	2541	18066.8	6489.57	273285
185	2480.18	922.58	3279.55	1718.42	134.68	9.04	1.75	2.17	3e-05	0.00104	0.01161	1.06
	0.73	5.38	141.82	995.53	409.49	379.79	6831.8	130.77	252	11601.5	8769.44	300832
186	4624.39	906.79	5742.7	1521.33	119.63	9.51	1.76	2.12	5.32e-05	0.00033	0.0011	1.12
	0.6	5.58	233.37	273.02	808.06	829.57	7412.45	197.74	765	16283.7	10185.8	400478
187	3356.29	397.3	4569.42	650.55	260.92	5.09	1.97	2.51	3.4e-06	0.00029	0.00179	1.97
	1.13	8.32	140.5	582.49	503.83	226.67	4629.68	145.82	560	16151.7	5879.56	235744
188	4118.8	451.15	5572.05	641.79	219.5	7.33	1.53	2.15	7.37e-05	0.00054	0.00172	2.74
	1.13	8.86	201.73	258.46	1075	486.91	4016.58	149.57	397	8016.8	5098.02	277971
189	2832.72	629.2	3716.11	1174.86	196.92	7.47	1.08	1.54	3.81e-05	0.00054	0.00229	2.12
	1.33	6.2	51.6	897.78	119.79	797.63	6840.33	145.71	877	7829.81	7902.69	388502
190	4410.93	355.83	5722.03	461.11	242.9	5.28	0.92	1.26	9.18e-05	0.00089	0.00456	1.88
	1.49	8.76	101.71	319.94	342.03	960.9	7107.95	162.9	2361	13135.5	9097.22	464080
191	2842.1	409.9	4033.32	623.52	128.25	6.53	1.08	1.4	2.86e-05	0.00079	0.00537	2.34
	1.08	5.57	169.07	498.04	978.75	474.21	7139.77	176.72	2984	14169.2	9136.38	268359
192	3216.06	679.75	5028.26	1084.17	100.94	5.62	1.29	1.64	9.99e-05	0.001	0.00604	1.65
	0.79	8	159.8	432.73	799.14	890.61	6474.29	145.4	463	8539.76	8409.25	363621
193	4135.32	876.11	6526.79	1588.49	173.38	8.68	1.2	1.52	4.38e-05	0.00098	0.01054	2.86
	1.44	10.84	151.7	662.8	548.3	339.87	4898.08	154.57	127	13688.3	5726.1	461917
194	4182.33	599.72	5942.01	906.03	141.5	5.55	0.52	0.64	5.01e-05	0.00088	0.00331	2.32
	1.73	8.61	206.25	607.64	472.99	653.14	3698.73	198.96	1474	17156.4	5286.54	463171
195	3203.84	720.6	4342.04	998.21	101.6	7.15	0.84	1.18	9.36e-05	0.00095	0.00992	1.52
	1.21	7.57	205.78	725.1	671.62	244.17	6062.96	161.03	2536	16839.7	6829.99	529159
196	2729.72	931.48	4011.78	1585.7	265.81	7.97	1.97	2.89	9.31e-05	0.00108	0.00529	1.69
	1.35	8.05	229.86	845.18	608.69	409.56	3171.28	162.11	1357	9194.4	4175.91	481470
197	3524.58	980.2	4855.64	1841.53	216.21	6.65	1.24	1.67	4.51e-05	0.00043	0.00481	2.66
	1.52	11.35	59.95	890.58	305.93	557.02	6826.07	182.03	2803	8744.75	8917.45	299915
198	2202.22	535.04	3331.61	1020.25	133.03	5.7	1.87	2.34	3.4e-05	0.00087	0.00839	1.93
	1.35	7.5	193.27	717.61	622.42	437.69	6314.65	122.36	2632	12148.7	8314.07	251639
199	4347.05	942.41	5952.35	1504.74	169.1	6.59	1.71	2.36	4.28e-05	0.00064	0.00309	2.04
	1.37	11.66	218.87	652.11	683.54	681.04	4905.89	142.6	1450	9476.29	5542.68	213010
200	4116.34	751.03	6359.06	1083.65	189.89	5.09	1.27	1.66	2.6e-06	0.00021	0.00122	1.81
	1.12	13.96	181.97	553.59	505.66	991.34	5407.8	195.85	1000	8402.79	7191.61	402693
201	4262.59	211.89	6515.1	320.71	100.41	9.43	1.73	2.58	7.77e-05	0.00042	0.00385	1.19
	0.84	7.15	111.57	996.03	236.99	810.1	4849.61	129.33	336	11860.6	6358.59	340845
202	4745.88	201.5	7047.62	252.04	270.55	6.18	0.55	0.79	9.33e-05	0.00042	0.00115	2.57
	1.22	9.39	62.47	280.24	271.87	253.56	7685.2	191.58	3685	14758.9	9851.04	391619
203	3436.56	249.65	5419.46	326.05	129.95	9.93	1.61	2.36	6.95e-05	0.00096	0.00349	2.72
	2.11	8.64	158.65	417.11	460.26	750.96	3968.24	128.94	239	10694.9	5712.99	327901
204	2423.25	313.84	3808.55	472.39	147.59	6.65	1.39	2.01	6.21e-05	0.00041	0.00345	1.35
	0.85	8.41	211.93	354.11	426.98	248.26	3217.41	143.27	1568	11196.9	4714.64	382528
205	3086.62	776.89	4840.86	1342.02	204.65	9.64	0.8	1.03	4.41e-05	0.00093	0.00471	1.25
	0.86	7.04	237.53	289.37	1374.99	657.63	4320.13	170.36	2067	16852.2	5019.6	365102
206	2709.41	573.87	4000.81	796.62	124.76	7.84	1.01	1.26	1.89e-05	0.00065	0.00316	1.71
	1.16	12.17	89.58	894.23	510.17	634.25	3441.81	158	626	15071.9	4369.24	334580
207	3332.43	961.11	5322.61	1773.24	259.18	8.1	1.33	1.63	4.85e-05	0.00088	0.0084	2.41
	1.8	10.38	69.71	650.77	391.02	631.67	7605.7	130.44	1888	14823.5	9411.63	424322
208	3290.21	995.17	4440.38	1807.06	164.98	5.23	1.43	1.95	1.82e-05	0.00033	0.00175	1.71
	0.73	6.85	174.32	845.23	817.28	665.04	3347.81	143.52	1293	8277.18	4965.22	472123
209	2903.9	241.68	3598.99	462.73	136.13	8.32	1.92	2.64	1.03e-05	0.0009	0.00934	1.36
	0.94	13.57	75.24	972.73	267.84	890.12	4181.68	147.24	326	15645.6	5589.18	428589
210	2975.68	305.41	4615.63	428.6	125.24	5.59	0.78	1.04	1.6e-05	0.00087	0.0042	2.55
	1.89	10.76	132.12	430.71	364.04	583.34	5486.52	125.93	303	13306.5	7976.34	350551
211	3716.66	862.86	5041.58	1407.52	287.97	9.79	1.84	2.27	9.95e-05	0.00087	0.00274	2.71
	1.57	7.5	143.88	718.15	706.1	981.62	5165.7	184.07	1887	7774.96	7739.93	445777
212	3551.08	503.62	4433.94	801.72	209.57	7.66	0.84	1.18	5.03e-05	0.00017	0.00075	2.89
	2.09	8.95	231.13	747.81	1046.36	728.61	7700.44	187.36	1796	16752.8	10521.5	339767
213	3714.73	276.71	5101.79	351.85	265.4	8.7	0.87	1.3	5.27e-05	0.00048	0.00253	2.61
	1.6	8.34	59.63	983.73	325.99	326.49	7718.22	136.32	2343	11717.1	8991.45	536201
214	4663.34	880.63	6297.51	1758.2	263.24	7.28	0.72	1.03	4.6e-06	0.00064	0.00263	1.83
	0.74	7.54	85.26	654.88	307.89	346.97	7999.85	174.85	2614	13765.2	8802.47	426644
215	4004.88	881.7	5793.67	1274.65	182.97	7.55	1.64	2.17	5.8e-05	0.00025	0.00143	1.38
	0.9	9.55	135.29	478.19	284.8	387.01	6118.51	122.05	609	11081.6	8549.73	456276
216	2051.43	879.94	2807.7	1720.29	253.32	8.97	0.76	1.11	6.4e-05	0.00043	0.00477	2.61
	1.63	11.73	72.71	257.54	159.95	460.94	5907.5	120.02	1223	13459.7	8693.58	224971
217	4040.17	228.3	6297.04	293.68	153.04	6.02	1.58	2.06	2.72e-05	0.00109	0.00761	1.56
	0.87	11.16	138.29	937.7	436.24	225.57	3307.98	155.63	1343	13680.8	3823	309823
218	2803.2	613.11	4216.54	745.82	294.56	5.68	1.53	2.04	4.6e-06	0.00054	0.00377	2.56
	1.77	9.11	151.06	218	606.19	872.61	6578.09	149.1	1540	9538.04	7635.94	439813
219	2882.87	762.75	4050.51	1268.89	126.23	5.21	0.95	1.35	8.84e-05	0.001	0.00791	2.1
	1.54	10.13	53.26	591.05	265.53	865.97	6868.55	148.21	2596	16294.3	8800.57	485561
220	2002.47	954.45	2773.49	1880.06	248.16	6.66	0.62	0.89	6.78e-05	0.00074	0.0075	0.92
	0.73	7.11	177.65	583.96	813.44	884.99	6751.12	152.97	147	16451	8452.96	462874

221	3725.45	819.93	5868.72	1130.22	199.2	7.83	1.56	2.31	5.51e-05	0.00015	0.00163	2.65
	1.08	10.05	244.49	691.14	876.67	432.67	3961.66	171.94	1991	13840.5	5559.18	293011
222	3869.6	234.14	5958.88	281.93	160.4	7.67	1.33	1.77	3.87e-05	0.00019	0.00098	2.47
	1.5	9.87	153.37	331.08	722.78	292.41	7373.55	192.33	3582	11297.2	8603.88	260952
223	4753.14	631.76	6020.54	1103	109.66	8.12	1.09	1.4	3.8e-05	0.00025	0.00087	2.18
	1.37	12.71	125.99	814.05	393.76	916.09	4447.91	171.5	685	12580.3	6249.86	205946
224	2622.67	595.58	3566.32	1156.2	249.4	9.04	1.32	1.69	3.89e-05	0.00026	0.00281	2.42
	1.81	5.04	178.17	577.63	742.55	278.49	7317.96	159	1499	9193.59	9172.34	315519
225	3965	818.27	5493.01	1290.03	259.76	8.16	1.82	2.2	5.81e-05	0.00028	0.00273	2.43
	1.02	7.01	63.93	352.63	370.22	298.6	5413.18	135.99	2210	7836.36	6283.58	224367
226	2500.6	577.66	3411.99	789.65	236.42	9.56	0.79	1.02	8.42e-05	0.00027	0.00285	2
	0.87	10.66	131.7	811.96	453.09	909.61	4244.2	187.54	1643	12003.3	6326.53	435719
227	2905.31	808.54	4264.15	1221.02	104.97	7.03	1	1.21	4.84e-05	0.00099	0.00798	1.89
	1.27	6.74	206.92	902.24	563.41	736.35	7070.61	176.13	3122	10366.1	9248.4	255390
228	3359.36	683.85	4271.61	1360.21	190.37	8.77	1.62	2.19	9.33e-05	0.00059	0.00222	2.59
	1.07	7.65	183.68	949.07	1032.33	828.68	6941.35	172.78	2848	12734.9	8309.49	429326
229	4320.81	208.04	5980.29	331.61	250.86	7.01	1.71	2.15	3.21e-05	0.00105	0.00666	2.41
	1.61	7.51	226.71	540.82	1025.09	875.53	3555	147.22	1605	18227.7	5015.47	259024
230	3649.01	962.49	5524.25	1354.37	259.56	8	1.96	2.37	7.29e-05	0.00013	0.00048	1.99
	0.87	6.12	64.01	209	154.14	461.04	6665.21	150.43	348	12278.4	9314.44	418593
231	4383.84	950.28	5538.62	1343.17	220.2	9.74	1.27	1.83	7.74e-05	0.0007	0.0062	2.63
	1.61	6.28	109.39	480.53	310.98	343.49	3730.42	135.21	149	9946.19	4505.19	548324
232	3033.56	932.37	4551.84	1214.45	231.24	8.16	1.69	2.24	2.6e-05	0.00025	0.00242	1.39
	0.68	13.72	98.78	912.29	508.98	463.09	6521.82	167.15	2313	11195	8082.48	322704
233	4947.21	774.73	7092.28	1190.59	174.39	8.88	1.31	1.6	6.35e-05	0.00021	0.00094	1.84
	0.93	13.02	226.46	338.69	959.59	448.78	3785.33	158.7	432	14016.6	4865.04	279252
234	2234.47	741.02	3212.03	1250.26	113.43	8.64	0.86	1.05	7.5e-06	0.00108	0.01188	2.8
	2.06	10.44	152.95	448.63	779.64	663.07	4293.67	123.17	2112	13410.8	5630.43	458849
235	4936.62	310.96	6425.83	450.62	102.68	7.9	0.52	0.65	7e-06	0.00096	0.00375	1.37
	0.65	6.26	88.76	563.39	278.77	662.27	4640.7	157.82	1214	8566.7	6405.12	537840
236	3239.99	550.64	4788.22	722.41	254.65	7.85	1.52	1.93	5.7e-06	0.00014	0.00134	2.77
	1.55	13.87	222.53	520.72	575.64	744.67	7623.42	177.5	2117	12796.6	8492.04	317165
237	3859.08	597.55	5793.12	776.58	110.08	5.81	0.99	1.49	3.07e-05	0.00102	0.00669	0.91
	0.53	7.45	87.85	657.45	274.21	286.16	7576.43	129.19	2797	8183.73	8597.4	535273
238	4648.2	589.43	5793.37	845.55	255.37	6.88	0.93	1.13	3.1e-06	0.00074	0.00299	1.94
	0.81	8.81	148.38	242.93	415.75	778.8	6249.04	183.39	2744	16186.2	7109.54	363861
239	2728.12	324.41	3936.73	400.82	268.86	5.77	1	1.39	8.97e-05	0.00079	0.00341	2.61
	1.5	13.06	87.75	607.35	505.1	819.72	3861.99	141.76	1749	14846.5	4910	338890
240	3642.01	771.34	5770	1037.59	213.72	8.83	0.68	0.86	1.64e-05	0.00076	0.00883	1.17
	0.83	8.54	196.55	519.59	774.52	577.6	6728.26	140.57	3363	14240.6	9255.29	559217
241	4541.9	303.23	5577.41	536.73	135.54	8.28	0.64	0.93	1.28e-05	0.00037	0.00341	2.47
	1.38	13.06	164.24	311.95	423.82	465.24	4182.51	122.62	1801	8346.59	5143.42	307025
242	3110.03	522.12	4005.75	915.58	157.2	5.87	0.91	1.23	5.49e-05	0.00018	0.00206	2.73
	1.52	9.87	207.62	526.52	1138.93	440.12	3966.45	196.27	377	13262	4703.66	299792
243	4150.31	810.37	5637.48	1113.75	277.11	7.87	1.63	2.37	1.32e-05	0.00086	0.00775	1.13
	0.46	6.75	50.24	557.67	265.47	268.96	4899.61	126	2411	12965.5	6284.27	375316
244	4554.19	862.58	7230.66	1502.07	175.26	9.74	0.59	0.73	7.22e-05	0.00031	0.00341	1.02
	0.79	8.51	98.34	240.89	558.34	738.52	7887.5	139.29	933	10610.6	11784.8	331189
245	4327.6	430.79	5819.96	637.39	173.6	6.68	1.83	2.48	1.1e-05	0.00063	0.0045	2.91
	1.99	8.06	141.66	454.49	590.98	366.86	6125.88	120.64	2073	10810.6	8488.7	395331
246	2805.17	799.93	4374.44	1083.69	136.18	8.75	1.53	2	5.26e-05	0.00034	0.00144	1.34
	0.56	7.76	100.76	219.09	590.53	274.5	6736.94	181.94	1334	17962.3	8183.32	381960
247	3352.21	442.08	5073.85	621.65	299.7	5.14	1.24	1.75	2.28e-05	0.00109	0.00554	2.29
	1.18	12.41	73.93	660.31	407.15	211.44	5590.7	167.43	2344	10148.9	7909.77	330965
248	2671.46	364.02	3705.49	530.53	126.68	8.18	1.66	2.46	3.6e-06	0.0002	0.00156	2.23
	1.42	6.18	169.82	652.95	536.96	618.57	6839.99	137.3	1636	8025.77	9774.6	270454
249	3008.08	361.31	4317.75	684.7	216	7.49	0.74	0.97	9.52e-05	0.00063	0.00683	2.05
	1.5	5.82	128.74	883.9	319.49	482.61	6574.22	184.21	1212	16701.9	7838.1	467939
250	4791.54	280.92	7078.83	506.99	210.85	5.06	0.89	1.11	4.79e-05	0.00093	0.0036	1.5
	0.61	10.17	206.99	540.27	537.75	535.52	5004.61	179.79	1868	7481.99	5559.83	227029
251	4972.01	333.04	6774	599.08	208.76	8.72	0.8	1.12	3.8e-06	0.00062	0.00737	2.72
	2.09	10.86	152.81	750.8	454.75	570.2	5359.54	126.03	583	10947.6	7159.37	373466
252	3962.61	586.16	6046.37	1012.83	262.78	7.06	0.62	0.81	7.4e-05	0.00087	0.00343	1.96
	0.91	8.24	211.67	834.23	842.2	607.6	3912.33	178.47	1794	16080.1	5524.78	416876
253	2542.95	297.44	3832.65	483.47	175.54	9.18	0.72	0.93	9.73e-05	0.00086	0.00707	1.49
	0.79	12.29	196.18	335.21	476.68	766.16	6245.53	154.5	1594	12644.2	7337.58	414403
254	3503.7	451.24	4252.86	899.45	208.33	9.18	0.53	0.64	6.23e-05	0.00071	0.00409	2.5
	1.81	10.41	97.44	617.56	216.24	610.74	4997.23	154.34	852	13638.1	6024.49	385031
255	4737.26	290.31	6748.75	494.14	240.56	7.99	1.62	2.19	8.52e-05	0.00062	0.00455	2.14
	1.35	7.27	230.62	218.69	602.24	439.85	7091.09	169.45	2541	14556.5	8215.27	401992
256	2590.03	966.55	3756.16	1348.23	275.62	8.43	1.42	2.03	2.29e-05	0.00056	0.00248	2.24
	0.98	6.32	92.58	642.88	440.33	686.95	6150.3	187.27	374	17412.5	8310.14	474168
257	3632.23	803.64	5517.26	1586.77	133.7	9.14	1.3	1.86	4.6e-06	0.00045	0.00471	2.01
	1.07	8.3	181.64	668.44	639.47	222.5	5182.24	167.32	2056	18164.4	6772.5	431356
258	3745.38	504.89	5403.19	634.7	118.95	8.32	0.81	1.21	5.75e-05	0.00023	0.00065	1.62
	1.05	6.54	119.04	395.5	418.53	506.06	4652.19	141.69	1395	9927.48	5542.96	227473
259	2275.59	209.57	3451.44	408.17	144.05	6.21	1.84	2.53	9.12e-05	0.00108	0.01281	1.17
	0.87	9.59	53.1	390.23	266.37	652.46	7815.76	160.67	3113	11078.9	10437.8	366908
260	2872.99	738.45	4449.7	1291.31	151.19	6.78	1.64	1.99	3.2e-06	0.00075	0.00602	2.82
	2.17	8.33	54.44	750.41	284.64	408.89	4711.41	148.76	1317	15176.8	5433.1	324049
261	2346.5	637.25	2969.23	972.46	131.44	9.59	1.56	2.11	7.32e-05	0.00048	0.00136	1.72
	1.25	11.78	123.21	223.55	591.7	758.74	7482.77	197.05	1742	9901.19	8625.16	232643
262	3419.01	909.07	5082.49	1604.48	227.92	7.41	1.18	1.53	3.5e-06	0.00083	0.00375	2.54
	1.47	10.88	159.04	200.37	369.95	735.43	7100.87	145.62	2454	17626.8	9520.96	452558
263	2156.92	950.9	3307.81	1690.41	265.32	9.31	1.69	2.07	4.57e-05	0.00086	0.01	2.82
	1.53	12.46	161.9	803	481.22	632.66	3102.62	151.22	647	9794.38	4195.78	369759
264	2305.27	334.07	3240.26	625.97	147.41	7.21	1.43	1.81	2.19e-05	0.00051	0.00189	2.04
	1.21	7.89	179.49	747.8	740.09	205.91	7910.1	190.98	1763	17165.5	10437	483714
265	2188.99	676.32	3092.78	1102.93	168.49	6.7	0.92	1.13	3.38e-05	0.00106	0.00564	1.92
	1.51	11.37	248.56	322.6	1209.76	832.64	5542.19	171.39	2349	17749.3	8070.7	238404
266	3878.91	998.84	4662.53	1985.29	121.69	7.26	1.52	1.89	5.97e-05	0.00059	0.00295	2.24
	1.6	13.49	248.55	426.4	645.3	235.85	4018.75	151.74	1989	10353.7	5185.83	386095
267	2336.78	894.06	3053.59	1474.32	267.82	7.09	1.03	1.28	5.9e-06	0.00082	0.00809	1.68
	0.68	5.81	74.62	923.07	226.98	627.39	3314.52	160.01	941	14867.8	4902.56	368494
268	2426.08	819.27	3186.48	1317.4	231.57	8.2	1.57	2.07	4.77e-05	0.00051	0.00134	2.86
	2.24	5.23	54.17	616.03	273.81	410.79	6546.14	179.31	1153	17004.2	7227.97	330460

269	3161.37	762.98	4187.21	1136.53	181	7.09	1.66	2.4	1.42e-05	0.00094	0.00621	2.94
	1.52	12.34	240.84	304.77	1306.18	368.08	6446.99	133.68	1778	13175.3	8056.08	368183
270	2324.03	282.18	3528.12	515.88	113.52	5.76	1.09	1.61	4.9e-06	0.00101	0.00478	1.71
	0.8	11.98	123.41	756.77	445.19	926.53	5451.6	193.48	1732	17446.3	7700.74	265512
271	4723.74	622.16	5893.16	1229.79	119.69	6.47	1.71	2.5	4.2e-06	0.00021	0.00105	1.44
	0.84	11.15	77.02	543.77	415.02	710.56	5831.88	122.39	2523	14572.7	8315.68	459147
272	4081.64	806.21	5743.94	1455.75	193.12	8.76	1.77	2.56	7.12e-05	0.00054	0.00145	1.92
	0.92	11.94	165.52	362.9	906.77	469.08	7392.73	166.5	57	17548.1	8159.17	264728
273	4111.68	413.54	5420.8	788	218.56	8.64	0.64	0.86	2.94e-05	0.00024	0.00202	2.37
	1.1	7.21	218.8	561.24	545.74	562.98	7030.99	161.14	1594	16487.5	10389.1	367567
274	3823.73	265.69	5165.2	496.9	133.57	5.26	1.11	1.34	8.53e-05	0.00048	0.00176	1.6
	1.18	7.99	220.13	231.31	460.54	702.11	7168.22	190.03	1482	12128.6	9597.35	486312
275	4092.53	963.75	5959.66	1414.93	117.11	8.26	1.85	2.32	3.44e-05	0.00036	0.00215	2.35
	1.65	5.24	236.39	866.14	969.35	734.45	5256.74	178.84	1017	10717.5	5843.39	256115
276	2293.9	850.86	3624.69	1178.37	209.73	5.22	1.32	1.94	7.8e-06	0.001	0.00789	1.47
	0.68	6.46	213.86	947.62	568.45	380.24	5502.64	148.09	2755	14545.6	6237.67	398868
277	2606.39	484.71	3833.8	736.28	271.16	5.57	0.56	0.71	1.47e-05	0.00059	0.00217	1.65
	0.94	6.84	54.49	726.23	168.64	903.44	3529.26	155.46	246	16515.9	4030.19	203223
278	3134.64	935	3983.16	1747.75	224.35	9.67	1.3	1.85	8.27e-05	0.00021	0.00161	1.71
	1.16	13.07	121.76	467.26	517.66	294.29	4498.8	133.61	1939	16086.4	6503.8	340103
279	4855.23	487.63	6424.68	686.2	135.06	8.69	0.91	1.36	7.01e-05	0.00023	0.00216	2.14
	1.01	6.97	221.06	428.75	937.85	719.57	4254.73	185.44	929	17835.7	5911.41	596099
280	2104.72	447.89	3259.01	797.52	206.65	7.47	1.27	1.71	6.4e-05	0.00079	0.00311	1.88
	0.85	13.13	159.55	940.26	859.89	647.55	4655.5	132.93	1526	18084.3	5646.32	225342
281	4601.04	968.62	5860.4	1739.4	151.85	6.49	1.79	2.53	5.5e-06	0.00075	0.00607	0.93
	0.71	7.61	96.6	851.03	513.83	510.41	6224.08	179.51	2491	13616.7	7197.12	377385
282	3219.78	912.43	5042.72	1513.91	278.4	5.31	0.68	1.01	7.33e-05	0.00047	0.00164	2.6
	1.39	7	182.21	906.39	897.03	238.8	3816.11	125.43	1336	15678.9	5535.3	334709
283	4761.46	618.56	7247.08	889.75	198.76	5.77	1.84	2.39	6.56e-05	0.00026	0.00228	2.66
	1.68	5.25	149.31	734.52	539.92	543	5048.4	149.21	1272	12743.9	6334.2	255145
284	3562.13	747.92	5548.43	1131.65	174.51	8.5	1.86	2.7	7.4e-06	0.00026	0.00278	1.73
	0.81	5.62	146.34	307.46	383.1	700.09	3936.83	121.01	1140	15784.7	5823.52	213977
285	3384.41	766.89	4187.11	1166.06	191.04	8.08	1.62	2.26	4.12e-05	0.00103	0.00705	2.95
	1.44	11.75	124.51	212.05	365.53	974.03	4736.22	196.56	1003	15282.9	5924.45	519933
286	2049.81	753.53	2591.15	1413.06	199.11	9.48	1.56	2.27	7.58e-05	0.00014	0.00154	2.27
	1.58	9.02	109.97	397.48	444.05	712.53	5112.45	197.39	950	10288.4	7576.35	344534
287	2911.57	555.06	4202.49	940.28	101.78	6.82	1.8	2.52	2.67e-05	0.00032	0.00274	2
	1.09	9.2	204.36	312.59	770.15	817.93	7405.21	168.87	2238	16559.3	8305.13	362805
288	4549.38	652.06	7060.81	1284.27	177.42	5.38	1.52	2.07	9.57e-05	0.00045	0.00277	2.32
	1.01	5.64	167.1	505.82	381.29	551.13	3921.63	164.73	964	14193.8	4951.81	461684
289	3810.89	662.13	5253.62	1136.48	251.59	8	1.1	1.64	3.81e-05	0.00092	0.00318	0.91
	0.43	6.17	65.89	992.55	188.65	564.43	5509.36	189.87	272	9899.77	7535.96	463695
290	3903.47	643.89	5323.79	1264.6	222.2	7.76	1.54	2.23	2.1e-06	0.00033	0.00343	2.83
	1.13	5.49	55.45	899.96	304.25	324.91	6782.71	131.23	185	11224.6	8117.22	330005
291	4580.13	326.08	5859.52	640.63	131.1	5.65	0.72	0.86	2.48e-05	0.00078	0.00759	2.69
	2.05	11.5	76.35	605.71	448.91	805.09	6818.9	122.66	2334	7567.9	9116	409553
292	4304.62	887.64	5533.45	1334.45	262.99	8.74	1.69	2.47	2.19e-05	0.00026	0.00303	2.87
	2.26	6.14	186.73	783.83	854.55	284.32	4468.39	168.27	1160	10093.4	5429.34	257280
293	3610.99	878.79	4650.3	1493.41	158.3	7.48	1.14	1.48	1.05e-05	0.00031	0.00104	2.46
	1.48	7.34	134.95	222.06	290.29	689.29	6010.08	188.16	2996	16544.7	7076.6	459459
294	2483.64	994.93	3590.07	1749.93	222.7	8.64	0.52	0.76	2.51e-05	0.0007	0.00584	1.83
	1.1	10.89	91.43	729.57	414.58	751.19	3920.2	184.83	1258	11981.3	5808.86	394074
295	4273.36	872.38	5191.26	1473.01	116.92	9.47	0.99	1.22	1.27e-05	0.00108	0.00331	2.79
	1.47	5.28	202.11	585.13	867.08	775.67	6293.52	145.74	579	7588.26	8307.91	321220
296	2477.39	947.3	3404.92	1255.66	165.05	7.06	1.91	2.51	7.24e-05	0.00081	0.00722	0.94
	0.67	12.64	98.7	270.03	226.43	669.21	4357.53	158.14	1025	15630.5	4965.95	225280
297	4404.49	424.34	5905.07	810.38	183.45	6.17	1.69	2.49	9e-06	0.00025	0.00176	0.95
	0.72	5.55	188.69	292.17	379.64	397.42	3481.24	167.87	1577	16439.4	4342.26	360457
298	4127.8	461.57	6574.96	590.04	245.99	9.21	1.66	2.07	2.3e-05	0.00051	0.00191	1.79
	0.91	13.62	152.41	885.59	811.45	848.69	7222.35	132.84	3305	14247.5	9457.9	420919
299	4033.05	420.59	5949.88	655.95	280.17	6.25	1.36	1.72	9.89e-05	0.00074	0.00497	0.92
	0.41	9.07	73.28	935.96	332.45	970.9	4915.67	182.95	107	8657.6	6183.85	258191
300	4395.22	616.3	5975.18	868.18	234.09	7.51	1.46	2.1	3.17e-05	0.00073	0.00474	1.96
	1.16	8.57	58.39	894.71	124.36	893.13	5096.45	156.86	793	12466.5	5645.22	432559
301	2242.19	285.89	2986.3	367.32	185.42	9.54	0.87	1.07	5.95e-05	0.00016	0.00171	2.51
	1.13	5.27	167.35	416.23	876.41	678.83	3524.19	125.27	959	17088.5	4586.6	351217
302	2605.38	979.75	3399.06	1572.51	241.28	9.85	1.75	2.25	5.2e-05	0.00047	0.00336	1.59
	0.88	11.43	182.67	220.1	716.07	574.17	6052.34	161.15	1549	10248.2	7024.16	274330
303	2744.42	813.04	3593.22	1212.48	178.64	6.51	0.92	1.35	3.06e-05	0.00083	0.0056	2.42
	1.16	8.31	110.08	516.91	649.88	749.96	6451.71	188.34	3138	14952.7	7238.99	354412
304	3400.97	327.69	5345.62	632.06	169.13	9.68	1.25	1.57	2.54e-05	0.00097	0.00549	1.04
	0.45	11.82	186.81	254.88	874.39	992.87	7176.53	153.55	1395	14183.9	9946.06	317487
305	2374.45	573.57	2919.06	1002.5	112.17	5.77	1.97	2.93	1.26e-05	0.00025	0.00276	1.26
	0.92	9.41	103.53	550.6	295.41	243.44	5597.64	181.87	1824	17420.1	6721.69	451199
306	2832.47	299.38	4393.98	471.81	116.05	8.48	1.43	1.94	9.72e-05	0.00093	0.00802	1.51
	0.93	11.3	78.48	604.14	370.25	323.02	4075.42	179.4	349	7703.35	4512.84	366894
307	3546.55	287.85	4522.43	506.96	115.97	9.79	1.53	2.16	2.49e-05	0.00028	0.00266	1.31
	0.9	10.36	89.68	341.24	284.68	834.81	4988.84	137.34	981	12554.5	5653.37	289659
308	4068.66	627.87	6037.59	768.06	228.78	7.14	1	1.46	8.92e-05	0.00042	0.00162	1.66
	0.86	5.93	118.51	276.24	494.05	362.34	4548.47	127.5	1711	14354.5	5064.64	267276
309	4858.15	872.53	6261.65	1616.59	172.74	6.73	1.83	2.6	3.45e-05	0.00061	0.00241	1.8
	1.22	10.07	149.98	591.89	574.17	973.01	5267.5	192.38	46	15578.9	7348.05	351354
310	2357.07	872.08	3638.86	1650.77	212.12	8.84	0.6	0.75	9.4e-05	0.00057	0.00265	0.96
	0.4	9.91	195.06	493.18	586.03	615.26	6855.33	187.49	602	7673.99	7976.51	422459
311	3983.78	283.35	5931.57	523.92	209.41	7.27	1.25	1.66	1.6e-06	0.00018	0.00127	1.42
	0.58	9.62	161.87	691.31	832.03	852.98	5361.86	133.03	735	17205.3	7762.55	441205
312	4784.3	611.12	7522.43	780.17	199.27	7.29	1.26	1.86	3.39e-05	0.00098	0.01023	2.75
	1.93	5.02	181.69	349.48	524.51	902.71	6777.58	157.44	2476	14000.3	8043.21	324685
313	2774.31	623.35	4148.55	834.2	206.06	9.6	0.85	1.21	6.58e-05	0.00064	0.00311	1.43
	0.61	10.08	52.68	788.25	165.65	867.67	3965.51	191.46	1368	15208.2	4500.44	250781
314	2735.1	526.51	4067.77	808.47	222.76	9.21	1.67	2.08	8.6e-06	0.00067	0.00733	1.52
	0.74	6.12	123.68	429.04	398.65	975.27	5617.48	128.32	970	11921.1	7538.32	311006
315	2430	765.48	3141.3	993.35	178.55	7.45	1.24	1.77	4.3e-06	0.0008	0.00246	1.4
	0.97	11.04	208.42	306.16	496.27	263.13	3779.24	188.39	538	10004.9	4734.2	272564
316	4708.23	594.98	7469.89	869.82	276.97	8.45	1.06	1.51	2.54e-05	0.00026	0.00155	1.57
	0.68	8.98	77.57	998.83	323.47	614.23	6912.78	180.78	2473	10308.4	8067.19	400895

317	2156.75	991.16	3240.69	1240.35	284.25	6.93	1.66	2.4	8.67e-05	0.0008	0.00951	2.55
	1.97	6.25	229.54	540.63	550.03	511.2	7947.96	177.52	3586	7372.96	9886.2	231677
318	4846.04	473.03	6487.26	580.23	239.8	5.08	1.01	1.23	9.1e-06	0.00074	0.00266	2.06
	1.27	10.64	188.41	308.72	512.35	406.02	4206.63	199.38	82	12207.9	4652.53	487297
319	3752.4	247.69	5468.54	396.33	174.84	9.42	1.78	2.25	5.63e-05	0.00089	0.00631	2.73
	1.45	7.44	217.75	567.58	514.36	201.63	7626.6	173.13	1374	9304.32	11004	435588
320	4713.23	644.19	6541.35	1179.03	176.26	8.63	0.83	1.01	1.41e-05	0.00059	0.0058	1.02
	0.51	12.42	65.76	959.04	197	281.21	3746.77	177.25	935	13641.9	5234.45	355452
321	4508.94	676.72	6013.53	864.44	165.26	8.66	1.27	1.84	2.89e-05	0.00041	0.00155	1.76
	0.92	7.2	105.42	501.55	574.81	269.55	7545.91	133.23	3387	8842.79	10725.3	374688
322	3201.86	294.26	4457.77	518.07	291.22	8.63	1.38	1.81	2.46e-05	0.00079	0.00896	2.44
	1.81	9.49	73.49	266.58	268.36	235.04	6290.04	132.67	2554	11215.1	8128.78	332759
323	2393.02	627.67	3124.72	1079.12	158.3	8.12	1.4	1.74	8.7e-06	0.00064	0.00337	1.51
	0.67	5.29	60.85	871	130.54	339.36	5492.09	193.18	2493	15906.9	7843.75	397770
324	2366.12	739.65	3738.69	1188.71	294.12	5.76	1.43	1.83	6.68e-05	0.00082	0.00746	1.27
	0.7	8.92	88.46	770.53	339.41	764.07	5726.49	190.9	954	11662.4	7822.09	295032
325	3950.78	822.38	5145.64	1494.65	145.43	9.93	0.82	1.18	8.27e-05	0.00062	0.00153	1.14
	0.91	9.26	116.65	282.26	251.19	275.99	6007.62	127.94	347	18173.7	7833.69	357563
326	3098.07	567.37	4510.78	738.77	130.31	6.37	1.65	2.15	6.09e-05	0.00028	0.00294	2.22
	1.36	13.47	137.02	592.85	568.35	891.5	7148.76	180.5	2710	7793.37	10099.6	422602
327	4734.76	781.61	7297.28	1091.77	131.65	7.11	1.93	2.83	5.9e-05	0.0004	0.00393	2.85
	2.24	9.79	151.91	733.51	833	332.69	7945.63	162.62	1787	17618.7	11712	407199
328	3832.61	353.44	4649.49	638.11	243.7	7.42	0.73	0.93	3.15e-05	0.00018	0.00047	2.9
	1.4	13.84	172.19	914.11	700.15	869.41	5163.82	142.21	853	16527.8	7068.44	218445
329	3445.9	432.51	4902.1	557.81	171.21	6.54	0.78	1.06	4.96e-05	0.00062	0.00463	2.38
	1.51	5.16	129.9	313.73	628.88	360.44	3941.05	124.66	1217	8558.85	5158.47	411846
330	3948.53	573.13	4987.73	976.39	142.44	8.51	1.09	1.43	2.77e-05	0.00036	0.00363	2.82
	1.58	12.84	223.75	564.72	1242.4	927.62	6694.73	123.84	943	18048.4	8055.26	492960
331	3130.51	765.26	4733.85	1310.39	116.79	5.56	1.48	2.06	3.69e-05	0.0003	0.00084	1.51
	0.85	11.68	243.56	813.67	1214.74	892.32	4494.13	131.16	905	13045	6444.9	337598
332	4823.82	313.01	7691.28	463.14	164.39	5.26	1.57	1.99	6.54e-05	0.00019	0.00188	1.32
	1	8.77	116.02	921.66	600.02	567.15	5780.62	139.74	1167	9867.88	7608.8	212213
333	3794.19	456.69	5264.95	852.11	103.3	9.5	1.48	1.86	6.07e-05	0.00066	0.00627	2.1
	1.43	11.22	218.36	213.64	1039.37	802.15	4875.3	141.23	955	10991.8	6840.17	288416
334	3463.08	706.84	4430.95	1382.78	202.78	9.89	0.52	0.7	8.31e-05	0.00033	0.00079	2.18
	0.92	12.27	182.42	296.84	713.35	896.7	7664.78	185.18	2933	10861.3	9509.82	312558
335	3376.46	438.15	4510.03	719.42	217.39	9.42	1.56	2	1.52e-05	0.00076	0.00292	2.85
	1.16	6.37	235.05	975.97	1214.87	519.51	3787.7	152.64	908	12347.2	5326.28	317876
336	3324.55	430.83	5186.24	519.07	210.02	9.04	1.24	1.79	2.5e-06	0.00058	0.00289	1.89
	0.96	8.16	115.87	420.94	362.45	317.27	7285.66	174.88	363	8154.13	10387.4	333252
337	3870.32	405.41	5523.81	657.33	263.9	8.97	1.28	1.55	3.1e-06	0.0003	0.0023	0.98
	0.66	11.12	139.08	952.54	572.02	512.64	7065.03	191.32	1975	15383.8	10207.8	498847
338	4830.68	205.54	7650.56	363.78	229.46	8.49	0.94	1.34	4.76e-05	0.0003	0.00286	2.25
	1.77	6.5	200.21	546.44	588.45	601.7	7532.15	138.84	500	8320.56	9599.43	400840
339	3217.77	875.54	3922.5	1707.14	165.76	5.23	1.08	1.59	1.36e-05	0.00099	0.00436	1.6
	1	8.44	176.84	519.8	605.67	341.46	5125.52	141.71	709	10465.2	7686.84	379934
340	2260.59	827.86	3160.26	1414.86	198.17	5.87	0.5	0.64	7.98e-05	0.00029	0.0012	1.11
	0.68	7.08	163.35	656.96	617.36	743.36	7918.63	145.35	3682	8839.64	9892.4	255019
341	3071.15	264.5	4081.6	360.49	142.68	7.8	0.74	1.01	6.48e-05	0.00084	0.00373	1.98
	0.96	12.64	69.31	739.3	290.55	943.59	3914.04	171.05	754	12955	5049.24	454384
342	3559.84	226.63	5077.11	380.25	279.24	6.99	1.5	1.85	9.56e-05	0.00029	0.00342	1.76
	0.95	11.7	154.92	519.24	578.42	720.43	7979.55	143.33	1920	13524.3	10361.6	324246
343	2351.64	818.98	3051.23	1238.73	288.96	6.87	1.36	1.83	6.9e-06	0.00083	0.00884	2.68
	1.21	6.24	234.02	779.16	1323.92	485.83	6296.84	152.91	2428	11200.2	7308.18	408851
344	3301.38	650.85	4851.59	797.48	109	5.53	1.66	2.35	9.31e-05	0.0003	0.00329	1.96
	1.18	9.58	147.39	980.44	554.03	720.85	5000.07	176.78	1778	14853.4	6988.35	415048
345	3136.04	770.41	4415.48	1040.25	140.45	9.64	1.83	2.38	2.15e-05	0.00079	0.00717	2.83
	1.46	12.54	139.59	455.76	282.72	905.91	5061.32	149.82	178	17349.8	7328.29	422371
346	3917.26	875.04	5710.26	1257.51	274.03	7.69	0.58	0.71	2.31e-05	0.00102	0.00328	2.58
	1.56	12.75	224.54	921.88	1208.96	860.21	3133.27	131.21	633	13384.5	3450.35	488896
347	3529.06	797.53	5011.17	1019.28	299.11	9.14	1.33	1.69	2.56e-05	0.00057	0.00243	2.22
	1.38	12.78	58.49	838.51	248.32	762.42	6878.54	137.1	3359	14529.5	7666.31	484912
348	2167.46	429.55	3170.18	702.73	146.8	7.45	1.01	1.47	8.67e-05	0.00091	0.00478	2.96
	2.07	5.78	73.62	719.8	362.23	366.41	4703.35	187.11	1104	12612.9	5368.03	307486
349	4803.07	807.39	6468.48	1429.97	193.49	8.8	1.3	1.57	1.17e-05	0.00046	0.0043	2.49
	1.13	10.61	200.01	319.1	815.38	567.3	7208.79	144.33	2380	17558.5	10727.9	523788
350	2072.43	543.47	2567.59	896.51	199.48	9.09	1.38	1.78	7.1e-06	0.00015	0.00173	1.35
	0.83	10.54	174.25	391.08	595.68	757.59	5429.18	183.37	400	15896.2	7375.14	211389
351	3298.09	329.83	5020.25	601.91	267.96	8.17	0.68	0.83	7.6e-06	0.00034	0.003	1.61
	1	11.29	96.35	433.71	321.66	927.43	7299.51	174.93	3472	7901.41	8246.44	477007
352	4959.25	713.91	6862.92	1027.3	149.48	8.92	0.74	0.97	1.61e-05	0.00061	0.00491	1.2
	0.6	10.37	53.67	953.23	190.01	324.27	3517.14	134.07	1258	16875.5	5001.96	465441
353	4017.02	963.1	6217.32	1738.49	259.47	6.1	1.85	2.62	2.36e-05	0.00083	0.00507	2.38
	1.06	11.66	230.09	807.79	894.9	816.99	6436.35	127.79	839	14969.6	7166.19	472103
354	2735.79	374.82	3647.99	653.71	163.6	6.42	1.23	1.62	3.42e-05	0.00091	0.00797	1.39
	0.82	9.43	135.61	482.65	365.48	265.72	6711.99	147.03	1403	9621.18	7717.65	486620
355	3499.28	391.13	5237.92	686.95	101.63	5.35	1.1	1.58	9.17e-05	0.00105	0.00304	1.11
	0.79	11.07	173.44	684.85	731.97	214.46	6671.67	190.3	2121	7609.79	7596.78	394222
356	3853.37	896.6	5209.71	1208.92	102.19	5.43	1.57	2.34	7.2e-06	0.00097	0.00538	2.09
	1.54	9.26	246.68	773.27	1003.01	917.26	4969.11	137.44	2298	14634.1	6225.47	447517
357	4686.43	317.74	6611.89	591.5	240.73	5.51	0.76	0.99	2.7e-06	0.00033	0.00241	1.68
	1.08	8.56	74.84	950.96	412.27	962.6	6614.96	127.01	1497	14214.7	8240.68	351796
358	2031.11	880.08	2937.95	1219.37	189.04	9.2	1.05	1.27	5.02e-05	0.00034	0.00303	2.66
	1.7	9.03	219.31	442.6	995.52	446.38	3800.83	162.43	174	13542.3	4249.08	319469
359	2030.4	574.77	3109.11	961.13	109.11	9.45	1.81	2.36	4.31e-05	0.00025	0.00099	1.47
	0.66	10.49	234.69	308.32	1086.84	843.43	4861.48	128.08	229	11058.1	7018.95	256786
360	3421.9	976.85	4266.1	1666.86	233.3	6.59	1.75	2.2	5.31e-05	0.00074	0.006	2.61
	1.26	12.09	131.83	483.17	511.07	285.46	6908.35	161	3283	12930.4	8334.84	416570
361	4105.54	370.1	6445.76	511.38	195.73	5.04	0.95	1.38	5.84e-05	0.00015	0.00151	2.54
	1.37	11.95	58.11	939.49	272.58	364.25	4170.21	144.94	1803	14243.6	4793.33	386342
362	3566.39	777.27	5209.9	1011.63	100.05	5.58	1.55	2.26	9.2e-05	0.00082	0.00798	1.59
	0.97	6.02	136.48	888.31	297.44	634.41	5134.82	148.17	2387	10558.4	6019.61	388661
363	3472.21	228.87	4370.85	382.27	258.72	6.6	0.97	1.25	9.7e-06	0.00045	0.00403	1.48
	0.97	5.18	114.13	300.25	603.28	319.59	4005.02	179.78	738	10768.8	4664.98	290792
364	2370.47	871.58	3478.39	1363.34	153.94	6.16	1.72	2.55	9.38e-05	0.00023	0.00179	2.67
	1.66	5.95	165.37	902.45	370.68	493.72	6675.63	138.13	2317	10606.3	8084.9	267770

365	2285.09	620.7	3283.6	1221.48	227.58	9.85	0.71	0.9	5.24e-05	0.00027	0.00062	1.07
	0.53	10.78	102.89	968.44	325.68	362.18	6435.72	181.72	340	16384.4	8426.7	261798
366	4841.72	833.53	6799.97	1400.7	125.76	8.54	1.12	1.6	9.07e-05	0.00109	0.00803	1.17
	0.76	6.55	140.69	208.13	358.68	684.61	5618.02	198.76	1102	10020.8	6808.82	290970
367	4353.33	826.26	6394.89	1473.21	278.06	5.75	1.44	2.12	5.8e-06	0.00043	0.00321	1.51
	0.76	11.69	227.87	892.9	1127.1	619.56	5153.48	130.9	443	13295.7	6116.97	407310
368	4225.38	205.19	6150.77	386.09	290.54	5.94	1.47	1.87	2.96e-05	0.00054	0.00393	2.12
	1.26	13.25	244.62	925.35	1238.54	845.82	4885.79	172.06	1233	14431.1	5535.42	440245
369	2291.54	946.33	3652.18	1625.34	246.47	5.97	1.32	1.71	4.46e-05	0.00062	0.00166	1.53
	1.08	13.79	102.02	895.71	406.02	562.47	6216.78	159.52	1157	16736	6882.11	235056
370	3457.29	677.02	4931.45	957.99	171.85	6.85	0.55	0.77	5.4e-05	0.00068	0.00157	2.77
	1.93	12.16	232.42	948.86	1117.97	845.46	6599.41	160.68	1209	8582.83	8218.43	284259
371	2373.54	937.1	3205.74	1718.88	264.47	9.33	0.51	0.75	6.59e-05	0.00059	0.00362	1.77
	0.95	12.96	156.1	332.63	603.38	670.06	4463	198.29	1744	7637.67	6254.16	359875
372	3240.9	643.55	4665.89	1117.02	256.92	7.38	2	2.91	7.1e-05	0.00044	0.00403	1.54
	0.98	9.28	73.69	660.1	435.13	612.23	3098.92	132.43	1523	10407.2	4504.22	243329
373	2875.11	696.74	4285.51	1298.72	112.02	5.82	0.92	1.28	1.84e-05	0.00077	0.00851	1.34
	0.96	7	192.7	437.92	582.51	639.97	4480.29	198.54	1424	11876.4	6024.45	463968
374	2492.25	835.46	3492.98	1212.19	167.77	7.33	1.38	1.75	1.03e-05	0.00108	0.00894	1.62
	1.2	8.9	118.37	387.35	328.32	561.38	3968.76	192	959	14843.5	5276.42	377602
375	3049.75	548.45	3855.36	980.92	150.25	6.93	1.51	2.01	1.23e-05	0.00046	0.00274	1.96
	1.44	9.34	52.09	704.39	111.82	529.47	3500.79	186.93	951	16785	4039.01	276833
376	2821.21	207.18	3694.23	259.86	128.91	9.59	0.89	1.2	8.8e-06	0.00036	0.00257	2.81
	2.07	10.17	185.25	395.82	1068.17	393.14	5999.9	128.46	664	11492.1	7660.86	296323
377	4699.26	462.86	7176.57	850.58	184.3	5.9	1.12	1.51	2.01e-05	0.00105	0.00392	1.73
	1.31	13.48	81.18	690.78	208.42	889.24	5865.5	143.95	562	12949.9	8169.94	273399
378	4341.71	338.34	6537.25	589.92	196.88	9.51	1.16	1.69	2.06e-05	0.00014	0.00142	1.93
	1.38	10.23	155.07	245.32	457.23	404.88	5694.86	132.89	522	18000.3	7416.19	432801
379	3197.25	938.01	4101.97	1713.36	210.24	8.8	1.59	2.22	3.57e-05	0.00086	0.00202	1.69
	0.94	12.22	135.15	641.95	669.81	763.82	3491.03	126.99	35	11323.7	4888.96	314791
380	4488.79	863.79	7024.01	1384.47	217.69	8.5	1.04	1.27	6.08e-05	0.00019	0.00087	1.35
	0.7	12.92	226.84	897.53	1066.6	238.68	3721.64	163.59	1255	11849.1	5128.02	238678
381	3811.35	709.87	5127.91	983.66	193.41	6.5	1.12	1.4	7.93e-05	0.00017	0.0005	0.96
	0.6	11.6	212.81	395.75	783.3	885.04	7306.62	166.24	526	17969.1	8736.41	434380
382	2021.16	280.4	3125.52	421.57	131.81	7.05	1.87	2.55	9.95e-05	0.00081	0.00261	2.33
	1.33	10.26	152.13	701.2	779.95	793.87	4973.15	190.55	56	7412.1	5563.88	350654
383	4447.75	793.85	5436.04	1228.33	164.7	7.13	1.69	2.46	2.2e-06	0.00027	0.00147	1.25
	0.51	11.72	170.69	574.2	795.34	236.91	4868.81	132.62	2172	18118.5	6206.09	407508
384	2303.04	543.78	3420.71	740.5	169.64	8.96	0.72	0.88	4.6e-06	0.00103	0.01039	2.91
	2.07	5.08	199.56	823.13	775.5	479.8	3942.02	141.08	1749	15918.8	4901.68	236892
385	2383.64	253	3518.14	416.86	244.6	5.25	1.11	1.54	8e-06	0.00071	0.00794	2.12
	1.14	13.12	142	415.21	508.18	760.8	3246.05	147.51	1082	16776.9	3897.83	355844
386	3167.76	618.84	4696.72	879.17	209.07	6.59	1.69	2.16	6.66e-05	0.00089	0.00825	2.28
	1.19	7.39	109.81	487.84	538.04	954.45	4291.64	157.27	1965	18145.5	5154.64	446206
387	4923.37	439.58	7105.26	714.35	220.4	8.08	0.63	0.89	6.18e-05	0.0004	0.00445	2.92
	1.69	13.21	170.76	251.83	496.1	828.31	3831.18	136.68	825	17765.2	5405.85	428717
388	2089.89	832.44	2949.11	1298.36	232.68	6.19	0.56	0.71	5.24e-05	0.00053	0.0023	2.37
	1.77	6.1	166.09	473.1	780.24	586.02	3155.46	190.58	979	12983.8	4638.56	350281
389	3114.47	760.06	4962.67	1104.89	147.48	6.37	1.04	1.28	1.76e-05	0.00086	0.00277	2.24
	1.23	9.23	243.05	331.44	982.53	617.72	3316.45	126.2	1612	9616.26	4493.97	495497
390	2187.45	569.19	3036.69	1119.19	187.09	9.24	1.46	2.12	1.86e-05	0.00039	0.00105	1.83
	1.09	7.38	166.2	299.14	503.48	716.49	5944.58	163.83	1850	8808.87	7475.51	275697
391	2717.98	787.64	3869.73	1420.65	221.17	8.74	1.2	1.74	5.58e-05	0.00056	0.00435	1.58
	1.06	8.7	123.8	578.68	325.25	248.69	5450.93	148.53	1375	12395.2	6138.33	366797
392	3231.09	622.37	4771.59	1074.47	251.55	6.94	0.82	1	2.03e-05	0.00013	0.00082	2.45
	1.37	12.87	245.99	260.95	955.55	433.57	4251.08	153.43	585	16963.9	6365.5	258005
393	2766.77	708.74	3817.99	977.48	282.45	8.74	1.88	2.68	3.6e-06	0.00103	0.0087	2.56
	1.91	13.87	148.34	305.72	508.17	778.93	4710.93	180.31	637	14048.2	5959.38	405271
394	2877.93	403.61	4046.85	613.48	271.99	7.52	1.07	1.33	9.8e-05	0.00073	0.00605	1.09
	0.59	6.15	136.45	884.86	582.08	936.6	4231.94	174.3	718	10936.3	5112.35	534048
395	3682.49	783.9	5372.8	1361.5	189.95	5.45	0.81	1.15	4.38e-05	0.00029	0.00267	2.01
	0.95	10.3	170.11	843.71	887.55	362.93	5913.74	195.05	2433	7425.45	7765.29	470855
396	2095.73	729.02	3070.1	1318.99	263.31	6.61	1.75	2.53	2e-05	0.00076	0.00797	2.63
	1.54	7.33	110.76	480.87	255.87	871.81	7530.52	193.89	1432	12386.9	8391.58	498149
397	3303.97	910.83	4755.58	1477.48	147.52	8.73	0.64	0.79	6.12e-05	0.00038	0.00304	1.44
	0.96	5.4	207.72	657.4	1239.4	881.11	7976.29	120.32	1093	18140	11256.5	257198
398	3177.08	250.42	5054.29	489.82	121.82	5.63	1.65	2.03	7.75e-05	0.00078	0.00263	2.1
	1.02	6.72	73.32	577.94	380.28	645.24	5988.64	142.06	2778	11595.3	6801.4	280837
399	2134.84	296.06	2926.06	582.59	277.88	9.73	1.62	2.13	2.15e-05	0.00094	0.0088	1.05
	0.6	9	109.87	917.51	369.9	272.59	3822.37	167.96	1284	17040.1	4692.42	382801
400	3598.94	629.36	4599.97	888.07	122.42	8.72	1.89	2.62	9.96e-05	0.00071	0.00542	2.86
	1.77	12.43	219.84	579.71	652.28	484.33	5776.31	137.01	1244	13098.8	8451.83	452983
401	2570.96	548.82	4086.68	812.87	182.48	9.69	1.59	2.25	2.7e-06	0.00098	0.00842	1.02
	0.48	13	189.2	898.16	762.42	960.55	4500.78	128.13	1327	17480.6	5151.97	393220
402	2918.78	822.9	3677.25	1465.02	298.99	8.72	1.49	2.15	1.06e-05	0.00102	0.00486	1.56
	0.93	5.75	217.44	356.02	739.13	617.46	7343.77	145.93	427	7488.45	9136.73	345860
403	3070.83	692.51	4645.15	1206.33	155.55	7.83	1.17	1.46	9.05e-05	0.00029	0.00265	1.88
	1.33	12.9	209.09	388.15	610.37	440.53	6560.81	182.23	814	10679.3	8987.83	312432
404	3673.46	720.08	4934.94	1051.58	137.3	7.42	1.89	2.58	9.52e-05	0.00061	0.0048	1.44
	1.07	10.95	126.14	938.39	383.78	232.62	4545.08	153.45	1004	9411.33	5071.16	488981
405	2187.71	530.93	2855.72	816.93	203.38	6.67	1.63	2.22	2.43e-05	0.00018	0.00075	1.1
	0.6	8.21	135.55	486.39	297.48	750.32	5081.07	144.6	222	10259.2	7567.79	295627
406	3831.23	901.79	6048.83	1754.59	246.52	6.95	1.77	2.14	1.84e-05	0.00058	0.00247	1.02
	0.54	5.36	243.19	636.29	1255.03	580.87	5172.33	181.39	2178	11222.1	7250.14	310781
407	3718.8	571.51	5185.28	897.79	173.81	9.87	0.92	1.29	5.31e-05	0.00058	0.00156	1.58
	1.12	8.6	197.63	227.84	773.66	720.23	3493.04	136.52	1730	10255.3	4579.48	320455
408	3181.52	891.34	4999.52	1681.27	193.8	9.99	0.62	0.91	4.3e-05	0.00083	0.00968	2.54
	1.98	12.6	74.21	843.42	174.17	787.93	3856.02	190.99	1427	8383.61	5221.62	474092
409	3133.02	584.89	4246.51	914.32	160.61	8.04	0.75	1	8.16e-05	0.00023	0.00133	2.49
	1.72	7.86	188.33	721.24	1089.41	514.04	5908.93	193.7	458	11583	7364.14	393007
410	4129.27	789.73	5905.31	1386.71	233.36	9.83	1.37	1.86	7.9e-05	0.00036	0.00358	2.39
	1.52	5.42	101.04	563.86	272.09	815.12	3935.84	146.29	839	11226.6	5334.24	269456
411	2236.78	606.17	2888.98	1100.4	128.68	9.97	1.46	1.83	6.82e-05	0.00034	0.0017	2.02
	1.48	7.77	112.47	752.5	505.45	568.5	6473.6	129.54	2783	16731.4	9165.7	296727
412	3256.22	928.56	5184.34	1825.31	180.54	9.82	0.7	0.95	7.98e-05	0.00072	0.00549	1.75
	1.14	7.62	72.76	943.82	257.07	499.11	5465.5	131.31	2602	13726.5	7413.24	230264

413	4332.53	231.39	6334.36	340.66	216.31	6.84	0.98	1.29	2.3e-06	0.00022	0.0012	1.04
	0.65	8.03	118.6	661.4	375.93	882.6	5072.21	156.16	830	13122.3	5858.86	435392
414	2714.95	697.11	3725.29	1148.85	296.69	6.39	1.75	2.31	8.45e-05	0.00076	0.00504	2.94
	1.98	8.63	134.86	384.36	688.21	686.3	4972.06	134.25	2046	14424.8	6052.86	464942
415	2884.5	830.93	4128.01	1391.09	279.89	6.99	1.17	1.66	9.9e-05	0.00053	0.00234	1.35
	0.82	8.31	141.35	404.29	551.25	423.25	6277.82	173.73	1887	8850.29	8154.28	262989
416	2609.59	376.44	3737.94	684.67	161.94	8.17	1.32	1.92	3.7e-06	0.00012	0.00114	1.39
	0.84	12.47	151.49	257.3	697.83	325.73	5593.22	185.23	697	12892.4	6946.45	212434
417	4408.67	528.28	6863.98	887.21	121.48	5.55	1.95	2.43	7.9e-05	0.00083	0.00242	0.96
	0.48	6	75.17	958.2	324.77	504.74	5460.45	152.46	971	14578.3	6160.4	461051
418	3389.06	598.28	4787.08	821.04	130.72	6.06	0.9	1.1	1.83e-05	0.00061	0.00239	2.22
	1.75	5.1	95.76	879.74	511.82	639.28	3364.82	133.37	152	9834.77	4555	228468
419	4397.88	635.83	5993.86	984.79	221.78	5.22	1.54	2.13	3.69e-05	0.0006	0.00247	1.35
	0.69	8.08	215.23	292.89	458.11	593.17	6472.18	190.67	896	11217.4	8670.32	479641
420	3089.01	704.17	4588.65	980.11	263.44	9.32	0.96	1.25	2.69e-05	0.00073	0.00338	1.36
	0.87	12.62	63.9	290.21	141.05	882.99	3870.86	134.91	520	10296.2	5152.49	312492
421	4499.81	671.94	5634.61	860.08	108.35	5.35	0.87	1.21	4.75e-05	0.00041	0.00192	2.17
	1.49	10.72	161.43	920.42	608.46	626.25	4783.39	183.85	2296	11095.8	6611.53	274705
422	4664.84	523.76	6183.78	902.37	294.82	8.92	1.22	1.82	9.46e-05	0.00034	0.00169	2.28
	1.11	5.77	249.2	234.47	1056.74	477.75	7319.97	147.05	359	10744	9891.1	422235
423	2092.38	856.33	3333.21	1227.71	213.57	6.71	1.83	2.39	6.47e-05	0.00047	0.00131	1.7
	1.29	6.29	205.07	523.43	465.88	285.02	7035	196.14	2163	11398.9	9857.42	421193
424	2297.2	270.65	3365.7	479.73	164.6	9.63	1.63	2.04	4.36e-05	0.00048	0.00355	2.67
	1.09	11.68	218.14	506.61	453.89	906.13	3156.28	188.99	1024	10359.5	4607.22	349878
425	2873.9	336.36	3895.83	667.67	231.37	6.41	1.4	2.05	8.35e-05	0.00011	0.00132	2.45
	1.02	11.34	105.58	621.18	576.08	330.49	5411.79	191.23	939	15858.7	7628.59	439962
426	3141.61	260.14	4265.26	317.46	166.79	6.59	1.88	2.43	8.16e-05	0.00104	0.00347	2.02
	1.45	11.6	164.29	201.97	552.58	814.97	6705.05	184.45	2304	11738.3	7632.63	471979
427	4311.65	543.86	6076.94	987.34	171.17	9.89	0.72	1.03	7.25e-05	0.00108	0.00744	2.93
	2.1	8.46	63.06	392.74	208.97	308.52	5205.14	164	2113	15892.4	7301.91	336712
428	2108.86	449.6	3218.24	778.56	295.93	5.09	1.65	2.2	8.79e-05	0.00058	0.00507	2.1
	1.09	9.38	72	416.18	424.96	990.85	6799.3	180.52	2596	15827.3	8612.52	234558
429	2669.69	935.55	3486.52	1643.83	228.66	6.21	1.65	2.21	3.37e-05	0.00077	0.00235	1.56
	1.15	12.05	209.43	568.12	861.52	383.8	7629.78	123.75	2762	14270.7	9183.61	419050
430	4314.46	765.99	5528.34	1392	132.53	9.9	1.04	1.38	1.09e-05	0.00095	0.00926	1.94
	1.19	9.32	170.58	970.63	422.51	475.41	3261.7	179.88	331	8145.1	4186.5	391984
431	4645.22	240.57	7203.87	368.99	154.38	8.71	0.79	1.03	1.42e-05	0.00081	0.00351	1.73
	0.89	7.09	221.7	217.29	716.95	758.52	4130.11	136.73	315	8373.34	5090.27	413791
432	4673.31	677.81	7153.32	948.98	181.07	9.17	1.76	2.48	3.59e-05	0.00088	0.00266	1.35
	1.05	7.1	110.75	611.9	488.64	575.72	4648.56	133.56	420	14407	5559.68	308366
433	2820.28	310.65	3492.02	517.6	228.09	5.97	1.18	1.68	7.63e-05	0.00084	0.00422	2.72
	2.07	13.47	124.44	707.2	338.51	494.58	4362.07	179.14	817	10242.6	6018.46	272957
434	4195.37	788.94	5100.12	1058.1	163.52	6.44	0.57	0.78	4.93e-05	0.00024	0.00189	2.84
	1.97	8.5	228.99	355.79	777.66	288.56	4630.9	147.34	1485	9067.48	6900.66	357808
435	2700.16	815.25	4082.04	1412.1	252.68	8.24	0.63	0.81	1.93e-05	0.0007	0.00258	2
	0.89	12.15	169.26	210.58	720.28	359	3782.37	163.71	949	8727.89	4693.39	215622
436	3418.57	996.53	4991.79	1540.95	275.87	8.13	0.68	0.88	1.52e-05	0.00097	0.00552	2.39
	1.59	10.94	152.51	664.66	884.48	983.97	7015.67	197.13	1840	8452.81	9454.18	459807
437	2205.22	453.08	3526.88	551.91	110.65	5.83	0.52	0.66	3.35e-05	0.00066	0.00724	2.69
	1.41	10.66	135.05	981.82	271.82	209.65	7827.51	154	3287	16392.7	10846	462958
438	2334.06	989.75	3303.17	1453.85	272.47	8.49	1.72	2.09	7.54e-05	0.00025	0.003	1.9
	1.31	8.98	51.22	232.79	179.07	349.55	6078.44	161.33	1197	12961.4	8099.23	256997
439	4730.77	302.35	7293.87	447.64	204.13	5.25	0.66	0.89	9.27e-05	0.00051	0.00125	2.92
	2.21	6.8	235.21	458.37	1364.82	451.64	3540.81	120.42	420	12815.4	4686.77	310015
440	2197.2	670.37	3497.33	927.94	150.28	7.23	0.64	0.79	5.9e-06	0.00028	0.00258	2.92
	1.55	5.99	51.12	758.79	194.9	252	4728.95	182.46	361	13602.6	6694.19	376494
441	2586.55	286.95	3599.82	389.58	231.03	8.75	1.61	2.28	4e-06	0.00061	0.00635	2.54
	1.47	13.93	202.18	330.87	702.99	503.18	3346.33	139.47	1319	9212.65	4464.48	413576
442	4490.46	405.32	7014.1	753.21	103.93	5.67	0.7	0.98	8.37e-05	0.00078	0.00741	1.2
	0.64	13.35	211.28	474.24	924.48	405.22	3261.23	190.16	1247	14435.2	3897.53	233352
443	2524.56	981.15	3323.38	1795	205.49	7.38	1.85	2.39	5.05e-05	0.00023	0.00108	2.46
	1.96	11.4	208.29	423.42	1047.48	334.87	6606.01	178.52	1150	13536.8	8142.76	462408
444	4994.68	683.39	7544.2	1184.24	103.37	7.38	1.9	2.78	5.16e-05	0.00044	0.00468	2.34
	1.77	10.39	176.93	217.98	734.84	711.72	7524.97	162.44	3303	16420	10335.7	468713
445	3295.94	736.54	4267.51	1109.05	146.21	9.97	0.91	1.19	7.84e-05	0.00033	0.00152	1.24
	0.95	12.76	125.36	633.4	320.56	428.28	3026.31	163.93	827	10384.4	4475.98	252593
446	4357.66	774.36	5987.44	1515.1	230.35	6.82	1.95	2.75	6.2e-05	0.00099	0.00335	2.07
	0.93	5.08	187.47	802.35	545.12	914.28	3620.83	187.15	159	14114.4	5020.69	402341
447	4483.05	295.32	5700.14	480.63	143.36	9.69	1.85	2.44	6e-06	0.00016	0.00136	2.86
	1.55	13.33	161.29	447.9	364.14	799.48	3225.4	124.39	288	13298.7	4590.7	229665
448	4777.28	328.84	6109.5	395.38	288.8	9.34	1.45	2.02	7.61e-05	0.00103	0.00239	2.27
	1.07	8.15	184.24	886.24	1041.27	902.39	4104.52	126.26	1567	10565	4691.59	400787
449	3360.35	466.93	4575.91	873.41	159.25	6.51	1.94	2.39	0.0001008	0.00061	0.00305	1.69
	0.72	10.28	62.2	827.78	143.95	271.28	7071.38	134.55	1560	12102.2	10215	308459
450	2998.85	222.99	4526.35	283.66	200.47	8.49	1.75	2.18	9.14e-05	0.00035	0.00385	2.84
	1.73	13.28	144.14	316.34	702.95	667.93	4554.98	168.96	1135	12547.5	6571.63	433004
451	4591.73	278.15	6834.14	555.09	273.52	9.58	1.7	2.1	7.81e-05	0.00015	0.00152	1.03
	0.64	11.89	211.86	660.99	925.76	855.21	7515.56	191.67	655	13035.9	8851.54	420116
452	3087.1	814.49	4561.46	1395.93	223.56	5.14	1.95	2.45	7.05e-05	0.001	0.00628	1
	0.62	7.25	53.63	479.67	281.21	273.57	4066.13	142.67	1915	15718	4649.93	479173
453	4411.76	331.97	6586.83	404.25	283.31	5.72	1.35	2	0.0001007	0.00017	0.00095	2.11
	0.94	7.32	98.19	800.83	530.47	948.8	4488.08	139.14	2135	9785.39	5974.43	300061
454	4599.68	439.9	6241.73	830.44	104.07	6.86	1.23	1.79	4.46e-05	0.00085	0.0045	1.41
	1.02	7.98	103.5	729.64	305.11	348.42	7502.67	133.06	1553	12855.7	9411.38	255589
455	2894.65	318.26	4514.69	465.52	210	9.2	1.97	2.71	6.3e-06	0.00102	0.00551	1.97
	1.23	13.62	162.81	356.95	748.57	361.51	6775.71	152.51	2393	9755.24	7645.66	372429
456	4327.1	845.8	6647.28	1226.11	291.03	9.13	1.41	1.92	4.22e-05	0.00018	0.00171	0.95
	0.68	9.11	233.68	767.11	1148.06	357.71	6017.16	183.29	1364	8576.47	7589.45	443672
457	3473.05	855.61	5068.24	1380.49	101.96	5.08	1.32	1.71	1.63e-05	0.00088	0.00855	1.9
	1.21	10.55	163.71	971.06	637.59	998.98	3605.26	178.55	1574	17789.7	5018.4	305091
458	3563.3	418.99	5632.75	711.49	185.26	9.6	1.91	2.48	9.81e-05	0.00052	0.00173	2.39
	1.76	9.69	125.49	273.69	598.68	993.65	3934.76	160.57	27	11459.1	4878.09	459667
459	3377.94	956.02	4178.71	1806.07	166.65	8.84	0.74	0.92	7.18e-05	0.0003	0.00175	2.68
	1.91	10.32	153.76	263.43	555.96	332.82	6739.65	131.02	1796	18054.7	9639.24	304603
460	3506.43	426.93	4567.69	589.85	251.71	6.89	1.55	2.32	1.73e-05	0.00036	0.0032	1.62
	0.96	12.73	163.62	225.35	619.92	317.91	3869.13	140.21	78	9955.79	5486.07	468535

461	4313.68	440.77	6582.3	669.81	288.55	7.19	1.23	1.65	8.22e-05	0.00012	0.0011	1.93
	1.27	7.86	166.14	455.15	751.39	619.15	6414.64	126.05	474	16339.4	7841.93	409046
462	3703.5	460.04	5248.69	653.67	261.06	5.41	0.88	1.24	0.0001008	0.00065	0.00542	1.87
	1.35	7.37	181.53	251.25	453.26	844.01	5303.87	123.12	1693	17108.8	7561.67	437892
463	4661.74	510.34	6821.08	853.11	180.78	7.35	1	1.35	5.8e-06	0.00096	0.00327	2.39
	1	11.79	108.26	822.12	648.03	902.95	3991.79	145.29	734	8481.96	5896.41	399237
464	3786.34	499.38	5522.25	717.24	265.56	6.09	1.82	2.45	3.19e-05	0.00059	0.00256	2.65
	1.09	10.74	224.61	785.67	1015.14	323.91	4152.39	139.37	1895	12403.1	5231.15	236795
465	2117.23	780.03	3166.94	1451.24	161.74	9.24	1.45	2.06	2.27e-05	0.00064	0.00597	1.34
	0.74	9.4	153.68	738.08	519.37	675.28	4838.52	187.42	1183	13251.5	6257.93	258478
466	3979.81	479.24	6040.79	952.37	216.8	7.98	1.94	2.88	8.03e-05	0.00035	0.00321	2
	1.07	9.05	149.16	449.73	313.55	854.4	3655.25	192.24	787	15444.2	4709.7	413977
467	3169.28	319.7	4387.97	542.84	134.44	9.37	1.47	1.97	7.4e-05	0.00082	0.00427	2.59
	1.87	11.49	185.39	398.91	782.85	720.63	6688.58	171.65	2949	17440.7	8519.01	382089
468	4087.21	884.43	5259.16	1173.18	155.22	6.99	1.29	1.91	1.9e-05	0.00052	0.00427	2.16
	1.07	8.19	186.02	462.29	397.45	711.96	6571.73	124.3	487	11753.4	7443.07	405668
469	3566.75	547.11	4793.64	839.64	224.53	9.12	0.68	0.84	6.35e-05	0.00066	0.00351	2.75
	1.35	5.74	201.53	566.22	540.34	894.15	7687.05	149.16	1512	17276	9098.25	562365
470	4750.52	879.13	6041.15	1708.38	138.59	5.02	1.06	1.53	8.45e-05	0.00012	0.00104	1.63
	0.89	12.75	234.24	596.12	819.99	733.49	5579.18	172.95	1675	16170.8	7888.28	359681
471	4805.88	485.21	7174.81	861.6	240.01	6.92	1.17	1.62	8.91e-05	0.00027	0.00099	2.48
	1.64	9.9	56.62	918.45	223.35	895.78	5939.26	179.45	1388	13309.2	6555.42	271049
472	2509.47	387.85	3293.41	697.58	195.84	8.01	1.19	1.7	6.17e-05	0.00045	0.00484	1.86
	1.48	9.69	203.63	364.36	643.97	526.01	6771.31	192.44	1840	10529.9	7941.84	318009
473	3316.7	640.61	5056.66	1153.61	274.14	5.84	1.48	2.03	4.45e-05	0.00103	0.00577	1.82
	1.42	12.48	131.12	250.56	458.63	998.09	3532.94	176.64	492	13009.3	4265.08	293261
474	2670.59	516.6	4223.05	643.22	140.61	9.67	0.63	0.91	7.9e-06	0.0006	0.00528	2.99
	2.14	12.44	165.3	238.2	847.29	494.15	6060.56	196.45	1659	15111.4	9081.5	411415
475	4345.38	215.23	6269.52	263.96	227.72	6.55	1.59	2.14	6.15e-05	0.00039	0.00247	2.36
	1.75	12.68	191.79	437.64	502.6	632.08	3206.24	148.72	1092	13853.3	4199.22	386614
476	2771.25	923.22	3521.45	1478.99	152.57	7.21	0.64	0.79	6.31e-05	0.00035	0.00409	2.3
	1.58	13.09	204.46	224.96	578.9	859.12	6061.69	125.88	1662	14116.9	8953.7	398802
477	3386.74	929.78	5413.9	1405.97	201.14	9.71	1.35	1.67	9.53e-05	0.001	0.00225	1.77
	1.25	7.6	180.64	918.17	1077.39	399.1	6685.92	179.27	674	17731.3	7694.03	471324
478	4885.19	626.21	6614.95	912.23	105.44	6.83	1.91	2.5	9.57e-05	0.00067	0.00361	1.92
	1.36	11.26	111.51	365.98	494.44	630.79	5070.83	184.42	264	10360.9	5851.51	429080
479	3931.55	967.37	5809.71	1910.76	187.21	7.34	1.74	2.33	8e-06	0.00096	0.00932	2.49
	1.15	13.83	249.43	640.79	1385.61	422.41	5965.07	122.21	335	7891.68	7881.51	453661
480	3203.24	356.49	4825.3	453.7	224.46	6.9	1.66	2.36	6.88e-05	0.00088	0.00206	1.41
	1.07	8.79	61.27	576.25	306.08	690.89	5975.98	139.63	1515	8913.91	7178.19	381853
481	4169.34	817.47	5205.27	1299.9	238.41	9.72	0.75	1.02	7.2e-05	0.00036	0.00308	2.72
	1.3	6.74	57.88	786.08	119.12	278.38	3250.8	170.08	664	7726.07	3720.57	406837
482	3596.8	898.53	4864	1507.98	286.25	5.3	0.68	0.92	4.59e-05	0.00088	0.00532	1.92
	1.37	13.21	157.25	649.57	896.2	551.49	4978.61	145.46	1000	12172.2	5842.08	547064
483	2661.33	764.79	3400.54	1324.98	101.17	8.58	1.18	1.54	2.33e-05	0.00082	0.00924	1.99
	1.5	13.14	107.47	364.77	608.9	861.63	5123.96	159.62	2351	8548.77	6020.19	342346
484	2000.85	212.33	2489.11	327.7	112.34	7.76	1.91	2.82	9.55e-05	0.0009	0.0027	1.3
	0.69	10.38	96.28	371.31	343.02	862.91	6366.06	122.46	567	15939.9	9395.55	284766
485	2501.63	215.94	3998.85	290.82	248.13	8.8	1.5	2.11	7.03e-05	0.00016	0.00153	1.76
	1.25	11.72	95.99	562.42	325.61	501.13	6625.21	158.35	1783	9589.3	8383.39	480025
486	4577.78	998.7	7219.96	1535.27	136.31	8.84	1.13	1.37	9.22e-05	0.00079	0.00232	2.8
	1.75	13.45	114.49	440.79	678.15	394.45	5572.81	169.33	1693	7306.09	7386.04	431577
487	2110.2	311.35	3002.65	590	289.81	7.93	1.3	1.69	4.57e-05	0.00109	0.00415	0.99
	0.41	7.35	167.43	226.77	586.66	672.85	6328.44	189.71	2449	16823.3	7698.18	336062
488	2710.76	366.36	3941.39	497.64	227.47	6.9	0.67	0.98	7.56e-05	0.00033	0.00193	1.45
	0.81	10.81	173.52	866.45	906.85	876.98	3393.02	199.97	1307	14782.5	3964.63	290831
489	3927.02	790.54	5497.71	1312.35	167.53	8	0.65	0.96	7.59e-05	0.00098	0.00521	2.97
	1.92	5.31	156.26	397.05	545.28	347.58	6299.73	176.75	2238	9479.86	7228.19	452061
490	3365.47	263.31	4971.53	456.71	266.9	6.03	1.96	2.39	4.09e-05	0.0009	0.00769	2.11
	1.52	7.38	238.98	787.74	736.63	648.28	7808.98	126.79	3151	12006.1	10858.8	480871
491	3523.62	506.15	4884.46	889.82	196.09	7.04	1.5	1.94	9.83e-05	0.00098	0.00471	1.72
	1.23	6.03	190.3	710.9	570.2	929.1	6852.29	145.04	860	12444.7	8589.76	309006
492	4061.19	491.49	6223.32	971.79	109.42	9.23	1.7	2.28	5e-06	0.00065	0.0063	2.35
	1.75	6.82	70.4	299.31	197.04	691.62	5397.58	149.01	379	16347.3	7902.25	344161
493	4885.93	940.53	7797.47	1444.96	269.1	8.97	0.79	1.11	7.68e-05	0.00014	0.00126	0.98
	0.54	7.91	237.67	737.03	1067.65	873.65	6761.17	190.57	552	14067	7741.88	351472
494	3767.07	430.24	5990.46	772.67	154.26	8.7	1.81	2.71	7.45e-05	0.00067	0.00595	2.23
	1.24	6.61	181.22	735.79	390.91	417.28	3323.26	132.56	735	8975.86	4608.41	408490
495	2492.96	836.62	3942.39	1595.81	239.47	5.6	0.54	0.64	9.62e-05	0.00065	0.00529	2.15
	1.42	7.35	134	905.06	635.77	404.65	5852.07	179.23	528	9517.77	6857.4	325808
496	3171.41	509.15	4578.95	986.06	177.07	8.3	1.02	1.44	8.98e-05	0.00041	0.00442	2.81
	1.94	13.76	77.13	714.71	297.7	431.66	4168.73	190.38	1828	13663.8	5337.1	383635
497	2121.03	540.26	2880.21	670.89	111.53	9.49	1.25	1.67	6.51e-05	0.0004	0.00262	1.93
	1.4	9.05	126.08	441.39	668.22	872.87	3577.61	156.17	1149	16898	4154.61	239270
498	4912.59	868.59	6522.18	1656.73	120.61	9.06	1.91	2.38	1.29e-05	0.00028	0.00261	2.37
	0.98	10.25	100.52	564.2	371.74	597.09	3457.66	197.57	606	7557.61	3847.54	442728
499	4192.74	792.57	5549.3	1516.44	140.73	5.26	1.49	2.02	6.77e-05	0.00036	0.00313	2.77
	1.63	7.55	246.9	821.48	576.69	966.93	5540.19	199.14	1233	17883.2	7541.15	339491
500	3807.68	653.23	5429.78	1005.02	162.3	6.47	1.87	2.78	7.85e-05	0.00059	0.00445	2.07
	1.01	12.26	99.97	797.71	524.82	348.06	6265.8	120.09	2299	14752.7	8182.94	448666
501	3207.3	282.38	3906.24	419.3	144.44	6.13	1.24	1.66	4.55e-05	0.00043	0.00177	2.95
	1.78	6.95	176.16	884.63	600.47	596.32	5156.78	122.84	1741	14604.2	7240.33	298707
502	4093.3	786.25	5469.2	1308.9	280.96	6.48	0.66	0.93	1.5e-06	0.00076	0.00567	1.19
	0.68	9.63	197.66	545.69	479.42	786.64	3974.86	154.12	1940	7953.5	4662.86	499613
503	4948.37	998.48	6973.8	1627.87	283.96	8.17	1.24	1.56	5.89e-05	0.0005	0.00359	2.32
	1.73	5.61	87.4	448.87	430.34	276.43	4467.12	189.4	546	14120.7	6603.31	572196
504	2855.07	510.93	3830.87	973.98	195.31	6.37	1.84	2.72	5.78e-05	0.00019	0.00151	1.07
	0.68	13	122.27	802.54	337.03	847.29	7584.47	155.39	1195	13572.9	10594.4	465625
505	3380.23	509.25	5103.6	948.02	106.46	9.77	1.23	1.7	3.96e-05	0.00054	0.00231	2.33
	1.06	5.14	110.14	339.61	563.25	978.1	4968.74	129.68	2006	14299.3	6769.15	262860
506	2848.09	693.91	4317.71	1213.67	110.14	8.41	1.26	1.77	7.29e-05	0.00047	0.00551	2.98
	1.32	8.78	141.48	423.04	283.54	922.5	5595.81	184.95	67	16332.8	6953.92	437502
507	4163.92	274.47	5101.76	367.09	218.01	6.77	1.53	1.86	2.79e-05	0.00089	0.00777	2.53
	1.09	7.45	134.85	268.39	696.4	935.96	3278.57	121.83	73	15589.2	4131.09	531433
508	3862.88	735.04	4811.06	1277.19	233.84	5.95	1.25	1.61	4.53e-05	0.00016	0.00072	1.97
	1	5	192.22	932.58	424.87	661.29	7619.03	173.28	774	12723.3	8551.19	470219

509	2019.11	868.99	2631.76	1596.11	237.62	6.31	1.52	2.21	9.43e-05	0.00085	0.0065	1.15
	0.58	13.9	52.9	964.47	211.4	569.07	6361.72	124.89	2263	10231.5	7189.63	411063
510	3901.36	582.54	5414.74	732.99	122.17	7.54	1.28	1.9	5.9e-06	0.0007	0.00508	2.91
	1.26	6.86	181.29	567.36	747.98	900.17	3553.02	184.19	538	9793.5	4439.01	285198
511	2178.78	396.38	2751.36	716.03	146.17	9.01	1.01	1.44	1.07e-05	0.00094	0.00221	1.75
	0.87	11.2	73.85	382.94	367.22	286.37	5969.86	129.87	1983	13404.5	6898.29	256222
512	4097.29	351.74	5091.07	516.36	189.5	7.72	1.48	2.19	3.96e-05	0.00032	0.00181	1.08
	0.65	9.03	50.39	634.3	209.26	462.75	6803.16	165.57	2968	10326.6	8413.43	468106
513	2127.17	848.11	2960.62	1042.66	112.56	8.56	2	2.53	1.46e-05	0.00093	0.00224	1.68
	1.22	8.16	150.25	615.3	530.67	492.07	5525.89	120.24	2525	15711.7	7307.91	270384
514	4672.19	781.55	6895.3	1372.97	218.27	8.59	1.02	1.53	9.71e-05	0.00041	0.00103	1.91
	0.94	5.19	137.09	398.14	665.02	251.31	4319.61	128.98	1823	14594.8	5962.44	321940
515	2652.37	706.21	3754.41	1161.89	202.08	7.86	1.63	1.96	3.43e-05	0.00109	0.00397	1.51
	1.15	11.03	92.68	466.3	279.53	328.34	3854.82	194.7	1614	8921.92	5049.81	470970
516	3912.5	231.69	4706.52	435.83	132.88	6.41	1.96	2.47	5.58e-05	0.00068	0.00561	1.37
	0.9	6.02	93.71	904.09	480.65	954.13	4627.91	149.71	2238	7974.15	6716.72	338817
517	4295.21	821.13	5322.54	1149.56	288.74	8.86	1.94	2.4	6.92e-05	0.00064	0.00358	1.39
	1.01	6	102.45	836.2	365.59	547.43	4819.11	158.05	1686	9600.36	5420.59	511317
518	2904.68	632.29	3897.89	1118.03	296.61	8.4	0.61	0.9	1.62e-05	0.0002	0.00233	2.83
	1.15	13.93	63.03	317.46	242.06	838.65	7247.36	130.21	271	13062.1	9638.75	420798
519	2471.49	580.98	3612.67	788.32	189.12	9.95	1.37	2.05	1.24e-05	0.00038	0.00123	2.27
	1.34	13.39	216.15	610.91	1245.82	394.65	6717.42	161.79	1644	12041	9718.79	211903
520	3159.34	539.65	4073.03	1029.66	104.58	7.63	1.67	2.07	1.51e-05	0.00044	0.00167	2.42
	1.83	8.48	221.24	246.02	491.28	704.13	5545.52	183.87	1874	12440.6	6996.31	308285
521	3792.5	205.72	5025.11	250.84	137.34	7.69	1.85	2.33	6.95e-05	0.00015	0.00143	2.29
	1.7	11.83	198.26	687.99	1047.09	976.95	5322.65	140.38	855	7895.4	7169.33	262501
522	2970.04	206.49	4713.87	374.23	151.29	7.04	1.84	2.65	9.77e-05	0.00021	0.00118	2.64
	1.91	11.85	231.35	482.56	680.78	783.16	7578.47	199.4	3678	11144.5	11049.6	318672
523	2439.78	258.32	3211.73	507.21	243.83	6.09	0.63	0.76	6.26e-05	0.00093	0.00503	2.2
	1.59	11.62	104.72	801.91	454.99	339.01	5824.13	131.12	1238	13702.1	7860.92	496205
524	3063.97	323.24	3958.95	427.82	104.23	5.29	1.55	2.12	2.65e-05	0.00103	0.00394	2.35
	1.72	10.41	68.37	347.42	337.82	263.93	7120.23	189.54	3494	12109.4	8368.16	333302
525	4379.14	505.73	6232.03	984.27	162.79	9.66	1.25	1.85	8.46e-05	0.00058	0.00178	2.96
	1.77	12.28	167.65	709.18	571.11	451.55	3143.51	136.77	1219	13400.4	4332.07	286654
526	3369.52	831.05	4725.66	1484.93	224.74	5.82	1.74	2.31	8.85e-05	0.00086	0.00703	2.1
	1.32	13.2	103.4	707.72	363.58	210.08	7906.77	141.33	1860	16954.8	11635.5	490179
527	2150.59	784.52	3389.3	946.51	161.22	5.73	1.73	2.38	7.88e-05	0.00088	0.00813	0.93
	0.44	9.61	158.87	537.14	900.25	680.51	3913.38	182.07	1947	11039.3	4856.33	411289
528	4999.27	367.38	6575.36	550.04	243.62	7.14	1.82	2.54	2.63e-05	0.0001	0.00115	2.25
	1.35	10.25	133.38	480.75	761.98	645.77	7883.02	138.97	892	15182.4	9870.73	282567
529	2384.43	527.66	3018.33	849.76	203.15	9.85	1.17	1.65	9.21e-05	0.0006	0.00363	1.98
	0.99	7.93	58.18	929.35	209.54	545.2	4444.3	134.1	713	10597.5	5894.68	337882
530	2028.26	609.88	2819.68	1032.37	166.49	6.79	0.82	1.11	7.71e-05	0.00055	0.00612	1.48
	1.05	7.49	213.26	506.08	1139.14	558.19	5994.57	147.92	1483	9017.5	7794.53	320498
531	3728.01	861.77	5827.28	1338.65	152.61	8.88	0.81	0.98	1.9e-05	0.00074	0.00536	2.62
	1.72	8	152.58	308.93	574	589.46	5855.01	131.45	1150	15035.1	7316.51	495872
532	2061.51	682.78	2921.07	1282.12	281.23	9.13	1.96	2.67	9.66e-05	0.00078	0.00753	2.18
	1.06	6.03	140.99	515.11	308.31	301.62	6703.94	128.03	1455	8403.29	8376.19	306785
533	2650.36	854.62	3646.36	1367.36	246.43	9.49	1.06	1.44	3.9e-05	0.00053	0.00217	2.46
	1.2	13.76	109.56	411.3	335.42	970.15	5604.43	180.38	1662	14791.4	7320.52	332334
534	3878.29	512.1	5259.59	796.3	156.79	5.8	1.95	2.37	2.41e-05	0.00017	0.00092	2.26
	1.46	12.61	237.41	788.74	588.71	511.54	7175.78	127.61	26	13927.4	7974.57	361983
535	3057.06	363.63	4669.69	656.65	236.46	7.56	0.82	1.23	1.49e-05	0.00105	0.00793	1.94
	1.26	11.35	104.12	635.7	214.93	608.52	3421.88	152.74	1497	9609.88	5066.75	425587
536	3401.74	974.44	5344.46	1611	111.71	6.26	1.48	1.99	7.37e-05	0.00039	0.00271	1.16
	0.57	7.73	202.39	274.07	520.62	574.86	5223.01	146.31	2221	15122.7	5853.01	284877
537	3570.96	728.76	4891.01	1276.42	124.49	7.69	1.5	2.23	6.14e-05	0.00106	0.00886	1.52
	0.62	10.45	139.65	600.79	476.18	392.46	5743.5	149.99	1123	8968.93	8564.27	410321
538	4894.66	944.2	6905.38	1518.79	247.36	6.18	1.73	2.3	6.01e-05	0.00034	0.00167	2.37
	1.11	8.34	138.8	884.09	385.54	305.6	4701.32	140.1	1528	9048.97	6374.35	419373
539	3140.09	921.46	3858.75	1543.63	100.47	9.89	0.86	1.04	4.42e-05	0.0008	0.00479	0.93
	0.68	7.18	133.21	340.36	539.48	409.7	4644.65	135.52	1624	8989.96	5237.91	288403
540	2750.9	538.13	3711.9	928.45	174.66	6.23	0.55	0.81	7.25e-05	0.00087	0.00953	2.61
	1.19	13.04	56.35	278.4	195.5	879.2	6386.22	134.75	524	18014.2	7675.66	450204
541	4228.08	684.09	5595.27	1045.21	136.23	6.03	1.77	2.37	5.41e-05	0.00029	0.00185	1.52
	0.86	7.11	86.39	555.65	379.11	202.71	5438.03	180.23	1605	7825.96	6237.87	269553
542	2152.95	547.6	2865.63	822.58	182.69	9.27	1.55	1.89	3.68e-05	0.00107	0.00962	2.3
	1.78	12.54	153.84	430.54	606.62	674.64	3097.08	186.43	1127	9102.3	4550.45	422785
543	4468.51	631.33	7021.39	1194.75	110.57	7.2	1.32	1.67	6.1e-06	0.00072	0.00244	2.34
	0.98	8.21	179.54	608.67	1024.15	996.67	6609.06	148.25	2550	14764.3	9563.23	226240
544	3002.99	852.73	3926.14	1511.73	179.24	7.51	1.95	2.6	9.73e-05	0.00059	0.00168	1.18
	0.65	5.36	84.11	536.35	318.8	675.63	3924.37	165.19	1035	11240.9	5715.46	424374
545	4733.79	846.85	6429.34	1308.89	244.67	5.98	1	1.4	1.16e-05	0.00022	0.001	2
	0.83	5.65	214.29	227.38	1169.4	611.64	5998.3	128.83	2788	8415.24	8094.4	413828
546	3000.1	437.26	3797.91	843.32	124.68	5.69	1.98	2.63	6.72e-05	0.00105	0.00244	1.39
	0.73	11.71	193.06	502.47	533.29	742.95	4035.75	122.58	219	12912.1	5264.89	454474
547	2252.43	541.01	3534.35	671.01	139.33	7.05	1.85	2.25	3.85e-05	0.00085	0.00493	2.31
	1.06	12.35	65.15	736.34	196.61	864.29	4420.86	140.8	1498	9330.28	5073.98	237517
548	4039.57	685.29	5616.16	837.91	297.69	5.31	1.49	1.95	2.66e-05	0.00033	0.00225	2.86
	2.25	7.58	107.56	811.16	259.82	368.86	7470.85	164.35	950	18134.2	9878.43	367260
549	3209.51	801.7	5042.13	1387.76	248.57	5	1.83	2.55	4.67e-05	0.00103	0.0036	1.42
	1.06	8.29	94.33	443.34	478.75	933.43	7926.65	141.51	115	12306.1	8988.4	478632
550	2535.8	313.41	3892.55	438.34	193.76	6.3	0.69	1	7.08e-05	0.00069	0.00553	1.11
	0.83	7.71	96.7	682.63	570.54	545.26	4107.7	179.22	1189	17646.2	4662.68	525844
551	4262.89	832.61	6520.5	1173.68	230.88	9.43	0.73	0.91	6.31e-05	0.00067	0.00145	1.26
	0.83	10.7	189.54	451.66	741.61	238.53	3292.76	175.72	1619	16055.5	3958.72	240928
552	4525.76	870.59	5976.57	1349.38	138.69	9.15	1.48	1.87	5.4e-05	0.00043	0.00499	1.09
	0.67	8.97	83.98	214.33	187.77	244.33	6946.14	139.41	1112	18234.6	9680.07	518660
553	3947.51	313.73	6128.63	570.34	127.07	5.39	1.26	1.78	1.6e-05	0.00091	0.00942	2.75
	1.15	6.88	200.32	337.51	891.47	671.92	5813.92	179.18	1358	9711.05	7997.85	370819
554	3656.75	467.77	5491.52	809.44	281.55	6.21	1.72	2.17	7.46e-05	0.00092	0.01008	2.25
	1.09	6.63	200	351.33	1072.77	673.57	3088.68	128.44	1458	17553.2	4298.08	474309
555	3055.16	556.58	4579.08	1107.91	171.84	6.34	0.75	0.95	6.8e-05	0.00073	0.00795	2.29
	1.62	11.88	238.49	959.98	816.52	524.65	6160.87	134.14	2242	9988.62	8471.04	371091
556	3269.76	993.93	3978.5	1719.33	132.77	7.92	1.68	2.17	4.22e-05	0.00101	0.00795	1.3
	0.55	6.01	114.53	476.9	364.08	438.21	3199.18	123.92	1258	9074.86	4629.68	375658

557	2298.6	418.47	3324.39	586.37	190.07	5.4	0.58	0.77	4.83e-05	0.00069	0.00577	2.02
	1.32	7.2	54.6	235	207.3	992.35	5375.57	156.59	2225	15541.5	7607	327994
558	3821.52	473.82	5525.63	654.77	231.41	9.09	1.01	1.3	9.89e-05	0.00064	0.00132	2.32
	1.7	13.81	156.88	576.82	659.07	822.11	7397.69	159.16	3452	13202.6	9337.14	476147
559	3696.14	499.75	5169.18	765.87	198.38	8.61	1.05	1.52	8.53e-05	0.00041	0.00255	1.72
	1.26	12.25	171.79	882.72	410.88	997.32	3570.21	188.92	512	13226.9	4066.61	304419
560	3117.96	704.99	3781.14	1360.38	205.19	6.37	1.85	2.45	2.88e-05	0.00025	0.00122	2.59
	1.82	13.68	184.47	743.41	501.52	643.05	7635.8	187.24	3368	14988.5	9320.88	497205
561	4461.91	784.39	5597.32	1351.64	226.07	5.07	1.43	1.91	1.83e-05	0.00033	0.0038	2.19
	1.54	11.11	90.94	688.39	372.13	685.46	4695.15	195.13	37	10051.1	5979.25	291976
562	2526.32	837.63	3388.78	1101.61	296.05	6.36	0.77	1.01	9.39e-05	0.00068	0.00814	2.35
	1.39	7.71	80.71	489.45	387.23	828.89	3818.21	159.2	46	7418.81	4991.44	527079
563	2811.11	758.19	3537.22	1328.99	262.59	8.11	0.85	1.23	5.89e-05	0.00094	0.0037	1.34
	0.82	7.64	117.69	447.61	587.86	513.84	5322.01	129.9	2668	10136.6	7758.08	472933
564	3333.54	931.31	4302.72	1639.33	205.43	8.41	0.82	1.21	8.25e-05	0.00013	0.00074	2.16
	0.98	7.16	226.68	899.42	1107.54	243.09	5312.01	132.99	1081	9289.32	6756.9	384162
565	3942.71	568.88	4900.73	1035.2	236.64	6.68	1.63	2.05	3.35e-05	0.00014	0.00158	1.66
	1.05	8.43	200.45	776.98	1020.13	696.04	3690.23	132.75	32	16926.5	4361.23	362496
566	3543.2	919.5	5135.57	1509.95	192.91	7.91	1.9	2.77	6.82e-05	0.00101	0.00624	2.82
	1.44	8.38	204.04	474.47	915.51	987.71	4473.12	163.21	38	16499.9	6574.54	514053
567	2640.58	763.76	3684.53	1104.42	213.83	5.35	1.59	2.13	4.94e-05	0.0007	0.00231	1.06
	0.53	6.15	72.17	329.31	365.36	980.05	4691.96	171.03	1967	17475.2	6619.41	245156
568	4667.01	639.06	6159.1	875.69	120.93	8.27	1.73	2.21	5.38e-05	0.0007	0.00716	2.49
	1.78	5.12	191.44	303.93	807.67	694.71	5416.95	199.25	2451	8292.08	7578.44	488270
569	2172.94	360.97	2876.51	572.02	245.77	8.07	1.2	1.7	0.0001007	0.00067	0.00462	2.46
	1.02	11.09	127.25	950.53	670.34	761.05	3366.67	135.79	1281	11427.4	4149.57	282073
570	3519.02	732.55	5122.95	1335.11	217.72	5.6	0.81	0.98	1.02e-05	0.00042	0.00133	1.8
	1.3	10.79	60.54	580.1	149.74	902.5	7093.94	140.27	2159	12824.1	8133.6	466618
571	2611.1	340.4	3226.06	619.85	240.13	6.56	1.41	1.7	8.96e-05	0.00056	0.00237	2.37
	1.22	7.32	224.87	566.41	558.57	743.08	5210.6	187.9	1339	13997.5	6155.24	306741
572	4103.44	365.63	6124.61	566.97	165.63	5.94	1.81	2.56	4.94e-05	0.00036	0.00304	2.56
	1.15	11.93	151.38	824.58	639.08	569.63	3388.37	199.6	90	10160.7	3846.03	293111
573	4316.01	330.49	6885.77	480.9	125.03	7.4	0.61	0.83	4.41e-05	0.00033	0.00267	1.62
	1.1	5.91	87.99	891.32	324.4	771.38	4369.55	152.01	2010	10672.3	4812.03	399990
574	3081.72	662.87	4138.7	1058.83	250.99	8.14	0.69	1	5.62e-05	0.00037	0.00076	2.69
	1.52	8.67	210.23	949.2	1001.75	525.68	5653.78	183.55	1544	16095.7	7735.35	335521
575	2270.94	848.2	3521.5	1343.6	207.77	6.52	1.19	1.77	3.55e-05	0.00096	0.00518	2.2
	1.05	12.97	100.1	551.51	530.65	539.31	3909.89	126.48	363	14913.3	5531.28	284802
576	4850.49	664.08	7356.53	1257.59	242.63	5.38	1.52	1.89	3.61e-05	0.00106	0.00428	1.73
	1.33	10.96	147.44	835.59	683.02	230.35	3120.74	178.95	320	10849.2	3681.47	495027
577	3322.39	429.99	5296.48	817.7	237.57	8.65	1.78	2.19	3.9e-05	0.00035	0.00186	2.04
	1.59	9.69	201.3	771.34	1015.08	682.49	5507.29	156.73	2766	14697.3	6725.64	491556
578	3131.34	725.23	3987.56	1236.23	180.22	8.18	0.77	1.1	3.51e-05	0.00059	0.00524	2.27
	0.95	5.82	227.38	983.56	952.1	509.24	5384.71	148.59	2115	17714.6	7531.35	559164
579	4584.48	808.28	6957.9	1084.79	179.72	6.84	1.29	1.78	8.51e-05	0.0002	0.00136	1.86
	1.48	10.67	233.48	631.12	945.76	741.75	4663.24	196.44	2131	16850.8	5388.17	269032
580	4132.45	582.23	6588.66	708.39	141.27	5.88	1.21	1.57	3.25e-05	0.00024	0.0011	2.99
	1.42	7.5	235.36	748.32	766.81	699.31	3693.75	138.72	797	14663.6	4524.32	364771
581	3372.02	776.28	4593.69	1088.67	241.89	7.43	1.77	2.2	3.67e-05	0.0003	0.00232	0.94
	0.65	13.94	224.93	555.83	1189.43	854.5	4923.12	155.11	1238	12872.9	6482.94	401815
582	4640.49	536.79	7091.28	921.64	232.02	9.56	1.21	1.78	2.75e-05	0.00045	0.00451	1.4
	1.03	9.71	130.48	481.84	745.64	602.88	6334.16	178.64	1803	7616.25	8625.24	421253
583	2785.27	695.8	4393.1	1007.01	276.61	5.46	0.72	0.91	5.51e-05	0.00034	0.00388	2.23
	1.12	13.5	70.07	639.55	330.85	974.5	6165.13	143.26	2822	16377.2	8735.04	342753
584	3513.63	357.16	5324.54	709.29	107.52	6.99	0.79	1	4.13e-05	0.00051	0.00364	1.96
	0.95	7.07	160.75	279.08	490.11	429.9	6177.19	176.41	1943	14740.8	7975.31	433606
585	2077.2	633.57	2627.83	1174.4	201.32	8.12	1.78	2.33	6.04e-05	0.00087	0.00895	1.19
	0.81	12.63	208.23	287.68	733.77	799.73	4802.3	144.54	931	14266.1	7017.83	461790
586	3508.85	640.09	4237.1	1002.38	198.94	6.41	1.96	2.75	7.71e-05	0.0005	0.00481	2.84
	2.23	11.39	236.19	409.34	648.57	635.26	4175.45	131.11	1154	12300.3	5600.34	445205
587	4453.8	821.38	7118.94	1157.45	185.59	8.53	0.61	0.74	1.43e-05	0.00053	0.00199	1.53
	1.08	9.1	74.38	438.85	272.11	811.52	6857.64	154.53	1143	17588	8601.04	283554
588	2931.66	991.35	3731.61	1279.89	281.86	9.52	1.12	1.37	3.28e-05	0.00068	0.00299	2.61
	2.07	9.34	64.26	636.99	282.88	534.3	7520.64	160.74	207	7887.86	9469.71	413140
589	4015.73	701.67	5845.28	1245.24	156.37	9.35	0.85	1.22	6.43e-05	0.00088	0.00996	1.98
	0.9	13.64	77.28	534.95	460.04	941.42	3910.73	126.61	1395	12111.4	4819.41	410639
590	3093.6	306.64	4822.79	541.42	136.65	6.52	0.57	0.84	4.21e-05	0.0009	0.00766	1.65
	1.2	12.72	105.68	743.31	583.18	855.72	4608.9	194.13	1928	11630.3	5124.22	385920
591	2514.54	578.57	3580.7	770.29	153.67	8.31	1.5	1.96	7.2e-06	0.00091	0.01026	1.26
	0.92	5.36	147.6	886.2	797.52	974.7	6023.48	199.67	1373	7733.45	8860.63	468156
592	4965.69	453.57	6491.55	878.56	264.95	7.97	1.36	1.89	1.34e-05	0.00011	0.00113	2.39
	1.47	6.72	82.48	906.17	191.67	421.29	6606.96	163.52	1440	17500.3	9183.96	365481
593	4074.85	795.49	5684.8	1512.35	236.59	6.86	1.41	1.95	9.7e-05	0.00028	0.00322	1.14
	0.68	9.85	216.92	648.69	615.17	440.76	6321.67	171.35	409	9808.93	8669.67	475477
594	3638.77	773.38	5053.25	1450.63	113.29	7.41	1.84	2.48	2.8e-06	0.0005	0.00241	1.91
	1.06	13.9	208.07	324.74	633.35	549.23	7278.37	188.42	2736	14039.3	10677	281436
595	3404.3	641.6	4903.4	1160.1	245.91	7.13	0.81	1.02	9.39e-05	0.00051	0.00466	2.51
	1.33	12.34	208.37	401.33	570.33	473.89	4438.21	172.5	1190	13023.8	5460.42	279373
596	3470.31	346.12	5219.06	638.72	248.05	9.55	1.72	2.35	1.51e-05	0.0006	0.00621	2.22
	1.06	11.23	215.73	971.3	569.14	591.29	3661.51	139.2	407	15464.1	5064.82	365187
597	4144.45	830.74	5008.08	1640.81	263.14	7.94	1.75	2.22	8.63e-05	0.00016	0.00113	1.11
	0.74	6.65	184.69	940.5	858.62	337.83	6621.07	194.27	3243	13955.6	8338.27	417359
598	3018.48	781.83	3998.9	1189.77	208.53	6.32	1.16	1.64	6.65e-05	0.00072	0.00408	1.45
	0.79	11.63	58.01	879.13	168.86	510.26	4540.28	195.49	295	8307.71	6753.89	331887
599	4509.54	295.56	5798.01	532.63	255.92	8.81	1.72	2.16	8.47e-05	0.00065	0.00705	1.13
	0.74	9.29	71.65	513.78	242.22	685.83	6038.42	134.43	2254	11856.5	8020.38	492403
600	2946.68	830.25	4414.92	1270.2	278.53	6.41	1.09	1.54	2.45e-05	0.0009	0.00309	2.46
	1.94	8.25	69.29	367.95	209.89	794.7	5843.4	155.38	1559	8138.16	6797.33	224487
601	4680.75	926.98	7204.31	1498.11	148.63	6.42	0.8	1.17	2e-05	0.00076	0.00761	1.61
	0.72	13.23	148.7	833.96	745.55	856.4	3000.82	144.15	377	12057.6	4438.09	469946
602	3702.34	573.7	4842.25	1021.74	180.3	9.46	1.41	2.01	3.1e-05	0.00055	0.00579	2.36
	1.22	7.8	157.59	419.79	544.5	542.5	5184.52	177.47	2553	11794.6	6879.75	427063
603	2781.45	375.81	3922.71	605.74	189.79	5.86	1.13	1.48	1.91e-05	0.00097	0.00532	2.95
	2.06	8.64	117.59	915.23	597.05	977.39	4513.4	154.98	1028	17823.1	5511.65	368914
604	3712.38	529.56	5553.29	1041.07	182.15	5.78	0.73	1	4.5e-05	0.00104	0.00826	2.88
	1.16	13.46	156.82	586.5	340.58	273.84	6820.43	192.49	1608	8646.14	10014.5	290965

605	2836.96	701	3600.29	1210.37	245.38	9.83	1.3	1.62	9.79e-05	0.00067	0.0066	2.86
	2.11	11.85	183.25	878.9	585.46	987.23	6091.02	136.08	2988	10686	8507.92	295547
606	3921.61	858.97	6081.45	1087.71	219.4	9.81	1.96	2.89	6e-05	0.00049	0.00591	1.58
	0.68	5.48	56.36	557	293.75	909.96	4423.96	170.11	1759	8356.71	5350.34	434647
607	3018.61	903	4282.63	1675.79	267.53	6.35	1.87	2.25	6.06e-05	0.00045	0.00526	1.91
	0.97	8.97	167.54	569.17	359.16	512.41	6007.19	150.95	651	14533	7479.62	400325
608	4317.57	670	6526.25	941.2	117.34	7.1	1.87	2.39	6.83e-05	0.00045	0.00318	2.33
	1.58	9.56	242.33	785.09	584.73	898.2	3463.02	150.58	855	18129.4	4534.72	450370
609	3234.76	414.31	3973.89	747.16	210.77	7.66	1.61	2.23	8.4e-05	0.00103	0.00313	2.93
	1.84	8.13	102.97	250.99	469.32	555.31	7441.38	146.12	674	13340.1	8916.55	299678
610	4700.14	715.45	6598.83	1393.67	254.91	9.37	1.64	2.16	8.21e-05	0.00096	0.00591	0.98
	0.77	10.51	110.83	205.85	333.13	451.28	7332.61	127.09	533	13168.5	8388.82	569942
611	4104.99	578.1	6372.44	873.23	245.72	6.67	1.89	2.42	8.38e-05	0.00024	0.00149	2.48
	1.31	8.09	125.5	261.97	394.57	367.24	6179.48	160.21	1682	15682.3	6959.63	338612
612	4696.91	791.15	5715.53	1376.37	102.77	6.57	0.96	1.24	7.79e-05	0.00032	0.00188	2.32
	1.09	13.4	146.85	708.97	725.93	310.81	6221.67	198.7	417	8021.88	8825.58	523960
613	4736.43	756.06	6465.35	1154.56	248.71	8.36	1.69	2.34	5.72e-05	0.00016	0.00084	1.34
	0.65	11.48	120.13	524.38	331.71	851.1	5597.38	134.51	450	12627.8	6819.32	300358
614	2082.9	888.12	2603.25	1368.93	205.36	5.88	0.9	1.21	8.84e-05	0.00098	0.0065	1.63
	0.71	10.56	126.2	535.95	258.92	514.22	3989.79	164.98	1914	15480.6	5891.92	573209
615	2790.43	505.37	3669.94	665.03	173.31	7.38	1.76	2.17	8.5e-06	0.00048	0.00454	2.95
	1.44	8.6	128.3	948.7	685.2	898.75	4842.05	151.89	1023	17466.2	7093.8	255692
616	3640.88	763.59	5095.15	1003.21	202.63	5.26	1.07	1.52	7.02e-05	0.00046	0.00193	1.28
	0.56	6.16	104.23	463.98	313.44	516.61	5699.96	137.46	1734	10217.6	7970.41	447278
617	2292.45	301.29	3185.99	527.6	284.94	8.37	1.34	1.75	2.28e-05	0.00061	0.0033	2.17
	1.16	8.32	80.64	728.09	411.8	585.32	6114.66	160.18	1704	14063.1	9057.18	268540
618	4683.35	893.41	7241.86	1572.22	168.18	9.24	1.68	2.02	7e-05	0.00063	0.00255	2.62
	2.04	13.38	190.36	959.24	618.22	919.67	6499.23	130.02	2007	11291.9	8725.22	263709
619	2547.12	917.6	3869.52	1741.81	165.52	9.23	0.87	1.2	1.26e-05	0.00026	0.001	1.36
	0.74	12.9	104.88	999.07	213.74	680.74	6575.41	178.22	2100	16622.3	8904.81	368746
620	3319.63	864.74	4833.57	1459.96	217.58	7.37	0.55	0.79	4.43e-05	0.00029	0.00319	1
	0.53	9.3	151.14	268.73	663.78	644.98	6442.2	182.09	1808	14565.7	8148.45	475335
621	3955.32	383.83	6261.68	730.17	280.74	6.62	1.28	1.92	1.92e-05	0.00023	0.00167	2.57
	1.18	13.54	134.05	945.72	512.5	382.77	5898.92	146.06	1189	7620.6	7019.21	417789
622	4959.65	389.62	6458.51	684.07	240.06	9.03	1.47	1.8	8.59e-05	0.00093	0.00494	2.3
	1.59	12.58	112.28	810.47	577.71	833.4	4525.72	170.18	1748	15398	5882.79	431924
623	4557.73	973.12	6564.02	1635.86	150.53	8.94	1.12	1.5	4.35e-05	0.00066	0.0043	2.74
	1.91	13.77	188.91	855.57	871.49	973.61	4043.98	144.17	1487	10616.2	5940.31	260183
624	3834.16	989.59	6044.03	1226.63	244.8	5.98	0.9	1.12	2.37e-05	0.00104	0.0036	2.68
	1.7	7.06	224.25	332.46	840.63	450.69	7891.4	166.66	2157	15662.8	11758.2	459889
625	4657.48	962.21	7297.84	1372.7	172.42	9.43	1.34	1.93	6.94e-05	0.00027	0.00094	2.74
	1.78	9.84	147.69	786.97	773.95	341.72	5670.98	132.07	1464	13933.8	7557.41	288266
626	3262.95	351.2	4739.33	590.56	184.54	5.54	1.14	1.61	1.9e-06	0.00081	0.00751	1
	0.5	6.67	146.17	433.92	582.84	845.18	6305.43	131.72	2771	10436.1	8576.72	451919
627	2306.1	503.11	3053.3	934.43	234.23	8.9	1.7	2.32	9.18e-05	0.00014	0.00116	1.19
	0.56	6.78	234.27	955.53	1103.41	651.4	4447.21	122.71	958	8896.97	5822.42	228725
628	2637.13	760.33	3976.32	1081.91	264.55	9.19	0.51	0.75	1.21e-05	0.00056	0.00474	2.43
	1.46	10.09	107.04	446.07	242.39	999.75	7516.66	177.37	3416	14866.3	10362	284754
629	2505.57	605.48	3630.74	1002.27	115.84	7.17	1.72	2.57	9.36e-05	0.00027	0.00255	2.05
	1.3	12.35	245.51	825.87	1181.96	941.03	6631.2	125.63	494	13630.3	7759.95	338701
630	2201.4	263.71	2873.11	483.4	208.73	6.64	1.85	2.67	3.32e-05	0.00038	0.00121	1.04
	0.45	6.57	57.84	254.62	156.8	559.76	6099.32	147.31	2165	7661.32	8229.61	341715
631	2230.58	417.96	3462.5	616.82	113.1	8.4	1.98	2.74	9.88e-05	0.00062	0.00366	2.18
	1.14	7.67	199.22	616.88	519.89	438.97	7639.71	140.36	112	15863.6	9675.9	368020
632	2003.5	255.27	2430.32	506.56	219.3	5.95	1.37	1.73	7.57e-05	0.00057	0.00153	1.4
	0.81	12.99	154.23	299.57	849.88	769.45	4985.14	185.37	910	12768.6	6090.87	221230
633	3347.39	462.57	4928.2	798.33	237.11	6.71	0.99	1.28	1.89e-05	0.0005	0.00106	1
	0.5	12.11	69.45	786.77	196.07	801.74	6518.75	196.94	284	15538	8963.67	423905
634	2009.17	933.98	2854.43	1717.11	127.64	8.64	1.57	2.2	4.48e-05	0.00053	0.00294	2.48
	1.56	9.41	221.38	530.13	628.27	797.27	7475.91	172.69	2961	15066.1	11099.2	292380
635	3476.74	961.89	4557.52	1300.35	226.14	5.79	0.67	1	2.38e-05	0.00047	0.00199	1.13
	0.73	7.44	138.68	999.21	588.27	284.6	5074.67	172.98	1508	13432.6	7237.85	535062
636	4430.65	466.71	6315.73	593.21	293.46	6.79	0.89	1.16	3.71e-05	0.00092	0.01109	1.98
	1.35	12.46	191.67	544.81	506.87	637.25	5310.13	158.17	2193	14216.8	5996.05	438727
637	4787.51	445.46	6598.54	713.48	197.9	5.2	1.93	2.56	7.55e-05	0.00106	0.00754	2.4
	1.76	7.01	247.56	428.53	591.3	914.15	5432.3	189.09	2082	17246.3	8000.41	299713
638	4666.9	651.24	6190.72	845.74	277.76	8.11	0.96	1.19	2e-05	0.00062	0.00153	1.86
	1.09	10.58	97.87	407.54	436.01	208.61	3220.13	182.78	851	12713	4302.37	392459
639	4913	596.3	7647.61	1100.86	207.35	5.89	0.68	0.86	2.84e-05	0.0009	0.00793	2.96
	2.15	9.3	95.73	311.02	547.84	923.72	5840.56	194.94	969	14152.6	8712.04	569076
640	2899.58	921.74	4615.97	1650.18	124.38	7.38	1.12	1.54	3.5e-06	0.00095	0.00203	1.85
	1.12	7.57	65.97	752.1	351.08	989.19	4946.15	126.28	745	16017.3	6222.89	449600
641	2015.25	607.92	3087.3	736.92	191.65	5.83	1.44	2.12	4.27e-05	0.00095	0.01029	1.82
	1.27	8.3	101.2	513.32	282.59	741.97	4093.98	197.96	1833	10064.7	4955.22	259874
642	3847.2	786.54	5204.99	1396.39	270.72	6.4	1.89	2.63	7.68e-05	0.00054	0.00114	1.76
	0.94	10.77	163.21	456.86	357.24	938.88	3680.79	198.96	848	14469.3	4654.44	238832
643	3009.63	492.25	4478.29	933.41	257.7	7.9	0.89	1.13	9.49e-05	0.00021	0.00116	0.99
	0.41	8.77	230.3	224.51	1072.52	900.92	5641.66	177.13	1126	7604.15	8419.48	383572
644	3766.01	968.22	5632.49	1483.3	175.91	9.78	1.17	1.62	4.48e-05	0.00024	0.00181	2.26
	1.69	7.94	111.04	336.43	324.94	684.32	5737.27	148.42	488	7988.4	6445.37	458366
645	2613.83	634.57	3681.13	1195.93	233.23	9.04	1.61	2.31	1.02e-05	0.00093	0.00827	2.82
	1.33	13.65	145.24	301.5	577.1	713.48	6669.51	126.69	2399	9697.44	8556.51	258073
646	4982.12	230.48	7214.47	342.82	246.22	7.34	1.14	1.56	8.13e-05	0.00039	0.00088	2.23
	1.29	7.78	91.2	501.16	378.9	674.4	4676.2	194.05	126	8172.9	5624.28	340746
647	2510.58	342.65	3125.88	575.23	134.46	6.05	1.43	1.72	7.53e-05	0.00072	0.00524	1.82
	1.23	11.27	201.92	415.5	796.81	217.81	3508.07	196.87	1011	9275.86	4538.04	461761
648	3730.6	531.84	4876.36	830.66	261.66	8.03	1.03	1.33	4.21e-05	0.00097	0.00319	2.17
	1.08	6.42	113.64	285.75	273.48	955.06	4957.28	187.87	1775	13246.9	5672.56	463928
649	4536.21	870.61	5861.64	1648.25	215.53	6.22	1.18	1.49	6.14e-05	0.0009	0.00347	2.04
	1.54	6.59	121.9	340.81	293.18	564.64	6622.69	143.67	698	8515.15	9198.74	365924
650	4216.26	719.25	6268.47	1260	200.82	6.99	1.64	2.1	9.24e-05	0.00022	0.00082	2.32
	1.63	12.2	83.45	492.77	298.82	548.82	6297.53	163.18	2955	17573.8	7185.38	341818

The following table includes data for Psf-qsf case.

Data #	L_{hw} (ft)	L_f (ft)	L_x (ft)	L_y (ft)	h (ft)	ϕ_m (%)	ϕ_f (%)	SRV-ϕ_m (%)	k_m (md)	k_f (md)	SRV-k_m (md)	Δx_s (ft)
	SRV-Δx_s (ft)	S_{wf} (%)	V_{L-CH_4} (scf/ton)	P_{L-CH_4} (psi)	V_{L-CO_2} (scf/ton)	P_{L-CO_2} (psi)	P_i (psi)	T_i (F)	$P_{sf-prod}$ (psi)	t_{prod} (days)	q_{sf-inj} (scfd)	P_{sf-inj} (psi)
1	2974.66	403.54	3745.78	712.57	267.69	7.76	1.42	1.83	3.88e-05	0.00071	0.00716	1.67
	1.09	12.69	97.76	238.2	264.03	430.06	3889.22	198.99	976	8887.24	2.02887e+06	5589
2	4638.47	552.17	7110.95	1085.95	273.62	7.79	0.97	1.31	1.4e-06	0.00017	0.00084	1.62
	1.29	13.55	193.91	236.31	849.18	478.64	6982.26	149.37	373	12483.5	1.31299e+06	7980
3	4618.63	869.86	6963.24	1219.68	176.96	5.69	0.97	1.31	2.28e-05	0.00062	0.00177	2.57
	1.24	10.32	148.22	263.94	332.47	270.78	7627.8	168.31	3052	16867.5	2.66418e+06	9444
4	4449.51	476.76	7089.34	751.22	283.77	8.91	0.88	1.18	8.9e-06	0.00025	0.00062	1.4
	0.88	10.01	219.86	984.92	1126.61	386.33	7769.77	134.72	2109	17576.7	878123	8592
5	2427.95	986.97	3751.24	1823.31	206.86	6.67	1.58	2.36	6.4e-06	0.00065	0.00214	0.9
	0.54	13.48	68.53	302.34	160.65	280.04	6571.21	152.36	2661	13170.9	833470	8749
6	2278.91	550.84	3021.49	874.12	174.56	7.16	1.08	1.35	6.9e-05	0.00101	0.01048	2.08
	0.88	10.9	206.77	381.77	659.54	847.09	5500.81	147.58	2616	14558.6	2.36543e+06	7464
7	3768.76	835.27	5425.21	1277.08	155.49	8.39	1.39	1.93	9.04e-05	0.00023	0.00183	1.67
	1.22	9.9	89.25	849.91	412.44	208.87	5403.94	129.04	1472	16381.8	2.63027e+06	6209
8	2316.69	702.5	3303	1293.15	213.36	9.52	1.77	2.19	4.3e-05	0.00044	0.00517	1.72
	0.94	9.08	134.22	854.77	773.18	486.3	3686.92	184.69	170	12920.2	2.03163e+06	4668
9	4334.12	276.47	6382.84	365.2	280.55	5.91	0.65	0.82	1.06e-05	0.00049	0.00328	1.29
	0.7	6.28	189.77	339.15	1018.62	824.56	4488.92	136.88	441	9728.02	3.58801e+06	6624
10	2564.58	947.52	3985.96	1172.78	113.56	6.54	1.51	2.01	5.44e-05	0.0005	0.00532	2.14
	0.89	7.39	171.87	381.42	634.51	916.79	5473.99	134.27	872	13368.1	1.29967e+06	7517
11	4270.08	973.87	5341.78	1556.04	280.82	9.38	1.56	2.33	4.16e-05	0.00069	0.00621	1.24
	0.93	8.47	214.48	912.81	1212.81	413.12	4176.43	157.53	1743	12015.5	3.92425e+06	5704
12	3853.37	896.6	5209.71	1208.92	102.19	5.43	1.57	2.34	7.2e-06	0.00097	0.00538	2.09
	1.54	9.26	246.68	773.27	1003.01	917.26	4969.11	137.44	2298	14634.1	1.57728e+06	6225
13	3599.56	423.46	5153.58	702.52	181.93	7.33	1.07	1.54	7.62e-05	0.00109	0.0034	1.73
	0.86	5.6	60.94	760.38	254.41	579.32	4184.42	161.3	1139	8872.59	1.04193e+06	5972
14	2548.19	493.59	3295.22	665.07	161.88	7.8	1.32	1.82	1.3e-06	0.00028	0.00162	1.31
	0.71	9.39	126.49	795.02	301.63	335.91	5382.96	167.33	1760	15484.3	619064	6136
15	4646.73	756.92	6695.58	1380.85	271.58	9.29	0.7	0.93	4.03e-05	0.00075	0.00462	1.12
	0.71	8.14	125.27	623.4	475.09	328.44	3978.3	124.27	271	9677.76	3.91983e+06	4504
16	3037.93	799.24	4548.83	1398.84	184.07	7.77	1.78	2.29	5.14e-05	0.0008	0.00433	2.2
	0.95	5.79	61.57	671.68	352.63	747.97	6352.14	151.46	2574	15426.3	2.95691e+06	8279
17	2588.54	291.39	3816.5	359.76	293.76	9.62	1.7	2.52	3.18e-05	0.001	0.01038	2.55
	1.53	6.42	136.15	666.4	330.47	954.88	5920.96	193.09	340	17086.4	2.50351e+06	5959
18	3271.6	598.08	4543.99	1128.46	230.64	7.33	1.99	2.94	4.58e-05	0.00067	0.00245	1.48
	0.89	11.85	175.02	289.51	582.1	730.42	3362.28	193.52	164	18242.4	1.09696e+06	4197
19	3446.5	660.73	4223.66	961.35	281.1	9.34	1.42	1.74	4.44e-05	0.00069	0.00333	2.33
	1.15	7.29	118.29	378.17	624.52	983.47	4930.55	179.88	1934	9030.68	938771	5803
20	4054.55	566.22	6466.22	684.23	184.65	6.26	0.75	0.96	6.9e-05	0.0008	0.00231	2.94
	1.7	13.3	66.68	541.72	196.46	416.54	3917.01	193.43	305	16078	592792	4819
21	3723.22	755.28	4538.49	1217.25	203.63	6.71	0.96	1.35	5.1e-06	0.00101	0.00643	0.96
	0.73	7.75	154.72	517.19	914.84	395	5785.19	171.74	1706	16803.9	3.64008e+06	8031
22	4767.98	409.25	6032.59	595.73	121.43	7.83	1.87	2.53	4.25e-05	0.00086	0.00972	2.23
	0.98	12.15	75.02	559.1	371.19	309.98	3329.83	183.07	1307	8780.98	564535	4506
23	2683.71	752.99	3868.07	1198.36	193.37	6.52	0.74	1.02	8.32e-05	0.00081	0.00575	2.89
	1.68	5.83	127.71	569.4	275.26	824	4719.76	193.14	665	10743.1	2.39058e+06	5291
24	2647.27	906.32	3272.72	1740.95	165.94	7.26	1.25	1.76	5.16e-05	0.00075	0.00583	2.94
	2.25	6.71	86.8	896.99	501.86	482.82	3850.4	183.15	285	9948.64	1.50938e+06	5321
25	4519.6	691.65	6973.82	1001.37	170.74	7.18	1.28	1.61	7.07e-05	0.00091	0.01055	0.95
	0.57	7.81	195.88	573.82	572.24	650.81	4677.05	180.33	1765	15472.5	2.65354e+06	5853
26	2477.39	947.3	3404.92	1255.66	165.05	7.06	1.91	2.51	7.24e-05	0.00081	0.00722	0.94
	0.67	12.64	98.7	270.03	226.43	669.21	4357.53	158.14	1025	15630.5	813354	4966
27	3520.72	910.37	5455.01	1300.36	148.94	6.73	0.96	1.41	5.84e-05	0.0007	0.0027	2.34
	1.31	8.88	209.49	678.93	1082.89	557.91	3311.42	127.14	1230	10916.7	1.37467e+06	4486
28	2541.89	266.06	3903.72	320.83	286.69	6.53	0.65	0.87	7.25e-05	0.00093	0.00471	2.38
	1.78	11.11	220.64	243.52	465.03	789.1	3428.01	147.98	1417	11183.9	2.22974e+06	4115
29	3566.39	777.27	5209.9	1011.63	100.05	5.58	1.55	2.26	9.2e-05	0.00082	0.00798	1.59
	0.97	6.02	136.48	888.31	297.44	634.41	5134.82	148.17	2387	10558.4	796351	6020
30	3421.9	976.85	4266.1	1666.86	233.3	6.59	1.75	2.2	5.31e-05	0.00074	0.006	2.61
	1.26	12.09	131.83	483.17	511.07	285.46	6908.35	161	3283	12930.4	2.16747e+06	8335
31	4472.71	714.24	6982.75	1414.57	225.15	7.65	1.22	1.79	4.5e-05	0.00023	0.00236	2.25
	1.46	7.29	205.81	689.85	667.34	431.32	5014.26	156	1550	8192.53	3.80149e+06	7321
32	2449.51	331.33	3493.4	495.5	124.3	8.58	1.39	1.9	1.8e-05	0.00083	0.00917	1.58
	1.25	7.68	215.34	425.46	997.85	418.57	3296.26	121.51	1015	11784.2	1.24957e+06	4340
33	2805.17	799.93	4374.44	1083.69	136.18	8.75	1.53	2	5.26e-05	0.00034	0.00144	1.34
	0.56	7.76	100.76	219.09	590.53	274.5	6736.94	181.94	1334	17962.3	3.14177e+06	8183
34	4604.37	463.56	6630.12	891.75	139.79	8.8	0.83	1.05	8.28e-05	0.00074	0.00189	2.64
	1.72	13.08	95.9	474.72	539.79	202.28	7268.46	166.3	3588	16203.2	1.61737e+06	9010
35	4717.3	423.24	6274.3	642.03	287.72	7.78	1.64	2.28	3.4e-06	0.00085	0.0092	1.57
	1.2	8.2	81.35	641.41	236.45	617.2	3242.35	170.2	1415	12655.7	1.48888e+06	4538
36	2494.13	800.48	3264.67	1070.96	202.35	5.4	1.49	2.05	8.69e-05	0.00032	0.00184	2.34
	1.55	12.72	220.57	469.03	1309.54	581.66	7523.55	148.26	3558	11294.8	1.71273e+06	10036
37	3547.36	462	4563.21	573.89	218.15	7.22	1.66	2.12	1.75e-05	0.00064	0.00635	1.94
	1.08	6.21	59.11	397.61	270.84	249.95	3899.07	173.08	16	7408.01	3.09017e+06	5604
38	4949.18	285.56	6057.75	524.74	207.94	7.56	1.92	2.72	9.06e-05	0.00021	0.0014	2.8
	1.19	9.29	245.59	664.59	575.48	374.78	5792.82	170.01	569	8534.46	1.36597e+06	7882
39	2062.27	925.59	2897.4	1704.76	286.13	7.77	0.56	0.82	9.07e-05	0.00091	0.00989	1.01
	0.78	8.67	191.09	919.43	539.94	294.08	5010.83	175.58	274	13085.4	3.51071e+06	5560
40	4858.15	872.53	6261.65	1616.59	172.74	6.73	1.83	2.6	3.45e-05	0.00061	0.00241	1.8
	1.22	10.07	149.98	591.89	574.17	973.01	5267.5	192.38	46	15578.9	2.54028e+06	7348
41	4899.42	443.98	7509.65	584.92	170.43	7.28	1.91	2.55	3.11e-05	0.00109	0.0085	1.5
	0.79	6.73	124.02	997.4	590.12	512.37	3188.42	120.17	225	12804.8	3.79674e+06	4092
42	3521.29	689.53	5154.26	1307.12	108.93	7.1	1.8	2.32	1.91e-05	0.00075	0.00598	1.87
	1.15	5.2	140.55	782.15	655.54	732.2	6531.36	194.47	1999	15874.9	1.83873e+06	8823
43	4902.05	377.25	7647.38	523.61	250.24	7.25	1.71	2.16	3.73e-05	0.00022	0.00169	1.18
	0.81	8.5	53.37	711.18	206.07	807.62	7759.2	150.09	2880	9750.14	3.20677e+06	11324
44	4365.71	977.17	5587.97	1466.38	275.98	8.86	1.27	1.69	6.42e-05	0.00044	0.00097	2.18
	0.96	9.61	142.49	640.12	617.35	592.01	4907.64	165.9	106	12070.2	1.46804e+06	7292

45	3107.4	734.81	4157.88	1437.07	114.38	8.45	1.69	2.51	1.96e-05	0.00069	0.00654	1.05
	0.48	8.88	120.15	840.91	390.95	820.5	7755.19	157.75	510	7934.15	1.84559e+06	9790
46	2321.24	466.31	3688.92	880.08	186.15	5.38	0.77	0.95	8.34e-05	0.00102	0.00837	1.37
	0.77	13.16	210	446.22	1010.89	422.01	5315.6	161.94	1510	15422.5	2.64429e+06	6208
47	4986.24	782.04	7159.89	1444.46	243.27	9.58	0.73	0.99	5.07e-05	0.00101	0.00299	1.76
	1.18	8.15	129.18	339.24	390.23	444.02	7930.69	161.77	1347	14502.9	2.0874e+06	10593
48	4489.57	296.92	5889.38	445.21	194.61	5.6	1.29	1.56	6.8e-06	0.00109	0.00289	2.33
	1.08	10.99	246.29	648.92	1450.76	772.6	5279.78	155.79	783	10146.4	3.15334e+06	6034
49	2873.9	336.36	3895.83	667.67	231.37	6.41	1.4	2.05	8.35e-05	0.00011	0.00132	2.45
	1.02	11.34	105.58	621.18	576.08	330.49	5411.79	191.23	939	15858.7	510547	6999
50	4796.08	666	5762.26	1149.67	228.42	8.58	1.4	1.7	3.8e-06	0.00063	0.00464	1.48
	0.83	13.26	189.28	839.72	562.47	668.19	7934.34	199.5	627	9000.01	2.78216e+06	11488
51	3442.76	799.17	4991.77	1170.28	248.5	8.58	0.78	1	5.17e-05	0.00101	0.00872	1.26
	0.75	9.2	248.9	288.1	1066.59	358.46	3460.85	148.46	1185	17120.3	1.38847e+06	5078
52	3196.1	987.26	4022.08	1566.93	134.3	8.5	1.65	2.29	2.96e-05	0.00084	0.00756	1.7
	1.34	12.28	150.4	614.61	402.7	897.58	6567.52	133.13	1160	17038.6	3.87627e+06	8758
53	4917.37	883.42	7352.68	1353.65	187.1	9	0.98	1.37	5.07e-05	0.00055	0.00573	2.01
	0.84	5.06	208.58	596.24	480.06	343.15	6330	155.35	1011	16166.8	1.81212e+06	6450
54	4682.58	455.46	6685.56	560.3	151.67	6.01	1.21	1.5	3.6e-05	0.00049	0.00165	1.15
	0.89	7.15	180.09	556.69	975.25	387.83	5174.45	131.66	1623	7520.25	2.40323e+06	7609
55	4513.27	426.43	6036.94	808.45	128.16	6	1.88	2.29	6.92e-05	0.00071	0.00647	2.77
	1.55	13.41	244.78	560.99	690.64	296.21	6810.92	192.9	1208	12393.3	2.27321e+06	8797
56	4131.45	703.65	6573.41	1235.67	253.24	9.16	1.49	2.05	1.42e-05	0.00096	0.00908	1.8
	1.06	10.72	147.7	939.63	847	632.31	5246.3	129.99	1445	14608.5	1.65233e+06	7367
57	4461.91	784.39	5597.32	1351.64	226.07	5.07	1.43	1.91	1.83e-05	0.00033	0.0038	2.19
	1.54	11.11	90.94	688.39	372.13	685.46	4695.15	195.13	37	10051.1	1.74035e+06	5979
58	4039.57	685.29	5616.16	837.91	297.69	5.31	1.49	1.95	2.66e-05	0.00033	0.00225	2.86
	2.25	7.58	107.56	811.16	259.82	368.86	7470.85	164.35	950	18134.2	3.74654e+06	9163
59	4416.29	561.77	7005.26	1007.58	156.75	7.15	1.71	2.16	2.75e-05	0.0007	0.0074	2.92
	1.94	6.26	87.01	466.55	335.29	961.1	3243.38	169.16	1056	10944.8	897199	4264
60	4153.54	983.29	5602.64	1890.86	242.46	6.57	0.56	0.73	2.87e-05	0.00058	0.00599	1.45
	1.15	9.75	226.58	791.99	976.01	495.79	6496.54	164.72	589	7687.97	1.4992e+06	8833
61	4187.35	629.63	5462.8	992.54	186.71	6.32	0.74	1.07	4.53e-05	0.00074	0.00296	2.65
	1.69	9.25	218.24	427.53	445.4	881.51	3976.68	166.02	1433	10091.5	1.29668e+06	5406
62	4487.7	259.43	6345.31	476.39	252.23	8.9	0.58	0.71	9.64e-05	0.00085	0.00344	2.09
	1.38	12.45	188.87	409.7	493.68	240.95	3352.05	138.28	315	12981.2	1.71733e+06	3990
63	4240.53	699.21	5578.24	1386.92	136.73	6.02	1.15	1.39	8.18e-05	0.0004	0.00271	2.01
	1.15	8.45	159.61	981.71	546.25	765.52	5197.12	170.7	277	13912.7	958409	6524
64	4223.33	621.36	5955.22	822.68	216.09	7.83	1.67	2.5	9.72e-05	0.00107	0.0067	1.98
	1.29	11.74	109.19	225.13	467.34	432.33	4981.29	155.25	2091	16040.4	1.86453e+06	6741
65	4937.32	436.34	6997.14	813.94	241.91	8.11	1.01	1.26	3.14e-05	0.00079	0.00227	2.46
	1.14	5.66	103.21	846.33	220.21	646.57	6776.51	164.48	270	15950.1	2.94994e+06	7707
66	2521.95	949.5	3493.39	1723.11	154.65	6.37	1.68	2.08	9.08e-05	0.00073	0.00334	1.32
	0.61	6.13	153.74	993.12	518.86	215.71	3111.15	154.29	1447	9951.56	843624	3451
67	3087.1	814.49	4561.46	1395.93	223.56	5.14	1.95	2.45	7.05e-05	0.001	0.00628	1
	0.62	7.25	53.63	479.67	281.21	273.57	4066.13	142.67	1915	15718	3.22739e+06	4650
68	3927.51	364.79	6207.47	449.14	230.35	8.83	1.16	1.7	4.53e-05	0.00051	0.00566	2.98
	1.98	10.46	56.85	702.19	297.34	429.09	6486.93	153.37	2796	7806.54	1.71706e+06	9455
69	4633.66	384.79	7124.76	741.24	202	5.65	1.3	1.94	4.71e-05	0.00021	0.00072	1.55
	1.1	8.34	102.26	982.17	437.01	695.14	6488.77	128.8	988	17191.5	720601	9559
70	3699.8	322	4574.62	605.3	295.6	8.75	1.9	2.54	5.92e-05	0.00048	0.0043	1.11
	0.65	10.92	104.41	314.01	412.66	611.57	7334.41	195.75	1420	15078.1	3.4016e+06	8823
71	4104.99	578.1	6372.44	873.23	245.72	6.67	1.89	2.42	8.38e-05	0.00024	0.00149	2.48
	1.31	8.09	125.5	261.97	394.57	367.24	6179.48	160.21	1682	15682.3	1.75374e+06	6960
72	4098.33	710.06	6165.56	1412.55	298.88	6.88	1.01	1.51	9.82e-05	0.00042	0.00398	1.33
	0.58	13.95	198.53	514.08	825	696.44	5128.06	149.55	2170	11483.1	3.0565e+06	7198
73	3996.98	713.08	6230.5	1303.03	123.44	9.88	1.65	2.02	1.02e-05	0.00104	0.00452	1
	0.53	13.12	156.77	457.67	808.43	602.68	3822.67	176.98	838	11477.6	3.22018e+06	5520
74	2502.51	655.56	3029.67	945.64	169.84	5.92	1.58	2.29	4.32e-05	0.00048	0.00516	2.92
	1.75	10.82	120	559.26	388.13	393.51	7611.94	199.85	2550	9823.55	2.3513e+06	10083
75	4420.8	343.58	6284.61	439.97	147.26	10	0.92	1.16	3.54e-05	0.0006	0.00444	1.12
	0.58	13.34	172.38	496.66	981.44	607.12	7112.73	178.33	3407	11414.5	2.61398e+06	7994
76	4935.7	609.64	6487.06	1111.91	102.05	8.77	1.64	2.2	4.26e-05	0.00062	0.00439	2.17
	0.92	10.68	223.09	603.27	585.15	826.91	5193.22	145.22	2360	7903.63	2.69187e+06	6774
77	3216.55	482.97	4317.52	906.59	116.12	8.87	0.91	1.12	4.87e-05	0.00044	0.00377	1.43
	0.59	12.96	87.71	648.36	379.65	975.56	4013.41	132.58	1126	7401.68	1.19087e+06	5503
78	2957.73	745.83	3877.58	1124.26	132.1	6.48	1.59	2.28	7.03e-05	0.00067	0.00507	2.31
	1.84	10.47	191.6	918.89	753.04	923.91	5761.27	167.24	1624	9510.48	2.31088e+06	8533
79	3059.51	546.01	4619.96	750.26	126.73	9.46	1.64	2.19	2.32e-05	0.00019	0.00177	2.15
	1	8.42	214.41	706.29	872.45	874.66	7409.17	172.31	1512	16683.5	920406	10172
80	2066.09	744.9	2505.85	1323.19	264.23	9.22	1.55	2.03	3.91e-05	0.00017	0.0018	1.2
	0.83	10.75	169.52	838.82	517.04	736.04	3576.52	144.67	461	16511.5	986327	5317
81	4317.44	925.36	5890.32	1533.13	156.14	5.04	1.26	1.83	3.35e-05	0.00079	0.00677	1.14
	0.53	7.51	98.7	864.11	382.14	655.51	5561.47	150.61	2098	17373.4	1.1223e+06	6863
82	2009.17	933.98	2854.43	1717.11	127.64	8.64	1.57	2.2	4.48e-05	0.00053	0.00294	2.48
	1.56	9.41	221.38	530.13	628.27	797.27	7475.91	172.69	2961	15066.1	2.03443e+06	11099
83	2606.39	484.71	3833.8	736.28	271.16	5.57	0.56	0.71	1.47e-05	0.00059	0.00217	1.65
	0.94	6.84	54.49	726.23	168.64	903.44	3529.26	155.46	246	16515.9	1.3099e+06	4030
84	2819.48	916.29	4446.18	1772.64	112.23	8.42	1.93	2.44	3.22e-05	0.00088	0.00591	1.61
	0.77	9.23	56.02	249.65	217.34	791.64	3748.52	165.08	1457	17920.8	712175	5356
85	3778.79	679.13	4636	1096.75	129.14	6.17	0.95	1.3	0.0001005	0.00099	0.00928	2.6
	1.48	13.54	102.94	885.21	284.94	529.97	5723.69	153.74	1958	16747.1	3.30717e+06	7629
86	3947.51	313.73	6128.63	570.34	127.07	5.39	1.26	1.78	1.6e-05	0.00091	0.00942	2.75
	1.15	6.88	200.32	337.51	891.47	671.92	5813.92	179.18	1358	9711.05	1.23658e+06	7998
87	2733.32	504.58	3709.82	974.12	290.47	6.28	1.64	2.2	7.24e-05	0.00069	0.00769	1.41
	0.61	6.01	155.67	392.38	791.23	354.19	3484.76	144.93	783	18036.4	2.97683e+06	4072
88	4359.01	885.7	6462.47	1268.31	267.45	8.36	1.25	1.65	2.09e-05	0.00021	0.00181	2.71
	1.25	13.14	217.37	777.44	1290.79	480.32	7747.14	158.2	1553	15795.1	2.96244e+06	9919
89	4653.22	758.22	5875.05	1396.31	208.17	9.7	1.32	1.68	4.15e-05	0.00054	0.00444	2.27
	1.14	13.4	167.27	847.55	788.9	257.15	4109.73	148.9	813	16941.7	1.62965e+06	4602
90	2766.16	908.54	4082.05	1174.31	229.75	5.48	1.4	2.07	8.59e-05	0.00056	0.00278	2.87
	2.2	5.03	242.62	986.66	1289.33	478.03	4212.63	152.69	1383	12250.5	2.08152e+06	4959
91	2893.59	957.55	4628.61	1409.65	104.11	6.24	0.94	1.26	8.34e-05	0.00071	0.00343	2.91
	1.43	13.48	89.24	497.16	286.28	730.86	5813.67	199.71	1804	11991.1	2.37463e+06	7505
92	4656.91	718.52	7288.45	1242.1	249.07	5.39	1.79	2.23	8.16e-05	0.00031	0.0036	1.17
	0.55	13.93	166.51	373.77	965.3	609.21	6591.31	174.15	2662	13913.9	2.14002e+06	7762

93	4577.14	608.23	6982.97	1042.29	268.44	7.63	1.35	1.76	5.59e-05	0.0004	0.00137	1.24
	0.67	9.51	158.17	758.58	522.26	305.11	3011.23	153.71	746	16213.8	2.02127e+06	3967
94	4924.26	869.48	6939.02	1698.02	123.28	9.59	1.37	1.8	4.64e-05	0.00072	0.00219	0.97
	0.55	9.73	178.21	904.68	570.36	264.83	7410.58	148.92	33	12820.4	2.83887e+06	9253
95	2373.29	394.83	3455.04	545.32	287.49	9.33	1.92	2.7	8.5e-06	0.00022	0.00168	2.92
	1.66	11.28	247.74	826.58	1105.39	886.1	7842.84	181.83	3485	16955.8	1.82927e+06	11015
96	3386.91	241.57	5305.61	330.11	281.94	9.38	1.39	1.91	0.0001002	0.00039	0.00348	2.89
	1.47	12.4	66.57	842.86	212.75	992.2	4552.61	189.66	850	12622	2.33518e+06	5482
97	4401.42	866.25	5302.43	1153.13	285.59	9.49	0.92	1.16	3.9e-06	0.00012	0.00137	1.78
	0.79	12.88	112.56	929.65	437.72	830.92	3086.15	199.28	274	8712.02	2.43517e+06	3468
98	3675.46	603.71	5289.34	995.76	100.84	6.55	1.38	1.94	3.29e-05	0.00053	0.0022	2.15
	1.17	13.4	243.13	465.73	1357.3	896.91	7518.35	171.76	966	8360.43	1.91158e+06	9509
99	2704.45	872.83	3809.57	1236.35	140.78	9.53	1.54	2.19	5.7e-05	0.00082	0.00739	2.93
	1.97	5.11	74.12	991.69	153.94	249.47	7610.74	142.08	993	7873.11	552213	8816
100	2995.33	637.61	4450.14	859.1	167.29	7.42	0.98	1.35	2.48e-05	0.0003	0.00206	1.84
	1.35	6.76	249.73	323.19	1486.36	787.73	6548.44	121.07	1611	9249.31	2.27826e+06	8285
101	2871.93	983.75	3664.33	1418.43	272.56	7.62	0.93	1.14	4.91e-05	0.00056	0.00306	2.73
	1.9	12.8	206.7	394.09	455.48	657.2	4112.14	154.32	623	15508	857397	4924
102	4756.1	707.63	7223.28	1078.65	172.15	5.1	1.04	1.29	2.79e-05	0.001	0.00669	1.74
	1.05	11.73	202.45	452.42	634.21	942.87	5844.61	130.27	927	10422.4	3.98117e+06	8070
103	3928.53	415.34	6075.8	531.99	275.1	5.33	0.69	0.87	8.74e-05	0.00051	0.00549	2.37
	1.68	7.01	118.47	228.62	544.2	383.2	4233.88	153.61	2086	14361.2	900676	5301
104	2287.76	825.11	3316.65	1120.55	108.31	9.82	1.75	2.6	9.53e-05	0.00095	0.00626	1.98
	0.88	9.09	117.85	854.59	501.15	550.67	7001.51	149.24	1525	17755.4	1.988e+06	8664
105	3631.61	354.68	5152.06	597.16	289.49	8.51	1.48	1.92	2.37e-05	0.00073	0.00834	2.69
	1.9	12.06	246.16	394.31	939.71	908.79	7670.21	189.4	2526	12783.2	2.49077e+06	8633
106	4087.21	884.43	5259.16	1173.18	155.22	6.99	1.29	1.91	1.9e-05	0.00052	0.00427	2.16
	1.07	8.19	186.02	462.29	397.45	711.96	6571.73	124.3	487	11753.4	1.54796e+06	7443
107	2599.96	382.35	3338.09	651.24	262.26	5.28	1.06	1.29	8.58e-05	0.00055	0.00489	1.59
	0.89	5.71	144.62	395.24	843.39	951.1	4941.1	156.81	2212	17133.8	2.10401e+06	7158
108	4707.38	584.72	6177.07	965.84	170.5	5.69	1.96	2.71	8.01e-05	0.00109	0.0098	1.55
	0.84	9.72	196.48	910.85	412.64	452.54	4634.11	161.89	2154	9121.18	2.10546e+06	6564
109	3701.51	266.55	5003.71	410.2	133.9	9.44	1.25	1.56	8.07e-05	0.00065	0.00494	2.69
	1.53	11.62	135.71	950.6	788.61	493.55	6618.29	151.86	2823	8507.63	2.66611e+06	9131
110	4335.36	561.47	5962.22	1071.1	248.79	6.64	1.62	2.21	2.45e-05	0.00081	0.00292	2.59
	1.76	12.36	201.14	798.74	1173.98	764.51	3835.1	136.99	937	13848.7	758022	4415
111	2867.01	473.53	3450.89	731.09	236.38	7.93	1.95	2.36	3.66e-05	0.00058	0.00127	1.77
	1.05	9.21	159.2	253	584.84	934.19	7126.38	180.03	3494	13387.8	965165	10151
112	4058.38	428.64	6098.38	654.43	205.35	8.82	0.52	0.69	3.54e-05	0.00035	0.00164	1.85
	0.74	9.42	151.95	341.17	738.78	402.34	5753.13	157.89	2650	16932.4	1.41652e+06	6661
113	4909.15	428.96	6876.6	801.67	289.91	7.66	1.3	1.84	5.81e-05	0.00078	0.00562	1.49
	0.7	5.43	81.83	521.18	465.62	811.91	5326.47	135.97	551	17126.5	2.81474e+06	5865
114	4493.65	896.38	7097.61	1365.98	203.95	5.54	0.79	0.96	6.91e-05	0.00025	0.00151	2.06
	0.89	5.27	201.17	881.53	991.57	800.48	7593.05	185.77	2355	16992.9	914110	10668
115	4855.23	487.63	6424.68	686.2	135.06	8.69	0.91	1.36	7.01e-05	0.00023	0.00216	2.14
	1.01	6.97	221.06	428.75	937.85	719.57	4254.73	185.44	929	17835.7	2.9353e+06	5911
116	4648.88	589.06	6722.84	976.23	231.98	5.24	1.53	2.1	2.84e-05	0.00029	0.00294	1.99
	1.34	8.55	166.6	553.96	384.31	710	5264.93	128.41	2446	8354.35	3.39654e+06	7215
117	2276.42	474.55	2976.47	786.71	294.71	5.35	1.36	1.81	6.33e-05	0.00018	0.00061	2.38
	1.82	7.07	98	705.91	215.47	565.66	7573.75	199.81	425	10656	1.23577e+06	9182
118	3529.06	797.53	5011.17	1019.28	299.11	9.14	1.33	1.69	2.56e-05	0.00057	0.00243	2.22
	1.38	12.78	58.49	838.51	248.32	762.42	6878.54	137.1	3359	14529.5	3.03451e+06	7666
119	4107.4	221.32	6335.36	366.11	111.49	9.06	1.4	2.03	6.6e-06	0.00082	0.00345	1.77
	1.06	10.48	131.78	458.55	732.16	694.97	4642.93	196.48	154	16613.9	919167	4756
120	4385.24	712.86	6885.74	1084.12	222.16	6.59	1.3	1.89	5.82e-05	0.00016	0.00133	2.76
	1.98	12.89	244.24	681.25	944.59	492.95	6206.57	125.59	1705	13876	2.25246e+06	7925
121	4248.89	478.74	6675.66	797.89	184.75	9.56	1.61	2.06	2.64e-05	0.00075	0.00881	2.56
	1.46	10.63	140.32	359.08	818.42	830.27	6983.36	147.16	1914	16144	2.51702e+06	7960
122	3143.19	561.88	4152.26	838.58	149.11	5.99	1.54	2.16	4.8e-05	0.00068	0.0018	1.8
	0.8	12.79	125.68	327.98	432.61	842.04	6390.71	193.41	1230	14394	1.63497e+06	9448
123	4950.58	431.94	7258.93	720.43	169.88	5.85	0.54	0.66	2.23e-05	0.00076	0.00425	2.16
	1.03	7.2	99.43	443.46	411.43	307.51	3763.49	130.19	1122	11275.7	739913	4265
124	3347.39	462.57	4928.2	798.33	237.11	6.71	0.99	1.28	1.89e-05	0.0005	0.00106	1
	0.5	12.11	69.45	786.77	196.07	801.74	6518.75	196.94	284	15538	1.30219e+06	8964
125	3310.65	590.78	5282.67	1024.16	297.14	6.43	0.89	1.09	8.76e-05	0.00099	0.00676	2.22
	0.92	6.35	212.53	701.83	787	661.42	4457.08	143.12	2009	8671.37	1.19719e+06	6242
126	4954.38	230.67	6199.26	327.61	114.61	9.69	1.13	1.42	7.9e-06	0.00036	0.00137	1.87
	0.76	8.62	155.26	673.79	817.55	479.97	4658.88	154.03	699	8628.72	2.29702e+06	6036
127	4791.1	291.01	7349.36	357.77	227.27	7.94	0.76	0.96	1.71e-05	0.00023	0.00117	2.46
	1.38	13.88	185.92	590.19	741.51	558.91	4582.22	177.5	535	11924	2.71121e+06	6587
128	3740.73	941.95	5565.72	1747.91	197.28	9.78	0.51	0.72	5.17e-05	0.00104	0.00419	2.05
	0.94	13.55	245.81	816.97	1276.03	773.33	6106.62	188.24	2410	10898.5	1.46707e+06	7125
129	4105.54	370.1	6445.76	511.38	195.73	5.04	0.95	1.38	5.84e-05	0.00015	0.00151	2.54
	1.37	11.95	58.11	939.49	272.58	364.25	4170.21	144.94	1803	14243.6	905706	4793
130	2815.25	508.34	4303.89	867.66	117.36	8.81	1.08	1.4	7.69e-05	0.00062	0.00506	2.65
	2.11	7.21	159.09	658.69	856.94	725.82	5207.47	154.38	2458	17872.2	1.02543e+06	5772
131	4405.18	294.58	5903.59	372.22	101.4	6.58	1.13	1.55	6.2e-06	0.00014	0.00125	2.7
	1.51	5.75	159.65	913.72	758.37	963.32	6116.14	184.39	1479	9410.43	546037	6734
132	2253.03	728.96	3133.18	895.27	170.15	8.27	1.7	2.35	1.3e-05	0.00104	0.0055	2.98
	2.06	13.98	242.95	672.06	840.16	749.73	7962.93	136.65	3703	13738.2	1.14001e+06	10096
133	4704.88	953.77	7288.95	1250.21	182.89	8.81	0.91	1.35	1.7e-05	0.00073	0.00476	2.45
	1.13	10.33	144.49	358.65	839.14	856.15	5458.01	143.03	822	15323	3.24726e+06	7281
134	4235.48	863.14	5115.58	1399.56	139.17	8.95	1.08	1.34	7.01e-05	0.00043	0.00516	1.24
	0.69	9.57	199.14	386.53	806.27	460.76	3336.59	186.49	202	17132.5	3.06465e+06	4225
135	4467.24	925.77	6307.25	1791.7	139.26	7.72	1.31	1.94	7.19e-05	0.0001	0.00088	2.49
	1.12	6.64	106.13	946.15	329.48	940.18	4359.43	135.77	1475	9556.72	704308	5946
136	2698.07	959.02	3649.04	1623.91	242.73	7.85	1.65	2.23	6.8e-05	0.00043	0.00398	2.96
	1.55	9.56	115.56	811.26	333.05	338.75	7111.51	189.21	502	14624	2.59726e+06	8979
137	3265.52	356.03	4972.36	558.53	286.53	6.48	1.19	1.68	3.45e-05	0.00099	0.00807	2.94
	1.96	5.22	119.61	438.25	571.17	614.6	7347.6	199.03	2039	9465.34	1.72409e+06	10618
138	2907.53	350.56	4278.59	440.58	244.34	9.21	1.53	1.89	9.6e-06	0.00045	0.00174	1.02
	0.7	5.34	60.77	422.2	357.21	692.58	6809.23	170.66	1164	15469.8	3.16715e+06	7911
139	2575.01	381.67	3955.06	739.75	156.49	6.22	1.3	1.8	3.13e-05	0.00059	0.00588	1.14
	0.51	13.66	56.68	842.68	156.48	352.08	3639.12	166.11	741	8253.82	1.11223e+06	5427
140	2909.4	739.05	3954.79	1164.8	257.83	6.35	0.96	1.36	5.8e-05	0.00099	0.00774	2.65
	1.97	10.23	177.55	532.75	376.42	841.93	3886.43	124.31	470	11333.8	3.2738e+06	4664

141	2039.15	946.94	3028.17	1766.03	273.08	6.87	1.4	2	7.79e-05	0.00061	0.00289	1.16
	0.47	13.01	130.83	430.08	290.58	500.2	4197.59	169.82	971	12828	1.16015e+06	5592
142	3028.51	406.87	4462.63	635.37	194.74	6.24	0.99	1.47	3.93e-05	0.00089	0.00779	1.71
	1.3	6.4	54.28	374.82	135.93	325.07	5271.41	167	2394	15783.1	3.00688e+06	6814
143	3989.17	764.17	5060.34	1293.9	262.36	5.81	1.85	2.45	1.38e-05	0.00104	0.01038	3
	2.1	5.81	228.58	236.13	1103.44	977.63	6104.85	197.3	852	15846.7	2.44343e+06	7108
144	4965.69	453.57	6491.55	878.56	264.95	7.97	1.36	1.89	1.34e-05	0.00011	0.00113	2.39
	1.47	6.72	82.48	906.17	191.67	421.29	6606.96	163.52	1440	17500.3	3.3497e+06	9184
145	3629.65	705.38	4378.51	1394.55	288.87	8.21	0.81	1.07	2.66e-05	0.00047	0.00121	1.93
	1.31	9.27	221.96	340.7	956.55	365.43	3633.35	191.14	283	10380.2	1.39682e+06	4044
146	2922.5	396.53	3523.5	569.9	128.44	5.42	1.68	2.21	4.66e-05	0.00013	0.00097	2.23
	1.24	5.23	225.37	486.61	494.96	262.6	7766.85	176.18	3168	12870.7	937331	11374
147	3272.14	293.65	4903.11	452.75	106.82	6.86	1.42	1.9	1.27e-05	0.0011	0.01018	1.18
	0.8	5.14	144.88	873.15	729.45	761.7	6216.01	136.19	1734	13947.8	2.42647e+06	8584
148	3289.87	536.39	4807.82	708.99	238	7.92	1.33	1.77	5.3e-06	0.00064	0.00425	1.13
	0.87	11.05	140.78	603.06	689.08	218.98	4846.93	132.49	117	14475.7	1.05712e+06	5022
149	2398.59	702.84	2970.01	1233.28	125.63	6.08	1	1.5	5.2e-06	0.00045	0.00108	1.47
	1.08	6.9	120.82	737.63	371.74	382.56	4084.81	198.48	695	14956.9	1.09774e+06	4501
150	3842.57	605.26	6140.42	888.2	272.19	7.39	0.59	0.85	4.02e-05	0.0003	0.00073	1.2
	0.51	12.32	213.45	972.36	535.46	298.27	3824.01	183.32	1783	15667.6	1.32798e+06	5604
151	2928.07	888.75	4526.48	1182.41	218.73	6.54	1.37	1.95	3.92e-05	0.00014	0.00128	2.34
	1.48	9.8	218.74	611.11	560.96	503.43	4160.24	156.09	1361	9970.59	1.38908e+06	5673
152	4574.84	653.58	7191.43	1037.46	179.3	7.12	1.32	1.76	1.15e-05	0.0004	0.00281	2.53
	1.57	12.93	215.9	974.88	833.77	208.15	3348.8	139.94	1001	10179.2	2.51595e+06	4345
153	3853.19	781.3	5323.37	1176.69	258.75	6.91	1.47	2.09	2.87e-05	0.00017	0.00189	2.93
	2.25	8.71	83.14	212.52	248.79	937.27	6303.97	163.05	2616	14088.2	594440	7197
154	3331.99	532.89	4918.35	769.13	117.96	8.64	1.09	1.35	4.44e-05	0.00107	0.01047	0.98
	0.65	9.55	99.29	988.88	335.11	663.62	5624.04	128.6	1494	8961.07	1.68569e+06	6732
155	2994.91	512.6	4683.16	745.43	224.69	7.79	1.39	2.07	7.46e-05	0.0011	0.00713	2.62
	1.49	13.97	118.6	658.06	309.91	478.28	6209.09	171.48	1513	13689.4	2.13632e+06	8273
156	3455.83	967.09	5080.31	1233.23	253.19	5.75	0.83	1.15	1.39e-05	0.00096	0.01022	1.22
	0.65	7.81	142.35	573.64	792.35	890.55	5006.13	165.04	2000	16500.8	3.62955e+06	7053
157	4769.79	584.56	7112.88	829.24	215.7	5.34	0.84	1.14	4e-06	0.00052	0.00323	2.63
	1.86	10.88	176.52	689.07	535.86	201.48	5834.28	123.59	1177	16810.9	2.70536e+06	7216
158	2281.38	230.19	3030.55	301.67	113.61	8.94	1.59	1.96	3.78e-05	0.00076	0.00583	2.95
	1.69	12.73	176.29	533.15	988.8	976.37	3786.4	142.41	559	12048	2.01777e+06	4365
159	2169.73	783.59	3305.57	1436.88	260.18	8.1	0.58	0.72	0.000101	0.00059	0.00374	2.57
	2.04	9.76	141.74	489.28	764.92	497.01	3059.51	142.51	415	11917.8	1.91654e+06	4484
160	3540.84	652.26	5654.71	784.1	172.32	5.06	1.59	1.98	5.2e-05	0.00027	0.0027	1.44
	0.85	8.41	82	492.02	305.46	676.89	5532.86	124.15	916	11159.8	2.77829e+06	8018
161	4829.92	418.31	7029.57	697.53	153.82	7.15	1.64	2.01	3.9e-06	0.00102	0.00975	1.16
	0.73	12.76	99.09	768.64	303.85	682.26	4374.65	175.82	1628	17230.4	1.0651e+06	6023
162	2506.45	304.44	3138.12	457.09	170.82	7.82	1	1.42	4.99e-05	0.00028	0.0033	2.07
	0.94	11.3	202.42	390.44	685.09	689.52	3008.19	186.84	856	10595.9	2.29495e+06	4344
163	4172.2	652.74	5660.91	898.33	237.49	9.49	1.82	2.36	8.04e-05	0.00053	0.00233	1.97
	1.27	5.27	160.22	790.23	848.05	483.08	5768.08	148.58	494	7540.8	1.76818e+06	6945
164	3810.89	662.13	5253.62	1136.48	251.59	8	1.1	1.64	3.81e-05	0.00092	0.00318	0.91
	0.43	6.17	65.89	992.55	188.65	564.43	5509.36	189.87	272	9899.77	666933	7381
165	3728.01	861.77	5827.28	1338.65	152.61	8.88	0.81	0.98	1.9e-05	0.00074	0.00536	2.62
	1.72	8	152.58	308.93	574	589.46	5855.01	131.45	1150	15035.1	2.93456e+06	7317
166	3654.81	926.02	4707.81	1367.86	111.63	7.27	1.46	2.05	7.15e-05	0.00042	0.00499	1.34
	0.61	10.47	173.29	676.99	772.2	768.61	5642.72	145.54	2001	10637.2	1.79749e+06	6560
167	3796.19	779.73	5415.27	1461.68	123.74	6.67	1.26	1.84	8.42e-05	0.00077	0.00792	1.57
	0.96	13.42	66.8	609.62	207.14	859.84	7013.84	194.09	2170	9799.22	754966	10410
168	2330.32	742.77	3385.55	1461.09	182.95	6.22	1.62	2.36	3.24e-05	0.00106	0.01057	1.1
	0.59	13.57	158.32	414	586.23	526.53	5424.09	146.62	311	13107	3.31967e+06	6841
169	2114.17	803.05	3111.51	1249.18	150.85	7.86	1.86	2.39	7.26e-05	0.00062	0.00357	1.05
	0.52	5.97	245.49	890.02	1160.41	606.82	4769.89	180.35	192	9532.68	1.03022e+06	7071
170	3822.83	436.41	5782.22	839.02	136.01	6.74	0.62	0.9	9.47e-05	0.00103	0.01239	1.2
	0.56	5.45	103.32	855.61	531.85	822.93	7901.07	195.15	3396	15036.5	3.00314e+06	9501
171	3418.57	996.53	4991.79	1540.95	275.87	8.13	0.68	0.88	1.52e-05	0.00097	0.00552	2.39
	1.59	10.94	152.51	664.66	884.48	983.97	7015.67	197.13	1840	8452.81	1.73355e+06	9454
172	4971.27	600.22	7158.77	934.34	291.32	7.16	1.24	1.58	8.2e-06	0.00042	0.00109	2.41
	1.47	8.51	67.04	735.06	179.6	973.39	6457.57	195.62	2888	16752.3	734718	7340
173	4048.42	970.69	5336.36	1717.1	242.53	6.76	1.18	1.49	1e-05	0.00089	0.00848	1.37
	0.72	12.54	165.61	851.79	568.53	999.49	6072.8	184.14	1765	7562.42	3.66857e+06	6827
174	3810.29	816.98	4855.65	1581.18	154.18	6.39	0.81	1.06	7.04e-05	0.00048	0.00552	2.09
	1.38	10.3	214.36	400.92	635.36	731.12	5150.28	174.71	1500	14292.5	1.52406e+06	6640
175	4175.98	857.73	5710.75	1447.33	282.21	8.95	1.44	1.75	2.76e-05	0.00073	0.00544	2.79
	1.74	9.63	155.31	530.98	417.29	281.63	7556.7	175.35	3310	17257.3	1.11724e+06	8820
176	4860.79	433.58	6844.43	804.23	128.78	5.44	1.52	2.04	3.62e-05	0.00041	0.00225	1.97
	1.27	8.49	80.15	892.43	183.97	266.2	4490.6	195.56	702	15437.8	1.49254e+06	5663
177	3070.83	692.51	4645.15	1206.33	155.55	7.83	1.17	1.46	9.05e-05	0.00029	0.00265	1.88
	1.33	12.9	209.09	388.15	610.37	440.53	6560.81	182.23	814	10679.3	700143	8988
178	2017.97	203.06	2994.15	260.71	266.33	8.96	1.25	1.82	2.97e-05	0.00052	0.00368	2.26
	1.45	5.86	62.61	467.17	266.91	758.94	4416.63	175.07	1541	16533.3	1.49473e+06	6566
179	2531.48	407.14	3900.38	670.9	155.09	7.79	1.24	1.73	4.88e-05	0.00042	0.00379	1.9
	1.43	12.74	153.44	231.13	312.13	695.33	7690.75	141.25	1425	12607.8	1.45147e+06	9167
180	4522.44	824.82	6791.23	1314.26	107.03	6.25	0.67	0.81	1.65e-05	0.0007	0.00341	2.8
	1.58	6.45	57.03	645.39	163.06	802.36	6697.76	194.7	409	13793.5	854180	8578
181	4933.83	986.56	7608.08	1194.66	272.21	9.45	1.48	1.97	6.58e-05	0.00021	0.0019	1.83
	1.25	11.26	107.13	979.52	385.94	610.89	7096.08	129.45	2670	14223.7	1.43773e+06	10164
182	3116.24	550.37	4516.15	803.55	267.42	6.72	1.13	1.48	5.88e-05	0.00088	0.00775	2.83
	1.47	6.92	123.3	453.4	321.86	456.31	4437.41	129.7	969	16817.7	861550	5752
183	4433.62	353.16	5501.81	449.67	287.38	8.59	1.82	2.35	2.85e-05	0.00028	0.00308	2.13
	1.13	10.53	64.06	898.22	217.37	350.14	5148.29	159.32	616	12078.8	2.97041e+06	6562
184	3135.01	245.81	4216.34	340.07	113.15	6.42	1.52	2.27	2.51e-05	0.00108	0.00589	2.38
	1.87	5.11	72.92	696.88	311.28	754.51	7909.43	195.8	2118	15319.3	859075	9645
185	3774.44	739.83	5209.55	1416.36	248.43	9.87	1.16	1.66	6.59e-05	0.00092	0.00753	2.78
	1.8	6.18	188.47	546.71	543.04	532.69	5052.1	132.71	747	9399.63	1.59801e+06	5659
186	4947.91	373.1	7062.29	679.18	239.12	6.19	1.29	1.84	0.0001003	0.00075	0.00308	2.9
	1.58	10.38	85.6	730.36	474.95	636.02	6431.71	127.29	1463	12261.2	1.73672e+06	8615
187	3102.28	700.47	3946.91	1353.18	156.64	7.65	1.55	2.3	6.44e-05	0.0009	0.00212	1.12
	0.66	12.98	135.39	271.25	568.24	296.81	6067.15	160.97	83	15268.8	2.87416e+06	7549
188	2164.62	864.95	3372.96	1120.1	276.69	9.27	0.77	1.09	6.6e-06	0.00081	0.00801	2.41
	1.22	12.8	98.12	396.87	355.64	837.79	4693.75	181.12	255	9880.38	1.73208e+06	5324

189	3647.48	707.54	5021.21	1207.51	167.38	9.2	0.82	1.17	9.3e-06	0.00016	0.00154	1.06
	0.47	13.95	182.94	779.95	864.16	319.83	5471.94	137.85	1347	12161.1	1.84372e+06	6707
190	3506.83	972.79	4955.95	1428.37	286.05	9.06	1.93	2.47	2.9e-05	0.00037	0.00149	2.73
	1.68	7.12	158.02	604.48	399.49	567.79	7781.85	176.23	3749	16922.1	1.49946e+06	9348
191	4206.55	513.94	5254.43	963.22	241.98	7.13	0.68	0.82	3.85e-05	0.00049	0.00113	2.25
	1.44	9.83	240.27	855.21	1314.83	673.31	3071.37	179.02	560	16044.5	1.86372e+06	4470
192	4068.66	627.87	6037.59	768.06	228.78	7.14	1	1.46	8.92e-05	0.00042	0.00162	1.66
	0.86	5.93	118.51	276.24	494.05	362.34	4548.47	127.5	1711	14354.5	1.59895e+06	5065
193	3454.34	477.64	4525.43	678.88	152.52	5.53	1.41	1.9	9.44e-05	0.0005	0.00459	1.18
	0.77	10.09	155.72	943.76	473.27	516.49	7253	150.54	974	14011.5	3.89818e+06	10152
194	3096.46	844.95	4664.94	1401.07	141.59	5.86	1.82	2.36	3.2e-05	0.0009	0.00598	1.1
	0.72	11.17	121.64	833.79	438.52	264	5259.2	128.34	2031	17010.1	2.36313e+06	6339
195	4162.6	645.76	6257.73	944.2	115.89	6.9	0.95	1.42	6.45e-05	0.00073	0.00594	2.02
	1.53	10.22	241.54	218.49	1144.25	759.24	3377.68	197.24	72	10210.3	1.37967e+06	4578
196	4619.31	394.6	6679.93	569.43	298.57	9.96	1.98	2.53	6.11e-05	0.00038	0.00192	1.15
	0.8	12.27	57.14	692.54	286.96	344.32	6924.3	122.44	187	13847.5	1.59304e+06	8688
197	3734.54	771.13	5596.6	1174.86	123.99	7.42	0.92	1.36	2.7e-05	0.00025	0.0014	2.31
	1.07	11.54	221.33	996.48	1243.37	404.48	4592.02	176.76	207	9114.73	2.0788e+06	6111
198	3951.82	477.26	5696.66	831.15	216.96	5.82	1.53	1.84	4.71e-05	0.00067	0.00606	1.27
	0.99	13.08	220.84	535.48	538.03	658.11	4386.93	150.06	620	15972.4	1.63647e+06	5258
199	2339.95	271.08	3189.73	456.29	176.77	9.85	1.89	2.62	4.33e-05	0.00063	0.0071	2.92
	2.02	8.19	150.64	570.98	651.53	524.29	7981.59	173.35	1346	10018.3	3.96107e+06	9318
200	3581.09	807.92	4613.18	1152.57	236.84	7.43	0.62	0.76	3.05e-05	0.00107	0.0048	2.54
	1.36	7.4	104.76	298.64	438.29	972.15	7666.89	188.02	3062	9484.55	3.00621e+06	10281
201	4314.46	765.99	5528.34	1392	132.53	9.9	1.04	1.38	1.09e-05	0.00095	0.00926	1.94
	1.19	9.32	170.58	970.63	422.51	475.41	3261.7	179.88	331	8145.1	884311	4187
202	2276.95	595.91	3219.22	891.76	158.07	8.38	1.56	1.94	7.54e-05	0.00103	0.00532	2.91
	2	12.74	212.85	534.61	1111.55	868.61	7737.8	199.22	191	16788.5	1.96219e+06	10237
203	3987.14	999.35	5695.24	1720.49	238.5	9.88	0.64	0.94	7.53e-05	0.00069	0.00563	1.33
	0.86	8.56	122.81	628.78	413.31	972.29	3510.53	144.56	1744	16711.5	1.73919e+06	4418
204	3524.58	980.2	4855.64	1841.53	216.21	6.65	1.24	1.67	4.51e-05	0.00043	0.00481	2.66
	1.52	11.35	59.95	890.58	305.93	557.02	6826.07	182.03	2803	8744.75	2.4768e+06	8917
205	4532.82	581.17	7057.77	735.38	103.54	5.24	1.81	2.47	1.62e-05	0.00047	0.00386	2.41
	1.16	10.11	76.54	711.26	265.34	619.39	4394.57	123.89	561	13590.2	2.11306e+06	4892
206	3254.68	551.04	5096.41	764.64	253.57	6.61	0.58	0.74	6e-06	0.00099	0.00797	2.26
	1.72	13.27	51.29	423.93	284.35	690.39	5170.37	154.54	379	15856.1	3.53864e+06	7313
207	2989.21	262.05	4133.79	483.7	287.75	8.83	1.37	1.66	8.23e-05	0.00107	0.00617	2.76
	1.18	9.77	95.52	333.34	407.69	772.67	7921.09	123.44	2231	11394.4	2.34383e+06	11283
208	4641.31	899.51	7222.55	1311.64	238.5	5.29	1.92	2.67	6.2e-06	0.00064	0.00139	2.21
	1.61	8.66	89.14	723.93	421.19	665.96	5148.98	129.12	2307	9432.67	1.0091e+06	7584
209	4807.96	792.68	7160.87	998.04	274.63	9.3	1.51	1.91	1.94e-05	0.00087	0.00516	1.7
	0.9	10.43	183.5	439.57	440.11	223.44	4171.4	173.26	1667	11150.7	2.8906e+06	5192
210	2072.43	543.47	2567.59	896.51	199.48	9.09	1.38	1.78	7.1e-06	0.00015	0.00173	1.35
	0.83	10.54	174.25	391.08	595.68	757.59	5429.18	183.37	400	15896.2	1.97565e+06	7375
211	4151.72	691.44	6143.11	1064.35	202.53	7.56	1.09	1.49	4.5e-05	0.00092	0.0075	2.76
	1.13	7.8	196.61	628.03	1055.15	767.28	7440.86	173.74	3162	7658.09	1.31061e+06	10221
212	3508.85	640.09	4237.1	1002.38	198.94	6.41	1.96	2.75	7.71e-05	0.0005	0.00481	2.84
	2.23	11.39	236.19	409.34	648.57	635.26	4175.45	131.11	1154	12300.3	2.39851e+06	5600
213	3203.24	356.49	4825.3	453.7	224.46	6.9	1.66	2.36	6.88e-05	0.00088	0.00206	1.41
	1.07	8.79	61.27	576.25	306.08	690.89	5975.98	139.63	1515	8913.91	1.34885e+06	7178
214	2383.64	253	3518.14	416.86	244.6	5.25	1.11	1.54	8e-06	0.00071	0.00794	2.12
	1.14	13.12	142	415.21	508.18	760.8	3246.05	147.51	1082	16776.9	2.03985e+06	3898
215	2839.35	647.95	4225.13	1266.93	148.97	7.81	0.96	1.25	4.4e-05	0.00026	0.00265	1.98
	1.08	7.4	200.95	676.57	940.06	278.19	3616.74	146.16	34	12012.6	1.56029e+06	4012
216	3109.25	937.74	4679.96	1280.45	257.29	7.17	1.78	2.49	8.7e-06	0.00025	0.00155	1.55
	1.11	12.51	228.12	203.42	1065.8	293.01	6083.68	194.25	537	12916.7	2.53913e+06	6939
217	4135.32	876.11	6526.79	1588.49	173.38	8.68	1.2	1.52	4.38e-05	0.00098	0.01054	2.86
	1.44	10.84	151.7	662.8	548.3	339.87	4898.08	154.57	127	13688.3	3.19687e+06	5726
218	3137.38	536.49	4227.02	960.86	138.96	5.72	1.55	2.11	8.2e-05	0.00055	0.00214	2.14
	1.51	6.96	142.56	204.15	659.84	895.2	7371.94	197.16	3442	11908.8	838234	9028
219	4353.33	826.26	6394.89	1473.21	278.06	5.75	1.44	2.12	5.8e-06	0.00043	0.00321	1.51
	0.76	11.69	227.87	892.9	1127.1	619.56	5153.48	130.9	443	13295.7	2.45567e+06	6117
220	2492.25	835.46	3492.98	1212.19	167.77	7.33	1.38	1.75	1.03e-05	0.00108	0.00894	1.62
	1.2	8.9	118.37	387.35	328.32	561.38	3968.76	192	959	14843.5	3.77656e+06	5276
221	4277.04	915.56	6308.5	1173.1	188.17	9.31	1.93	2.52	5.8e-06	0.00097	0.00456	2.6
	1.23	11.79	245.03	293.02	1009.99	499.85	7321.12	167.1	3317	17476.7	2.12558e+06	9272
222	3392.5	770.21	4740.09	1511.24	259.64	7.8	1.4	1.69	5.17e-05	0.00079	0.00457	2.16
	0.87	13.98	209.58	780.12	1204.48	895.59	3981.85	186.17	1678	11266.4	3.07355e+06	4493
223	3238.47	338.56	4167.9	502.47	213.33	8.26	1.84	2.64	3.43e-05	0.00102	0.0053	2.84
	1.46	10.77	113.59	377.95	384.23	433.14	7981.21	132.69	3538	17990	1.01202e+06	9346
224	4907.31	318.02	6248.46	539.25	207.31	6.9	0.71	1.01	8.29e-05	0.00012	0.00142	1.26
	0.94	9.6	166.48	357.82	918.6	683.73	4403.01	198.15	375	9144.37	1.70176e+06	5111
225	4859.84	396.73	6365.26	537.8	149.37	5.75	1.73	2.34	1e-06	0.00085	0.00412	2.93
	1.4	6.81	228.38	899.67	797.86	853.1	7364.69	162.64	2522	8081.6	2.39616e+06	10398
226	4793.13	886.41	7200.72	1219.28	189.55	5.98	0.53	0.66	7.3e-05	0.00034	0.00359	1.39
	0.79	5.41	125.41	494.03	646.39	595.26	7002.78	148.08	2870	12473.5	3.50706e+06	8812
227	2734.71	895.24	4116.35	1337.82	225.56	9.08	1.22	1.69	2.44e-05	0.00052	0.00399	2.28
	1.74	5.99	66.83	732.43	330.22	320.85	4576.34	190.71	1663	9061.08	2.07439e+06	6853
228	3564.43	384.06	5581.95	734.2	199.4	9.88	1.5	2.14	4.46e-05	0.00095	0.00599	1.44
	0.66	5.54	235.76	411.18	949.14	284.63	3877.6	129.09	1773	17292.1	2.83596e+06	5398
229	4546.28	963.51	6452.53	1373.82	251.64	5.2	1.42	2.1	5.17e-05	0.00107	0.01089	1.6
	0.69	8.01	160.34	841.32	786.36	391.04	4348.55	194.12	2116	15068.9	2.82301e+06	5716
230	2219.25	913.42	3182.64	1644.2	223.5	7.35	1.48	2.11	1.88e-05	0.00046	0.00371	1.8
	0.85	12.92	154.98	669.1	848.46	887.19	3342.55	178.89	356	8689.7	1.69062e+06	4711
231	2912.93	545.6	3939.04	804.28	272.9	7.02	1.18	1.48	4.29e-05	0.00097	0.01132	2.92
	1.53	11.34	105.26	776.55	502.89	897.78	5299.07	120.64	375	11340.2	1.12526e+06	6059
232	3478.56	979.95	5140	1250.48	215.79	6.35	1.74	2.17	4.78e-05	0.0006	0.00271	2.12
	1.2	6.39	148.11	618.29	767.14	377.09	6074.4	186.77	164	8944.19	1.40257e+06	8102
233	3053.26	739.49	4756.45	1107.78	241.42	5.09	1.53	2.28	9.99e-05	0.00094	0.00958	2.96
	1.28	7.52	238.84	263.63	612.77	517.98	6364.24	121.46	1390	15730.5	2.84858e+06	8996
234	4581.54	830.05	5593.82	1211.35	165.89	5.16	1.7	2.31	1.63e-05	0.00022	0.00194	1.23
	0.54	11.58	191.37	350.34	635.09	652.27	5114.2	144.47	1936	11177.6	2.80789e+06	6298
235	3414.72	487.2	5388.85	701.87	239.39	9.8	0.71	0.9	9.64e-05	0.00101	0.00805	1.21
	0.76	10	100.93	644.93	395.79	575.23	3536.56	141.85	1189	18113.2	2.8091e+06	4555
236	3124.65	213.72	4894.21	328.57	198.69	7.64	1.12	1.66	3.6e-06	0.00018	0.00103	1.04
	0.56	12.07	199.04	590.54	888.27	991.93	5683.59	151.73	2471	17102.6	519077	8521

237	2988.2	634.11	3618.5	1218.37	267.09	9.71	0.83	1.09	8e-05	0.00076	0.002	2.06
	0.92	10.08	121.42	693.73	282	573.18	6269.75	139.65	1892	13499.3	1.45343e+06	7556
238	4957.21	937.35	7085.16	1137.6	138.3	5.19	1.65	2.36	7.28e-05	0.0006	0.00296	2.11
	1.49	12.87	150.69	720.64	899.02	609.79	7595.95	184.38	3019	9693.34	3.09958e+06	9219
239	4077.22	392.18	6274.14	582.17	110.33	5.32	1.83	2.25	2e-05	0.00105	0.00499	1.45
	1.12	6.57	141.63	786.54	770.88	414.43	3797.81	165.14	1317	12029.3	2.60124e+06	5344
240	3413.38	677.23	4630.42	844.98	259.71	8.37	1.34	1.78	5.3e-06	0.0006	0.00475	2.71
	1.91	12.89	59.9	998.55	209.9	363.65	5399.82	157.55	286	9983.33	2.12145e+06	6379
241	2971.83	689.2	4198.17	920.16	208.08	7.6	1.02	1.52	4.2e-05	0.00102	0.00319	2.29
	0.93	11.93	113.96	283.59	456.19	240.05	6170.47	128.11	241	10883.6	2.99562e+06	7595
242	3223.87	491.17	4741.52	605.07	222.49	7.77	1.32	1.84	3.88e-05	0.0009	0.01031	2.57
	1.13	12.73	78.7	451.01	243.13	576.98	5923.45	164.76	2911	13240.6	773815	6887
243	2396.56	996.12	3573.1	1988.97	182.59	6.86	1.55	2.18	8.1e-05	0.00053	0.00335	0.93
	0.57	11.6	104.28	470.81	334.92	760.05	7853.99	170.86	681	13720.8	728933	8903
244	3537.25	383.73	5456.81	601.49	181.37	5.79	0.53	0.7	4.65e-05	0.0006	0.00228	1.25
	0.78	7.5	101.24	862.26	234.8	424.98	3635.02	196.89	666	13163.9	1.52316e+06	4981
245	3212.04	378.73	4528.62	549.34	145.71	9.94	0.53	0.64	4.81e-05	0.00022	0.00205	2.23
	1.74	13.54	119.14	512.75	571.33	316.03	5173.37	134.89	806	8770.46	2.09346e+06	7347
246	4186.27	798.14	6599.67	1581.27	268.77	5.15	0.53	0.74	5.71e-05	0.00031	0.00276	1.22
	0.58	10.21	175.62	675.41	699.39	816.41	4237.45	175.46	886	16365.1	2.91787e+06	5069
247	3180.72	450.24	4945.5	540.38	152.88	8.09	1.89	2.73	3.19e-05	0.00024	0.00153	1.92
	1.09	9.79	117.04	930.76	335.25	579.56	5819.28	185.39	1329	17875.4	553326	8312
248	2013.22	392.62	2505.75	587.09	299.57	7.17	1.08	1.59	5.24e-05	0.0004	0.00218	2.83
	1.97	10.57	134.99	419.89	774.34	380.7	7480.4	165.76	2424	12726.7	1.50149e+06	10889
249	4095.02	747.75	5435.82	1250.65	230.74	7.81	0.87	1.23	6.67e-05	0.00049	0.00578	1.99
	1.35	7.25	94.54	578.84	349.85	433.83	7045.7	162.57	232	12896.1	3.34616e+06	8059
250	2742.76	562.74	3843.5	983.93	257.15	7.45	1.55	2.07	2.96e-05	0.00056	0.0067	1.86
	1.09	12.52	64.84	933.04	208.45	202.19	3410.26	126.36	1549	13698.7	2.92437e+06	4026
251	2008.55	210.66	2643.77	298.28	171.59	5.2	1.67	2.25	8.31e-05	0.00082	0.00182	1.7
	0.89	12.24	107.72	418.11	582.2	912.78	4389.69	197.86	2132	15555.1	592654	6158
252	4748.46	603.98	7379.14	1059.31	196.49	9.17	1.83	2.73	8.73e-05	0.0006	0.0032	2.7
	1.5	6.73	219.63	814.88	1163.6	307.3	4442.14	167.55	245	11446.1	810196	6051
253	4695.01	887.31	7133.93	1448.31	182.81	9.87	1.68	2.27	1.49e-05	0.00105	0.0067	1.66
	0.7	7.78	195.65	981.55	999.78	463.98	6805.78	136.12	2643	17514.1	2.36762e+06	8738
254	3814.59	957.91	5492.07	1578.13	293.04	8.65	0.82	1.22	5.56e-05	0.00042	0.0027	1.09
	0.67	10.31	142.27	763.35	697.64	507.57	5290.41	155.1	1066	15138.5	3.8456e+06	7468
255	4285.92	370.31	5332.97	480.11	201.41	8.55	0.97	1.37	8.9e-05	0.00033	0.0018	1.42
	1.13	12.36	164.9	700.35	330.11	817.13	4911.41	165.56	1129	11122	2.5631e+06	6233
256	3492.12	661.26	4849.28	1174.03	173.49	9.09	0.7	0.92	4.82e-05	0.00066	0.00441	0.91
	0.66	7.96	108.96	485.26	410.24	994.11	6627.43	164.98	2622	13767.1	3.41323e+06	8668
257	4034.67	262.52	6399.5	375.34	179.48	7.7	1.6	2.4	5e-06	0.00049	0.00129	1.63
	1.2	8.43	193.15	337.17	839.62	258.63	5244.73	120.22	1742	16897.5	768125	6376
258	3366.5	437	4826.9	774.16	220	7.97	1.58	1.94	3.1e-05	0.00046	0.00456	1.16
	0.82	9.3	213.52	784.94	499.38	932.28	4510.39	168.41	244	15288.6	3.18508e+06	5448
259	3125.53	453.84	4511.93	690.01	275.3	9.64	0.87	1.17	5.85e-05	0.0004	0.00299	1.08
	0.68	13.92	97.33	464.4	206.21	434.33	3374.13	152.08	936	11201.5	1.54446e+06	4779
260	2184.79	960.62	3287.58	1177.57	170.55	9.26	1.42	2.03	6.86e-05	0.00083	0.00988	1.38
	0.93	7.6	143.04	617.36	408.31	502.08	4021.47	142.4	1247	9256.47	2.75516e+06	5367
261	3781.07	997.52	5597.27	1408.04	145.17	10	1.76	2.62	1.31e-05	0.00037	0.00343	0.95
	0.75	9.25	246.8	590.72	558.64	610.42	7969.38	127.98	298	10440.6	3.26578e+06	11495
262	4017.83	622.99	4898.77	1110.4	246.2	5.72	0.75	0.98	4.24e-05	0.00041	0.00392	1.4
	0.78	8.29	59.95	201.72	136.71	693.46	7308.08	154.17	1350	12224.7	1.46668e+06	7896
263	2320.13	709.17	2789.74	916.28	204.28	6.32	1.39	1.74	9.55e-05	0.00082	0.00958	2.07
	1.55	12.92	163.3	568.42	480.8	527.84	3267.39	148.54	1627	9468.22	2.54944e+06	3769
264	3296.09	494.61	4266.3	736.91	282.32	5.32	1.68	2.42	6.95e-05	0.00078	0.00457	0.99
	0.57	9.95	247.36	581.13	1387.86	812.91	3728.6	123.79	548	8894.37	3.80418e+06	4168
265	4563.53	546.25	7035.45	667.41	291.68	5.58	1.64	2.38	5.34e-05	0.0009	0.00249	2.81
	1.82	10.62	142.07	801.1	533.52	635.71	6094.41	133.21	896	16610.4	2.00761e+06	8405
266	3666.74	803.49	5378.9	1512.78	210.37	5.45	0.77	0.94	4.4e-05	0.00074	0.00656	2.72
	1.59	5.45	246.63	964.1	818.96	532.08	4138.73	129.72	676	16373.9	2.60211e+06	5531
267	4164.79	300.8	6284.77	508.99	112.93	6.62	0.52	0.65	4.97e-05	0.00065	0.00769	2.03
	1.19	12.35	129.1	200.61	571.25	975.65	7782.98	146.81	1009	14288.3	3.29928e+06	10463
268	3050.07	637.9	4603.37	1049.88	242.17	9.7	1.19	1.65	1.2e-05	0.00045	0.00487	2.21
	1.19	7.06	117.96	558.89	640.78	332.03	5631.64	169.59	1272	12616.2	2.62611e+06	6895
269	3107.92	613.44	4085.39	1172.92	288.13	9.43	1.96	2.7	1.2e-05	0.00097	0.00196	2.47
	1.74	12.86	158.52	653.36	392.44	571.08	6921.17	132.01	3036	17539.4	848526	10372
270	3954.05	638.64	5655.62	1208.69	248.62	8.92	0.76	0.97	2.35e-05	0.00078	0.0055	1.05
	0.47	8.95	152.32	698.61	774.55	327.21	5884.78	192.9	1890	8084.22	3.28647e+06	8815
271	2902.55	320.81	4295.4	607.34	118.44	8.9	1.74	2.52	2.22e-05	0.00043	0.001	1.01
	0.51	6.83	79.7	367.79	202.37	546.79	7777.25	198.05	595	15151.5	1.41918e+06	8292
272	3953.35	757.54	5617.99	1259.09	253.53	5.74	1.98	2.82	2.35e-05	0.00026	0.00222	1.48
	0.69	13.28	108.39	511.55	448.82	842.82	5756.6	177.63	949	7494.87	3.55723e+06	7012
273	2079.11	251.15	3276.91	328.53	162.08	5.31	1.82	2.51	9.4e-05	0.00065	0.00615	2.34
	1.02	11.09	232.66	541.46	542.59	321.98	3122.6	138.15	450	8421.06	2.24765e+06	4200
274	3372.88	867.09	4626.23	1330.82	276.94	6.4	1.51	2.1	9.21e-05	0.00041	0.00195	1.28
	0.87	10.02	164.58	960.38	501.53	408.78	4294.29	175.25	1134	10999	1.33207e+06	5708
275	4468.51	631.33	7021.39	1194.75	110.57	7.2	1.32	1.67	6.1e-06	0.00072	0.00244	2.34
	0.98	8.21	179.54	608.67	1024.15	996.67	6609.06	148.25	2550	14764.3	2.20369e+06	9563
276	3134.64	935	3983.16	1747.75	224.35	9.67	1.3	1.85	8.27e-05	0.00021	0.00161	1.71
	1.16	13.07	121.76	467.26	517.66	294.29	4498.8	133.61	1939	16086.4	1.58225e+06	6504
277	2466.89	733.2	3170.61	1299.8	182.53	5.51	1.83	2.34	8.02e-05	0.00075	0.00577	1.46
	0.9	9.49	52.18	257.78	305.21	625.34	4797.5	162.02	526	16386.3	3.0194e+06	5874
278	2600.97	481.23	3309.27	621.67	247.67	6.08	1.96	2.39	5.41e-05	0.00092	0.00348	3
	1.81	6.88	92.84	508.89	530.82	837.28	6223.06	121.66	1096	9174.39	2.76258e+06	7172
279	2887.95	842.74	3865.55	1092.36	232.17	5.1	1.67	2.21	2.17e-05	0.00107	0.00473	1.22
	0.59	10.2	55.13	700.94	296.28	906.98	6491.46	154.79	65	7662.22	2.1561e+06	9515
280	2366.12	739.65	3738.69	1188.71	294.12	5.76	1.43	1.83	6.68e-05	0.00082	0.00746	1.27
	0.7	8.92	88.46	770.53	339.41	764.07	5726.49	190.9	954	11662.4	2.66171e+06	7822
281	4461.05	642.21	5604.45	1152.99	241.53	7.68	0.98	1.27	9.26e-05	0.00057	0.00369	2.48
	1.62	8.4	247.85	595.31	867.26	969.94	5905.02	122.52	255	14833.3	3.27972e+06	7300
282	4117.33	888.56	6232.43	1477.28	181.52	7.68	1.82	2.42	2.74e-05	0.00011	0.0013	2.35
	1.04	8.46	240.14	726.89	784.53	501.72	5033.58	159.22	120	16351.6	3.51758e+06	5624
283	4351.72	935.21	6020.03	1769.46	187.78	9.08	1.11	1.66	5.44e-05	0.0005	0.00156	2.8
	1.38	8.18	67.93	279.74	137.36	650.66	7255.65	167.66	1326	16426.8	2.28827e+06	9812
284	3482.9	241.19	5090.58	298.1	231.74	6.55	1.25	1.7	5.7e-06	0.00088	0.01	2.92
	1.95	9.94	183.81	808.39	889.75	404.26	7412.95	196.71	3450	15756.3	2.79096e+06	10244

285	2540.26	760.6	3114.25	1277.62	263.71	9.44	0.89	1.17	4.21e-05	0.00015	0.00171	2.85
	1.85	8.73	88.03	302.98	476.9	437.01	5566.4	181.61	2683	15242.4	820270	6449
286	2602.93	903.84	3549.02	1615.49	246.83	9.12	1.53	2.23	5.32e-05	0.00107	0.00334	1.98
	1.58	7.34	172.56	951.34	656.55	977.91	3222.61	134.63	584	9301.63	1.50528e+06	3646
287	4701.76	669.42	7007.13	1110.89	132.44	8.51	0.96	1.32	2.3e-05	0.00068	0.00318	2.34
	1.75	13.11	190.97	789.22	552.41	211.77	3321.99	160.38	422	12053.1	675430	4473
288	2791.88	941.45	4418.8	1595.65	134.82	9.05	1.01	1.41	3.83e-05	0.00042	0.00302	2.28
	1.56	10.73	114.45	608.48	592.57	559.12	6539.59	125.76	2666	15575	586590	9642
289	3432.17	524.31	5325.35	940.74	211.34	9.62	1.94	2.82	3.51e-05	0.00053	0.00203	1.73
	0.71	8.31	87.59	574.83	244.92	523.56	5708.79	167.92	730	16317	3.32685e+06	7757
290	3603.47	207.39	4832.6	397.84	290.95	8.43	1.36	1.78	9.89e-05	0.00082	0.00349	1.31
	0.94	10.83	161.13	944.58	853.6	549.45	5854.17	169.13	2386	10236.4	3.8735e+06	7464
291	4734.76	781.61	7297.28	1091.77	131.65	7.11	1.93	2.83	5.9e-05	0.0004	0.00393	2.85
	2.24	9.79	151.91	733.51	833	332.69	7945.63	162.62	1787	17618.7	2.14538e+06	9541
292	3463.49	977.41	5524.7	1766.27	217.17	8.74	0.92	1.11	8.2e-05	0.00049	0.00438	1.08
	0.81	9.65	105.86	809.15	493.56	930.97	6677.71	198.63	28	10386.3	3.98913e+06	8736
293	3452.52	841.39	5341.76	1462.31	189.83	5.47	1.62	2.33	7.1e-06	0.00103	0.00449	1.03
	0.66	7.37	71.82	329.84	412.58	533.33	6928.34	166.37	2248	15389.2	1.66153e+06	7737
294	4292.04	811.61	5954.2	1009.13	258.53	9.73	1.64	2.35	6.5e-05	0.00078	0.00642	1.52
	1.08	7.67	127.93	914.8	714.26	780.31	4062.1	162.18	1533	8933.39	1.87962e+06	4619
295	2811.11	758.19	3537.22	1328.99	262.59	8.11	0.85	1.23	5.89e-05	0.00094	0.0037	1.34
	0.82	7.64	117.69	447.61	587.86	513.84	5322.01	129.9	2668	10136.6	2.04793e+06	7758
296	4598.27	605.93	7290.5	840.26	257.94	8.21	1.34	1.63	5.69e-05	0.00049	0.00535	2.91
	2.19	6.93	100.74	936.51	481.2	709.54	5058.62	135.11	2434	8898.84	2.05241e+06	7118
297	3659.68	458.78	4480.28	692.06	294.62	5.28	1.8	2.19	2.47e-05	0.00068	0.00155	2.02
	1.18	11.37	127.12	266.61	316.41	480.13	6091.62	177.22	735	13249.9	1.03468e+06	8974
298	4561.83	762	6413.34	1257.26	202.03	5.82	0.68	0.91	1.66e-05	0.00034	0.00365	2.88
	1.2	7.1	226.93	796.24	539.22	923.09	6057.39	127.28	2263	14155.6	2.91748e+06	7806
299	3126.23	320.04	4719.64	586.16	143.46	9.26	0.88	1.08	5.52e-05	0.00093	0.00909	0.91
	0.37	6.41	200.48	838.28	1092	325.97	3499.07	143.9	1354	15158.5	1.09038e+06	4068
300	2292.45	301.29	3185.99	527.6	284.94	8.37	1.34	1.75	2.28e-05	0.00061	0.0033	2.17
	1.16	8.32	80.64	728.09	411.8	585.32	6114.66	160.18	1704	14063.1	2.38308e+06	9057
301	4412.69	662.79	6896.54	984.46	144.69	7.19	1.74	2.52	6.5e-05	0.0006	0.00554	1.51
	1.06	5.15	222.96	300.55	1296.98	944.14	6755.87	156.44	2827	7507.82	822949	9290
302	3007.18	514.03	4602.3	831.47	211.45	5.99	1.52	2.24	8.32e-05	0.0003	0.00141	0.91
	0.53	5.97	231.99	933.25	1079.72	706.44	7337.8	166.43	2553	17567.9	2.22144e+06	9034
303	2980.41	581.63	3840.25	1103.28	210.65	8.76	1.87	2.45	6.25e-05	0.00085	0.00803	1.17
	0.75	6.99	215.28	774.23	458.83	782.9	4518.85	144.26	1528	14805.6	1.84087e+06	5417
304	2435.73	523.53	3324.09	820.11	222.28	5.18	0.6	0.85	1.77e-05	0.00048	0.00163	1.6
	0.85	9.18	216.33	313.01	536.51	541.17	7245.05	129.31	346	11797.8	762651	10163
305	2840.23	956.8	4525.36	1579.5	268.35	6	1.48	1.91	5.08e-05	0.00026	0.00064	1.22
	0.64	13.15	92.77	614.58	499.48	559.57	5389.24	148.99	792	13082.1	763794	7622
306	4530.08	431.34	5882.61	812.29	270.42	6.3	1.35	1.95	7.22e-05	0.00101	0.00315	2.07
	1.55	13.25	95.86	503.7	525.38	347.73	6529.88	185.36	3061	14574.8	3.04145e+06	8351
307	4517.32	658.11	6775.26	1279.45	139.83	7.06	1.05	1.46	8.39e-05	0.00044	0.00374	1.67
	1.02	5.16	97.04	823.46	353.1	330.06	4656.8	171.91	668	10783	3.3572e+06	6499
308	2299.45	695.64	3311.76	1173.19	167.96	5.58	0.64	0.84	9.64e-05	0.00031	0.00204	2.19
	1.08	7.47	85.38	554.03	283.65	753.41	6071.78	189.16	870	17686.3	1.44118e+06	8911
309	2013.88	226.21	2669.52	348.51	162.44	9.63	0.56	0.79	1.48e-05	0.00031	0.00289	2.65
	2.01	10.68	220.39	420.74	824.15	955.48	3144.78	191.4	558	16939.2	2.12633e+06	4407
310	4821.19	854.45	6006.24	1348.79	252.64	7.32	1.11	1.4	9.36e-05	0.00063	0.00681	1.04
	0.77	8.96	150.26	878.72	320.78	375.38	3241.1	185.29	387	12316.9	2.61044e+06	3821
311	2594.08	347.28	3694.59	516.93	141.71	6.79	1.09	1.4	2.57e-05	0.0011	0.00921	2.66
	1.97	10.09	133.42	875.61	695.78	237.28	3259.64	163.7	1575	10251.4	2.10673e+06	3834
312	2685.53	844.55	4212.85	1462.33	239.2	9.4	1.46	2.01	4.69e-05	0.00105	0.01229	2.37
	1.85	11.99	91.38	469.23	227.41	667.23	7601.2	143.52	3211	16158.9	3.14016e+06	9263
313	4354.13	626.02	5870.1	1250.12	276.13	7.46	1.4	1.69	2.42e-05	0.00036	0.00161	1.5
	0.64	8.94	233.23	454.78	1016.21	994.25	3214.64	187.44	424	9286.56	1.2985e+06	4248
314	4525.76	870.59	5976.57	1349.38	138.69	9.15	1.48	1.87	5.4e-05	0.00043	0.00499	1.09
	0.67	8.97	83.98	214.33	187.77	244.33	6946.14	139.41	1112	18234.6	3.76429e+06	8690
315	3199.64	492.84	4395.36	701.69	139.4	7.13	1.27	1.86	9.91e-05	0.00092	0.01044	2.73
	1.35	7.69	170.36	284.02	960.17	673.15	6534.33	129.5	2175	9220.82	1.16336e+06	9266
316	2992.5	510.73	3822.59	797.95	144.47	9.91	1.42	1.73	5.46e-05	0.00095	0.00551	2.99
	1.44	6.8	210.81	552.54	929.57	801.43	6746.69	133.57	3266	7549.37	1.70031e+06	10033
317	2627.28	982.41	3705.08	1492.25	197.96	7.77	1.74	2.12	3.34e-05	0.00102	0.0082	1.74
	0.88	9.53	93.96	369.2	392.37	988.4	5746.6	192.48	1514	11259	1.93674e+06	8550
318	3345.68	621.9	4856.09	1062	219.01	6.83	0.74	1.04	3.25e-05	0.00055	0.00237	1.47
	0.66	13.26	63.97	529.38	346.38	909.51	7660.44	188.73	2111	17395.3	1.43983e+06	10250
319	3940.73	471.36	5802.48	853.52	287.94	9.83	1.41	2.1	9.67e-05	0.00099	0.01122	2.59
	1.96	9.84	176.03	859.79	1043.65	595.85	6383.67	125.81	1685	16479	3.27767e+06	7023
320	4463.45	235.85	5603.81	392.73	106.96	8.84	1.9	2.36	9e-06	0.00054	0.00187	1.77
	1.32	11.24	151.58	757.52	572.46	957.06	6030.1	144.51	1790	16247.9	537090	7246
321	3918.81	419.37	4912.47	748.08	298.92	9.36	0.85	1.18	6.5e-05	0.00054	0.00332	2.4
	1.61	5.29	124.76	642.65	621.48	323.65	6014.15	170.04	1484	17307.1	2.96685e+06	8058
322	3826.71	507.16	4944.03	736.44	284.09	5.75	0.62	0.77	8.3e-06	0.00048	0.00249	2.79
	1.59	5.35	205.99	946.36	473	553.91	4550.58	130.61	1180	14995.5	1.4706e+06	5320
323	4626.92	286.6	7046.35	490.64	129.29	5.23	1.73	2.25	0.0001004	0.00036	0.00298	2.6
	1.6	7.46	77.23	787.28	268.18	292.72	5553.73	198.19	2782	11050.3	1.34708e+06	7842
324	3463.08	706.84	4430.95	1382.78	202.78	9.89	0.52	0.7	8.31e-05	0.00033	0.00079	2.18
	0.92	12.27	182.42	296.84	713.35	896.7	7664.78	185.18	2933	10861.3	1.41045e+06	9510
325	2604.45	565.34	3782.44	695.61	277.29	8.66	0.63	0.77	7.65e-05	0.00068	0.00663	1.69
	1.3	11.52	100.18	445.42	303.58	223.91	7055.18	189.3	3521	14650.6	1.32909e+06	9331
326	2440.26	488.5	3146.64	689.03	229.33	7.78	1.46	1.83	3.54e-05	0.00052	0.00539	2.06
	1.56	9.57	186.2	756.41	612.86	856.44	3435.81	175.57	743	11829.1	1.50243e+06	4315
327	2295.71	829.87	2829.95	1190.67	293.71	7.52	1.58	2.16	4.83e-05	0.00102	0.00388	1.73
	1.11	7.8	130.77	863.58	464.83	931.44	5457.32	162.13	1967	7574.65	3.75178e+06	8105
328	4087.34	589.6	5611.3	894.56	230.27	8.65	1.78	2.15	4.91e-05	0.00102	0.0102	1.11
	0.69	8.38	90.47	650.35	439.2	748.74	4620.23	143.06	229	8248.63	2.38892e+06	5311
329	2243.87	617.63	3351.68	945.03	137.65	7.27	1.29	1.57	9.37e-05	0.00108	0.00982	2.34
	1.68	7.22	108.44	609.98	442.3	782.58	4948.43	145.76	368	11534.7	2.53669e+06	6081
330	2815.88	558.18	4491.9	809.92	120.68	5.47	1.79	2.18	2.91e-05	0.00066	0.00508	1.78
	1.35	10.27	153.89	859.17	827.32	631.55	7791.72	168.47	669	10965.9	2.46653e+06	10722
331	2315.15	673.89	3386.61	1028.7	103.42	5.01	0.79	1.19	3.86e-05	0.0007	0.005	2.12
	1.69	10.76	100.47	585.58	223.62	295.63	3534.69	142.46	1777	11581	1.08346e+06	4867
332	3632.23	803.64	5517.26	1586.77	133.7	9.14	1.3	1.86	4.6e-06	0.00045	0.00471	2.01
	1.07	8.3	181.64	668.44	639.47	222.5	5182.24	167.32	2056	18164.4	1.60429e+06	6773

333	3133.32	350.1	4389.84	476.89	204.94	7.15	0.59	0.85	8.63e-05	0.00024	0.0023	2.3
	1.77	7.64	114.56	529.64	438.94	868.15	3258.44	181.96	1195	15832.3	1.67067e+06	3876
334	4123.78	354.54	6096.18	592.55	117.25	8.77	0.82	1.18	3.08e-05	0.00087	0.00907	1.21
	0.6	11.23	143.57	368.5	508.14	811.15	4720.73	155.7	1662	9580.76	3.28933e+06	5717
335	2408.31	201.62	3764.68	369.37	281.64	5.97	1.81	2.49	3.89e-05	0.001	0.00864	1.18
	0.81	13.15	224.32	859.32	1145.21	454.96	5489.69	159.8	931	13092.9	3.70521e+06	6166
336	4869.69	275.32	7315.09	385.06	283.28	9.71	1.38	1.93	1.3e-06	0.00095	0.00268	1.27
	0.76	13.5	161.24	905.81	534.87	600.34	4144.06	172.65	2069	14932	1.7517e+06	5832
337	2835.57	358.73	4089.96	585.82	270.81	6.07	1.2	1.72	8.96e-05	0.00087	0.00428	2.43
	1.92	7.99	56	413.98	217.92	884.78	7508.59	174.77	2153	14161	569367	8159
338	3597.84	249.39	4538	365.09	215	5.99	1.45	1.85	8.66e-05	0.00023	0.00162	1.81
	1.43	9.08	68.31	434.34	178.73	313	3137.11	188.54	983	16583.9	1.33014e+06	3881
339	4148.68	904.35	5967.62	1791.25	157.87	8.4	1.32	1.67	8.7e-06	0.00019	0.00193	1.41
	0.84	13.85	126.29	965.78	285.4	774.41	3360.6	133.6	717	12776.9	785378	4336
340	2808.24	743.23	4434.71	1221.96	165.96	8.39	1.11	1.58	7.75e-05	0.00108	0.00888	2.9
	2.08	11.46	218.91	751.55	886.84	407.35	6651	190.17	1685	16564.8	1.08473e+06	8073
341	3369.52	831.05	4725.66	1484.93	224.74	5.82	1.74	2.31	8.85e-05	0.00086	0.00703	2.1
	1.32	13.2	103.4	707.72	363.58	210.08	7906.77	141.33	1860	16954.8	1.90661e+06	11635
342	3197.25	938.01	4101.97	1713.36	210.24	8.8	1.59	2.22	3.57e-05	0.00086	0.00202	1.69
	0.94	12.22	135.15	641.95	669.81	763.82	3491.03	126.99	35	11323.7	3.78871e+06	4889
343	3527.83	357.64	5558.61	503.56	209.93	9.25	1.55	1.93	4.27e-05	0.00092	0.00706	2.93
	1.96	11	234.6	488.09	844.54	728.12	7449.14	121.94	1231	13245.3	3.46813e+06	9179
344	4063.6	894.45	5082.82	1355.21	159.95	8.46	1.22	1.72	6.63e-05	0.00087	0.00525	1.22
	0.69	9.97	96.56	223.07	448.96	369.53	4874.82	144.4	1086	9937.12	3.48033e+06	6940
345	3474.05	844.31	4691.76	1545.68	262.85	8.32	1.58	2.27	8.08e-05	0.00026	0.00179	1
	0.46	9.14	249.25	824.79	881.06	740.05	3067.81	133.43	699	17417.3	508949	3997
346	4806.52	326.23	6350.37	636.02	235.66	6.43	1.61	2.3	1.7e-05	0.00055	0.00286	2.47
	1.06	10.38	233.77	696.77	764.84	572	6869.77	164.37	214	17910.7	2.26531e+06	7589
347	4049.76	870.37	4904.52	1498.37	254.19	5.86	1.64	2.2	9.1e-06	0.00105	0.01025	2.19
	1.18	5.58	155.23	985.68	553.42	620.76	5563.37	129.01	42	14670.9	2.28512e+06	8072
348	4939.27	738.23	7210.07	1465.9	201.47	5.56	0.76	1.12	5.3e-06	0.00016	0.0017	1.64
	0.82	8.86	171.83	500.5	445.13	415.13	5662.76	130.32	1674	11044.6	1.58355e+06	7320
349	3742.6	545.54	4859.5	1039.64	238.64	9.97	1.66	2.39	7.36e-05	0.00051	0.0052	2.35
	1.19	5.25	72.9	934.67	428.64	787.06	6589.41	197.35	2929	11121.4	2.88993e+06	7625
350	2656.65	596.52	3329.54	1011.34	298	8.56	0.74	0.9	4.09e-05	0.00097	0.00906	1.5
	0.64	5.99	96.11	478.94	377.36	326.16	4854.27	172.71	830	10994.6	3.61963e+06	5961
351	2789.46	939.24	4336.99	1732.7	290.26	5.85	1.44	2.03	7.51e-05	0.00047	0.00146	1.45
	1.08	11.17	182.13	484.7	676.13	224.86	3164.7	192.77	95	8006.08	573113	3956
352	3052.08	971.3	4362.88	1268.4	273.17	7.23	0.54	0.79	3.5e-06	0.0008	0.0083	1.69
	1.27	9.48	237.74	630.6	1086.33	406.66	4667.92	163.09	578	15565.6	1.91294e+06	6440
353	4130.18	601.5	6359.26	978.74	299.93	9.45	1.3	1.71	8.51e-05	0.00057	0.00377	2.1
	0.85	7.11	114.75	331.62	465.37	827.58	7939.06	188.42	488	7453.68	1.57118e+06	10210
354	2207.07	582.07	3179.8	914.91	191.28	9.56	0.59	0.8	7.18e-05	0.00062	0.00463	2.71
	1.13	11.77	177.42	603.91	862.8	507.75	5269.19	136.92	696	10174.7	2.34964e+06	7329
355	3244.94	288.79	4306.2	559.24	179.39	5.98	0.69	0.9	7.06e-05	0.00107	0.00937	0.91
	0.55	7.45	145.17	913.88	353.05	578.18	7356.96	151.59	2455	7860.87	1.91486e+06	8549
356	4892.07	481.98	6588.87	903.79	212.89	8.72	1.19	1.57	3.82e-05	0.00031	0.00124	1.48
	0.67	8.83	67.66	371.17	307.32	348.73	6107.64	131.7	520	14405.9	2.79734e+06	8627
357	2172.94	360.97	2876.51	572.02	245.77	8.07	1.2	1.7	0.0001007	0.00067	0.00462	2.46
	1.02	11.09	127.25	950.53	670.34	761.05	3366.67	135.79	1281	11427.4	2.08603e+06	4150
358	2526.32	837.63	3388.78	1101.61	296.05	6.36	0.77	1.01	9.39e-05	0.00068	0.00814	2.35
	1.39	7.71	80.71	489.45	387.23	828.89	3818.21	159.2	46	7418.81	3.87745e+06	4991
359	2348.47	722.17	2944.43	1283.5	261.79	6.28	1.34	1.97	1.53e-05	0.00073	0.00191	1.72
	0.84	12	80.59	489.83	286.17	237.41	6889.86	187.32	332	10535.2	2.23387e+06	9621
360	3180.05	669.2	3923.87	1180.62	295.53	7.88	1.48	2	2.31e-05	0.0003	0.00306	2.67
	1.55	13.31	104.64	472.22	233.05	982.53	5530.86	133.29	1887	9929.72	1.42034e+06	7410
361	3505.48	847.91	4690.76	1131.17	105.84	7.37	1.71	2.54	2.67e-05	0.00094	0.00288	1.82
	0.87	7.31	199.93	419.01	745.21	238.01	4356.19	152.74	325	13287.9	1.61195e+06	5797
362	2275.59	209.57	3451.44	408.17	144.05	6.21	1.84	2.53	9.12e-05	0.00108	0.01281	1.17
	0.87	9.59	53.1	390.23	266.37	652.46	7815.76	160.67	3113	11078.9	794128	10438
363	2280.15	581.51	3043.73	953.34	186.86	6.34	0.69	0.93	1.99e-05	0.00077	0.00613	2.17
	1.46	11.77	64.65	787.85	315.52	687.32	5209.52	158.47	1032	17379.2	1.62049e+06	6856
364	4252.2	411.88	6246.89	749.94	241.66	6.21	1.5	1.85	2.64e-05	0.00042	0.00288	1.52
	1.09	6.84	75.75	282.63	418.47	741.14	6288.47	192.69	1769	8049.96	843983	8778
365	2776.43	420.97	3740.31	773.38	228.19	8.21	0.74	1.08	6.9e-06	0.00022	0.00115	2.12
	0.87	9.78	217.15	783.43	1116.46	370.84	7450.53	135.73	2008	16011.3	1.32193e+06	10787
366	3948.18	719.52	4917.84	866.04	261.54	8.01	1.23	1.56	7.44e-05	0.00073	0.0046	1.9
	1.43	11.4	66.18	776.72	287.39	744.45	4135.61	143.71	1753	15086.2	3.10956e+06	4636
367	3239.22	544.29	5157.53	780.26	214.87	8.46	1.07	1.51	7.91e-05	0.00106	0.00713	2.8
	1.49	13.69	95.67	606.5	372.24	434.52	6956.52	162.41	470	8828.39	3.70918e+06	7430
368	4694.52	936	6707.47	1320.6	163.04	8.57	1.26	1.76	1.61e-05	0.0005	0.00245	1.81
	0.74	6.83	66.65	468.88	177.88	352.33	4064.66	144.83	80	11061.4	3.03217e+06	5113
369	2015.25	607.92	3087.3	736.92	191.65	5.83	1.44	2.12	4.27e-05	0.00095	0.01029	1.82
	1.27	8.3	101.2	513.32	282.59	741.97	4093.98	197.96	1833	10064.7	2.31464e+06	4955
370	3379.58	969.87	5114.73	1737.67	181.73	5.73	1.07	1.46	8.89e-05	0.00105	0.01071	1.49
	0.97	8.24	116.58	847.69	633.25	509.03	7552.19	141.75	2990	12798.8	682156	9148
371	3465.78	905.54	5322.28	1619.92	245.26	6.99	0.65	0.79	1.92e-05	0.00077	0.00647	2.64
	1.93	6.09	127.09	295.57	668.42	388.23	5799.85	136.34	717	16338.8	1.77378e+06	8412
372	3129.36	456.31	4387.14	667.3	236.77	8.53	1.66	2.42	5.87e-05	0.00035	0.00116	1.49
	0.62	9.43	63.85	806.59	159.47	419.03	5570.9	182.5	917	7569.27	2.28361e+06	8164
373	2511.89	564.24	3878.64	786.7	242.34	8	1.03	1.5	5.91e-05	0.00061	0.00179	1.89
	0.79	10.34	134.26	326	542.94	226	6684.36	172.22	1904	13413.2	2.39424e+06	9625
374	4093.3	786.25	5469.2	1308.9	280.96	6.48	0.66	0.93	1.5e-06	0.00076	0.00567	1.19
	0.68	9.63	197.66	545.69	479.42	786.64	3974.86	154.12	1940	7953.5	1.12964e+06	4663
375	3106.61	997.24	4289.58	1872.87	175.47	9.75	1.02	1.23	9.59e-05	0.00105	0.00656	2.81
	2.13	6.61	222.83	832.6	901.68	965.5	6536.31	183.61	632	8857.27	2.75682e+06	8232
376	3409.82	698.08	4198.25	1367.74	161.31	7.99	0.63	0.95	2.81e-05	0.00012	0.00068	1.75
	0.96	13.09	211.7	963.27	963.39	315.07	3708.96	153.18	1363	11302.3	613390	5498
377	3538.77	623.65	4914.96	916.53	249.41	8.18	0.98	1.32	3.7e-05	0.0008	0.00911	2.32
	1.53	11.97	192.67	341.56	459.93	440.93	4471.53	183.5	1034	7646.81	3.61225e+06	6476
378	3000.1	437.26	3797.91	843.32	124.68	5.69	1.98	2.63	6.72e-05	0.00105	0.00244	1.39
	0.73	11.71	193.06	502.47	533.29	742.95	4035.75	122.58	219	12912.1	1.95619e+06	5265
379	4121.48	450.51	5396.5	755.39	154.82	7.88	0.82	1.13	9.4e-06	0.0011	0.0091	2.65
	1.26	10.74	223.71	628.54	722.66	367.68	6793.66	149.08	2075	13025.6	2.01394e+06	8747
380	3005.88	718.36	4199.48	1275.67	191.12	6.72	1.31	1.77	3.58e-05	0.00042	0.0025	1.9
	1.47	12.86	80.52	977.02	161.86	312.33	6093	199.94	1349	15713.8	2.01531e+06	8078

381	3927.02	790.54	5497.71	1312.35	167.53	8	0.65	0.96	7.59e-05	0.00098	0.00521	2.97
	1.92	5.31	156.26	397.05	545.28	347.58	6299.73	176.75	2238	9479.86	745649	7228
382	2650.36	854.62	3646.36	1367.36	246.43	9.49	1.06	1.44	3.9e-05	0.00053	0.00217	2.46
	1.2	13.76	109.56	411.3	335.42	970.15	5604.43	180.38	1662	14791.4	952851	7321
383	3099.93	363.39	4362.83	567.06	181.65	6.84	1.51	1.99	6.7e-05	0.00023	0.0008	2.68
	1.4	11.95	131.5	792.98	354.56	339.66	3152.23	124.41	1209	12637.5	585480	3512
384	4601.95	795.37	7090.81	1044.44	117.24	9.01	1.38	2	1.8e-06	0.00093	0.00837	2.8
	2.14	9.82	92.63	929.12	391.87	698.55	4418.98	164.19	1559	8303.96	2.27551e+06	5871
385	4821.77	480.75	6060.78	869.47	260.62	8.62	0.61	0.91	9.04e-05	0.00029	0.00212	1.76
	1.07	12.42	72.29	803.14	176.43	601.43	3302.39	196.91	112	14320.9	1.46548e+06	4193
386	4692.01	499.85	6497.81	702.6	251.23	7.99	1.84	2.4	1.01e-05	0.00104	0.00817	2.04
	1.36	11.31	62.55	910.32	303.73	885.3	5443.54	169.56	2325	11651.4	1.74565e+06	6198
387	2117.23	780.03	3166.94	1451.24	161.74	9.24	1.45	2.06	2.27e-05	0.00064	0.00597	1.34
	0.74	9.4	153.68	738.08	519.37	675.28	4838.52	187.42	1183	13251.5	1.28807e+06	6258
388	4430.65	466.71	6315.73	593.21	293.46	6.79	0.89	1.16	3.71e-05	0.00092	0.01109	1.98
	1.35	12.46	191.67	544.81	506.87	637.25	5310.13	158.17	2193	14216.8	2.78741e+06	5996
389	4654.13	381.19	7249	677.71	150.37	6.04	1.93	2.72	7.37e-05	0.0006	0.00609	0.97
	0.65	7.85	191.45	774.4	1124.67	885.98	3105.05	179.1	967	10956.9	1.77965e+06	4502
390	2977.61	920.77	4548.86	1667.86	168.06	8.32	1.29	1.64	4.71e-05	0.00102	0.0067	1.61
	0.73	10.21	108.17	914.97	371.51	430.58	4308.71	121.67	2155	13172.1	2.13187e+06	6220
391	4201.01	347.6	5854.75	602.28	198.81	5.28	0.79	0.99	3.4e-06	0.0011	0.01173	2.36
	1.84	10.35	240.49	594.48	727.93	233.67	7092.53	197.47	2774	10815.9	3.41909e+06	8739
392	3743.74	366.09	5453.74	732.05	207.71	7.22	1.27	1.54	9.07e-05	0.00053	0.00619	2.2
	0.97	13.77	195.3	416.73	608.83	270.37	5859.44	137.62	2061	8436.96	2.28444e+06	6486
393	3843.76	281.69	4800.08	542.74	229.67	8.4	1.28	1.67	1.78e-05	0.00049	0.00556	1.49
	0.91	9.14	199.84	374.27	856.7	966.02	4185.14	137.52	355	17092.2	976542	4358
394	4610.95	571.15	6406.14	794.93	109.63	9.86	1.96	2.74	6.56e-05	0.00032	0.00327	3
	2.14	7.76	186.46	969.85	524.2	877.54	6190.55	162.54	863	13992.6	608085	6561
395	2150.75	265.26	2744.03	445.66	252.28	6.29	0.73	0.93	7.49e-05	0.00047	0.00559	2.78
	1.6	10.41	115.04	663.24	426.51	791.54	4531.66	167.21	1791	14339.2	2.2281e+06	6418
396	3449.07	588.27	5377.12	957.34	222.87	6.56	1.87	2.46	6.18e-05	0.00012	0.00109	2.65
	1.96	13.61	184.25	522.02	721.83	946.57	6501.13	134.34	81	13558	1.17105e+06	9256
397	3765.39	845.28	5922.4	1586.51	148.42	6.99	1.56	2.02	2.13e-05	0.00053	0.00354	1.25
	0.64	9.3	72.38	994.8	211.74	792.26	7773.75	195.23	2456	14923.6	1.27701e+06	9685
398	4926.69	675.41	6301.74	1289.1	247.26	6.63	1.54	2.01	9.41e-05	0.00088	0.00252	2.18
	1.45	9.7	183.06	565.12	565.32	870.77	3754.13	138.6	520	10432.6	678775	4251
399	3153.76	832.84	3993.22	1522.07	282.58	9.64	0.84	1.18	4.4e-06	0.0008	0.00295	1.97
	1.39	8.8	90.9	421.29	366.84	262.02	6050.53	143.2	428	15568.7	928436	7037
400	3004.5	954.74	4524.88	1765.19	193.03	8.85	1.71	2.25	6.14e-05	0.00082	0.00522	2.69
	1.54	11.06	185.79	363.57	1012.26	256.82	6726.39	181.8	3019	12677.7	2.42966e+06	9665
401	4823.25	989.04	7195.39	1844.98	233.54	5.78	1.02	1.52	4.81e-05	0.00046	0.00295	1.56
	1.25	10.61	210.32	542.36	598.4	426.22	5678.9	135.16	936	17130.3	2.14716e+06	6909
402	4985.32	862.8	7684.94	1719.28	196.22	7.71	0.53	0.67	3.9e-06	0.00074	0.00763	2.39
	1.27	12.75	140.39	642.54	591.65	518.31	6288.86	193.01	1629	7353.46	1.49703e+06	7744
403	3540.21	377.9	4767.12	731.13	215.29	9.34	1.35	1.83	8.78e-05	0.00033	0.00293	2.73
	1.15	9.16	199.66	247.89	921.59	763.43	4601.32	186.4	1818	17096.5	1.56109e+06	6850
404	2535.8	313.41	3892.55	438.34	193.76	6.3	0.69	1	7.08e-05	0.00069	0.00553	1.11
	0.83	7.71	96.7	682.63	570.54	545.26	4107.7	179.22	1189	17646.2	2.56999e+06	4663
405	3021.62	681.88	3843.64	1199.79	186.62	8.54	1.89	2.73	8.39e-05	0.00057	0.00404	1
	0.61	10.45	186.44	418.29	970.29	829.12	6991.26	173.21	987	15989.1	2.68133e+06	7838
406	3695.59	899.04	5155.93	1533.3	227.67	5.76	0.96	1.26	5.27e-05	0.00017	0.00091	2.76
	1.78	7.46	82.18	705.13	326.64	811.74	3574.02	125.21	173	14998	503965	4725
407	3600.01	362.89	4743.9	480.34	157.76	7.56	1.12	1.45	9.69e-05	0.0006	0.00353	2.54
	1.71	9.09	81.01	987.28	442.72	817.45	3087.24	128.59	1157	11795.2	1.96868e+06	3986
408	2951.38	730.68	3996.52	1273.41	289.61	7.54	1.79	2.31	7.99e-05	0.00024	0.00085	2.35
	0.98	12.61	55.16	517.44	223.89	252.89	3528.66	180.08	580	11494.7	759036	5252
409	2792.54	938.36	3448.34	1525.91	145.02	7.61	1.3	1.63	7.08e-05	0.00061	0.00337	1.4
	0.68	13.17	56.79	289.03	232.14	527.31	3070.59	191.87	1052	11317.2	694613	3817
410	4171.39	928.84	5623.12	1782.49	282.06	8	0.87	1.22	6.66e-05	0.00052	0.00479	1.38
	0.8	11.98	144.07	507.05	714.54	556.65	6155.76	186.27	2601	8952.43	982875	6313
411	3044.56	214.87	4741.01	306.32	173.61	6.75	1.28	1.73	5.43e-05	0.00086	0.00845	2.56
	1.96	11.39	128.13	686.98	297.9	530.68	3749.74	138.69	838	7883.34	929233	4866
412	2809.78	628.08	3675.22	1000.98	227.8	6.01	0.64	0.83	3.31e-05	0.00091	0.00631	1.66
	0.68	6.98	55.87	424.49	301.65	586.21	3806.89	169.1	1545	13019.4	1.51698e+06	5339
413	4241.49	791.8	6044.86	1467.1	219.75	7.76	1.11	1.58	3.77e-05	0.00087	0.00207	2.58
	1.04	13.73	240.07	780.48	720.3	935.5	4115.48	132.72	525	16001	1.24894e+06	5523
414	2025.32	771.71	2853.65	1349.15	261.42	8.05	0.72	0.88	3.95e-05	0.00076	0.00564	2.58
	1.98	5.89	57.15	773.83	141.26	864.91	4432.55	178.36	187	13854.1	3.83321e+06	6300
415	3637.46	905.38	5075.86	1810.19	289.14	6.76	1.28	1.89	2.68e-05	0.00096	0.00992	1.88
	1.46	5.74	71.73	754.39	274.5	707.43	4313.09	141.03	1777	15019.6	3.6408e+06	5275
416	4074.09	470.49	5561.03	656.44	139.53	5.47	1.43	1.81	7.6e-06	0.00049	0.00244	2.48
	1.93	6.29	190.33	488.23	825.16	855.83	4127.76	189.34	591	13263.7	914927	5198
417	2301.09	498.37	3311.9	912.3	152.35	8.93	0.64	0.87	4.76e-05	0.00058	0.00581	2.53
	1.95	11.5	85.17	664.06	219.33	778.07	7423.61	150.75	2236	12535.3	1.44472e+06	8277
418	3532.98	758.58	5259.34	1194.93	186.53	7.17	0.93	1.36	7.11e-05	0.00096	0.00293	0.91
	0.56	13.52	74.04	456.3	369.33	616.74	3398.95	135.83	841	15925.7	1.45443e+06	4215
419	3678.42	848.84	5839.61	1289.06	270.08	6.91	1.48	1.79	6.73e-05	0.001	0.00245	1.01
	0.7	9.98	194.93	604.61	791.01	782.07	6448.05	140.76	2765	15681.8	3.83144e+06	9457
420	4417.71	974.31	5475.98	1730.92	196.19	7.03	0.66	0.93	7.73e-05	0.0002	0.00193	1.26
	0.59	6.96	62.9	812.03	161.62	809.16	3503.12	193.65	517	10788.7	1.27851e+06	3906
421	2077.86	864.29	2672.34	1531.44	178.69	6.89	1.13	1.64	6.32e-05	0.00078	0.00872	2.11
	1.34	7.48	84.46	628.22	470.88	473.79	5084.34	147.19	1005	13613.1	2.46109e+06	6272
422	3012.25	906.91	4711.39	1587.74	173.86	8.26	1.27	1.7	6.35e-05	0.0008	0.00354	2.21
	1.19	13.9	223.62	240.16	640.26	509.51	7983.38	186.82	570	9185.73	2.26952e+06	8701
423	2722.01	367.03	4144.91	505.49	296.29	8.07	1.94	2.59	1.85e-05	0.00066	0.00439	1.3
	0.77	13.74	87.46	655.99	351.09	438.52	5748.4	120.16	2715	11631.6	1.56721e+06	7926
424	4127.8	461.57	6574.96	590.04	245.99	9.21	1.66	2.07	2.3e-05	0.00051	0.00191	1.79
	0.91	13.62	152.41	885.59	811.45	848.69	7222.35	132.84	3305	14247.5	1.82076e+06	9458
425	2269.55	841.79	3171.85	1187.99	150.69	6.12	1.7	2.14	4.48e-05	0.00084	0.00907	2.36
	1.25	10.46	191.15	308.59	865.15	699.03	4118.22	125.65	1055	7528.84	876263	4883
426	3962.77	714.9	5736.45	1026.3	294.44	9.16	0.71	0.98	9.58e-05	0.0002	0.00083	1.91
	1.39	8.41	190.66	775.91	1076.13	489.9	3432.97	134.81	690	16548.6	826655	5033
427	2134.84	296.06	2926.06	582.59	277.88	9.73	1.62	2.13	2.15e-05	0.00094	0.0088	1.05
	0.6	9	109.87	917.51	369.9	272.59	3822.37	167.96	1284	17040.1	1.21852e+06	4692
428	4086.01	886.97	6267.19	1418.43	140.03	9.02	1.65	2.23	8.09e-05	0.0008	0.0033	2.78
	1.22	11.82	175.8	882.53	406.35	281.49	5501.92	141.78	771	9011.39	1.14867e+06	6555

429	2367.02	519.52	3284.46	650.5	106.19	7.85	0.95	1.41	9.86e-05	0.00085	0.00714	1.96
	1.36	6.27	89.81	229.05	514.76	896.17	7085.18	154.5	3482	11607.1	970355	9189
430	4455.66	493.29	7120.78	875.5	132.17	5.1	1.08	1.44	7.13e-05	0.00039	0.00186	1.42
	0.93	6.34	241.26	780.65	1179.2	798.13	5982.49	135.37	2070	17448	995055	6856
431	4720.58	867.7	6631.16	1396.56	188.44	9.97	1.14	1.69	1.88e-05	0.00045	0.00196	2.25
	1.67	8.07	188.77	245.77	643.71	437.95	7637.03	194.29	2896	8024.36	3.89886e+06	9794
432	4532.38	342.94	5605.09	549.41	263.38	6.66	1.92	2.41	4.97e-05	0.0002	0.00149	2.67
	1.73	10.49	189.47	946.77	638.91	738.26	4097.07	167.08	1573	10476.1	519929	5804
433	3755.97	279.73	5362.83	453.96	246.05	8.63	1.29	1.85	2.14e-05	0.00035	0.00362	2.82
	2.23	10.83	136.82	539.71	520.8	883.02	5390.16	165.26	924	15007.7	1.85952e+06	7335
434	4697.9	686.37	7188.97	1307.51	134.03	9.26	1.23	1.51	9.02e-05	0.00099	0.00973	2.59
	2	12.32	131.24	956.27	549.29	548.55	4772.17	190.9	2268	10121.1	3.05073e+06	6077
435	3419.01	909.07	5082.49	1604.48	227.92	7.41	1.18	1.53	3.5e-06	0.00083	0.00375	2.54
	1.47	10.88	159.04	200.37	369.95	735.43	7100.87	145.62	2454	17626.8	3.86362e+06	9521
436	3377.44	495.32	5184.96	799.28	129.4	6.67	1.54	2.29	5.6e-05	0.00087	0.00995	0.92
	0.5	9.36	145.4	544.8	342.43	964.56	3801.44	178.39	1614	16886.8	1.28863e+06	4775
437	4563.33	863.97	6231.62	1245.14	264.05	7.86	1.27	1.73	4.05e-05	0.00056	0.00147	2.23
	1.23	10.84	108.51	750.37	314.77	852.12	4325.01	131.03	463	8205.84	1.37756e+06	6230
438	4310.71	897.59	5935.88	1132.11	161.97	8	1.37	1.95	7.34e-05	0.00019	0.00053	2.66
	2.01	13.09	192.19	797.43	915.45	250.21	4909.68	147.67	466	13636.2	2.23431e+06	6617
439	2304.27	348.2	3237.12	538.61	158.19	5.39	1.1	1.43	9e-05	0.00085	0.0039	1.54
	1.05	10.25	63.65	503.53	205.93	543.48	7190.88	129.04	3213	12934.3	812151	9670
440	4577.78	998.7	7219.96	1535.27	136.31	8.84	1.13	1.37	9.22e-05	0.00079	0.00232	2.8
	1.75	13.45	114.49	440.79	678.15	394.45	5572.81	169.33	1693	7306.09	629319	7386
441	4783.33	400.31	7464.97	482.78	182.1	5.92	0.86	1.06	8.22e-05	0.00109	0.00678	1.51
	0.73	13.68	247.99	431.65	803.85	708.28	4189.96	176.3	1453	9577.85	2.91574e+06	4979
442	3878.91	998.84	4662.53	1985.29	121.69	7.26	1.52	1.89	5.97e-05	0.00059	0.00295	2.24
	1.6	13.49	248.55	426.4	645.3	235.85	4018.75	151.74	1989	10353.7	1.91691e+06	5186
443	2714.95	697.11	3725.29	1148.85	296.69	6.39	1.75	2.31	8.45e-05	0.00076	0.00504	2.94
	1.98	8.63	134.86	384.36	688.21	686.3	4972.06	134.25	2046	14424.8	870214	6053
444	3285.45	822.53	5233.46	1559.12	146.49	6.4	1.78	2.29	2.95e-05	0.00074	0.00867	2.09
	0.86	11.1	154.45	933.96	427.67	862.11	5197.77	165.38	1743	13427.2	2.78689e+06	7056
445	2894.65	318.26	4514.69	465.52	210	9.2	1.97	2.71	6.3e-06	0.00102	0.00551	1.97
	1.23	13.62	162.81	356.95	748.57	361.51	6775.71	152.51	2393	9755.24	2.37106e+06	7646
446	4744.72	978.05	6869.35	1224.88	163.91	8.3	1.24	1.75	9.7e-06	0.00068	0.00269	1.73
	0.98	5.3	84.29	589.23	341.78	524.44	3538.86	164.62	127	14138.7	2.46754e+06	4771
447	2756.05	481.8	4059.35	867.45	226.65	7.86	1	1.27	8.26e-05	0.00042	0.00274	1.84
	1.08	5.63	91.82	633.88	289.43	258.84	7840.48	175.41	2631	11179.4	915711	9666
448	2107.75	752.22	2939.83	1005.81	177.23	5.38	1.83	2.23	9.25e-05	0.00066	0.0014	2.92
	1.46	7.09	51.01	964.67	218.28	636.31	4938.1	133.36	959	12519.2	558717	6997
449	4366.87	849.42	6639.78	1455.95	232.77	6.22	0.88	1.08	3.38e-05	0.00052	0.00438	1.85
	1.04	12.96	98.8	265.98	460.41	320.18	3370.85	195.06	1394	14163.9	2.98366e+06	3959
450	4787.51	445.46	6598.54	713.48	197.9	5.2	1.93	2.56	7.55e-05	0.00106	0.00754	2.4
	1.76	7.01	247.56	428.53	591.3	914.15	5432.3	189.09	2082	17246.3	1.35709e+06	8000
451	4871.73	297.31	5920.42	485.35	278.23	8.38	1.05	1.45	2.94e-05	0.00018	0.00102	1.46
	0.62	12.24	167.85	444.48	404.38	484.75	3158.66	199.23	1417	13944	1.71614e+06	3556
452	2664.75	441.04	3735.34	844.11	237.03	8.83	1.6	2.11	1.37e-05	0.0003	0.00312	2.09
	1.56	5.77	159.4	863.98	418.74	737.77	7136.46	162.58	1707	16718.6	2.36381e+06	9075
453	4368.19	910.69	6648.2	1380.29	195.61	5.71	1.18	1.69	6.74e-05	0.00011	0.00128	1.1
	0.52	5.71	245.43	317.25	1032.97	989.75	7656.28	126.4	56	18059.8	991872	11074
454	4046.23	889.26	5618.17	1206.45	287.1	5.12	1.75	2.16	6.86e-05	0.00043	0.00313	1.79
	0.94	7.37	109.11	661.12	410.5	696.73	4009.83	141.83	1664	14933.3	1.43455e+06	5832
455	3397.75	590.17	4192.31	751.02	137.99	7.01	1.15	1.61	8.87e-05	0.0005	0.00213	1.97
	0.86	11.15	92.43	748.9	187.72	794.16	4304.54	166.51	1349	12280.3	943086	6424
456	3935.46	294.04	5642.19	362.28	123.12	6.11	1.67	2.16	0.0001008	0.00029	0.00188	1.21
	0.93	12.71	88.71	824.92	516.72	733.24	5180.93	158.04	2201	13434.7	1.12676e+06	6182
457	2520.8	686.15	3284.82	885.75	125.44	6.69	1.17	1.69	8e-05	0.0007	0.00533	1.82
	0.75	9.31	95.15	468.36	300.57	910.9	4067.23	167.28	1462	13959	514958	4836
458	4968	970.28	6076.02	1811.35	253.94	5.46	1.9	2.7	1.19e-05	0.00018	0.00174	1.42
	1.13	6.45	178.93	295.28	589.44	618.22	3076.01	163.61	1436	14562.7	1.93336e+06	3779
459	4827.78	985.94	6391.64	1666.76	144.95	5.41	0.62	0.79	3.31e-05	0.00072	0.0026	0.95
	0.4	10.64	140.9	877.2	663.54	622.79	4383.8	177.99	1347	8738.8	2.9043e+06	6243
460	3468.71	893.91	4636.47	1266.64	294	8.95	1.5	2.23	7.9e-06	0.00043	0.00454	1.19
	0.95	9.41	213.58	831.41	436.96	953.55	6229.83	122.16	2245	10978.1	1.78208e+06	8453
461	3475.91	717.71	4691.29	926.92	247.78	8.95	1.69	2.16	6.67e-05	0.00062	0.00515	2.66
	1.87	11.59	186.89	257.07	659.06	257.61	7421.83	146.78	1665	9939.84	3.4325e+06	10113
462	3401.74	974.44	5344.46	1611	111.71	6.26	1.48	1.99	7.37e-05	0.00039	0.00271	1.16
	0.57	7.73	202.39	274.07	520.62	574.86	5223.01	146.31	2221	15122.7	830783	5853
463	4081.64	806.21	5743.94	1455.75	193.12	8.76	1.77	2.56	7.12e-05	0.00054	0.00145	1.92
	0.92	11.94	165.52	362.9	906.77	469.08	7392.73	166.5	57	17548.1	3.76521e+06	8159
464	3671.08	217.49	5688.63	335.47	236.97	8.08	1.06	1.47	3.56e-05	0.00077	0.00428	2.92
	1.88	6.39	228.34	818.3	1065.32	659.69	4740.83	191.61	456	9623.11	3.34643e+06	6969
465	3645.89	395.55	5346.69	697.41	212.6	9.16	1.59	2.1	5.28e-05	0.00103	0.01005	2.67
	1.61	8.37	61.83	523.09	134.51	965.09	3045.65	134.76	1044	10374.7	626855	4380
466	4266.66	661.18	6461.83	1109.75	130.56	9.44	1.15	1.71	7.13e-05	0.00099	0.01116	1.68
	0.99	8.87	190.08	365.28	1054.06	627	6127.72	133.01	2707	7318.97	1.6937e+06	7108
467	4543.47	373.46	6829.88	579.59	156.17	9.44	1.63	2.04	6.77e-05	0.00052	0.00367	2.61
	1.49	9.55	67.31	825.7	303.78	882.41	7876.56	164.89	2597	12258.1	3.36356e+06	9663
468	2080.41	926.56	3249.2	1628.7	206.82	5.11	1.13	1.62	5.97e-05	0.00092	0.00606	2.39
	1.02	11.41	225.59	420.27	714.42	497.74	4257.54	194.81	1812	14131.2	880527	6086
469	3493.44	504.4	4775.84	626.25	255.27	8.15	1.89	2.75	6.85e-05	0.00051	0.00412	2.26
	1.64	13.57	130.24	414.35	353.76	880.79	4524.61	164.9	1142	14461.8	2.07395e+06	5835
470	3131.34	725.23	3987.56	1236.23	180.22	8.18	0.77	1.1	3.51e-05	0.00059	0.00524	2.27
	0.95	5.82	227.38	983.56	952.1	509.24	5384.71	148.59	2115	17714.6	3.81895e+06	7531
471	3551.08	503.62	4433.94	801.72	209.57	7.66	0.84	1.18	5.03e-05	0.00017	0.00075	2.89
	2.09	8.95	231.13	747.81	1046.36	728.61	7700.44	187.36	1796	16752.8	2.08082e+06	10522
472	4651.11	538.95	5720.91	887.8	250.46	5.39	1.22	1.71	3.93e-05	0.00053	0.00529	2.84
	1.89	11.48	157.47	670.08	492.92	523.79	5217.02	143.38	1733	8340.92	2.30838e+06	6353
473	4646.95	533.11	6306.29	1059.13	247.05	9.84	0.93	1.35	2.88e-05	0.00084	0.00248	1.29
	0.75	12.22	84.93	949.53	308.5	720.02	3177.41	161.57	233	14254.1	1.34573e+06	4064
474	2864.86	496.01	3884.63	971.32	288.39	5.93	1.99	2.72	4.67e-05	0.00033	0.00333	1.26
	0.76	9.4	81.66	213.04	449.5	956.54	5751.38	126.88	467	14211.5	2.17137e+06	8169
475	4640.49	536.79	7091.28	921.64	232.02	9.56	1.21	1.78	2.75e-05	0.00045	0.00451	1.4
	1.03	9.71	130.48	481.84	745.64	602.88	6334.16	178.64	1803	7616.25	1.45501e+06	8625
476	3273.15	491.73	5002.08	845.9	267.36	6.51	1.27	1.89	3.45e-05	0.0004	0.00444	2.98
	1.36	10.09	66.46	952.11	213.05	875.78	4669.18	150.5	1572	9282.47	941484	5280

477	2298.6	418.47	3324.39	586.37	190.07	5.4	0.58	0.77	4.83e-05	0.00069	0.00577	2.02
	1.32	7.2	54.6	235	207.3	992.35	5375.57	156.59	2225	15541.5	956245	6479
478	3824.39	625.57	5903.44	1215.13	138.34	7.65	1.2	1.52	9.58e-05	0.00035	0.00163	2.69
	1.23	6.69	204.99	679.17	979.72	625.96	3255.26	171.22	405	17490.2	2.48423e+06	3663
479	4609.95	715.26	6237.39	1368.35	219.9	5.74	0.81	1.13	9.53e-05	0.0008	0.00498	1.42
	0.99	8.36	142.97	216.68	322.97	676.24	7604.6	175.28	2620	11100.2	2.06436e+06	11043
480	4827.19	953.58	6014.63	1657.63	130.97	9	1.04	1.29	4.7e-06	0.00096	0.00807	2.38
	1.61	7.67	134.45	450.48	716.76	611.87	3044.08	143.78	724	9932.37	2.28068e+06	4341
481	3222.38	617.42	5152.23	1181.54	178.91	7.73	1.95	2.74	3.1e-05	0.00034	0.00299	1.97
	1.28	9.16	222.67	407.06	1114.23	657.98	5135.38	156.37	1883	14598.9	3.52399e+06	7291
482	3653.56	655.2	5086.94	1205.87	275.24	8.11	1.14	1.41	2.78e-05	0.00078	0.00684	1.9
	1.36	5.23	141.6	650.94	305.05	231.51	7327.29	172.29	459	8684.88	1.11833e+06	7426
483	2935.58	873.02	3728.49	1519.27	284.01	9.02	1.19	1.44	6.74e-05	0.00083	0.00563	2.45
	1.81	9.74	186.91	372.7	835.59	278.7	5229.51	180.21	1000	17150.8	2.21701e+06	6278
484	2344.53	759.44	3066.03	1160.83	259.99	6.55	0.71	0.93	4.1e-06	0.00095	0.00643	1.11
	0.53	12.33	194.43	677.69	848.56	824.84	7765.2	182.71	1323	9420.3	2.96623e+06	9551
485	4643.29	762.35	5819.71	1192.73	286.95	5.73	1.59	2.07	5.19e-05	0.00093	0.00804	1.38
	0.78	10.48	50.96	457.35	160.39	452.04	7011.15	186.09	2214	8191.89	3.29484e+06	8909
486	4784.3	611.12	7522.43	780.17	199.27	7.29	1.26	1.86	3.39e-05	0.00098	0.01023	2.75
	1.93	5.02	181.69	349.48	524.51	902.71	6777.58	157.44	2476	14000.3	1.36762e+06	8043
487	4611.9	657.31	6985.38	947.54	287.01	9.19	0.79	1.09	7.17e-05	0.00106	0.00671	2.22
	1.42	6.51	182.46	250.15	799.72	523.07	4881.14	155.59	1000	12544.8	3.182e+06	6467
488	2270.07	322.39	3012.64	459.4	221.38	7.55	0.99	1.36	4.49e-05	0.00043	0.00412	2.98
	1.67	5.53	150.12	990.44	324.02	789.54	4413.32	161.35	428	16196.1	1.57206e+06	5374
489	3025.73	742.96	3941.16	1114.79	252.56	9.56	1.91	2.72	6.34e-05	0.00108	0.00238	1.52
	0.84	10.98	128.2	688.67	308.07	471.64	5130.41	133.26	872	15593.3	1.18452e+06	7534
490	3111.74	630.96	4903.72	903.63	233.08	8.67	1.28	1.56	6.1e-05	0.00035	0.00376	1.03
	0.78	5.7	141.87	564.32	620.23	864.18	6879.69	183.27	3198	9267.29	3.86749e+06	10198
491	2693.94	828.18	4094.58	1221.26	155.97	6	1.61	2.2	2.25e-05	0.00039	0.00439	2.97
	1.31	10.83	100.43	867.33	208.17	838.97	5763.29	185.05	314	11938.6	2.52857e+06	6396
492	2156.92	950.9	3307.81	1690.41	265.32	9.31	1.69	2.07	4.57e-05	0.00086	0.01	2.82
	1.53	12.46	161.9	803	481.22	632.66	3102.62	151.22	647	9794.38	2.69668e+06	4196
493	2436.47	968	3863.84	1181.72	166.75	7.98	0.79	1.15	9.4e-05	0.00086	0.00219	2.07
	1.06	9.42	234.12	436.21	938.1	648.9	4713.28	144.72	638	12430.2	2.17302e+06	5590
494	3988.48	641.03	5348.98	959.62	187.29	9.11	1.47	2.17	6.88e-05	0.00024	0.00289	1.39
	0.76	7.03	56.06	652.64	315.76	458.89	7710.22	123.35	3698	13117.3	1.25149e+06	9297
495	4923.37	439.58	7105.26	714.35	220.4	8.08	0.63	0.89	6.18e-05	0.0004	0.00445	2.92
	1.69	13.21	170.76	251.83	496.1	828.31	3831.18	136.68	825	17765.2	3.88375e+06	5406
496	2078.38	690.16	3313.46	994.99	294.17	8.96	0.87	1.19	3.43e-05	0.00094	0.00848	2.52
	1.36	13.82	209.39	891.08	982.76	429.79	5226.04	190.75	590	11020.1	1.81053e+06	7234
497	3948.53	573.13	4987.73	976.39	142.44	8.51	1.09	1.43	2.77e-05	0.00036	0.00363	2.82
	1.58	12.84	223.75	564.72	1242.4	927.62	6694.73	123.84	943	18048.4	3.96362e+06	8055
498	4232.3	988.2	6325.13	1759.7	163.08	7.68	1.51	1.98	4.82e-05	0.00056	0.00615	2.4
	1.58	6.23	128.23	841.17	616.65	454.21	3092.37	172.59	830	16844	2.68001e+06	3963
499	4177.58	539.51	6493.33	1031.05	248.85	8.1	0.83	1	5.64e-05	0.00038	0.00124	2.64
	1.85	12.37	248.36	383.05	1473.82	608.88	7849.47	138.48	868	11442.4	560279	10956
500	4573.57	730	6043.38	1416.12	242.07	8.48	1.88	2.42	6.7e-06	0.00038	0.00366	2.79
	1.47	7.9	125.93	206.77	642.28	677.8	6688.8	181.34	38	8685.85	2.31176e+06	9530
501	4731.65	794.09	7533.06	1065.4	220.43	8.47	1.62	2.26	6.59e-05	0.00042	0.00172	2.57
	1.38	13.24	195.17	475.02	1166.32	418.99	5797.2	171.85	1286	7400.19	1.10526e+06	6993
502	4566.96	973.8	6843.11	1478.27	100.12	5.22	1.41	2.09	9.12e-05	0.00089	0.00798	2.28
	1.63	11.2	142.36	777.68	617	535.84	7086.32	179.06	426	13807.8	3.93973e+06	7994
503	4025.83	821.9	5482.74	1435.09	249.86	7.67	1.15	1.6	4.07e-05	0.00068	0.0024	2.44
	0.99	10.52	92.23	529.45	484.05	942.37	4708.22	174.75	574	8594.89	844956	5691
504	2508.6	598.97	3504.94	972.22	286.3	8.66	1.26	1.71	4.24e-05	0.00039	0.00162	2.16
	0.89	8.11	179.99	865.16	536.12	963.83	6791.64	182.36	551	15653.7	3.35078e+06	9814
505	3749.08	636.54	5645.21	880.4	235.25	7.87	1.94	2.37	1.52e-05	0.00067	0.00194	2.2
	1.59	11.87	246.94	758.09	1086.71	355.97	7542.46	174.03	1698	16459.4	3.47987e+06	9419
506	2576.27	924.06	3893.05	1747.46	282.85	6.85	0.67	0.87	2.57e-05	0.00106	0.01123	1.5
	0.88	9.49	180.23	422.79	896.9	287.36	7033.55	184.46	2513	8821.21	3.45503e+06	9686
507	3705.33	568.56	4970.81	912.35	282.98	7.81	1.75	2.33	4.1e-06	0.00104	0.00822	1.34
	0.8	6.57	222.25	898.41	661.83	724.51	5760.99	162.93	2195	13618.7	1.82454e+06	6881
508	4440.2	738.79	6165.3	1442.27	283.17	8.38	1.29	1.74	8.12e-05	0.00013	0.00115	2.17
	1.67	13.83	129.44	329.6	520.57	961.31	6793.83	156.13	1751	10085.1	1.33761e+06	7854
509	3324.55	430.83	5186.24	519.07	210.02	9.04	1.24	1.79	2.5e-06	0.00058	0.00289	1.89
	0.96	8.16	115.87	420.94	362.45	317.27	7285.66	174.88	363	8154.13	3.68034e+06	10387
510	2085.5	525.8	2915.63	1036.85	261.92	7.59	1.72	2.37	4.54e-05	0.00098	0.00746	2.35
	1.16	8.84	151.23	861.11	475.06	740.3	7487.18	147.56	2804	8575.19	2.26188e+06	9513
511	3994.54	372.3	5061.32	717.73	238.35	5.13	1.46	2.16	7.84e-05	0.00075	0.00753	1.27
	0.62	11.93	195.51	335.74	550.44	746.92	3275.14	196.05	1197	8411.14	2.84382e+06	4719
512	4511.28	294.78	5723.8	561.24	124.3	5.54	1.39	1.89	4.27e-05	0.00012	0.00072	1.25
	0.92	11.19	232.19	655.36	1218.29	430.21	7497.3	132.5	3126	16349	538936	8779
513	2640.23	977.62	4223.7	1623.85	236.05	8.12	1.46	2.03	6.17e-05	0.00049	0.00124	1.15
	0.87	11.91	176.07	435.48	533.85	933.82	5714.31	141.37	901	15374.9	586773	6793
514	3545.38	990.17	4511.23	1462.21	294.24	8.19	1.37	2.03	6.01e-05	0.00016	0.00191	2.89
	1.33	10.08	171.65	759.27	468.3	789.94	4110.74	195.52	1891	18099.1	1.35076e+06	5079
515	3318.78	234.73	5131.07	282.26	104.37	10	1.47	1.97	5.42e-05	0.00061	0.0063	1.47
	0.68	9.96	137.86	222.25	381.97	929.73	5337.57	135.65	2135	8209.14	1.05408e+06	7424
516	2327.4	611.48	3616.13	750.52	187.7	5.74	1.42	2.1	8.38e-05	0.00047	0.00412	2.25
	1.79	10.36	65.45	679.74	189.67	467.41	4755.67	190.06	1580	12850.1	2.26301e+06	5775
517	4417.07	831.96	6719.28	1580.69	252.47	8.54	1.03	1.28	3.92e-05	0.00104	0.00572	1.98
	1.35	5.1	78.24	831.31	222.18	956.8	7724.6	151.93	727	12573.4	2.40605e+06	9749
518	4565.03	893.27	5724.49	1554.28	271.29	9.13	0.85	1.18	4.55e-05	0.00017	0.00118	1.7
	0.85	9.64	166.7	374.54	581.86	448.46	4508.89	131.6	1196	7390.75	609698	5914
519	4367.42	514.63	6099.22	740.13	174.32	9.26	1.22	1.58	5.93e-05	0.00038	0.002	1.56
	1.13	6.26	226.44	931.7	721.01	921.92	6000.32	181.42	551	11782.6	2.71371e+06	8849
520	3471.21	247.3	4834.5	473.21	138.87	9.16	0.82	1.22	5.47e-05	0.00044	0.00265	1.33
	0.91	6.16	141.24	275.62	505.21	403.48	6791.18	120.7	1569	12136	1.50411e+06	10081
521	4213.33	400.5	6627.73	601.52	159.59	6.94	0.52	0.77	7.8e-06	0.0008	0.00462	0.96
	0.53	8.28	113.89	439.86	274.88	239.49	6563.76	132.03	3071	17262.6	1.06982e+06	7252
522	3354.33	483.98	4425.59	755.43	269.77	7.46	0.83	1.13	8.37e-05	0.001	0.01132	0.94
	0.48	11.29	171.71	315.44	436.67	913.23	5555.79	199.36	1515	12842.7	1.94892e+06	5803
523	4297.29	576.86	5936.17	987.12	221.41	9.76	1.9	2.43	1.69e-05	0.0009	0.00227	1.74
	0.75	5.44	145.87	872.17	472.26	213.54	7970.67	181.05	2681	14620.3	3.32316e+06	10861
524	4606.28	813.64	6514.21	1449.36	251.93	8.01	1.42	1.97	8.12e-05	0.00104	0.00705	2.98
	2.16	7.14	216.06	735.35	552.96	803.76	4902.43	124.75	1479	11141.6	2.4691e+06	5736

525	3276.77	776.73	4969.43	1018.55	231.66	9.05	1.33	1.62	4.2e-05	0.00056	0.00445	2.87
	1.53	6.47	101.94	333.48	411.54	457.64	5102.89	157.73	2437	11713.8	3.44954e+06	5651
526	4134.1	656.39	5955.52	928.03	174.41	8.68	1.14	1.41	8.75e-05	0.00084	0.00529	1.49
	0.69	8.46	235.3	629.9	931.98	723.73	3291.7	168.69	1376	13328.2	2.97338e+06	4772
527	4078.51	511.83	5679.89	997.12	122.01	8.46	1.7	2.38	9.65e-05	0.00098	0.00844	1.59
	0.81	12.25	78.83	389.65	183.53	246.75	5979.3	189.8	2783	18046.2	1.15227e+06	8649
528	2468.32	522.77	3187.03	659.58	249.32	9.99	1.17	1.41	7.76e-05	0.00062	0.00712	2.66
	1.79	5.5	101.89	704.61	606.67	312.83	6087.35	173.52	2215	8071.04	3.03521e+06	7918
529	2717.02	712.34	3481.96	1059.03	188.93	5.11	1.35	1.83	1.35e-05	0.00052	0.00116	2.09
	1.34	5.54	112.39	528.49	568.21	834.13	5696.84	188.46	2761	18005	781447	8543
530	2069.47	208.83	2916.42	335.03	242.42	5.58	1.45	1.96	8.93e-05	0.00057	0.00137	2.65
	1.6	9.13	243.33	764.07	516.3	556.45	4860.15	138.24	411	8187.2	1.09895e+06	6392
531	3986.43	483.63	5583.46	954.09	117.16	6.43	0.81	1.15	8.2e-06	0.00084	0.00283	2.1
	0.87	5.87	76.16	555.51	420.13	818.65	4614.86	180.84	1214	16739.8	2.84849e+06	5813
532	2479.86	450.09	3685.3	770.9	232.5	7.31	1.93	2.6	1.93e-05	0.00089	0.00861	0.92
	0.41	8.03	74.79	280.93	196.74	521.53	3751.1	174.22	1840	14841.5	1.1504e+06	4508
533	2265.42	213.21	3282.07	361.7	241.07	9.17	1.49	1.79	8.76e-05	0.00067	0.00624	1.57
	0.85	9.12	242.77	393.44	1453.24	520.4	6352.74	148.12	1963	14067.7	1.86886e+06	7896
534	4053.93	283.52	6460.74	380.62	215.38	7.9	0.55	0.73	1.28e-05	0.00067	0.00723	2.1
	1.46	13.34	132.6	588.58	612.3	755.59	6513.31	121.79	1555	9674.78	2.67739e+06	8386
535	3849.19	454.85	6097.87	635.85	170.28	8.54	1.57	2.28	8.63e-05	0.0003	0.00208	1.68
	1.27	10.61	52.59	859.94	219.43	783.56	7205.86	156.67	829	14530.7	986791	7583
536	4345.02	250.37	5768.29	485.83	150.45	6.08	0.99	1.47	2.99e-05	0.00056	0.00398	1.72
	1.18	9.03	111.8	969.78	472.38	356.47	7197.93	123.57	3041	17774.7	1.13749e+06	8532
537	4554.19	862.58	7230.66	1502.07	175.26	9.74	0.59	0.73	7.22e-05	0.00031	0.00341	1.02
	0.79	8.51	98.34	240.89	558.34	738.52	7887.5	139.29	933	10610.6	2.95337e+06	10409
538	3801.12	780.76	5203.93	1165.92	174.93	8.59	1.38	1.9	2.74e-05	0.00024	0.00058	1.59
	0.84	6.2	178.41	362.64	419.99	344.77	4095.44	181.99	608	13488.1	1.42518e+06	4572
539	2007.2	433.38	3187.59	748.78	155.76	5.66	1.42	1.84	7.84e-05	0.00063	0.00621	0.95
	0.76	5.66	163.43	546.82	628.91	706.9	7681.84	165.23	3107	9355.64	1.81813e+06	10052
540	3353.1	483.26	4283.63	897.23	245.88	8.65	1.17	1.75	2.62e-05	0.00049	0.00531	1.64
	0.75	9.31	112.12	751.84	628.08	635.14	3569.2	180.41	819	12673.6	3.57711e+06	4062
541	4387.86	742.18	6100.8	1034.6	282.17	9.92	0.94	1.37	6.05e-05	0.00091	0.00993	2.76
	2.13	13.02	206.33	663.9	1111.67	992.75	5117.55	197.33	1928	8259.24	2.9084e+06	6491
542	4719.76	520.95	6884.8	858.74	105.73	9.45	0.95	1.22	3.98e-05	0.00025	0.00256	1.44
	0.66	9.88	130.67	570.24	704.6	842.26	6902.85	182.47	1362	7798.11	3.07536e+06	9660
543	2286.44	372.89	3506.54	630.8	253.08	6.59	1.9	2.82	8.99e-05	0.00032	0.00244	1.86
	0.84	6.48	140.01	993.38	555.33	773.17	6173.95	173.17	2054	9443.57	1.73147e+06	6930
544	3382.45	898.92	5149.63	1488.11	250.3	7.5	0.96	1.32	5.58e-05	0.00028	0.00325	1.23
	0.79	9.21	72.01	503.86	243.11	308.99	7339.87	128.28	401	18126.7	1.21987e+06	10551
545	2672.97	564.73	3879.06	859.51	297.02	7.59	1.69	2.1	8.81e-05	0.00072	0.00305	1.82
	0.95	9.51	231.3	203.38	894.99	612.05	4913.66	148.44	2154	13151.6	2.72308e+06	6959
546	2289.55	423.96	3091.38	649.9	283.69	5.1	1.08	1.43	6.57e-05	0.00086	0.00886	1.12
	0.48	10.11	170.49	474.85	673.1	369.88	3863.8	194.15	993	16067.4	3.76605e+06	5192
547	4896.55	279.24	7352.13	539.49	163.56	7.11	1.77	2.33	9.55e-05	0.00103	0.00521	1.89
	1.48	7.42	98.29	216.01	574.56	662.88	5987.48	120.36	1067	14451.7	3.30659e+06	8092
548	4959.25	713.91	6862.92	1027.3	149.48	8.92	0.74	0.97	1.61e-05	0.00061	0.00491	1.2
	0.6	10.37	53.67	953.23	190.01	324.27	3517.14	134.07	1258	16875.5	1.03119e+06	5002
549	3999.05	205.32	6055.58	272.55	205.73	9.82	1.22	1.47	1.91e-05	0.00016	0.00131	2.25
	1.37	8.91	52.77	767.55	134.69	658.46	7559.02	160.47	266	16091.6	2.80947e+06	7654
550	2562.61	681.3	3172.61	1150.08	198.51	7.25	0.58	0.79	9.1e-05	0.00097	0.00717	2.83
	1.31	10.91	249.01	514.46	1368.09	990.11	3896.9	171.01	1960	11112	933370	5037
551	2560.48	449.84	3674.71	844.91	157.53	8.19	1.99	2.88	7.27e-05	0.00027	0.00259	1.88
	0.79	11.62	231.72	936.69	809.98	201.97	3944.79	189.14	671	13097.4	623359	5729
552	3680	638.46	5862.61	825.6	192.24	5.89	0.9	1.23	8.96e-05	0.00055	0.00133	2.91
	1.44	8.75	142.66	396.6	498.48	269.84	4335.88	141.61	164	15291.1	854803	4960
553	4492.89	318.96	5614.73	532.83	219.75	7.74	0.83	1.2	7.02e-05	0.00056	0.00319	2.66
	1.79	6.44	125.22	343.42	644	919.18	6049.73	196.59	3004	11210.9	3.71464e+06	8697
554	4894.66	944.2	6905.38	1518.79	247.36	6.18	1.73	2.3	6.01e-05	0.00034	0.00167	2.37
	1.11	8.34	138.8	884.09	385.54	305.6	4701.32	140.1	1528	9048.97	3.85719e+06	6374
555	4319.07	388.46	5728.6	698.33	194.41	7.01	1.83	2.73	7.67e-05	0.00079	0.003	1.65
	0.87	11.47	191.01	202.92	748.57	613.21	6954.19	186.12	535	11435.1	2.7668e+06	8048
556	4304.62	887.64	5533.45	1334.45	262.99	8.74	1.69	2.47	2.19e-05	0.00026	0.00303	2.87
	2.26	6.14	186.73	783.83	854.55	284.32	4468.39	168.27	1160	10093.4	3.38149e+06	5429
557	3194.43	596.97	4965.7	1068.81	146.05	7.55	0.58	0.83	5.1e-06	0.00101	0.00577	1.15
	0.81	10.69	210.74	524.54	1069.39	369.79	3729.77	126.85	1035	17949.6	2.11993e+06	5109
558	3720.36	385.33	4651.32	764.34	184.93	7.95	1.92	2.42	9.17e-05	0.00017	0.00187	1.67
	0.7	8.84	169.47	237.86	829.57	309.79	4674.45	155.27	1144	14735.7	3.48125e+06	6966
559	4591.73	278.15	6834.14	555.09	273.52	9.58	1.7	2.1	7.81e-05	0.00015	0.00152	1.03
	0.64	11.89	211.86	660.99	925.76	855.21	7515.56	191.67	655	13035.9	2.55511e+06	8852
560	2551.38	576.58	3856.2	778.11	126.42	9.26	1.33	1.69	5e-05	0.00077	0.00719	1.29
	0.56	10.64	194.99	450	581.48	984.34	4958.59	135.87	1912	7740.72	1.88997e+06	6937
561	2253.63	411.45	3123.39	656.58	221.9	7.68	1.34	1.77	6.62e-05	0.0003	0.00169	1.06
	0.76	5.79	79.9	481.26	394.9	206.56	5974.2	170.48	556	17249.9	1.74447e+06	7289
562	4100.3	825.33	6426.89	1264.96	199.97	7.59	1.89	2.67	5.99e-05	0.00075	0.00688	2.79
	1.87	5.56	180.87	978.68	981.99	620.89	7630.48	187.73	1495	17878.8	3.32534e+06	9616
563	3085.73	431.74	4523.25	617.86	292.22	6.22	1.57	2.01	3.23e-05	0.00066	0.00405	1.08
	0.58	6.82	199.33	439.65	1088	638.56	5160.1	139.85	1886	8377.02	2.18153e+06	7236
564	3741.27	655.31	5719.13	1119.46	111.41	8.28	0.9	1.28	1.08e-05	0.00057	0.00569	2.14
	1.15	9.86	224.37	734.8	708.1	320.31	4357.42	187.33	2097	9787.94	3.02901e+06	5864
565	3933.34	486.87	4792.67	746.42	258.44	8.57	1.53	2.12	2.68e-05	0.00108	0.00776	2.21
	1.12	11.55	185.19	980.94	1063.07	752.1	5255.19	191.82	658	8824.1	3.56199e+06	6664
566	4306.23	494.99	5175.38	771.51	284.18	8.9	0.7	0.91	3.41e-05	0.00039	0.00195	2.06
	1.39	10.6	102.36	401.92	256.2	703.94	7028.53	154.67	2605	10801.9	1.1597e+06	8877
567	3136.66	813.57	4656	1106	246.67	5.22	0.52	0.65	5.32e-05	0.00032	0.00098	1.97
	0.94	9.37	121.01	431.14	715.27	438.13	7343.18	138.72	688	11360.3	1.68037e+06	8788
568	2978.78	504.65	3634.01	646.09	279.17	9.98	1.52	1.92	3.47e-05	0.00062	0.00348	2.85
	2.04	9.19	70.22	867.41	374.23	586.56	3039.79	199.43	1050	10201.9	595340	3967
569	3469.26	999.61	5021.63	1710.86	299.2	8.22	1.01	1.46	8.4e-06	0.00075	0.00575	2.3
	1.18	7.73	225.68	239.57	550.3	765.97	7675.94	166.79	2518	12833.5	2.92876e+06	9842
570	4553.58	694.04	6982.63	902.29	218.48	9.46	1.89	2.55	6.12e-05	0.00012	0.00144	1.05
	0.59	11.57	103.97	496.45	312.1	397.33	4460.89	137.15	54	11306.9	850792	5860
571	4381.05	411.33	6741.01	558.18	272.54	9.06	1.77	2.25	6.47e-05	0.00073	0.00608	1.81
	1.28	13.86	81.28	519.13	464.99	367.51	6715.1	142.81	1257	12875.7	3.97882e+06	7349
572	4379.14	505.73	6232.03	984.27	162.79	9.66	1.25	1.85	8.46e-05	0.00058	0.00178	2.96
	1.77	12.28	167.65	709.18	571.11	451.55	3143.51	136.77	1219	13400.4	2.11153e+06	4332

573	2851.26	942.95	4286.61	1691.5	286.88	5.79	0.98	1.31	7.73e-05	0.00027	0.00153	1.68
	0.79	11.48	166	521.24	912.52	588.86	7023.46	145.12	679	12183.2	3.26742e+06	9663
574	3209.51	801.7	5042.13	1387.76	248.57	5	1.83	2.55	4.67e-05	0.00103	0.0036	1.42
	1.06	8.29	94.33	443.34	478.75	933.43	7926.65	141.51	115	12306.1	1.95383e+06	8988
575	2851.07	215	3951.92	369.58	289.45	7	0.5	0.74	2.12e-05	0.00055	0.0042	1.06
	0.82	13.87	112.09	887.73	281.08	967.29	7331.04	167.58	1200	15462.2	647916	7410
576	3016.37	470.27	3960.59	771.58	215.97	7.25	1.14	1.49	9.5e-05	0.00064	0.00306	2.36
	1.01	5.75	179.94	870.82	1071.14	665.26	6498.48	159.53	140	17684.5	2.2921e+06	8609
577	4210.4	563.35	6161.73	1067.1	236.5	9.89	1.28	1.63	4.03e-05	0.00049	0.00395	1.99
	0.99	8.22	70.96	853.83	181.4	986.25	4939.82	192.42	947	14640.6	1.69202e+06	5461
578	3689.83	619.9	5526.57	923.83	126.59	7.71	0.67	0.91	8.24e-05	0.00083	0.00539	2.39
	1.81	5.78	221.48	723.56	1223.89	731.7	4736.81	131.08	2073	11562.3	2.37239e+06	5929
579	3639.64	797.27	5534.48	1280.5	275.18	9.98	1.19	1.67	6.49e-05	0.00055	0.00393	2.76
	1.93	9.12	139.97	778.62	524.08	637.68	4835.38	199.38	1360	10320.8	1.87447e+06	6407
580	3427.43	572.93	4897.45	1106.6	247.2	5.53	1.97	2.64	6.05e-05	0.00055	0.00299	1.9
	1.3	5.48	142.93	294.39	846.77	893.88	7878.39	162.09	1246	12507	1.51805e+06	10249
581	2655.54	592.22	3405.73	928.01	110.5	9.05	1.44	2.07	1.52e-05	0.00071	0.00355	2.02
	1.36	12.46	91.55	817.34	485.39	512.93	5932.16	196.62	1948	8265.64	1.89213e+06	6748
582	3886.12	672.26	5798.75	1227.71	278.93	9.07	1.81	2.31	1.38e-05	0.00055	0.00634	2.62
	2.03	13.7	139.73	779.48	374.95	493.23	6784.02	197.52	1361	11882.9	1.29049e+06	9492
583	4279.5	507.7	5291.97	973.66	207.82	9.07	0.8	1	7.45e-05	0.00043	0.00367	1.4
	1.04	13	170.42	445.6	696.98	590.26	3712.32	143.41	594	12413.6	3.48656e+06	4578
584	2795.91	958.48	3532.8	1550.05	297.5	5.66	1.7	2.2	1.08e-05	0.00068	0.00166	2.4
	1.11	10.01	188.51	285.56	863.2	525.3	6100.28	183.81	213	16061.7	2.09948e+06	7384
585	3952.78	859.95	4984.81	1703.97	137.51	10	1.28	1.76	7.05e-05	0.00064	0.00371	1.21
	0.92	6.19	70.54	685.42	341.61	837.5	3394.18	193.04	505	15218.3	3.34332e+06	4385
586	4833.81	687.84	6581.35	949.37	187.93	7.04	1.88	2.48	6.1e-06	0.00101	0.00679	2.55
	1.64	12.59	64.73	746.78	149.74	713.4	4666.66	180.57	1582	7877.78	1.11552e+06	6554
587	2202.79	649.19	3469.36	1097.02	184.11	6.56	1.3	1.62	2.07e-05	0.00026	0.00181	2.04
	0.97	5.02	86.1	500.94	400.87	345.66	4038.97	168.32	1441	16321.6	524392	4484
588	2116.48	439.34	2776.84	650.35	232.09	7.44	1.32	1.86	7.94e-05	0.00063	0.00252	2.42
	1.54	6.94	74.58	705.31	254.67	679.19	5318.6	198.22	260	15894.9	1.45032e+06	6643
589	2798.3	607.33	4284.5	897.94	274.22	8.83	1.71	2.37	1.2e-06	0.00033	0.00352	2.13
	1.35	9.04	173	521.62	586.17	784.08	3631.72	130.14	341	8980.61	911431	4087
590	3408.37	818.7	5395.64	1106.27	121.29	9.96	0.92	1.17	2.3e-06	0.00058	0.00322	1.41
	1.01	5.47	60.46	888.87	192.98	329.14	7973.18	145.66	1060	15136.3	3.62868e+06	8882
591	3703.16	408.98	5829.16	598.47	156.65	9.92	1.45	1.78	4.13e-05	0.00036	0.00366	1.01
	0.46	7.24	115.81	482.19	491.52	310.38	5064.73	120.98	18	12867.5	1.19931e+06	5853
592	4693.58	472.59	7022.55	585.19	222.07	7.37	1.64	2.2	5.03e-05	0.00022	0.00114	1.3
	0.69	12.52	108.86	291.94	305.51	374.47	3848.2	134.48	590	13566.4	1.69813e+06	5469
593	4769.17	203.61	6334.32	380.06	110.2	8.91	1.15	1.6	6.26e-05	0.0003	0.00333	2.23
	1.64	10.18	59.4	799.72	262.96	226.34	3047.38	184.71	1269	18214.9	783282	3383
594	2996.69	587.97	3650.51	871.89	153.24	8.42	1.89	2.71	5.32e-05	0.00013	0.00049	2.54
	1.31	6.56	224.09	253.99	858.28	366.23	6466.12	176.52	1732	8605.92	1.10378e+06	7947
595	2763.72	658.45	3956.03	948.46	279.46	8.1	1.33	1.93	2.4e-06	0.00015	0.00052	2.83
	2.01	12.12	88.11	296.29	315.06	913.89	3930.84	180.64	357	14900.5	618629	4396
596	4862.91	273.68	7647.4	348.85	141.54	9.49	1.03	1.34	8.2e-05	0.00074	0.00436	2.51
	1.44	9.28	158.07	489.72	514.05	426.07	4275.65	184.32	1588	12243.5	1.3603e+06	5896
597	3438.33	593.45	5421.6	995.83	187.67	5.29	1.11	1.55	5.87e-05	0.00057	0.00509	1.62
	0.98	13.6	205.58	286.49	1184.01	320.42	6396.81	153.09	2024	10727.2	1.23046e+06	7718
598	4605.77	700.37	6680.92	1306.23	205.07	8.81	1.72	2.42	9.47e-05	0.00057	0.00452	1.58
	0.84	6.37	119.92	579.42	524.12	200.15	7230.2	193.49	1893	18190.8	3.10243e+06	10450
599	2262.08	314.7	3502.89	488.13	107.91	8.08	0.88	1.13	5.68e-05	0.00095	0.01091	2.89
	2.29	11.7	103.13	716.32	588.63	495.59	7527.1	188.96	2472	15977.8	2.20893e+06	10695
600	4107.86	787.43	5628.49	1528.4	223.28	9.77	0.81	1.06	7.34e-05	0.00108	0.00719	1.21
	0.61	9.44	77.85	837.52	348.18	595.64	6204.48	125.51	662	9911.26	2.06616e+06	7627
601	4791.54	280.92	7078.83	506.99	210.85	5.06	0.89	1.11	4.79e-05	0.00093	0.0036	1.5
	0.61	10.17	206.99	540.27	537.75	535.52	5004.61	179.79	1868	7481.99	1.35632e+06	5560
602	3002.99	852.73	3926.14	1511.73	179.24	7.51	1.95	2.6	9.73e-05	0.00059	0.00168	1.18
	0.65	5.36	84.11	536.35	318.8	675.63	3924.37	165.19	1035	11240.9	859916	5715
603	4501.08	802.58	7059.02	1147.05	230.46	5.77	1.72	2.54	3.7e-06	0.00095	0.01076	1.54
	0.76	7.21	165.43	996.6	426.47	934.93	6885.31	158.83	2235	17168	3.22436e+06	9621
604	2636.11	995.28	3711.03	1452.9	250.05	5.21	1.49	1.96	3.89e-05	0.0007	0.00161	2.01
	1.47	12.33	117.37	861.52	543.94	987.07	7941.5	157.95	2004	14946.6	2.61674e+06	9336
605	2421.07	337.04	3766.13	580.56	105.67	8.9	0.79	1	7e-05	0.00045	0.00465	2.5
	1.55	7.33	233.15	732.06	599.45	918.4	7864.25	163.37	1224	9663.12	1.94546e+06	10061
606	3847.2	786.54	5204.99	1396.39	270.72	6.4	1.89	2.63	7.68e-05	0.00054	0.00114	1.76
	0.94	10.77	163.21	456.86	357.24	938.88	3680.79	198.96	848	14469.3	2.14138e+06	4654
607	2601.66	527.09	3749.53	824.44	152.12	8.09	1.29	1.85	9.64e-05	0.00051	0.00602	2.43
	1.03	10.62	208.65	648.18	776.92	748.53	7270.48	167.24	277	10161.7	2.84249e+06	9063
608	4730.77	302.35	7293.87	447.64	204.13	5.25	0.66	0.89	9.27e-05	0.00051	0.00125	2.92
	2.21	6.8	235.21	458.37	1364.82	451.64	3540.81	120.42	420	12815.4	2.15874e+06	4687
609	2066.81	246.36	2651.42	399.28	168.28	6.02	1.75	2.27	1.8e-06	0.00101	0.00297	1.53
	0.64	13.18	167.62	248.27	772.95	791.84	3919.39	193.81	1520	11647.5	1.12416e+06	5342
610	2570.52	656.76	3491.39	967.84	240.31	9.71	0.55	0.74	9.97e-05	0.00038	0.00289	0.91
	0.43	12.4	76.22	871.35	230.79	536.88	4400.54	127.7	135	11208.4	1.60923e+06	5577
611	4201.63	835.73	5865.18	1357.6	139.69	5.5	0.63	0.93	2.62e-05	0.00091	0.00391	1.63
	1.1	8.32	105.51	709.86	630.37	364.11	3567.1	140.46	1201	17202.3	3.51949e+06	5223
612	4191.56	967.64	6216.23	1830.57	143.65	9.13	0.73	0.92	9.09e-05	0.00023	0.00195	2.74
	2.03	10.82	242.44	907.54	1214.9	288.74	4852.88	129.84	1000	7351.33	2.38966e+06	6477
613	3177.99	602.98	4657.96	1049.65	118.26	9	1.43	1.85	7.41e-05	0.00083	0.00652	1.64
	1.15	6.75	58.71	636.02	123.98	947.02	5079.62	193.12	1751	7633.49	3.13311e+06	6599
614	4804.83	551.45	6318.27	1077.2	220.05	9.59	0.86	1.19	9.43e-05	0.00058	0.00566	1.9
	1.04	11.28	205.01	256.13	519.94	323	4607.35	136.28	2010	17505.3	1.52051e+06	5432
615	3461.18	642.85	5374.34	1025.49	249.13	5.74	1.65	2.43	7.2e-05	0.00038	0.00425	0.94
	0.54	11.07	80.86	231.55	443.92	624.48	4879.64	132.24	2219	7613.92	3.45238e+06	6629
616	4889.08	497.16	7465.13	994.25	178.71	6.2	1.97	2.4	9.61e-05	0.00043	0.00459	1.79
	1.32	5.01	219.95	459.62	1296.53	412.85	4706.59	192.34	1306	16716.9	2.04063e+06	6895
617	3770.47	451.98	5387.7	669.29	149.87	5.02	0.81	1.16	7.57e-05	0.00032	0.00366	1.91
	1.43	11.34	204.61	593.78	625.13	727.31	4332.43	190.51	120	17013.6	3.0543e+06	5072
618	3035.12	942.06	4827.76	1873.54	244.19	9.3	1.05	1.55	9.02e-05	0.00051	0.00593	2.71
	1.91	9.53	153.98	919.37	851.4	929.36	6914.4	170.94	1732	14811.2	701416	7980
619	2701.23	752.7	3749.69	921.36	255.67	8.62	0.66	0.97	5.04e-05	0.00042	0.00144	2.6
	1.63	6.16	138.04	215.5	379.39	399.92	6386.83	144.09	1640	13971.6	1.45819e+06	8979
620	4702.97	939.64	6417.58	1589.2	259.67	9.57	1.28	1.75	2.95e-05	0.00061	0.00605	2.58
	1.17	13.72	214.63	391.84	496.27	591.73	7397.24	172.36	796	16968.7	3.96252e+06	9161

621	2153.61	826.43	3246.5	1407.8	240.24	5.79	1.81	2.29	6.01e-05	0.00075	0.00787	2
	1.01	13.41	126.03	528.24	254.67	708.05	7881.58	159.06	3542	9035.06	1.97934e+06	9038
622	3154.58	981.36	4327.43	1196.05	254.56	6.07	1.24	1.59	0.0001009	0.00059	0.00404	2.55
	1.61	12.97	73.06	772.85	174.06	794.37	3171.18	170.91	1180	14415.2	2.75939e+06	3880
623	3923.06	838.07	4920.08	1624.63	189.7	5.63	1.42	1.9	1.58e-05	0.00069	0.00765	2.79
	2.03	12.23	177.38	675.89	436.1	389.63	7091.54	188.57	3280	16642	1.98533e+06	9697
624	3407.37	435.63	5101.84	577.48	295.06	9.83	0.55	0.77	6.9e-05	0.00051	0.00613	2.85
	2.05	7.35	116.76	944.24	463.67	683.42	7067.99	161.9	2002	10448.2	2.14455e+06	8073
625	4711.61	768.27	7500.14	1504.01	252.14	9.3	1.61	2.11	3.64e-05	0.00026	0.00226	2.31
	1.17	9.58	203.49	608.81	1144.7	791.1	3710.91	168.82	412	7383.95	3.81634e+06	4567
626	3766.01	968.22	5632.49	1483.3	175.91	9.78	1.17	1.62	4.48e-05	0.00024	0.00181	2.26
	1.69	7.94	111.04	336.43	324.94	684.32	5737.27	148.42	488	7988.4	3.01301e+06	6445
627	3586.96	992.35	4472.65	1656.34	170.07	8.54	1.59	2.31	7.86e-05	0.00058	0.00352	2.45
	1.1	6.7	77.71	728.25	372.49	446.91	4150.15	130.29	1953	9348.57	640531	4692
628	2139.52	984.16	2916.12	1636.82	269.55	9.14	0.59	0.82	1.31e-05	0.00095	0.00238	1.28
	0.87	6.59	237.18	765.24	1200.53	227.53	7119.61	128.08	2137	11006.7	809059	8687
629	3839.15	736.75	5722.94	1224.23	257.62	5.15	0.57	0.72	9.83e-05	0.00039	0.00355	1.83
	0.77	8.92	153.46	705.48	810.83	645.86	7951.54	135.45	1585	11810.8	3.22974e+06	11274
630	4120.42	769.27	6480.56	926.61	260.37	5.99	1.31	1.6	8.56e-05	0.00098	0.0023	2.4
	1.35	11.38	202.03	829.8	829.28	408.24	6340.35	120.96	2997	9724.35	1.15701e+06	8683
631	4775.92	508.84	6491.89	894.52	160.59	7.91	1.41	1.8	7.95e-05	0.00107	0.0032	2.16
	1.41	7.86	195.69	766.71	469.27	969.31	3141.67	159.74	521	10869.4	829735	4331
632	3697.79	950.16	5318.45	1498.19	213.85	7.85	1.34	1.71	1.94e-05	0.00081	0.00972	2.12
	1.63	13.89	102.6	926.59	455.6	997.4	3233.35	187.74	531	9167.15	2.92811e+06	3830
633	4268.64	380.33	5615.84	642.84	166.52	5.69	1.23	1.51	1.54e-05	0.00025	0.00099	1.63
	0.83	6.63	180.66	963.45	380.18	910.21	6789.79	124.01	2531	15529.5	621871	7911
634	4111.68	413.54	5420.8	788	218.56	8.64	0.64	0.86	2.94e-05	0.00024	0.00202	2.37
	1.1	7.21	218.8	561.24	545.74	562.98	7030.99	161.14	1594	16487.5	1.9836e+06	10389
635	2803.2	613.11	4216.54	745.82	294.56	5.68	1.53	2.04	4.6e-06	0.00054	0.00377	2.56
	1.77	9.11	151.06	218	606.19	872.61	6578.09	149.1	1540	9538.04	1.13854e+06	7636
636	2290.31	969.64	3606.95	1393.06	154.61	6.13	1.25	1.58	1.75e-05	0.0008	0.00263	2.85
	1.37	5.53	148.95	521.5	381.42	569.41	4578.74	138.25	1063	17973.7	1.54121e+06	6000
637	4224.23	989.3	5284.58	1667.83	247.42	9.72	0.69	1.02	3.03e-05	0.00055	0.00589	2.09
	1.52	5.26	136.59	845.82	628.86	698	5363.37	150.94	324	13607.6	2.98544e+06	6208
638	3519.92	454.68	4521.85	746.98	192.66	8.07	1.95	2.8	2.16e-05	0.00046	0.0035	2.78
	2.05	5.6	214.68	477.52	863.23	600.12	4942.17	130.36	1185	15145.4	2.7561e+06	6728
639	3958.6	466.55	4805.57	738.91	150.15	5.99	0.71	0.88	3.2e-06	0.00084	0.00799	2.83
	1.3	8.97	55.75	235.94	210.37	543.32	7169.16	130.15	3242	17574.5	1.28066e+06	9586
640	2667.72	769.44	3771.1	1383.63	250.05	7.07	1.45	2	4.3e-06	0.00101	0.00723	2.11
	0.95	13.58	118.14	956.13	658.99	710.8	4822.6	136.91	319	16659.5	2.47149e+06	5317
641	2622.67	595.58	3566.32	1156.2	249.4	9.04	1.32	1.69	3.89e-05	0.00026	0.00281	2.42
	1.81	5.04	178.17	577.63	742.55	278.49	7317.96	159	1499	9193.59	736962	9172
642	3736.98	208.8	5821.28	348.65	115.16	8.02	1.95	2.41	9.98e-05	0.00097	0.00939	2.64
	1.13	10.52	197.27	293.77	842.3	812.07	6134.89	171.42	1358	10044.2	954225	7008
643	2583.99	734.48	3309.96	1408.85	288.93	6.74	1.29	1.69	7.5e-06	0.00075	0.00392	1.87
	0.76	6.5	173.99	802.18	500.27	424.72	3182.71	124.96	123	16156	1.44374e+06	4265
644	3171.61	839.73	4075.21	1203.18	264.76	6.69	1.46	1.91	3.74e-05	0.001	0.00844	1.65
	0.72	8.4	55.59	762.26	122.77	664.97	4562.22	126.83	2149	8849.29	1.39889e+06	6151
645	3494.14	548.23	5329.5	852.85	274.19	7.78	1.66	2.27	1.88e-05	0.00093	0.00934	2.21
	1.35	9.2	174.38	675.24	642.21	405.83	5917.58	148.96	1197	18153.3	2.18995e+06	8275
646	4708.38	593.99	7058.98	1175.28	129.89	9.77	1.82	2.72	2.26e-05	0.00085	0.00505	2.48
	1.51	13.05	219.22	582.79	586.17	260.78	6717.65	145.65	412	14772.9	3.82181e+06	7246
647	4102.05	367.87	5673.82	507.06	256.6	7.95	0.93	1.21	7.61e-05	0.0011	0.00686	1.07
	0.47	13.35	129.79	702.26	605.79	481.23	3778.37	173.41	1643	7693.5	3.94146e+06	3809
648	4049.25	431.47	5615.37	783.87	269.65	6.73	1.74	2.15	8.6e-05	0.00015	0.00073	1.64
	1	5.94	235.34	622.09	670.82	469.73	6674.25	192.93	2084	9338.71	1.33279e+06	9463
649	4036.82	737.32	5902.51	1176.09	160.47	7.62	1.9	2.65	6.13e-05	0.00055	0.00628	1.42
	0.96	8.04	61.54	960.77	180.42	769.08	6022.03	178.38	706	8723.21	1.26265e+06	7490
650	3067.79	490.07	4597.18	761.95	243.15	7.52	0.91	1.13	4.06e-05	0.00045	0.00518	1.82
	0.82	6.81	238.28	373.31	1302.32	721.71	7185.2	151.5	936	15403.3	3.81083e+06	9375

The following table includes data for qsf-Psf case.

Data #	L_{hw} (ft)	L_f (ft)	L_x (ft)	L_y (ft)	h (ft)	ϕ_m (%)	ϕ_f (%)	SRV-ϕ_m (%)	k_m (md)	k_f (md)	SRV-k_m (md)	Δx_s (ft)
	SRV-Δx_s (ft)	S_{wf} (%)	V_{L-CH_4} (scf/ton)	P_{L-CH_4} (psi)	V_{L-CO_2} (scf/ton)	P_{L-CO_2} (psi)	P_i (psi)	T_i (F)	$q_{sf-prod}$ (scfd)	t_{prod} (days)	P_{frac} (psi)	q_{sf-inj} (scfd)
1	2287.03	478.1	2814.23	816.57	285.77	9.54	1.26	1.77	8.9e-06	0.00107	0.0035	1.25
	0.55	13.42	200.66	284.53	1138.17	959.34	4745.94	124.45	4.45529e+06	9476.53	6945.43	385768
2	2085.16	998.26	3029.16	1847.65	179.45	5.04	1.51	1.86	1.63e-05	0.0007	0.00514	1.71
	1.31	9.18	106.62	277.97	478.79	289.02	6731.3	189.23	3.56195e+06	9022.53	7585.34	304000
3	4134.58	741.4	6432.69	1316.79	279.82	7.81	0.77	1.11	8.43e-05	0.0008	0.00496	1.37
	0.79	11.53	154.63	528.71	853.67	860.47	4617.12	168.35	4.60633e+06	9005.95	6177.57	493535
4	4238.05	941.1	5689.44	1692.14	271.66	5.18	1.74	2.11	8.05e-05	0.00041	0.00122	3
	1.57	6.14	159.26	375.81	594.47	280.91	4032.29	195.88	1.57755e+06	17482.4	4858.65	211018
5	2540.26	760.6	3114.25	1277.62	263.71	9.44	0.89	1.17	4.21e-05	0.00015	0.00171	2.85
	1.85	8.73	88.03	302.98	476.9	437.01	5566.4	181.61	4.40124e+06	15242.4	6448.6	495587
6	2597.43	965.19	3670.18	1166.01	268.1	8.8	1.17	1.63	1.56e-05	0.00038	0.00308	2.86
	1.96	11	193.01	814.55	1099.72	537.69	5068.54	194.35	4.64754e+06	13278.4	7225.47	376844
7	3403.3	755.98	5252.86	1006.58	263.8	9.11	1.45	1.84	7.97e-05	0.00101	0.00801	2.06
	1.06	6.29	245.05	307.97	556.27	467.89	3030.37	179	4.82768e+06	10080.1	3379.97	266308
8	4585.29	632.58	5563.49	1259.28	115.42	7.64	0.51	0.66	3.71e-05	0.00082	0.00171	2.69
	1.37	11.29	228.5	835.28	891.48	426.99	6743.13	156.77	2.77343e+06	12885.8	7455.72	435080
9	2592.84	599.51	4088.17	1127.98	169.33	7.88	1.48	2.1	4.2e-06	0.00046	0.00367	1.05
	0.79	10.26	222.94	541.3	825.96	277.55	7170.7	168.12	4.59848e+06	17287.3	7935.08	281768
10	4696.91	791.15	5715.53	1376.37	102.77	6.57	0.96	1.24	7.79e-05	0.00032	0.00188	2.32
	1.09	13.4	146.85	708.97	725.93	310.81	6221.67	198.7	2.86571e+06	8021.88	8825.58	459722
11	2001.76	621.48	2976.71	1186.76	122.67	6.82	0.85	1.05	2.75e-05	0.00098	0.00444	1.94
	1.36	11.07	115.46	432.07	615.44	262.42	3903.67	160.06	1.60599e+06	17803.9	4647.42	263899
12	3606.15	361.79	5689.84	678.1	123.86	7.31	1.81	2.53	2.89e-05	0.00017	0.00204	1.36
	0.88	11.88	208.04	956.92	420.16	888.66	4641.9	141.52	3.96379e+06	15755.6	6134.51	275253
13	4661.74	510.34	6821.08	853.11	180.78	7.35	1	1.35	5.8e-06	0.00096	0.00327	2.39
	1	11.79	108.26	822.12	648.03	902.95	3991.79	145.29	4.78307e+06	8481.96	5896.41	399237
14	2769.08	759.68	4079.07	1420.22	277.93	9.53	1.7	2.53	5.96e-05	0.00068	0.00654	1.83
	1.37	11.57	231.95	492.23	516.9	633.48	6893.54	125.99	4.27843e+06	9717.24	9253.27	370451
15	2890.87	335.56	4584.71	666.05	291.86	5.06	1.4	1.74	7.1e-06	0.00024	0.00252	2.53
	1.68	5.05	65.92	565.3	325.96	302.1	3189.17	178.84	2.91529e+06	15434.5	4006.74	292671
16	2179.46	440.4	3087.52	811.76	211.28	5.72	0.68	0.82	1.4e-06	0.0007	0.00428	1.24
	0.81	5.13	130.64	966.92	494.66	435.5	3593.06	166.71	3.27727e+06	12137.8	4034.27	294260
17	2811.72	722.69	4487.54	952.42	214	7.1	1.69	2.07	7.19e-05	0.00028	0.00268	2.78
	1.49	9.67	115.51	374.72	472.07	418.2	6270.11	173.19	2.75945e+06	13930	8842.62	296416
18	2003.5	255.27	2430.32	506.56	219.3	5.95	1.37	1.73	7.57e-05	0.00057	0.00153	1.4
	0.81	12.99	154.23	299.57	849.88	769.45	4985.14	185.37	4.21572e+06	12768.6	6090.87	260349
19	2548.19	493.59	3295.22	665.07	161.88	7.8	1.32	1.82	1.3e-06	0.00028	0.00162	1.31
	0.71	9.39	126.49	795.02	301.63	335.91	5382.96	167.33	2.42104e+06	15484.3	6136.21	251486
20	4437.26	646.86	5920.56	805.08	288.01	5.3	0.56	0.7	2.11e-05	0.00017	0.00116	2.6
	1.79	7.84	127.58	373.88	418.6	242.65	6163.54	191.08	3.4777e+06	11128.9	8435.24	546924
21	2623.88	570.29	3772.16	1037.67	199.1	8.37	0.6	0.85	8.25e-05	0.00053	0.00269	1.54
	1.06	12.94	61.71	345.85	358.46	445.86	5343.5	199.11	3.70673e+06	10676.8	7324.13	259302
22	2035.73	674.59	2765.45	1115.12	158.95	6.51	0.77	1.08	2.56e-05	0.00049	0.00439	1.2
	0.53	8.76	248.67	489.16	762.67	472.36	7217.79	147.58	2.30513e+06	8954.66	8545.46	288110
23	2639.36	980.92	4208.58	1617.39	122.25	5.31	0.68	1.01	9.69e-05	0.00059	0.00379	2.93
	1.51	12.38	168.94	508.74	784.1	443.35	4812.28	129.65	1.78151e+06	13988.2	6901.77	476391
24	4488.18	994.18	6354.67	1814.87	162.32	8.69	0.9	1.28	6.6e-05	0.00021	0.001	2.02
	1.41	9.98	86.41	840.27	269.15	796.54	5964.04	120.52	3.02378e+06	15697.8	8897.07	289036
25	4861.93	480.04	7177.09	957.74	122.11	7.06	0.92	1.24	7.99e-05	0.00021	0.00113	1.66
	1.16	9.62	238.86	364.46	1370.05	229.42	6699.96	132.81	3.65944e+06	9732.78	7964.92	231566
26	2892.67	853.99	3791.19	1429.21	247.58	6.08	1.21	1.46	2.43e-05	0.00067	0.00484	1.36
	0.99	9.93	133.14	559.97	334.45	719.67	4786.38	134.96	4.3614e+06	8973.01	7040.22	462650
27	2912.59	738.17	3903.52	1235.7	186.05	5.41	1.32	1.9	9.71e-05	0.00062	0.00419	2.33
	1.54	6.67	134.39	774.64	363.26	313.61	3029.36	144.1	1.9484e+06	15490.1	4080.56	339518
28	3377.94	956.02	4178.71	1806.07	166.65	8.84	0.74	0.92	7.18e-05	0.0003	0.00175	2.68
	1.91	10.32	153.76	263.43	555.96	332.82	6739.65	131.02	3.83349e+06	18054.7	9639.24	304603
29	4168.53	372.56	6523.13	703.03	206.73	6.16	1.05	1.56	3.12e-05	0.00014	0.00093	2.32
	1.29	8.66	103.69	715.64	313.68	735.98	6076.78	171.97	4.22783e+06	7421.7	7482.27	470680
30	2738.45	434.65	3555.39	838.06	293.59	5.15	1.97	2.56	5.03e-05	0.0003	0.00364	2.04
	1.52	6.09	218.79	359.86	1255.81	836.25	5634.17	137.25	4.49865e+06	12122.5	6741.19	404059
31	2346.39	995.66	3722.99	1345.54	100.23	9.78	1.51	2.23	2.05e-05	0.00025	0.00196	1.63
	0.77	6.6	50.33	977.33	207.76	475.82	3683.76	139.49	4.42252e+06	9835.73	5360.94	457659
32	2604.59	656.48	4147.51	1104.95	189.96	7.97	0.58	0.77	5.53e-05	0.00038	0.00223	2.68
	1.32	7.15	120.65	304.44	548.27	635.52	5233.57	145.89	1.72912e+06	13142.1	5757.53	434885
33	2023.1	654.28	3125.62	1073.82	183.69	6.33	1.37	1.96	6.65e-05	0.00044	0.00172	1.35
	0.96	12.4	152.36	321.96	545.93	579.03	4965.18	153.05	2.55703e+06	7444.55	6667.18	220297
34	2233.29	837.17	3019.59	1577.2	205.69	8.67	0.93	1.38	3.48e-05	0.00061	0.00432	2.15
	1.39	8	139.29	403.82	472.41	984.8	5452.56	191.38	3.14477e+06	14084.5	6294.1	311530
35	4411.76	331.97	6586.83	404.25	283.31	5.72	1.35	2	0.0001007	0.00017	0.00095	2.11
	0.94	7.32	98.19	800.83	530.47	948.8	4488.08	139.14	4.82381e+06	9785.39	5974.43	300061
36	3747.7	854.3	5924.8	1070.28	270.24	8.59	0.7	0.92	9.77e-05	0.00032	0.0015	2.71
	1.14	12.83	157.19	387.67	686.62	903.34	6690.08	190.4	4.91177e+06	8869.95	9364.84	344260
37	2376.17	459.99	3150.85	729.8	185.7	8.92	0.79	1.07	9.81e-05	0.00049	0.00259	1.53
	0.67	5.91	212.39	805.79	822.7	911.08	7813.51	146.68	3.02194e+06	14967.3	11438.6	552870
38	3668.82	901.45	5570.19	1668.7	118.58	6.75	0.56	0.79	9.38e-05	0.00021	0.00203	2.96
	2.34	12.8	80.76	887.46	471.83	981.26	7157.18	121.08	3.0205e+06	14898.5	8938.02	217168
39	3864.19	540.64	5857.82	923.12	113.88	9.78	0.57	0.77	6.89e-05	0.00079	0.00188	1.33
	0.74	12.17	145.65	667.84	667.7	586.7	3884.88	179.83	3.23399e+06	13660.3	5760.2	317755
40	4869.69	275.32	7315.09	385.06	283.28	9.71	1.38	1.93	1.3e-06	0.00095	0.00268	1.27
	0.76	13.5	161.24	905.81	534.87	600.34	4144.06	172.65	2.5968e+06	14932	5831.76	339564
41	2471.96	782.43	3667.61	1031.39	197.74	5.61	1.54	1.96	7.74e-05	0.001	0.00674	2.18
	1.64	14	68.13	705.61	203.4	954.22	3438.76	196.4	3.13274e+06	9483.12	4095.36	336954
42	4827.78	985.94	6391.64	1666.76	144.95	5.41	0.62	0.79	3.31e-05	0.00072	0.0026	0.95
	0.4	10.64	140.9	877.2	663.54	622.79	4383.8	177.99	2.81121e+06	8738.8	6243.2	495151
43	3068.9	673.67	4606.54	990.91	265.51	7.11	0.67	0.89	2.5e-05	0.00071	0.00231	1.5
	0.96	13.97	92.3	462.56	370.67	379.82	5539.04	122.34	2.22495e+06	8456.94	8102.91	392585
44	2310	578.95	3217.44	1029.45	105.62	8.72	0.53	0.67	5.49e-05	0.00023	0.00102	1.8
	0.89	10.71	235.12	597.11	901.37	698.9	5394.45	179.59	1.93388e+06	9501.46	6902.53	288078

45	4507.84	455.62	6814.49	726.58	233.26	9.03	0.82	1.09	9.6e-05	0.00016	0.00042	2.42
	1.82	8.77	178.7	212.96	878.75	846.61	5417.87	126.08	1.92135e+06	12890	6974.86	339885
46	2015.25	607.92	3087.3	736.92	191.65	5.83	1.44	2.12	4.27e-05	0.00095	0.01029	1.82
	1.27	8.3	101.2	513.32	282.59	741.97	4093.98	197.96	4.72861e+06	10064.7	4955.22	309604
47	2100.91	727.14	2778.76	1237.13	134.08	7.37	1.81	2.72	5.84e-05	0.00061	0.00572	2.59
	1.27	9.89	228.76	547.56	859.91	725.28	3004.92	166.33	4.429e+06	14725.8	3924.66	415802
48	2958.87	482.44	3744.85	845.81	113.25	6.98	1.05	1.32	4.08e-05	0.00047	0.00411	2.1
	1.13	11.21	152.76	935.51	603.18	646.34	4281.18	157.3	3.73874e+06	14460.6	5046.17	304322
49	2840.92	642.48	4260.02	1042.47	265.39	5.31	1.08	1.43	7.07e-05	0.00011	0.00057	1.04
	0.75	13.8	163.76	937.21	823.94	837.12	6752.13	173.06	4.98402e+06	12591.4	8507.24	291844
50	2693.94	828.18	4094.58	1221.26	155.97	6	1.61	2.2	2.25e-05	0.00039	0.00439	2.97
	1.31	10.83	100.43	867.33	208.17	838.97	5763.29	185.05	4.47764e+06	11938.6	6396.32	494468
51	3429.37	424.66	4822.61	693.47	250.6	9.03	1.78	2.44	4.29e-05	0.00031	0.00188	2.35
	1.18	10.96	223.85	923.2	825.82	681.22	7401.39	174.6	4.94456e+06	17045.5	9460.75	490125
52	3657.56	802.23	5035.46	1146.27	291.41	6.71	1.61	2.15	9.03e-05	0.00019	0.00097	1.62
	1.2	6.66	187.54	423.36	514.15	699.55	4804.01	164.95	2.97792e+06	16511.8	6862.67	250338
53	3403.17	590.44	4218.96	1063.48	189.42	7.91	1.32	1.83	5.81e-05	0.00064	0.003	2.13
	0.89	6.59	198.03	897.93	725.02	541.29	7145.02	199.13	4.43189e+06	17711.3	9667.75	588721
54	3230.43	523.99	4198.63	932.7	252.92	6.25	1.88	2.35	7.08e-05	0.00029	0.00151	2.76
	1.29	10.03	228.42	790.76	757.37	947.85	4914.01	126.51	3.02956e+06	13805.6	6466.4	218632
55	2413.31	888.25	2920.03	1401.66	165.15	7.09	0.69	1.01	3.01e-05	0.00067	0.00324	2.41
	1.28	7.35	99.89	562.12	554.81	844.74	4610.02	130.83	3.09211e+06	11880.8	5719.16	353985
56	2354.6	447.65	3174.77	832.09	289.01	5.02	1.23	1.55	5.11e-05	0.00062	0.00201	1.91
	1.31	7.85	195.12	996.92	741.57	776.5	4607.78	164.33	1.50657e+06	10387.9	6874.72	278266
57	2823.7	412.46	3764.75	670.23	145.11	5.01	1.72	2.42	3.67e-05	0.00018	0.00114	1.17
	0.85	10.55	210.65	611.4	670.24	796.27	5930.04	191.81	1.9072e+06	10054.2	7234.11	480734
58	3445.16	777.72	4492.34	940.55	172.36	9.86	1.68	2.21	3.39e-05	0.00027	0.00214	1.02
	0.77	8.06	168.74	998.14	627.55	534.52	3478.03	130.47	4.90158e+06	13032.7	4692.04	398905
59	3939.34	528.08	5765.94	917.85	227.24	6.24	1.66	2.26	2.25e-05	0.00098	0.00378	2.72
	1.67	12.14	185.53	895.3	713.89	907.37	3415.17	168.12	3.26665e+06	13376.6	3912.97	292730
60	4525.09	701.95	6703.21	1132.16	220.58	9.79	0.96	1.39	7e-06	0.0002	0.00112	2.88
	1.76	13.19	152.68	345.17	556.98	765.03	4229.75	169.98	4.40798e+06	11433.5	5588.11	443492
61	2235.34	273.28	3061.43	488.85	244.02	5.78	1.63	2.23	6.8e-05	0.00078	0.00269	2.33
	1.03	12.4	202.54	478.47	772.33	729.49	7988.25	169.62	4.61093e+06	9728.28	9977.67	376188
62	2412.63	501.91	3469.58	819.15	207.17	5.2	1.65	2.42	1.37e-05	0.0006	0.0068	1.75
	1.07	9.66	140.86	391.21	588.1	305.41	3466.42	187	2.96528e+06	10940	4804.55	399341
63	2508.6	598.97	3504.94	972.22	286.3	8.66	1.26	1.71	4.24e-05	0.00039	0.00162	2.16
	0.89	8.11	179.99	865.16	536.12	963.83	6791.64	182.36	1.78653e+06	15653.7	9813.84	420482
64	2748.2	501.01	3932.54	615.72	210.73	5.57	1.51	2.09	1.71e-05	0.00066	0.00353	2.38
	1.64	9.95	238.57	492.54	960.56	362.78	4015.21	149.36	1.61461e+06	16677.8	4709.8	336548
65	3300.74	920.09	4675.25	1260.23	268.66	6.49	1.14	1.46	1.29e-05	0.00017	0.00132	2.33
	1.56	13.1	57.3	370.47	262.09	425.25	4137.12	175.61	4.26657e+06	9742.57	5167.68	317309
66	2532.46	352	3045.45	576.99	263.92	8.14	0.52	0.69	1.08e-05	0.001	0.00203	1.53
	1.04	6.88	128	861.22	621.23	639.48	3663.55	138.02	4.82845e+06	12970.2	5471.91	410207
67	3991.19	775.69	4891.22	1299.83	187.19	9.75	1.2	1.62	1.78e-05	0.00038	0.00243	2.63
	1.56	13.57	107.65	307.27	442.2	604.08	6490.42	131.89	4.58329e+06	7939.23	9061.07	245937
68	2963.61	784.7	4197.17	1131.66	106.64	9.2	1.05	1.31	8.3e-05	0.0003	0.00198	2.15
	1.36	10.75	227.97	258.62	623.84	633.1	5485.32	121.25	4.29859e+06	12847.5	6242.7	254734
69	2917.59	397.9	3576.12	750.76	100.73	8.88	0.88	1.13	9.03e-05	0.00017	0.00186	1.32
	0.82	10.64	75.65	415.16	335.27	672.4	7739.99	189.28	4.08339e+06	8163.08	10561.4	327421
70	2502.03	969.32	3493.15	1209.56	101.11	7.19	0.58	0.82	1.16e-05	0.00056	0.00527	1.07
	0.53	8.86	124.48	623.85	541.33	956.16	4697.54	170.59	2.00037e+06	11770.3	5336.42	460061
71	2013.22	392.62	2505.75	587.09	299.57	7.17	1.08	1.59	5.24e-05	0.0004	0.00218	2.83
	1.97	10.57	134.99	419.89	774.34	380.7	7480.4	165.76	3.7745e+06	12726.7	10889.3	577228
72	4380.25	658.32	6054.92	1071.61	105.09	5.52	1.41	1.95	6.93e-05	0.00031	0.00144	1.97
	1.36	9.92	169	657.14	404.6	450.88	4613.72	132.12	1.31432e+06	16835.6	5289.56	342215
73	3996.98	713.08	6230.5	1303.03	123.44	9.88	1.65	2.02	1.02e-05	0.00104	0.00452	1
	0.53	13.12	156.77	457.67	808.43	602.68	3822.67	176.98	3.43706e+06	11477.6	5519.56	385306
74	2517.8	982.34	3727.72	1903.15	166.4	8.53	0.88	1.29	4.55e-05	0.00028	0.00272	2.86
	2.22	12.11	132.33	234.13	408.15	788.41	4916.99	154.43	1.94009e+06	15955.9	6149.78	469362
75	4966.82	859.23	7622.05	1685.11	153.63	5.58	1.64	2.05	5.54e-05	0.00094	0.0019	1.65
	0.75	9.38	152.22	257.83	528.91	809.64	5614.49	169.72	2.11309e+06	13006.1	7468.72	241174
76	2889.06	815.93	4490.16	1009.53	168.44	7.23	1.34	1.92	8.8e-05	0.00106	0.00285	1.61
	1.27	5.86	244.95	451.92	1137.32	849.63	5919.61	175.94	2.43134e+06	8315.83	8310.75	468341
77	2550.04	801.12	3953.42	1520.97	104.69	6.89	1.54	2.27	2.39e-05	0.00097	0.00624	2.74
	1.2	7.45	151.77	219.98	789.17	269.29	3659.7	148.05	3.29112e+06	15335.2	4982.21	376317
78	4825.84	816.37	7276.12	1309.38	111.96	9.73	0.91	1.26	1.74e-05	0.00017	0.00078	1.71
	0.85	13.17	173.65	680.91	1011.15	508.08	6263.39	194.41	3.35839e+06	8818.99	9348.7	423781
79	2436.47	968	3863.84	1181.72	166.75	7.98	0.79	1.15	9.4e-05	0.00086	0.00219	2.07
	1.06	9.42	234.12	436.21	938.1	648.9	4713.28	144.72	2.18647e+06	12430.2	5590.25	456162
80	2520.36	519.62	3682.53	694.23	217.25	9.76	1.76	2.47	6.87e-05	0.00104	0.0082	2.47
	1.83	10.95	180.42	917.67	371.25	220.02	3334.73	161.11	3.21879e+06	12592.5	4285.11	282445
81	2546.75	771.85	3963.59	1405.93	260.8	9.68	1.85	2.75	6.97e-05	0.00061	0.0052	2.42
	1.61	6.51	128.61	422.46	345.66	212.95	3325.29	143.62	3.52993e+06	10550.3	4507.52	410149
82	2031.11	880.08	2937.95	1219.37	189.04	9.2	1.05	1.27	5.02e-05	0.00034	0.00303	2.66
	1.7	9.03	219.31	442.6	995.52	446.38	3800.83	162.43	1.73803e+06	13542.3	4249.08	319469
83	3810.89	662.13	5253.62	1136.48	251.59	8	1.1	1.64	3.81e-05	0.00092	0.00318	0.91
	0.43	6.17	65.89	992.55	188.65	564.43	5509.36	189.87	4.03109e+06	9899.77	7535.96	463695
84	4050.53	610.9	5679.08	1158.59	187.41	7.71	1.38	2.03	7.4e-06	0.00013	0.00049	2.48
	1.2	13.56	214.07	651.37	649.52	284.17	7436.83	132.54	4.88329e+06	13490.5	9461.67	335547
85	3961.19	543.24	5791.11	858.57	216.65	8.55	0.74	0.89	2.17e-05	0.00055	0.00193	1.7
	1.17	9.35	55.05	348.43	210.66	282.67	4484.93	197.9	3.19586e+06	15503.4	5440.82	316850
86	2370.47	871.58	3478.39	1363.34	153.94	6.16	1.72	2.55	9.38e-05	0.00023	0.00179	2.67
	1.66	5.95	165.37	902.45	370.68	493.72	6675.63	138.13	1.34493e+06	10606.3	8084.9	267770
87	3125.53	453.84	4511.93	690.01	275.3	9.64	0.87	1.17	5.85e-05	0.0004	0.00299	1.08
	0.68	13.92	97.33	464.4	206.21	434.33	3374.13	152.08	2.88904e+06	11201.5	4779.35	316157
88	2069.47	208.83	2916.42	335.03	242.42	5.58	1.45	1.96	8.93e-05	0.00057	0.00137	2.65
	1.6	9.13	243.33	764.07	516.3	556.45	4860.15	138.24	4.76911e+06	8187.2	6392.15	233381
89	4522.44	824.82	6791.23	1314.26	107.03	6.25	0.67	0.81	1.65e-05	0.0007	0.00341	2.8
	1.58	6.45	57.03	645.39	163.06	802.36	6697.76	194.7	4.54568e+06	13793.5	8578.45	370612
90	2677.8	775.18	3588.34	1214.61	286.26	9.66	1.88	2.58	6.2e-05	0.00038	0.00401	2.75
	2.12	5.92	201.36	537.22	588.14	457.27	7829.92	148.32	3.69016e+06	11711.6	11015.5	354949
91	3239.99	550.64	4788.22	722.41	254.65	7.85	1.52	1.93	5.7e-06	0.00014	0.00134	2.77
	1.55	13.87	222.53	520.72	575.64	744.67	7623.42	177.5	2.27351e+06	12796.6	8492.04	317165
92	4666.9	651.24	6190.72	845.74	277.76	8.11	0.96	1.19	2e-05	0.00062	0.00153	1.86
	1.09	10.58	97.87	407.54	436.01	208.61	3220.13	182.78	4.73035e+06	12713	4302.37	392459

93	4319.07	388.46	5728.6	698.33	194.41	7.01	1.83	2.73	7.67e-05	0.00079	0.003	1.65
	0.87	11.47	191.01	202.92	748.57	613.21	6954.19	186.12	4.36516e+06	11435.1	8048.34	461190
94	2811.11	758.19	3537.22	1328.99	262.59	8.11	0.85	1.23	5.89e-05	0.00094	0.0037	1.34
	0.82	7.64	117.69	447.61	587.86	513.84	5322.01	129.9	4.70774e+06	10136.6	7758.08	472933
95	4191.56	967.64	6216.23	1830.57	143.65	9.13	0.73	0.92	9.09e-05	0.00023	0.00195	2.74
	2.03	10.82	242.44	907.54	1214.9	288.74	4852.88	129.84	2.03987e+06	7351.33	6477.15	307387
96	3175.69	485.95	3984.65	727.6	108.13	6.38	0.83	1.2	9.2e-05	0.0008	0.00338	1.41
	0.87	12.02	130.88	312.75	516.93	301.47	4365.88	146.24	3.53311e+06	14759.9	5874.46	487490
97	2218.91	567.62	2751.05	933.34	117.69	8.2	1.04	1.3	8.75e-05	0.00062	0.0049	2.73
	1.99	13.51	127.41	673.48	392.35	928.84	3091.1	141.48	1.7279e+06	14807.8	4026.57	392619
98	4169.34	817.47	5205.27	1299.9	238.41	9.72	0.75	1.02	7.2e-05	0.00036	0.00308	2.72
	1.3	6.74	57.88	786.08	119.12	278.38	3250.8	170.08	1.90493e+06	7726.07	3720.57	406837
99	3498.97	896.66	5110.83	1122.27	130.1	7.99	0.81	1.07	7.39e-05	0.00023	0.0013	2.59
	1.47	10.8	169	416.92	384.02	209.82	5056.36	134.87	2.06188e+06	17800.3	6852.85	276132
100	3572.54	992.14	4919.87	1942.54	150.87	7.03	1.41	1.91	3.84e-05	0.00048	0.00486	1.91
	1.38	5.48	196.76	809.86	756.91	572.33	3263.83	135.26	2.00583e+06	17062.3	4525.62	476720
101	4262.89	832.61	6520.5	1173.68	230.88	9.43	0.73	0.91	6.31e-05	0.00067	0.00145	1.26
	0.83	10.7	189.54	451.66	741.61	238.53	3292.76	175.72	1.85965e+06	16055.5	3958.72	262582
102	3520.72	910.37	5455.01	1300.36	148.94	6.73	0.96	1.41	5.84e-05	0.0007	0.0027	2.34
	1.31	8.88	209.49	678.93	1082.89	557.91	3311.42	127.14	2.44674e+06	10916.7	4485.88	416748
103	2352.85	243.09	2858.5	322.49	109.31	8.25	1.32	1.86	8.64e-05	0.00057	0.00261	2.81
	1.47	11.38	106.42	827.97	391.15	878.68	3705.24	179.41	3.00539e+06	17604.1	4829.49	296567
104	4046.23	889.26	5618.17	1206.45	287.1	5.12	1.75	2.16	6.86e-05	0.00043	0.00313	1.79
	0.94	7.37	109.11	661.12	410.5	696.73	4009.83	141.83	3.57787e+06	14933.3	5831.77	484475
105	2286.44	372.89	3506.54	630.8	253.08	6.59	1.9	2.82	8.99e-05	0.00032	0.00244	1.86
	0.84	6.48	140.01	993.38	555.33	773.17	6173.95	173.17	3.37453e+06	9443.57	6930.2	266554
106	3696.14	499.75	5169.18	765.87	198.38	8.61	1.05	1.52	8.53e-05	0.00041	0.00255	1.72
	1.26	12.25	171.79	882.72	410.88	997.32	3570.21	188.92	3.93584e+06	13226.9	4066.61	304419
107	3214.27	821.67	4223.78	1530.94	258.35	5.3	1.04	1.52	9.68e-05	0.00093	0.00214	2
	1.25	8.82	206.07	838.66	691.34	455.1	4450.63	144.26	2.22884e+06	16181.7	5931.95	248623
108	2598.52	938.93	3560.19	1413.48	230	7.65	1.41	1.75	7.6e-06	0.00047	0.00256	2.12
	1.01	9.24	244.56	399.91	1148.5	904.48	7204.87	189.02	3.28735e+06	17697.8	9903.05	377692
109	3458.84	739.32	5515.58	935.95	197.36	5.56	0.93	1.13	0.0001002	0.00035	0.00252	1.81
	1.15	5.57	212.47	726.42	664.35	475.15	3356.7	182.86	1.1641e+06	13964.8	4014.14	423538
110	3035.87	403.2	4202.02	617.58	183.8	5.5	0.97	1.27	8.46e-05	0.00099	0.00265	2.28
	1.46	5.08	241.94	954.58	621.4	925.9	4435.35	122.84	3.80205e+06	17570.8	6201.81	217541
111	4790.67	681.1	6894.63	1059.33	203.43	5.57	1.83	2.51	6.37e-05	0.00025	0.00146	2.67
	1.29	9.41	215.54	734.13	1052.12	629.55	3129.07	151.57	3.52064e+06	15668.8	3624.53	303810
112	3453.74	630.55	5230.78	1042.61	251.78	6.88	1.15	1.42	3.05e-05	0.00019	0.00157	1.04
	0.5	9.9	139.52	731.23	308.57	499.37	6029.69	152.79	1.25281e+06	14332.7	6980.89	347452
113	3842.57	605.26	6140.42	888.2	272.19	7.39	0.59	0.85	4.02e-05	0.0003	0.00073	1.2
	0.51	12.32	213.45	972.36	535.46	298.27	3824.01	183.32	1.91606e+06	15667.6	5604.18	210076
114	4269.14	851.59	5622.32	1026.25	235	6.22	1.67	2.16	3.02e-05	0.00059	0.00145	2.56
	2.01	6.27	56.73	640.94	325.68	269.05	5309.96	161.23	3.77492e+06	17148.5	7944.16	386507
115	3025.18	649.27	3794.45	1207.71	265.69	5.1	1.66	2.03	7.79e-05	0.00031	0.00176	0.9
	0.65	8.84	170.34	373.02	402.59	666.29	4068.74	162.99	1.47047e+06	10997.1	4755.04	203465
116	4514.41	936.46	7033.7	1762.87	265.78	7.58	1.05	1.32	8.54e-05	0.00091	0.00341	1.24
	0.53	10.48	176.67	271.72	893.95	667.02	3783.05	160.64	3.91545e+06	11975.1	4742.96	399461
117	2411.78	670.97	2984.12	948.82	270.16	5.04	0.67	0.9	2.98e-05	0.00063	0.004	2.44
	1.52	5.74	232.28	360.58	474.95	570.76	4169	166.92	3.5118e+06	9028.09	5061.76	337124
118	2729.72	931.48	4011.78	1585.7	265.81	7.97	1.97	2.89	9.31e-05	0.00108	0.00529	1.69
	1.35	8.05	229.86	845.18	608.69	409.56	3171.28	162.11	1.77817e+06	9194.4	4175.91	481470
119	4421.69	890.83	5320.14	1238.2	188.33	7.96	1.2	1.79	2.86e-05	0.00079	0.00364	1.27
	0.75	7.32	60.21	230.42	128.83	615.58	3268.59	190.4	1.39785e+06	9446.58	4127.47	385862
120	3734.54	771.13	5596.6	1174.86	123.99	7.42	0.92	1.36	2.7e-05	0.00025	0.0014	2.31
	1.07	11.54	221.33	996.48	1243.37	404.48	4592.02	176.76	2.4434e+06	9114.73	6110.51	460170
121	3836.67	811.41	4856.19	1087.06	158.72	5.03	1.4	2.09	8.3e-06	0.00073	0.00167	1.41
	0.78	6.01	219.14	912.14	828.44	670.79	4279.34	124.03	4.4449e+06	14302.1	6126.05	335361
122	4357.66	774.36	5987.44	1515.1	230.35	6.82	1.95	2.75	6.2e-05	0.00099	0.00335	2.07
	0.93	5.08	187.47	802.35	545.12	914.28	3620.83	187.15	4.73584e+06	14114.4	5020.69	411238
123	3997.43	475.28	6015.36	851.33	203.69	6.64	1.4	1.72	1.28e-05	0.0006	0.00174	1.26
	0.54	11.77	95.83	637.51	524.1	270.19	5373.42	155.14	4.09535e+06	9982.72	6355.14	293190
124	3404.78	699.43	4760.62	886.66	243.22	5.05	1.36	1.86	6.7e-06	0.00031	0.00331	1.47
	0.66	10.51	211.12	572.52	896.43	951.81	4580.43	140.1	3.48244e+06	12917.5	5184.42	272159
125	2164.62	864.95	3372.96	1120.1	276.69	9.27	0.77	1.09	6.6e-06	0.00081	0.00801	2.41
	1.22	12.8	98.12	396.87	355.64	837.79	4693.75	181.12	2.85374e+06	9880.38	5324.25	522755
126	4574.84	653.58	7191.43	1037.46	179.3	7.12	1.32	1.76	1.15e-05	0.0004	0.00281	2.53
	1.57	12.93	215.9	974.88	833.77	208.15	3348.8	139.94	4.35702e+06	10179.2	4345.29	287632
127	4838.06	935.07	7447.35	1735.61	202.91	9.17	1.11	1.63	2.78e-05	0.00036	0.00244	2.85
	1.98	8.17	208.81	770.12	956.44	761.86	5686	139.04	4.16005e+06	13064.1	7549.1	429698
128	3000.1	437.26	3797.91	843.32	124.68	5.69	1.98	2.63	6.72e-05	0.00105	0.00244	1.39
	0.73	11.71	193.06	502.47	533.29	742.95	4035.75	122.58	1.68722e+06	12912.1	5264.89	454474
129	2052.21	864.15	3151.85	1543.25	175.66	5.32	0.78	1.12	6.99e-05	0.00071	0.007	1.54
	1.02	11.36	106.7	764.98	346.81	971.57	4653.89	195.6	2.10763e+06	9204.38	5889.88	396999
130	4946.43	762.13	6296.77	1279.59	196.96	8.13	0.71	1	8.06e-05	0.00018	0.00108	2.14
	1.71	6.4	195.45	240.73	566.41	428.42	3650.16	184.53	3.15222e+06	13885.7	5454.29	275142
131	4003.45	255.76	6077.56	457.38	236.12	6.5	0.8	1.2	8.67e-05	0.00054	0.0036	1.57
	0.64	6.38	200.18	894.18	422.97	715.65	7118.66	178.46	4.01634e+06	14438.8	8450.48	394877
132	4799.78	679.24	6593.45	862.03	262.2	6.15	1.9	2.65	2.3e-05	0.0005	0.003	2.81
	1.32	7.25	154.56	427.28	840.56	909.12	3984.6	156.44	2.85816e+06	8119.36	4805.34	436970
133	2192.21	715.02	3102.25	1364.48	256.06	7.6	1.06	1.33	7.64e-05	0.00021	0.00233	1.08
	0.75	6.38	249	528.95	737.14	235.68	7532.66	163.13	3.39867e+06	17235.1	10245.7	491332
134	4619.31	394.6	6679.93	569.43	298.57	9.96	1.98	2.53	6.11e-05	0.00038	0.00192	1.15
	0.8	12.27	57.14	692.54	286.96	344.32	6924.3	122.44	2.63968e+06	13847.5	8688.39	400660
135	2642.58	678.36	3661.91	1114.64	158.99	8.19	0.71	0.94	2.16e-05	0.00084	0.00183	2.19
	0.97	9.84	205.85	630.82	856.85	442.48	6166.65	138.77	2.23132e+06	16891.4	9235.8	328297
136	2066.81	246.36	2651.42	399.28	168.28	6.02	1.75	2.27	1.8e-06	0.00101	0.00297	1.53
	0.64	13.18	167.62	248.27	772.95	791.84	3919.39	193.81	2.78601e+06	11647.5	5341.7	235247
137	2758.71	300.51	4304.5	599.5	232.25	8	1.66	2.38	7.21e-05	0.00033	0.00166	1.58
	0.84	10.36	129.74	909.47	763.92	219.69	7272.98	132.27	1.93772e+06	8487.77	10877.2	224798
138	2521.95	949.5	3493.39	1723.11	154.65	6.37	1.68	2.08	9.08e-05	0.00073	0.00334	1.32
	0.61	6.13	153.74	993.12	518.86	215.71	3111.15	154.29	4.29764e+06	9951.56	3450.76	449110
139	3336.75	393.88	5148.18	599.85	255.97	6.17	0.71	0.9	6.46e-05	0.00062	0.00193	1.43
	0.59	13.22	71.37	755.67	250.27	723.38	5811.66	188.59	2.34963e+06	14222.1	6518.86	368030
140	2352.38	618.29	3585.15	1001	193.91	9.3	1.14	1.66	7.57e-05	0.00054	0.00197	1.86
	1.21	6.7	162.62	223.68	930.77	671.07	7051.91	193.21	3.47117e+06	16396.2	8186.96	254281

141	3378.79	657.69	4753.86	1273.13	257.87	7.8	1.83	2.75	1.3e-06	0.00039	0.00245	2.03
	1.37	12.8	236.54	534.53	1264.74	906.6	5783.14	185.51	4.4857e+06	18206.3	6971.43	361015
142	3004.5	954.74	4524.88	1765.19	193.03	8.85	1.71	2.25	6.14e-05	0.00082	0.00522	2.69
	1.54	11.06	185.79	363.57	1012.26	256.82	6726.39	181.8	3.9297e+06	12677.7	9664.54	397174
143	2755.65	965.77	3401.82	1543.11	193.29	6.3	1.35	1.99	8.77e-05	0.00076	0.00466	2.66
	1.68	10.76	223.48	954.13	1007.41	301.32	3771.2	129.93	3.14498e+06	13666.6	5325.69	495615
144	3446.96	770.03	5343.15	956.87	264.17	5.3	1.15	1.44	2.59e-05	0.00091	0.0022	2.13
	0.93	10.66	155.03	401.53	623.09	951.28	4174.03	188.66	3.15505e+06	10574.2	5070.35	469536
145	2652.69	983.09	3709.64	1388.51	248.46	8.29	0.65	0.88	3.7e-05	0.00047	0.00123	1.59
	1.15	10.85	102.45	796.85	283.36	834.22	7949.21	137.62	2.35843e+06	14592.4	10527.8	205300
146	2220.13	919.81	2683.34	1694.82	104.71	6.13	1.82	2.7	4.95e-05	0.00026	0.00112	2.3
	1.52	7.08	168.41	235.44	623.96	611.23	6823.96	145.28	1.26538e+06	14013.5	9099.31	368357
147	3473.05	855.61	5068.24	1380.49	101.96	5.08	1.32	1.71	1.63e-05	0.00088	0.00855	1.9
	1.21	10.55	163.71	971.06	637.59	998.98	3605.26	178.55	3.40931e+06	17789.7	5018.4	305091
148	4458.89	918.84	6710.24	1363.02	192.82	6.91	1.57	2.27	3.36e-05	0.00047	0.00328	0.94
	0.73	13.09	101.67	905.21	467.94	420.14	4631.39	121.95	4.14748e+06	13890.8	5599.81	297561
149	4041.06	545.05	5572.76	712.38	117.09	5.17	1.21	1.48	1.74e-05	0.00047	0.0016	1.47
	0.68	7.22	116.92	510.35	244.26	365.21	4800.98	125.39	2.69698e+06	7762.36	6801.84	452158
150	4620.72	856.91	5597.93	1110.37	274.82	5.34	1.72	2.27	7.9e-06	0.00105	0.00331	2.13
	1.33	11.58	239.07	540.43	1106.23	753.88	3031.84	124.92	3.79085e+06	18233.2	4293.87	521170
151	3587.24	687.07	5093.06	1093.03	192.98	9.45	1.98	2.68	1.18e-05	0.00091	0.00478	2.6
	2.07	13.19	93.87	623.35	387.92	608.08	3138.71	197.78	2.32167e+06	11147.7	3849.59	242309
152	3559.84	226.63	5077.11	380.25	279.24	6.99	1.5	1.85	9.56e-05	0.00029	0.00342	1.76
	0.95	11.7	154.92	519.24	578.42	720.43	7979.55	143.33	3.22645e+06	13524.3	10361.6	324246
153	2867.01	473.53	3450.89	731.09	236.38	7.93	1.95	2.36	3.66e-05	0.00058	0.00127	1.77
	1.05	9.21	159.2	253	584.84	934.19	7126.38	180.03	3.57348e+06	13387.8	10150.7	371894
154	2701.23	752.7	3749.69	921.36	255.67	8.62	0.66	0.97	5.04e-05	0.00042	0.00144	2.6
	1.63	6.16	138.04	215.5	379.39	399.92	6386.83	144.09	1.59191e+06	13971.6	8978.7	300373
155	4839.69	500.81	6287.37	884.59	297.85	6.32	1.66	2.31	1.02e-05	0.00042	0.00251	1.02
	0.79	11.98	210.44	332	914.59	556.98	3068.8	126.12	3.25197e+06	14325.3	3396.34	397370
156	3333.54	931.31	4302.72	1639.33	205.43	8.41	0.82	1.21	8.25e-05	0.00013	0.00074	2.16
	0.98	7.16	226.68	899.42	1107.54	243.09	5312.01	132.99	3.94473e+06	9289.32	6756.9	384162
157	4648.2	589.43	5793.37	845.55	255.37	6.88	0.93	1.13	3.1e-06	0.00074	0.00299	1.94
	0.81	8.81	148.38	242.93	415.75	778.8	6249.04	183.39	4.80252e+06	16186.2	7109.54	462814
158	4359.01	885.7	6462.47	1268.31	267.45	8.36	1.25	1.65	2.09e-05	0.00021	0.00181	2.71
	1.25	13.14	217.37	777.44	1290.79	480.32	7747.14	158.2	4.87776e+06	15795.1	9919.4	433805
159	3837.3	544.78	5717.74	950.78	121.76	7.6	1.63	2	1.87e-05	0.00011	0.00113	2.31
	1.7	7.03	216.43	887.86	1116.37	690.65	5731.61	146.38	2.83847e+06	8720.48	7370.81	419404
160	3397.75	590.17	4192.31	751.02	137.99	7.01	1.15	1.61	8.87e-05	0.0005	0.00213	1.97
	0.86	11.15	92.43	748.9	187.72	794.16	4304.54	166.51	1.15691e+06	12280.3	6423.57	522532
161	3264.7	887.55	4457.12	1741.56	140.22	7.33	1.24	1.78	5.4e-06	0.00068	0.00334	1.31
	0.59	9.43	242.66	625.34	590.6	245.39	6017.54	141.99	4.31844e+06	18093.8	7822.23	245497
162	4866.75	785.69	5908.94	1551.56	294.05	5.95	1.12	1.51	9.27e-05	0.00017	0.00097	2.47
	1.66	6.2	158.41	509.03	347.84	912.51	5387.03	177.44	3.46895e+06	15812.2	7220.31	386909
163	3249.44	672.11	4797.96	1141.86	164.29	9.27	1.7	2.16	4.4e-06	0.00018	0.00083	1.1
	0.46	7.16	231.48	781.19	1031.46	823.28	7811.39	166.14	3.31637e+06	7772.25	9292.4	289169
164	2175.04	495.51	2758.49	976.29	285.11	6.52	0.53	0.66	7.51e-05	0.00016	0.00182	2.33
	1.68	10.1	213.94	436.95	435.68	298.94	6664.2	140.06	4.56216e+06	8927.03	8229.96	264169
165	2348.47	722.17	2944.43	1283.5	261.79	6.28	1.34	1.97	1.53e-05	0.00073	0.00191	1.72
	0.84	12	80.59	489.83	286.17	237.41	6889.86	187.32	2.52823e+06	10535.2	9620.81	405456
166	4220.22	543.13	6540.94	794.98	102.71	5.85	0.61	0.86	8.33e-05	0.00071	0.00208	2.2
	1	13.86	177.75	954.68	480.17	386.63	3557.77	131.18	4.08715e+06	10731	4655.37	450109
167	4186.27	798.14	6599.67	1581.27	268.77	5.15	0.53	0.74	5.71e-05	0.00031	0.00276	1.22
	0.58	10.21	175.62	675.41	699.39	816.41	4237.45	175.46	2.73264e+06	16365.1	5068.9	336612
168	2011.29	905.9	3187.2	1292.67	273.59	9.77	1.31	1.81	2.73e-05	0.00095	0.01109	2.06
	1.07	6.6	229.02	707.43	795.52	513.38	3587.69	171.33	3.51583e+06	16977.3	4893.74	505985
169	2876.04	212.82	4157.88	371.31	241.34	6.31	1.34	1.92	8.23e-05	0.00015	0.00074	1.24
	0.89	5.69	224.14	409.94	1094.77	742.24	5684.97	134.6	3.67897e+06	16363.3	6651.88	296481
170	3134.64	935	3983.16	1747.75	224.35	9.67	1.3	1.85	8.27e-05	0.00021	0.00161	1.71
	1.16	13.07	121.76	467.26	517.66	294.29	4498.8	133.61	4.6538e+06	16086.4	6503.8	340103
171	3086.62	776.89	4840.86	1342.02	204.65	9.64	0.8	1.03	4.41e-05	0.00093	0.00471	1.25
	0.86	7.04	237.53	289.37	1374.99	657.63	4320.13	170.36	4.85574e+06	16852.2	5019.6	443243
172	2068.05	551.82	3302.9	1007.55	236.94	9.38	1.13	1.62	6.56e-05	0.00061	0.00343	1.92
	0.93	8.52	181.1	564.98	367.46	651.91	3666.73	130.31	4.93343e+06	7498.72	4473.53	231022
173	2550.92	773.59	3658.84	1458.58	240.16	6.91	0.77	1.03	1.44e-05	0.00091	0.0089	1.32
	0.65	12.98	101.08	690.83	372.5	275.64	4099.87	178.13	3.52869e+06	9326.18	4950.97	299241
174	4683.95	888.85	7107.48	1775.88	167.83	5.83	0.89	1.09	1.74e-05	0.00033	0.00208	2.36
	1.31	11.53	223.21	738.62	825.71	411.11	7526.1	151.76	4.6717e+06	12348.3	10916	413669
175	3442.22	424.51	5122.99	726.99	265.47	5.74	1.14	1.49	6.97e-05	0.00042	0.00212	1.84
	0.84	7.33	174.09	581.98	525.63	818.49	4405.32	166.93	1.56264e+06	10220.1	5679.09	490574
176	4131.64	916.9	5116.78	1226.55	288.85	5.97	1.4	1.71	1.4e-05	0.00095	0.00519	2.36
	1.74	10.87	179.87	483.72	452.58	870.92	4027.95	196.57	2.92102e+06	12152.5	4777.89	419332
177	2074.53	628.5	3238.96	972.12	121.73	5.18	0.69	0.9	8.61e-05	0.0002	0.00136	1.11
	0.49	13.25	152.87	528.16	397.57	292.37	5839.24	176.96	2.56592e+06	14857.1	6657.05	322418
178	4386.86	829.35	5733.35	1134.9	148.83	8.18	0.85	1.15	6.75e-05	0.0004	0.00285	2.68
	1.65	9.68	234.35	993.51	734.41	680	4204.54	147.06	2.28049e+06	9781.41	5573.64	327342
179	3719.2	211.7	5140.21	349.92	198.47	6.5	1.05	1.49	4.09e-05	0.0005	0.00145	0.92
	0.73	13.43	103.86	417.99	261.57	928.39	3437.99	193.7	2.49755e+06	14295	4766.21	240397
180	3153.76	832.84	3993.22	1522.07	282.58	9.64	0.84	1.18	4.4e-06	0.0008	0.00295	1.97
	1.39	8.8	90.9	421.29	366.84	262.02	6050.53	143.2	3.53983e+06	15568.7	7037.16	486120
181	4180.86	934.01	5747.89	1781.25	274.1	7.73	1.88	2.75	4.23e-05	0.0002	0.00128	1.13
	0.74	8.69	206.5	219.45	657.24	403.29	5234.65	150.84	4.47111e+06	12557	5824.51	301589
182	4818.98	890	6978.92	1240.17	135.26	8.63	0.69	0.86	8.61e-05	0.00022	0.00105	2.76
	1.61	13.62	246.33	253.39	1376.66	797.83	7541.19	141.46	3.82047e+06	8815.98	9539.18	485103
183	2184.79	960.62	3287.58	1177.57	170.55	9.26	1.42	2.03	6.86e-05	0.00083	0.00988	1.38
	0.93	7.6	143.04	617.36	408.31	502.08	4021.47	142.4	4.03759e+06	9256.47	5366.61	429545
184	3766.01	968.22	5632.49	1483.3	175.91	9.78	1.17	1.62	4.48e-05	0.00024	0.00181	2.26
	1.69	7.94	111.04	336.43	324.94	684.32	5737.27	148.42	3.72984e+06	7988.4	6445.37	458366
185	3986.43	483.63	5583.46	954.09	117.16	6.43	0.81	1.15	8.2e-06	0.00084	0.00283	2.1
	0.87	5.87	76.16	555.51	420.13	818.65	4614.86	180.84	3.26043e+06	16739.8	5812.89	448253
186	3401.74	974.44	5344.46	1611	111.71	6.26	1.48	1.99	7.37e-05	0.00039	0.00271	1.16
	0.57	7.73	202.39	274.07	520.62	574.86	5223.01	146.31	4.84376e+06	15122.7	5853.01	284877
187	2708.17	299.55	3335.44	404.2	255.04	5.02	0.76	1.05	4.7e-05	0.00054	0.00427	2.87
	1.53	10.05	114.2	342.5	646	967.51	4542.13	124.61	3.32261e+06	15168.4	6778.78	584811
188	2863.92	263.9	4118.7	468.04	106.07	5.5	1.38	1.83	7.06e-05	0.00024	0.00145	2.23
	1.34	13.18	168.39	853.69	403.13	596.81	3813.2	128.18	3.23934e+06	14453.6	4637.11	272660

189	2570.52	656.76	3491.39	967.84	240.31	9.71	0.55	0.74	9.97e-05	0.00038	0.00289	0.91
	0.43	12.4	76.22	871.35	230.79	536.88	4400.54	127.7	3.89969e+06	11208.4	5576.67	507328
190	3907.99	507.43	5133.96	830.2	128.12	8.06	1.33	1.97	3.95e-05	0.00053	0.00175	1.22
	0.6	5.13	229.76	214.83	478.29	713.01	4686.93	183.57	2.48526e+06	13894.5	6023.46	252413
191	3745.38	504.89	5403.19	634.7	118.95	8.32	0.81	1.21	5.75e-05	0.00023	0.00065	1.62
	1.05	6.54	119.04	395.5	418.53	506.06	4652.19	141.69	4.25174e+06	9927.48	5542.96	227473
192	2947.3	502.86	4118.62	929	281.28	7.46	0.87	1.12	1.8e-05	0.00032	0.00176	2.29
	1.38	11.22	214.8	973.75	1273.72	447.17	4251.81	133.75	1.55574e+06	17708.6	6130.25	456572
193	2438.92	269.74	3661.65	357.2	101.3	7.1	1.82	2.25	5.76e-05	0.00063	0.00218	2.57
	1.88	10.58	110.33	484.86	440.61	340.35	5175.9	157.63	2.32392e+06	10690.2	6723.62	499049
194	3609.32	733.75	5292.73	945.99	203.78	7.57	1.98	2.72	7.27e-05	0.00105	0.00348	2.65
	2.04	6.3	66.74	207.73	226.11	382.22	3894.87	179.56	2.89477e+06	8019.8	5076.2	266076
195	3143.19	561.88	4152.26	838.58	149.11	5.99	1.54	2.16	4.8e-05	0.00068	0.0018	1.8
	0.8	12.79	125.68	327.98	432.61	842.04	6390.71	193.41	3.74104e+06	14394	9448.14	429584
196	2056.36	540.43	2764.42	649.59	258.66	7.78	1.8	2.59	2.29e-05	0.00039	0.00342	2.18
	1.54	11.81	77.92	943.04	164.86	396.35	7382.89	187.39	4.71628e+06	18141.4	10196.8	408385
197	3591.03	873.55	5589.53	1728.78	162.51	8.45	1.35	1.67	1.73e-05	0.00039	0.0011	1.53
	1.03	6.81	95.22	721.98	478.56	237.71	7957.2	164.94	3.04995e+06	16271.7	10131.7	462669
198	3018.48	781.83	3998.9	1189.77	208.53	6.32	1.16	1.64	6.65e-05	0.00072	0.00408	1.45
	0.79	11.63	58.01	879.13	168.86	510.26	4540.28	195.49	3.53817e+06	8307.71	6753.89	345524
199	2560.48	449.84	3674.71	844.91	157.53	8.19	1.99	2.88	7.27e-05	0.00027	0.00259	1.88
	0.79	11.62	231.72	936.69	809.98	201.97	3944.79	189.14	2.1948e+06	13097.4	5728.67	284574
200	3012.55	904.42	4412.6	1719.25	260.56	5.71	0.78	1.09	7.85e-05	0.00077	0.00383	2.58
	1.96	6.89	161.84	687.68	771.97	983.38	3997.35	140.99	3.91973e+06	8696.45	4667.96	375072
201	4119.7	233.3	5572.4	282.59	269.28	8.03	1.15	1.58	8.4e-06	0.00068	0.00143	2.26
	1.02	12.21	184.36	203.96	650.54	833.82	5089.94	156.91	3.23769e+06	12379.3	7185.53	216292
202	2410.27	927.77	3089.58	1333.84	165.56	7.97	0.81	1.06	3e-06	0.00065	0.00479	1.66
	1.07	7.5	96.66	831.88	439.01	505.1	4501.34	163.29	3.48008e+06	16252.4	5873.99	274660
203	2556.2	341.11	3787.06	628.94	220.75	6.35	1.51	2.27	4.63e-05	0.0009	0.00219	1.87
	1.49	7.55	236.68	672.48	561.76	445.55	3312.84	145.68	3.91853e+06	9544.9	3884.95	272044
204	3075	932.87	4352.31	1467.41	161.6	5.91	1.67	2.01	8.25e-05	0.00019	0.00077	2.06
	1.28	13.92	87.91	438.52	382.48	349.96	7644.68	120.58	2.14773e+06	17216.3	11167	231866
205	4000.06	586.92	5548.54	1097.47	176.51	5.9	1.57	2.1	1.41e-05	0.00014	0.00077	1.64
	1.13	12.51	151.73	684.44	568.36	911.34	4284.59	138.63	3.89579e+06	8520.09	6285.79	385401
206	2787.81	659.96	3642.13	800.69	267.85	9.78	1.51	2.14	3.95e-05	0.00026	0.0019	2.86
	1.99	13.85	55.73	896.38	236.05	217.36	7620.28	129.64	2.76948e+06	7548.61	9633.12	494690
207	3966.85	833.76	5140.68	1341.4	155.27	8.29	1.38	1.97	2.36e-05	0.00059	0.00291	2.2
	1.38	9.38	179.35	229.49	670.58	217.03	5627.08	131.25	2.79666e+06	16857.6	7614.53	276708
208	3595.47	382.63	5551.69	474.7	186.81	6.11	0.91	1.23	9.42e-05	0.00066	0.00242	2.77
	2	11.59	237.56	860.94	876.02	675.97	4679.41	175.22	4.66484e+06	8078.74	5364.46	466311
209	3707.81	932.63	5791.99	1524.17	195.96	6.45	0.65	0.96	8.5e-05	0.00078	0.00565	1.52
	1.03	5.25	113.54	752.35	361.88	772.09	4845.39	133.15	4.74249e+06	13396.7	5475.4	304573
210	3015.38	695.22	3796.57	955.13	299.67	5.95	1.05	1.35	7.2e-06	0.00035	0.00073	2.15
	1.02	7.73	171.62	278.29	822.87	378.2	7726.65	136.04	3.4618e+06	11500.8	9737.48	224035
211	3726.23	711.07	5880.88	1361.86	248.25	6.45	0.63	0.77	6.22e-05	0.00019	0.00202	0.93
	0.63	11.8	175.31	517.32	913.98	398.42	3335.05	190.26	1.24637e+06	16599	4283.05	296674
212	2350.56	588.93	3710.69	735.75	102.41	6.61	0.71	0.87	7.48e-05	0.00014	0.00096	2.18
	1.43	5.11	172.88	725.59	889.67	574.64	5341.25	196.96	1.71112e+06	7790.98	6324.75	200429
213	2306.1	503.11	3053.3	934.43	234.23	8.9	1.7	2.32	9.18e-05	0.00014	0.00116	1.19
	0.56	6.78	234.27	955.53	1103.41	651.4	4447.21	122.71	1.77437e+06	8896.97	5822.42	228725
214	3879.66	611.93	5284.32	1050.44	126.19	7.04	1.31	1.83	3.38e-05	0.0003	0.00175	1.39
	1.06	7.19	249.06	679.22	1424.39	573.78	3545.69	187.7	2.59579e+06	9117.51	4992.19	244720
215	2845.75	439.04	3426.81	864.32	142.6	8.04	1.42	1.83	4.52e-05	0.00042	0.00172	1.95
	1.27	8.56	91.62	645.19	433.5	391.94	5587.32	181.37	4.70259e+06	9686.87	7061.86	490212
216	3605.14	794.96	4559.73	1396.69	159.25	6.74	1.96	2.9	8.55e-05	0.00072	0.00733	1.65
	1.06	7.89	203.03	802.61	1077.45	925.57	3608.81	165.68	4.00663e+06	12227.9	4995.69	481836
217	3537.25	383.73	5456.81	601.49	181.37	5.79	0.53	0.7	4.65e-05	0.0006	0.00228	1.25
	0.78	7.5	101.24	862.26	234.8	424.98	3635.02	196.89	2.30769e+06	13163.9	4981.08	246360
218	2292.79	713.77	2994.64	1138.89	168.01	7.24	1.84	2.41	9.86e-05	0.00085	0.00217	1.92
	1.15	5.55	126.57	984.55	465.95	781.33	5947.75	198.11	2.49974e+06	9513.65	7006.19	453393
219	3837.74	560.65	5510.35	838.21	181.15	9.94	1.65	2.23	8.81e-05	0.00042	0.00239	0.97
	0.43	7.02	93.61	719.55	322.54	701.69	5102.12	135.9	2.98903e+06	13740.5	6390.12	487604
220	3822.45	957.62	5048.43	1336.7	241.24	9.66	1.02	1.35	8.71e-05	0.00021	0.00077	1.24
	0.78	6.11	103.18	892.05	574.79	573.35	7936.87	184.8	4.72528e+06	8301.36	10008.5	355137
221	2630.9	625.35	3946.21	983.48	220.74	7.72	1.45	1.91	8.03e-05	0.0004	0.00417	2.43
	1.32	5.56	67.12	342.79	250.75	577.26	3232.3	156.12	2.81664e+06	14324	3769.04	223563
222	2744.98	391.23	3815	682.45	255.83	6.77	1.52	1.83	3.92e-05	0.00038	0.00168	2.49
	1.97	6.31	112.72	734.76	477.1	692.74	5379.3	191.54	1.62455e+06	7837.1	7864.81	263814
223	3981.06	692.22	6183.06	1095.3	179.53	9.94	1.21	1.66	8.34e-05	0.00036	0.00154	2.04
	1.27	5.26	166.62	526.67	756.23	566.72	3955.88	163.8	2.88438e+06	11132.8	5475.33	434942
224	4923.96	449.34	6523.87	878.21	155.35	5.62	1.51	1.96	1.13e-05	0.00014	0.00118	1.81
	0.87	11.53	194.33	488.7	981.17	990.3	4895.93	161.51	4.67907e+06	8032.55	7115.51	393289
225	3818.26	734.72	4881.9	1420.01	270.67	9.09	0.74	1.08	7.55e-05	0.00035	0.00246	2.52
	2.01	9.38	204.33	217.08	1183.62	233.56	5896.93	188.6	3.2794e+06	14308.5	8654.43	414383
226	4102.81	755.12	5309.78	1358.94	155.65	8.98	1.46	1.99	9.44e-05	0.00091	0.00424	1.7
	1.03	11.14	236.61	768.13	1372.56	970.79	4310.82	180.7	3.90302e+06	9153.08	5904.36	488006
227	2962.04	358.15	3797.59	655.74	226.52	8.17	1.62	2.02	8e-06	0.00041	0.00173	0.94
	0.62	9.83	71.06	901.69	380.68	812.59	6853.65	198.31	2.20258e+06	8759.4	7688.52	375797
228	4372.42	209.26	6584.7	406.39	234.41	9.87	1.81	2.63	6.76e-05	0.00026	0.00086	2.09
	1.19	11.18	184.86	960.05	374.28	358.12	7104.63	179.91	1.88502e+06	15452.4	9767.47	258873
229	3012.25	906.91	4711.39	1587.74	173.86	8.26	1.27	1.7	6.35e-05	0.0008	0.00354	2.21
	1.19	13.9	223.62	240.16	640.26	509.51	7983.38	186.82	3.37194e+06	9185.73	9127.4	439639
230	2382.23	457.01	3156.81	783.08	145.06	5.45	1.75	2.26	4.14e-05	0.00089	0.00475	2.64
	1.73	10.91	107.67	714.2	481.81	644.34	4976.92	140.85	3.86132e+06	8470.62	7455.01	339167
231	2776.43	420.97	3740.31	773.38	228.19	8.21	0.74	1.08	6.9e-06	0.00022	0.00115	2.12
	0.87	9.78	217.15	783.43	1116.46	370.84	7450.53	135.73	2.42765e+06	16011.3	11042.9	440848
232	2889.97	503.45	3789.28	914.38	160.98	5.67	0.84	1.15	4.85e-05	0.0005	0.005	2.07
	0.99	12.03	51.87	554.95	274.53	642.21	3551.21	173.89	4.22238e+06	9839.13	4793.02	366614
233	2057.53	620.96	2635.97	1163.57	131.86	9.7	1.38	2	7.31e-05	0.00089	0.00953	2.19
	1.65	5.62	183.42	305.97	751.92	623.07	3703.36	136.8	3.27328e+06	11897.6	4104.18	213088
234	2709.41	573.87	4000.81	796.62	124.76	7.84	1.01	1.26	1.89e-05	0.00065	0.00316	1.71
	1.16	12.17	89.58	894.23	510.17	634.25	3441.81	158	3.79044e+06	15071.9	4369.24	334580
235	2336.78	894.06	3053.59	1474.32	267.82	7.09	1.03	1.28	5.9e-06	0.00082	0.00809	1.68
	0.68	5.81	74.62	923.07	226.98	627.39	3314.52	160.01	4.3417e+06	14867.8	4902.56	368494
236	3831.23	901.79	6048.83	1754.59	246.52	6.95	1.77	2.14	1.84e-05	0.00058	0.00247	1.02
	0.54	5.36	243.19	636.29	1255.03	580.87	5172.33	181.39	4.20007e+06	11222.1	7250.14	338354

237	4678.34	904.08	6298.42	1636.24	125.73	5.04	1.39	1.83	2.31e-05	0.00058	0.00257	0.94
	0.55	5.81	141.94	396.53	823.95	261.06	7096.25	126.25	4.86162e+06	16650.6	7978.85	292880
238	2943.55	489.83	4103.43	883.86	152.24	9.95	0.69	0.97	4.7e-06	0.00069	0.00242	2.64
	1.39	7.76	59.83	572.85	133.72	666.47	5744.31	190.49	2.88833e+06	11176	8368.06	415344
239	2831.01	754.66	3528.18	1271.84	279.01	7.92	0.75	0.92	2.73e-05	0.00065	0.00426	2.01
	1.09	11.32	210.56	997.18	425.68	611.02	3998.5	152.1	2.13876e+06	17076.2	5070.56	339603
240	2000.85	212.33	2489.11	327.7	112.34	7.76	1.91	2.82	9.55e-05	0.0009	0.0027	1.3
	0.69	10.38	96.28	371.31	343.02	862.91	6366.06	122.46	2.57564e+06	15939.9	9395.55	339392
241	2113.01	511.15	3195.54	928.68	278.79	9.34	0.7	1.02	8.18e-05	0.00071	0.00322	1.92
	1.17	5.94	199.18	244.34	716.65	255.34	5112.65	196.86	2.18329e+06	8369.73	7189.02	288814
242	2040.35	860.91	2886.98	1535.31	230.06	5.4	1.51	2.13	2.52e-05	0.00061	0.00318	1.2
	0.71	12.34	52.91	995.82	290.31	661.97	4973.96	153.64	3.34319e+06	10194.2	7043.31	425229
243	4924.26	869.48	6939.02	1698.02	123.28	9.59	1.37	1.8	4.64e-05	0.00072	0.00219	0.97
	0.55	9.73	178.21	904.68	570.36	264.83	7410.58	148.92	3.06621e+06	12820.4	9253.5	321482
244	3264.25	407.88	4683.23	660.1	268.81	5.12	1.09	1.5	8.48e-05	0.00068	0.00583	1.14
	0.89	11.57	137.21	211.89	323.68	791.26	3849.85	138.08	2.92188e+06	14679.8	4485.86	497897
245	4273.36	872.38	5191.26	1473.01	116.92	9.47	0.99	1.22	1.27e-05	0.00108	0.00331	2.79
	1.47	5.28	202.11	585.13	867.08	775.67	6293.52	145.74	4.22945e+06	7588.26	8307.91	321220
246	3203.24	356.49	4825.3	453.7	224.46	6.9	1.66	2.36	6.88e-05	0.00088	0.00206	1.41
	1.07	8.79	61.27	576.25	306.08	690.89	5975.98	139.63	3.50934e+06	8913.91	7178.19	381853
247	4127.8	461.57	6574.96	590.04	245.99	9.21	1.66	2.07	2.3e-05	0.00051	0.00191	1.79
	0.91	13.62	152.41	885.59	811.45	848.69	7222.35	132.84	4.13804e+06	14247.5	9457.9	569073
248	2866.46	619.48	4418.28	825.62	276.03	6.11	1.02	1.48	3.96e-05	0.00046	0.00467	2.63
	1.66	7.7	91.32	779.6	452.07	608.22	3781.16	195.36	1.98263e+06	16463.1	4425.81	566775
249	3105.52	735.48	3798.03	993.41	115.07	6.77	1.35	1.97	4.5e-06	0.00037	0.00256	1.99
	1.5	5.63	78.57	658.91	357.03	999.08	3222.09	125.61	1.36372e+06	7375.37	3810.86	317776
250	3055.96	814.89	4235.03	1392.16	165.8	8.46	1.16	1.66	3.39e-05	0.00078	0.00227	1.22
	0.69	9.52	52.14	644.07	124.36	554.38	3287.23	124.67	2.65631e+06	11566.4	4618.17	417061
251	2559.73	429.3	3800.55	767.36	136.07	8.12	0.97	1.25	7.32e-05	0.00062	0.00282	2.36
	1.61	9.95	55.22	757.79	301.26	439.01	5227	189.54	4.47659e+06	12548.3	5878.86	374336
252	3611.27	951.4	4795.36	1640.68	224.81	8.3	1.65	2.43	8.8e-06	0.00092	0.0019	2.11
	1.55	5.94	124.56	214.05	420.87	708.42	4201.16	190.74	1.57383e+06	16705.9	6140.49	411942
253	2288.5	675.29	3021.42	1210.31	215.3	6.01	1.03	1.26	3.49e-05	0.00084	0.00398	2.6
	1.44	10.33	218.19	598.51	1019.3	489.75	6403.44	193.96	2.77931e+06	17006.7	8429.79	391884
254	2200.73	276.34	3464.45	378.79	287.6	5.11	1.05	1.54	7.4e-06	0.00046	0.00224	1.77
	0.98	12.91	125.12	609.24	403.25	557.49	5779.83	127.14	3.05491e+06	13783.2	7389.77	412298
255	3222.38	617.42	5152.23	1181.54	178.91	7.73	1.95	2.74	3.1e-05	0.00034	0.00299	1.97
	1.28	9.16	222.67	407.06	1114.23	657.98	5135.38	156.37	3.67859e+06	14598.9	7290.62	486657
256	2686.38	577.16	3842.91	1042.45	184	8.97	1.74	2.4	6.93e-05	0.00018	0.00078	1.03
	0.7	13.61	241.85	338.54	872.3	848.3	7550.04	188.85	2.3917e+06	9500.72	11140	244466
257	2792.54	938.36	3448.34	1525.91	145.02	7.61	1.3	1.63	7.08e-05	0.00061	0.00337	1.4
	0.68	13.17	56.79	289.03	232.14	527.31	3070.59	191.87	2.45429e+06	11317.2	3816.76	236348
258	2628.31	966.29	3419.06	1433.93	143.76	5.93	1.18	1.53	9.12e-05	0.00067	0.00387	2.3
	1.07	13.14	208.53	834.68	800.49	909.21	5302.74	130.81	2.67643e+06	16355.3	6907.9	379627
259	3759.41	907.96	5289.63	1174.26	264.3	9.91	0.78	0.97	2.14e-05	0.00065	0.00201	1.16
	0.76	6.24	233.53	440.59	1043.18	638.87	3995.86	148.61	4.30835e+06	11660.5	4816.31	424660
260	4089.04	616.74	6324.54	861.31	164.12	6.5	1.84	2.26	7.59e-05	0.00022	0.0013	2.65
	1.25	9.14	238.75	958.74	1188.67	502.4	4781.41	180.6	3.80396e+06	15572.1	7077.81	268094
261	2657.49	913.16	3411.15	1707.74	202.72	6.88	0.79	1.05	9.57e-05	0.00051	0.00314	2.16
	1.17	8.18	151.04	833.11	811.65	580.07	5827.57	151.1	4.79459e+06	16624.5	8612.42	518474
262	2142.25	218.68	2626.71	266.56	294.38	6.54	1.27	1.85	2.1e-06	0.00015	0.00131	2.49
	1.49	7.26	154.76	969.09	882.96	995.79	4780.57	149.62	3.18439e+06	14181.9	6205.8	249661
263	2142.78	346.43	3383.49	491.11	205.8	8.56	0.84	1.25	8.71e-05	0.00017	0.00151	2.67
	1.64	11.31	67.88	543.35	355.19	881.7	4741.89	130.99	3.35147e+06	10766.3	7111.41	427216
264	4886.85	731.53	6811.95	1306.89	146.14	9.98	0.56	0.68	5.69e-05	0.00045	0.00306	2.96
	2.1	12.46	129.32	956.57	637.05	253.9	3098.51	136.83	4.87161e+06	14027	3518.83	308146
265	4442.74	654.19	6129.68	1044.31	192.86	6.55	1.84	2.28	6.52e-05	0.00016	0.00118	1.5
	1.13	5.31	157.38	346.16	453.31	247.25	3468.73	123.98	1.23182e+06	10065.2	4410.44	206100
266	2512.39	292.93	3193.08	382.18	194.59	9.31	1.78	2.64	3.77e-05	0.00029	0.00082	1.36
	0.79	10.35	206.7	654.17	667.99	907.71	5922.26	149.75	3.94155e+06	7452.08	7045.97	227537
267	3039.57	853.66	4641.68	1533.97	195.88	5.55	1.21	1.61	1.6e-06	0.00081	0.00246	1.56
	0.79	7.83	161.65	392.92	766.82	770.15	7387.33	133.47	4.90945e+06	16555.3	9440.72	368630
268	3474.79	838.95	4340.92	1570.26	295.66	9.53	1.04	1.52	6.87e-05	0.00015	0.0017	2.73
	1.58	8.69	78.32	350.57	378.94	821.13	6962.8	120.93	3.44407e+06	12750.7	9068.75	215931
269	4657.48	962.21	7297.84	1372.7	172.42	9.43	1.34	1.93	6.94e-05	0.00027	0.00094	2.74
	1.78	9.84	147.69	786.97	773.95	341.72	5670.98	132.07	3.43417e+06	13933.8	7557.41	288266
270	2077.2	633.57	2627.83	1174.4	201.32	8.12	1.78	2.33	6.04e-05	0.00087	0.00895	1.19
	0.81	12.63	208.23	287.68	733.77	799.73	4802.3	144.54	4.79904e+06	14266.1	7017.83	538971
271	2375.01	812.82	3132.52	1451.91	162.21	9.07	0.93	1.23	4.93e-05	0.00022	0.00139	1.1
	0.74	11.51	231.69	663.65	822.29	997.06	6786.24	132.15	4.24039e+06	17564.9	9287.72	233703
272	3678.57	793.19	5313.08	1077.99	183.54	8.98	0.99	1.41	9.01e-05	0.00077	0.00308	2.87
	1.24	5.13	64.88	854.08	137.5	393.69	5427.32	162.52	4.91857e+06	9666.11	7933.89	242702
273	4294.2	736.31	5991.49	961.86	152.79	6.38	1.61	2.13	4.07e-05	0.00101	0.0029	1.38
	1.04	9.82	109.42	548.81	395.35	394.19	4622.12	159.02	1.92482e+06	8544.21	6108.78	366144
274	2037.09	319.96	2504	478.72	217.89	9.36	1.65	2.16	6.84e-05	0.00034	0.00256	1.49
	1.07	8.28	96.79	952.32	441.79	991.64	4813.55	139.69	3.04265e+06	12176.6	7201.65	396083
275	2643.57	840.95	4118.57	1189.62	242.15	9.03	0.61	0.82	6.25e-05	0.0007	0.00464	1.46
	0.8	13.35	141.06	435.87	801.83	986.56	3843.18	198.26	4.47361e+06	15743	5539.9	420281
276	2258.69	944.65	3329.02	1801.1	210.95	5.38	1.16	1.52	7.33e-05	0.00025	0.00287	2.32
	1.29	13.31	168.85	747	680.21	603.3	7026.28	177.06	3.36544e+06	17162.6	8012.35	496355
277	3821.52	473.82	5525.63	654.77	231.41	9.09	1.01	1.3	9.89e-05	0.00064	0.00132	2.32
	1.7	13.81	156.88	576.82	659.07	822.11	7397.69	159.16	4.44648e+06	13202.6	9337.14	476147
278	2342	593.74	3500.16	879.89	268.16	6.9	1.71	2.31	8.11e-05	0.00023	0.00209	1.25
	0.75	5.1	229.41	353.12	1023.03	715.89	5275.15	161.27	1.72364e+06	9548.88	5844.01	442596
279	2830.43	863.28	3935.51	1136.64	120.75	9.09	1.79	2.16	7.59e-05	0.00033	0.00343	1.22
	0.68	10.5	175.67	266.07	639.44	553.4	4774.49	173.61	2.58664e+06	7607.85	5259.94	285224
280	4381.63	675.03	6787.17	1145.83	131.52	6.3	1.18	1.71	9.9e-06	0.00079	0.0018	2.96
	1.47	9.54	139.35	577.47	697.37	752.99	4627.4	176.09	3.22264e+06	11097.5	6459.72	332143
281	4117.33	888.56	6232.43	1477.28	181.52	7.68	1.82	2.42	2.74e-05	0.00011	0.0013	2.35
	1.04	8.46	240.14	726.89	784.53	501.72	5033.58	159.22	4.01926e+06	16351.6	5624.42	256280
282	4009.58	595.14	4814.3	1170.35	221.33	6.83	1.67	2.24	8.86e-05	0.0005	0.00301	2.35
	1.79	7.87	135.8	714.59	605.35	894.43	5978.52	193.85	4.84342e+06	15032.2	7099.13	497894
283	4118.8	451.15	5572.05	641.79	219.5	7.33	1.53	2.15	7.37e-05	0.00054	0.00172	2.74
	1.13	8.86	201.73	258.46	1075	486.91	4016.58	149.57	1.75754e+06	8016.8	5098.02	295789
284	2955.34	325.33	4313.54	573.35	169.23	6.53	1.92	2.47	7.16e-05	0.00017	0.00165	2.1
	1.48	10.88	123.27	720.98	476.6	583.8	3795.46	148.89	2.34029e+06	11831.2	4984.99	204264

285	3718.17	749.75	5078.39	948.14	176.81	6.48	0.65	0.93	2.92e-05	0.00059	0.00319	2.56
	1.51	12.7	64.38	790.52	141.03	375.94	4228.74	128.67	3.87619e+06	13053.5	4699.29	357379
286	4744.72	978.05	6869.35	1224.88	163.91	8.3	1.24	1.75	9.7e-06	0.00068	0.00269	1.73
	0.98	5.3	84.29	589.23	341.78	524.44	3538.86	164.62	1.67562e+06	14138.7	4771.4	420041
287	2713.3	518.93	3734.86	922.44	281.66	8.22	0.7	0.91	8.5e-05	0.00023	0.0012	1.53
	0.64	13.79	80.48	550.28	314.12	346.22	5603.32	153.66	1.4302e+06	18066.8	6489.57	273285
288	4337.91	744.77	5475.56	1334.2	226.23	9.41	1.21	1.59	5.46e-05	0.0002	0.00086	2.95
	1.21	12.84	79.62	801.78	162.37	405.47	4344.58	148.66	3.6223e+06	7431.29	5686.16	286141
289	3871.18	638.02	5886.45	980.74	209.54	7.53	0.84	1.16	7.86e-05	0.00014	0.00113	1.3
	0.8	13.6	201.98	784.09	745.91	502.67	6553.51	138.93	4.32789e+06	10171	7552.04	360031
290	3030.7	933.69	3938.63	1387.55	131	8.31	1.61	2.06	3.14e-05	0.00079	0.0038	1.61
	0.69	9.92	197.18	260.18	626.53	384.35	3180.27	194.07	3.64933e+06	7467.79	4028.81	355967
291	4540.24	561.22	6379.74	1091.68	103.75	9.9	1.84	2.27	1e-06	0.00016	0.00071	2.26
	1.49	7.12	147.48	622.99	475.66	580.36	6087.63	192.29	3.16032e+06	10648.9	7754.34	470561
292	2284.11	865.23	3622.01	1461.06	223.41	5.3	0.53	0.71	5.98e-05	0.00025	0.00111	1.29
	1	7.13	220.41	973.27	1310.68	795.28	7960.92	171.71	4.88615e+06	16585.7	11300.5	352246
293	2516.61	398.85	3999.83	587.48	297.8	5.92	0.92	1.25	8.41e-05	0.00085	0.00257	1.7
	0.7	10.16	193.22	376.67	551.77	259.66	4864.92	184.51	4.85879e+06	12105.6	5971.68	321177
294	3276.77	776.73	4969.43	1018.55	231.66	9.05	1.33	1.62	4.2e-05	0.00056	0.00445	2.87
	1.53	6.47	101.94	333.48	411.54	457.64	5102.89	157.73	3.75797e+06	11713.8	5651.17	310392
295	4969.79	760	6396.88	1311.84	191.18	6.98	1.9	2.3	7.2e-05	0.00039	0.00217	2.58
	1.46	9.36	173.45	681.5	906.81	308.2	6517.92	195.53	4.14572e+06	14032.6	8655.71	444479
296	3142.26	681.68	4094.11	1009.52	149.63	7.98	1.48	2.05	9.11e-05	0.00081	0.00424	2.24
	0.97	9.31	72.12	909.88	305.67	378.81	4159.33	152.05	4.5391e+06	7914.81	5071.7	494880
297	2127.17	848.11	2960.62	1042.66	112.56	8.56	2	2.53	1.46e-05	0.00093	0.00224	1.68
	1.22	8.16	150.25	615.3	530.67	492.07	5525.89	120.24	1.70319e+06	15711.7	7307.91	270384
298	2672.97	564.73	3879.06	859.51	297.02	7.59	1.69	2.1	8.81e-05	0.00072	0.00305	1.82
	0.95	9.51	231.3	203.38	894.99	612.05	4913.66	148.44	4.87449e+06	13151.6	6958.64	311675
299	4741.45	975.67	5881.03	1544.12	144.07	6.78	1.13	1.65	4.62e-05	0.00045	0.00298	2.77
	1.59	6.34	189	574.36	947.91	500.54	6019.91	158.38	3.03131e+06	11556.9	8850.33	522739
300	3210.24	827.08	4085.43	1382.94	184.37	8.99	1.57	2.1	4.03e-05	0.00093	0.0061	2.43
	1.73	8.4	74.89	871.7	158.37	726.38	3104.35	148.63	4.45935e+06	8620.56	4232.31	493703
301	3102.28	700.47	3946.91	1353.18	156.64	7.65	1.55	2.3	6.44e-05	0.0009	0.00212	1.12
	0.66	12.98	135.39	271.25	568.24	296.81	6067.15	160.97	4.72366e+06	15268.8	7548.97	256941
302	4663.05	918.34	6437.69	1696.88	130.2	7.63	1.79	2.51	6.11e-05	0.00014	0.00081	2.55
	1.18	6.73	199.47	275.81	505.85	693.04	5583.78	128.34	3.31517e+06	14433.3	7848.5	477876
303	2700.16	815.25	4082.04	1412.1	252.68	8.24	0.63	0.81	1.93e-05	0.0007	0.00258	2
	0.89	12.15	169.26	210.58	720.28	359	3782.37	163.71	3.69194e+06	8727.89	4693.39	215622
304	3718.8	571.51	5185.28	897.79	173.81	9.87	0.92	1.29	5.31e-05	0.00058	0.00156	1.58
	1.12	8.6	197.63	227.84	773.66	720.23	3493.04	136.52	3.06062e+06	10255.3	4579.48	320455
305	3600.75	280.36	4943.82	469.06	281.07	7.84	1.82	2.19	4.63e-05	0.00043	0.00324	2.13
	1.11	5.57	230	616.56	1180.29	886.5	6197.95	167.38	3.00666e+06	15315.2	9205.85	578932
306	2070.84	843.62	3244.67	1223.8	272.6	9.08	1.96	2.43	6.7e-06	0.00105	0.00269	2.46
	1.18	5.94	237.06	619.48	533.8	939.9	4682.97	134.04	3.61671e+06	9370.73	6041.95	418550
307	4058.38	428.64	6098.38	654.43	205.35	8.82	0.52	0.69	3.54e-05	0.00035	0.00164	1.85
	0.74	9.42	151.95	341.17	738.78	402.34	5753.13	157.89	4.59468e+06	16932.4	6661.47	469784
308	2193.71	987.46	2715.08	1894.84	274.29	5.82	1.92	2.36	7.96e-05	0.00027	0.00283	1.83
	0.87	6.36	185.62	407.28	404.91	343.62	4785.92	142.37	4.21652e+06	13030.2	5736.58	326230
309	4868.02	863.51	6871.6	1519.06	223.37	8.16	1.62	2.3	6.8e-06	0.00012	0.00125	2.95
	1.87	12.7	193.86	628.81	891.72	799.99	6640.34	127.55	3.92195e+06	17430.3	7454.49	225825
310	2489.17	461.34	3419.9	759.22	184.71	6.37	1.24	1.76	8.24e-05	0.00061	0.00175	1.62
	1.27	6.53	178.03	881.93	1005.38	645.46	7355.18	130.36	2.84891e+06	13881.6	8935.57	368104
311	4630.98	674.96	5557.64	999.9	176.46	5.33	1.55	1.98	7.89e-05	0.00047	0.00244	2.95
	2.27	9.33	163.47	625.88	669.23	222.72	3651.83	172.83	3.9895e+06	14137.2	5228.49	516875
312	4722.2	971.44	7047.2	1401.05	287.3	8.6	1.3	1.57	5.56e-05	0.00033	0.00255	1.21
	0.58	8.42	214.04	873.72	1135.29	205.14	3424.54	172.61	2.85739e+06	9059.92	4261.34	401371
313	4791.54	280.92	7078.83	506.99	210.85	5.06	0.89	1.11	4.79e-05	0.00093	0.0036	1.5
	0.61	10.17	206.99	540.27	537.75	535.52	5004.61	179.79	4.41056e+06	7481.99	5559.83	378231
314	2261.3	876.64	3348.64	1365.67	202.23	9.03	0.77	1.01	9.15e-05	0.00061	0.00328	0.97
	0.5	10.45	154.25	842.32	536.26	656.61	5088.74	171.72	4.15316e+06	11410.6	6585.87	320907
315	2007.79	466.07	2968.95	822.01	149.06	8.38	0.86	1.11	8.1e-06	0.00084	0.00652	2.04
	1.5	8.09	129.45	502.95	371.54	368.54	4132.05	151.07	3.79322e+06	17232.6	5765.73	450738
316	2196.09	651.48	2761.23	1088.55	104.42	7.04	0.78	0.98	9.82e-05	0.00066	0.00361	2.65
	1.68	13.33	112.9	534.27	259.54	252.51	7571.04	177.76	3.18976e+06	12864.7	10319.8	331970
317	2414.03	432.87	3218.29	843.75	266.69	5.42	1.89	2.6	6.16e-05	0.00094	0.00896	2.41
	1.77	9.62	126.73	379.09	327.2	357.94	4312.37	153.03	2.07382e+06	17784.8	6399.95	489840
318	3619.8	377.76	4734.5	488.21	260.41	5.84	1.87	2.31	8.26e-05	0.00087	0.00556	2.3
	1.08	12.29	90.24	588.98	256.58	790.66	3471.46	146.2	2.22389e+06	16114.2	4281.88	239360
319	2299.45	695.64	3311.76	1173.19	167.96	5.58	0.64	0.84	9.64e-05	0.00031	0.00204	2.19
	1.08	7.47	85.38	554.03	283.65	753.41	6071.78	189.16	3.83883e+06	17686.3	8910.7	358486
320	2062.27	925.59	2897.4	1704.76	286.13	7.77	0.56	0.82	9.07e-05	0.00091	0.00989	1.01
	0.78	8.67	191.09	919.43	539.94	294.08	5010.83	175.58	4.65135e+06	13085.4	5559.79	439515
321	4646.95	533.11	6306.29	1059.13	247.05	9.84	0.93	1.35	2.88e-05	0.00084	0.00248	1.29
	0.75	12.22	84.93	949.53	308.5	720.02	3177.41	161.57	4.19216e+06	14254.1	4063.81	319245
322	2225.92	734.12	3389.81	1090.58	252.89	8.18	1.99	2.89	1.04e-05	0.00084	0.00213	2.41
	1.16	10.49	77.35	204.73	318.41	500.98	7997.14	181.24	3.84002e+06	13014.5	11223.9	206962
323	4435.33	800.68	5587.55	1273.5	126.62	7.18	1.33	1.93	4.92e-05	0.00066	0.0023	2.17
	1.21	11.61	207.96	273.43	950.39	718.38	3799.22	137.24	2.29281e+06	16990.4	4906.28	473075
324	3314.11	889.86	5101.93	1572.27	181.28	9.22	0.58	0.76	8.01e-05	0.0001	0.00108	1.27
	0.73	9.35	90.36	757.92	396.63	506.27	7582.88	162.74	1.99587e+06	14787.5	10088.7	342094
325	4228.3	787.93	5680.74	1108.16	221	8.91	1.62	2.28	5.05e-05	0.00106	0.00441	2.21
	1.72	9.04	162.02	742.02	435.05	662.79	3447.15	140.53	2.79285e+06	9336.46	4207.96	284664
326	2005.25	813.37	2904.61	1158.31	226.77	6.53	1.51	2.16	3.52e-05	0.00036	0.0022	2.02
	1.37	11.46	231.4	909.75	1386.3	322.4	5737.54	179.68	1.80677e+06	8940.09	6990.86	431777
327	4028.81	834.9	5419.71	1449.9	175.83	5.51	1.85	2.42	1.95e-05	0.00025	0.00101	1
	0.57	12.93	91.27	699.69	517	296.55	5053.98	120.77	1.23754e+06	8391.06	5699.92	382665
328	4197.81	499.01	6066.42	867.77	169.54	8.27	0.96	1.36	5.57e-05	0.00089	0.00366	1.4
	1.08	5.04	183.3	693.21	520.87	251.44	3622.02	158.85	4.31146e+06	8570.71	4123.4	364862
329	4388.1	220.69	6710.46	437.6	264.84	5.24	1.59	2.16	6.86e-05	0.00053	0.0016	1.53
	1.18	12.67	119.86	402.74	526.58	480.86	4140.39	135.25	3.61961e+06	11945.2	5032.24	371990
330	3425.67	585.98	5420.11	1037.69	140.4	5.1	1.36	2.03	3.08e-05	0.00025	0.00052	2.88
	1.57	8.78	68.77	727.13	338.12	563.15	6615.78	182.69	3.53123e+06	13301.8	8940.04	364437
331	3085.73	431.74	4523.25	617.86	292.22	6.22	1.57	2.01	3.23e-05	0.00066	0.00405	1.08
	0.58	6.82	199.33	439.65	1088	638.56	5160.1	139.85	4.30083e+06	8377.02	7235.72	581184
332	4730.77	302.35	7293.87	447.64	204.13	5.25	0.66	0.89	9.27e-05	0.00051	0.00125	2.92
	2.21	6.8	235.21	458.37	1364.82	451.64	3540.81	120.42	2.72505e+06	12815.4	4686.77	310015

333	3512.52	356.28	5310.68	535.87	282.39	5.81	1.53	2.06	7.06e-05	0.00054	0.00121	2.07
	1.32	10.23	208.34	853.04	431.47	626.12	4471.18	126.23	2.54978e+06	17689.2	4932.13	262184
334	2252.43	541.01	3534.35	671.01	139.33	7.05	1.85	2.25	3.85e-05	0.00085	0.00493	2.31
	1.06	12.35	65.15	736.34	196.61	864.29	4420.86	140.8	3.85452e+06	9330.28	5073.98	237517
335	4351.72	935.21	6020.03	1769.46	187.78	9.08	1.11	1.66	5.44e-05	0.0005	0.00156	2.8
	1.38	8.18	67.93	279.74	137.36	650.66	7255.65	167.66	2.88229e+06	16426.8	9811.67	361159
336	4218.64	993.23	6453.18	1337.04	230.96	8.31	0.52	0.72	6.37e-05	0.00019	0.00159	2.44
	1.11	5.08	222.12	316.74	1170.6	877.87	7671.69	198.92	4.70093e+06	10756.4	9593.67	372932
337	4481.7	410.05	7112.43	600.65	208.98	9.21	0.88	1.25	4.72e-05	0.00023	0.00068	2.16
	1.26	13.21	215.04	741.27	582.26	336.13	5790.41	134.03	3.97548e+06	13940.8	8626.44	469697
338	4449.51	476.76	7089.34	751.22	283.77	8.91	0.88	1.18	8.9e-06	0.00025	0.00062	1.4
	0.88	10.01	219.86	984.92	1126.61	386.33	7769.77	134.72	3.08404e+06	17576.7	8591.66	228935
339	2615.7	670.5	3507.37	905.3	109.81	8.18	1.39	1.84	7.76e-05	0.0003	0.00178	2.27
	1.71	11.87	223.17	762.61	554.07	370.04	6273	159.42	4.45801e+06	10631.6	8402.02	327575
340	2280.95	735.72	2855.75	1412.5	195.54	9.21	1.73	2.39	5.6e-05	0.00048	0.00272	1.3
	0.95	12.8	232.38	295.1	650	361.86	6566.09	136.3	2.53466e+06	15582.9	8605.74	261221
341	2266.6	964.42	3316.85	1905.88	179.56	6.4	1.75	2.28	6.02e-05	0.00083	0.00823	2.13
	1.29	6.43	69.87	931.43	298.88	243.37	4203.07	140.4	4.99033e+06	10220.9	5069.57	231379
342	2326.58	513.27	3093.2	876.31	237.72	6.1	0.93	1.35	2.9e-05	0.00098	0.00582	1.57
	0.83	13.45	240.35	934.81	914.55	663.57	6845.38	162.49	4.76016e+06	11374.6	8367.68	562963
343	2939.79	703.02	3596.96	1356.95	187.33	5.43	0.66	0.95	9.85e-05	0.00094	0.00206	2.05
	1.57	5.8	149.21	704.95	806.97	455.64	7851.33	142.98	4.20523e+06	16773.8	11680.9	348246
344	4308.69	910.58	6109.98	1319.81	107.27	8.24	1.55	2.01	9.45e-05	0.00032	0.00209	2.82
	1.27	10.41	51.82	938.89	192.54	851.7	4375.85	144.87	2.82949e+06	9516.55	5156.45	308993
345	3568.1	537.56	4748.47	904.95	183.17	6.52	0.95	1.23	4.4e-06	0.00048	0.00195	1.56
	1.1	5.12	183.13	613.7	435.67	259.87	5527.46	128.95	4.90346e+06	9280.72	7672.41	243807
346	4587.02	953.13	5847.43	1812.44	104.05	8.85	1.93	2.56	7.77e-05	0.00061	0.00235	2.74
	1.42	6.48	220.01	431.54	1257.1	301.05	5620.5	190.05	3.82575e+06	7438.48	6944.07	236295
347	2827.92	608.82	3822.03	1208.06	146.58	5.41	1.45	1.81	3.94e-05	0.00045	0.00199	1.65
	0.94	12.51	233.33	560.6	591.2	587.94	3567.85	140.83	3.55629e+06	14176.9	4366.96	441229
348	4775.92	508.84	6491.89	894.52	160.59	7.91	1.41	1.8	7.95e-05	0.00107	0.0032	2.16
	1.41	7.86	195.69	766.71	469.27	969.31	3141.67	159.74	4.54267e+06	10869.4	4330.58	227693
349	4067.12	766.46	6041.82	1128.59	110.99	9.95	1.02	1.53	5.33e-05	0.00027	0.00241	1.75
	1.02	7.05	68.82	989.33	377.42	921.12	6514.16	195.99	4.28827e+06	8639.05	8451.47	240060
350	2108.86	449.6	3218.24	778.56	295.93	5.09	1.65	2.2	8.79e-05	0.00058	0.00507	2.1
	1.09	9.38	72	416.18	424.96	990.85	6799.3	180.52	3.13106e+06	15827.3	8612.52	251981
351	4275.57	490.99	5251.11	720.18	144.6	5.92	1.8	2.38	9.72e-05	0.00071	0.00235	2.22
	1.29	7.07	111.69	690.39	375	810.71	4768.54	179.72	2.05182e+06	14785.2	5923.11	578775
352	2346.5	637.25	2969.23	972.46	131.44	9.59	1.56	2.11	7.32e-05	0.00048	0.00136	1.72
	1.25	11.78	123.21	223.55	591.7	758.74	7482.77	197.05	3.21535e+06	9901.19	8625.16	232643
353	2768.57	645.92	3874.68	1278.04	223.89	7.79	1.55	1.96	1.81e-05	0.00047	0.00459	0.92
	0.47	6.23	71.55	688.96	240.43	615.18	3725.69	138.12	3.48751e+06	10088.6	4393.35	492075
354	3375.1	845.18	4805.06	1553.54	103.15	7.07	1.08	1.47	4.01e-05	0.00065	0.00228	1.54
	0.86	12.53	146.22	952.85	715.3	521.34	7721.93	123.99	3.97366e+06	16699.8	10182.4	289278
355	4054.55	566.22	6466.22	684.23	184.65	6.26	0.75	0.96	6.9e-05	0.0008	0.00231	2.94
	1.7	13.3	66.68	541.72	196.46	416.54	3917.01	193.43	3.89773e+06	16078	4818.86	407288
356	4892.07	481.98	6588.87	903.79	212.89	8.72	1.19	1.57	3.82e-05	0.00031	0.00124	1.48
	0.67	8.83	67.66	371.17	307.32	348.73	6107.64	131.7	4.10629e+06	14405.9	8802.02	432535
357	3897.59	311.88	5268.49	600.37	117.58	7.5	1.55	2.3	8.5e-05	0.0003	0.00147	2.12
	1.05	8.33	68.4	320.05	281.8	771.41	4597.08	143.44	3.84513e+06	13651.3	5285.67	366719
358	3372.88	867.09	4626.23	1330.82	276.94	6.4	1.51	2.1	9.21e-05	0.00041	0.00195	1.28
	0.87	10.02	164.58	960.38	501.53	408.78	4294.29	175.25	4.59252e+06	10999	5707.91	411176
359	3286.17	604.08	4358.32	893.24	102.14	8.48	1.79	2.38	9.14e-05	0.00019	0.00086	2.79
	2.16	5.19	106.24	856.82	344.55	779.35	7614.25	125.84	2.05737e+06	11289.8	9699.28	243263
360	2064.7	858.26	2778.28	1588.09	146.74	9.21	0.56	0.84	8.8e-06	0.00032	0.00305	2.69
	1.27	6.44	203.98	386.93	1219.76	790.06	6280.81	157.01	3.88166e+06	11824.4	8911.36	209672
361	2650.36	854.62	3646.36	1367.36	246.43	9.49	1.06	1.44	3.9e-05	0.00053	0.00217	2.46
	1.2	13.76	109.56	411.3	335.42	970.15	5604.43	180.38	3.60452e+06	14791.4	7320.52	332334
362	2851.26	942.95	4286.61	1691.5	286.88	5.79	0.98	1.31	7.73e-05	0.00027	0.00153	1.68
	0.79	11.48	166	521.24	912.52	588.86	7023.46	145.12	4.84913e+06	12183.2	9663.05	335921
363	3941.12	724.93	4739.89	1430.66	192.51	9.55	1.72	2.49	3.81e-05	0.00018	0.00192	1.65
	0.99	14	178.96	594.67	391.52	483.79	3406.31	194.92	4.61665e+06	8236.91	3801.5	404588
364	4672.19	781.55	6895.3	1372.97	218.27	8.59	1.02	1.53	9.71e-05	0.00041	0.00103	1.91
	0.94	5.19	137.09	398.14	665.02	251.31	4319.61	128.98	3.7191e+06	14594.8	5962.44	321940
365	2537.06	635.23	3246.83	893.08	127.42	7.58	1.99	2.73	6.66e-05	0.001	0.00287	2.55
	1.93	13.07	234.58	822.7	975.22	859.33	7151.59	136.02	3.13031e+06	17945.4	10146.6	291773
366	4588.44	359.61	6475.29	706.36	127.38	7.41	1	1.42	3.28e-05	0.00042	0.0015	0.98
	0.51	5.2	93.24	646.28	292.51	476.97	3058.7	191.91	1.76986e+06	15544.1	3866.27	430325
367	2372.69	897.17	2934.5	1782.63	254.42	5.79	1.67	2.44	4.87e-05	0.00082	0.00418	2.39
	1.66	9.19	216.18	949.78	1211.52	952.84	4767.36	175.03	4.61599e+06	16533.7	6046.21	332931
368	2818.27	931.83	4298.91	1527.26	212.52	8.24	1.38	1.67	4.86e-05	0.00019	0.00199	1.66
	0.7	12.04	224.83	246.92	1139.84	747.72	3282.37	130.8	3.29681e+06	10661.2	4302.81	211737
369	3399.7	556.31	5051.92	1045.68	297.2	9.01	1.42	1.74	8.09e-05	0.00107	0.00278	2.36
	1.79	8.78	243.85	878.01	553.18	877.05	4795.78	194.54	2.69019e+06	14047.7	6343.46	370267
370	4850.77	867.82	7242.83	1246.34	267.02	9.06	1.58	2.16	3.75e-05	0.00054	0.0035	2.98
	1.62	10.56	137.51	367.3	469.92	934.38	4567.23	184.26	4.88991e+06	12880.1	5253.64	437403
371	2563.83	615.49	3752.17	962.43	294.96	7.97	1.67	2.44	6.54e-05	0.00034	0.00374	2.93
	1.26	8.37	89	779.39	514.1	806.69	4078.49	145.94	1.04614e+06	14644.5	4702.63	316508
372	2741.91	487.96	3693.29	800.18	276.79	7.06	1.71	2.38	3.46e-05	0.00071	0.00261	1.59
	0.74	8.54	247.63	431.27	1187.74	435.73	3248.68	126.64	4.18612e+06	12931.7	4623.87	357487
373	3412.05	469.33	4369.06	878.52	160.91	6.95	1.35	1.98	3.04e-05	0.0008	0.0028	1.53
	0.84	10.26	247.16	385.36	807.96	411.71	3970.69	124.48	1.7542e+06	14829.3	4404.63	290569
374	3754.12	809.04	5646.4	1495.73	203.22	7.64	1.69	2.05	7.49e-05	0.00016	0.00086	1.62
	1.18	13.27	225.21	610.34	1170.83	473.05	7069.23	138.67	2.54211e+06	8044.04	8704.64	206271
375	3165.06	797.68	4932.67	1282.2	237.35	5.96	0.84	1.03	9.51e-05	0.00044	0.00191	1.47
	1.16	13.83	60.69	335.15	243.02	653.6	4138.76	165.51	2.37704e+06	17668.9	5073.58	377886
376	2803.47	343.72	4026.4	642.44	220.21	6.2	0.61	0.82	6.72e-05	0.0007	0.00303	1.89
	1.5	9.99	197.72	306.6	704.15	391.44	4839.85	156.93	3.58466e+06	9604.34	7221.51	438497
377	3290.21	995.17	4440.38	1807.06	164.98	5.23	1.43	1.95	1.82e-05	0.00033	0.00175	1.71
	0.73	6.85	174.32	845.23	817.28	665.04	3347.81	143.52	2.21656e+06	8277.18	4965.22	472123
378	3983.51	966.08	4880.47	1868.52	180.03	9.65	1.82	2.41	4.98e-05	0.00078	0.00577	2.98
	1.22	9.1	140.85	597.96	613.46	971.65	3228.99	147.48	4.97424e+06	17117	4566.23	418347
379	2777.9	487.5	3500.65	884.08	142.32	9.7	0.88	1.2	3.12e-05	0.00051	0.00159	2.41
	1.18	5.46	214.86	482.83	667.89	456.47	6972.29	164.09	4.9764e+06	16631	7924.34	418731
380	2942.41	586.44	4073.68	849.38	193.73	6.17	0.76	1.07	8.7e-05	0.0002	0.00187	2.1
	1.43	7.82	184.11	465.2	1084.2	447.88	4245.93	127.45	2.751e+06	8041.21	4686.66	342605

381	4998.36	422.88	7280.92	723.19	113.34	6.77	1.39	2.04	2.36e-05	0.00047	0.0013	1.15
	0.82	8.72	181.79	785.39	1032.38	759.02	5219.46	191.65	3.58545e+06	12044.4	5945.64	329031
382	3629.8	979.28	5584.53	1823.27	154.03	8.15	1.35	1.91	1.88e-05	0.00102	0.00538	3
	2.39	10.32	187.95	247.33	1119.65	493.03	4072.62	125.69	3.96793e+06	16281.1	6084.25	493475
383	3552.04	879.78	4780.86	1191.09	229.98	7.57	0.72	0.99	9.66e-05	0.00021	0.0009	2.89
	1.38	12.55	124.06	205.16	456.98	704.91	5961.25	172.9	1.25625e+06	14665.3	8827.54	315910
384	3558.4	481.19	5101.71	761.63	178.53	5.49	1.08	1.39	1.68e-05	0.00018	0.00089	1.4
	1.12	10.74	125.03	245.91	686.75	803.53	5893.16	131.35	2.55639e+06	13658.1	7634.81	310297
385	2616.32	625.62	3354.49	856.62	105.59	7.25	2	2.92	6.33e-05	0.00077	0.0044	2.16
	1.6	5.05	61.75	394.71	269.56	859.68	5488.62	162.04	3.91084e+06	16958.1	6751.68	276551
386	3957.95	720.8	5146.57	1217.91	139.96	9.2	1.13	1.49	6.55e-05	0.00024	0.00166	2.03
	1.04	12.71	245.94	483.44	739.79	433.75	6119.77	126.35	3.17329e+06	12633.1	8656.48	431842
387	2766.16	908.54	4082.05	1174.31	229.75	5.48	1.4	2.07	8.59e-05	0.00056	0.00278	2.87
	2.2	5.03	242.62	986.66	1289.33	478.03	4212.63	152.69	4.11504e+06	12250.5	4958.74	346108
388	3603.57	575.17	4620.53	1138.46	244.47	5.71	1.45	1.95	3.66e-05	0.00043	0.00281	0.93
	0.63	13.32	203.36	755.35	982.42	931.7	6964.7	123.47	4.30187e+06	14401.8	8993.33	373768
389	4478.33	445.72	5999.9	811.14	160.32	5.27	1.88	2.47	7.64e-05	0.00029	0.00134	1.23
	0.83	5.33	243.44	671.05	1391.38	387.5	5158.65	188.49	4.73809e+06	17454.9	7533.75	351496
390	2870.93	300.16	4504.67	462.14	266.98	5.7	1.36	1.98	8.29e-05	0.00034	0.00231	2.15
	1.53	10.15	180.15	658.23	980.91	967.81	6438.87	121.41	4.16763e+06	7695.36	9073.08	436297
391	2809.2	892.05	3855.01	1313.67	118.18	6.81	1.23	1.81	7.05e-05	0.00088	0.00365	1.07
	0.78	13.83	148.9	619.11	413.92	907.49	6671.01	180.72	3.96905e+06	17334.6	7431.9	264813
392	3117.96	704.99	3781.14	1360.38	205.19	6.37	1.85	2.45	2.88e-05	0.00025	0.00122	2.59
	1.82	13.68	184.47	743.41	501.52	643.05	7635.8	187.24	3.4591e+06	14988.5	9320.88	497205
393	4182.33	599.72	5942.01	906.03	141.5	5.55	0.52	0.64	5.01e-05	0.00088	0.00331	2.32
	1.73	8.61	206.25	607.64	472.99	653.14	3698.73	198.96	1.39908e+06	17156.4	5286.54	463171
394	2738	585.68	3612.55	932.49	129.66	7.7	1.39	2	5.22e-05	0.00104	0.00214	2
	1.54	7.3	51.36	899.04	172.33	470.17	5003.52	170.63	2.04999e+06	15777.1	5728.27	451252
395	3517.21	809.52	4240.94	1468.89	270.98	8.36	1.02	1.26	5.2e-05	0.00036	0.00241	1.7
	1.25	5.5	78.53	299.71	283.01	271.16	4401.85	135.93	4.18282e+06	12514.4	5869.13	229844
396	3498.29	659.6	4400	1161.61	261.61	8.33	0.99	1.36	2.07e-05	0.00083	0.00324	1.23
	0.89	5.85	191.92	746.02	825.11	305.21	4978.88	163.5	3.29276e+06	17457.8	5837.41	486639
397	2415.01	564.96	3149.48	1054.78	144.22	9.65	0.97	1.24	8.92e-05	0.00018	0.00185	1.43
	0.57	13.45	120.51	276.61	632.16	656.81	4892.97	190.86	2.97617e+06	10719.4	7074.34	437386
398	2053.13	702.34	3220.29	1068.62	293.4	8.08	0.92	1.36	8.78e-05	0.00048	0.00316	1.82
	1.07	9.04	181.41	997.86	528.66	318.86	3452.15	136.53	1.10342e+06	12115.8	4307.81	220494
399	4844.06	730.97	6592.78	1029.92	253.05	8.89	1.06	1.44	1.57e-05	0.00036	0.00165	1.18
	0.7	13.91	190.82	240.41	532.98	734.25	7198.86	164.84	2.35196e+06	16748.1	8579.01	541439
400	3352.21	442.08	5073.85	621.65	299.7	5.14	1.24	1.75	2.28e-05	0.00109	0.00554	2.29
	1.18	12.41	73.93	660.31	407.15	211.44	5590.7	167.43	3.51685e+06	10148.9	7909.77	424095
401	2444.11	529.93	3167.66	721.17	109.03	5.96	1.06	1.27	2.31e-05	0.00058	0.00214	1.22
	0.77	8.52	65.51	369.72	213.55	671.37	6316.2	193.45	2.94512e+06	17196.7	8712.44	215107
402	2805.17	799.93	4374.44	1083.69	136.18	8.75	1.53	2	5.26e-05	0.00034	0.00144	1.34
	0.56	7.76	100.76	219.09	590.53	274.5	6736.94	181.94	2.31688e+06	17962.3	8183.32	381960
403	2871.93	983.75	3664.33	1418.43	272.56	7.62	0.93	1.14	4.91e-05	0.00056	0.00306	2.73
	1.9	12.8	206.7	394.09	455.48	657.2	4112.14	154.32	4.34277e+06	15508	4923.82	270047
404	3614.68	535.4	5652.18	692.16	212.32	5.66	0.97	1.37	2.47e-05	0.00025	0.00113	2.59
	1.43	6.52	88.67	392.06	308.76	571.25	6720.73	157.22	4.5401e+06	9428.12	9670.52	250237
405	3326	742.58	5020.6	1251.37	115.24	9.55	2	2.83	3.98e-05	0.0002	0.00184	1.63
	0.65	12.88	249.38	520.21	631.49	765.38	3571.69	145.36	4.70413e+06	17531.1	5223.29	329348
406	3974.93	525.02	5857.49	915.02	150.65	7.49	1.61	2.14	6.83e-05	0.00041	0.00231	2.33
	1.64	12.66	157.97	324	834.21	472.66	3733.1	165.42	3.42629e+06	9291.85	4952.86	251318
407	3878.91	998.84	4662.53	1985.29	121.69	7.26	1.52	1.89	5.97e-05	0.00059	0.00295	2.24
	1.6	13.49	248.55	426.4	645.3	235.85	4018.75	151.74	3.56299e+06	10353.7	5185.83	386095
408	2611.1	340.4	3226.06	619.85	240.13	6.56	1.41	1.7	8.96e-05	0.00056	0.00237	2.37
	1.22	7.32	224.87	566.41	558.57	743.08	5210.6	187.9	2.56869e+06	13997.5	6155.24	306741
409	4434.47	467.83	5550.4	689.18	242.65	8.37	1.56	2.2	2.77e-05	0.00067	0.00155	2.46
	1.13	9.88	129.13	294.45	636.67	536.43	6459.85	139.77	4.43293e+06	13579.7	9643.62	451760
410	4856.41	920.25	7006.78	1807.16	267.3	5.78	1.63	2.4	9.59e-05	0.00085	0.00333	0.92
	0.69	6.07	207.2	558.4	1063.04	469.24	6761.98	158.28	4.17452e+06	9366.17	9477.02	492133
411	3703.5	460.04	5248.69	653.67	261.06	5.41	0.88	1.24	0.0001008	0.00065	0.00542	1.87
	1.35	7.37	181.53	251.25	453.26	844.01	5303.87	123.12	4.36783e+06	17108.8	7561.67	437892
412	2574	364.32	3434.58	712.89	239.65	7.56	1.37	1.7	7.31e-05	0.00053	0.00275	1.45
	0.96	9.76	207.02	457.12	461.84	295.37	3950.75	187.56	1.80961e+06	16104.9	5501.5	324966
413	2416.86	696.27	3714.07	1090.44	163.45	9.03	1.7	2.29	6.96e-05	0.00064	0.00733	2.67
	1.36	12.83	223.29	920.38	1293.88	530.34	3235.18	147.45	2.95645e+06	14710.2	4287.04	387320
414	3603.47	207.39	4832.6	397.84	290.95	8.43	1.36	1.78	9.89e-05	0.00082	0.00349	1.31
	0.94	10.83	161.13	944.58	853.6	549.45	5854.17	169.13	4.63258e+06	10236.4	7464.47	567723
415	2452.48	258.13	3225.8	366.38	116.01	5.98	1.92	2.75	2.86e-05	0.00036	0.00126	1.28
	0.84	6.68	125.88	741.13	485.54	939.45	5013.31	182.92	3.18077e+06	9859.92	6928.54	239900
416	2929.91	360.02	4656.86	601.78	175.32	7.2	0.83	1.14	3.2e-06	0.00023	0.00127	1.87
	0.89	8.48	234.91	333.95	1348.09	884.51	4465.51	158.49	4.49286e+06	11331.7	5259.66	313699
417	3151.46	915.24	4438.17	1297.97	113.49	8.01	1.31	1.89	5.6e-06	0.00099	0.00566	1.7
	1.07	10.17	89.71	702.51	344.49	968.23	4303.53	135.38	3.47233e+06	18194	4910.61	335090
418	3675.46	603.71	5289.34	995.76	100.84	6.55	1.38	1.94	3.29e-05	0.00053	0.0022	2.15
	1.17	13.4	243.13	465.73	1357.3	896.91	7518.35	171.76	4.00945e+06	8360.43	9508.84	369686
419	4179.33	512.2	5978.38	682.43	289.23	5.48	1.51	1.88	2e-06	0.00074	0.00387	2.66
	1.66	8.29	225.61	925.47	465.52	229.23	4149.61	170.26	4.58118e+06	9050.38	6223.76	442827
420	3334.55	757.12	5094.69	1008.56	264.09	6.24	1.61	2.33	4.74e-05	0.00044	0.00263	1.46
	1.06	12.67	56.56	400.14	203.67	461.71	5713.16	129.15	2.25068e+06	14093	7327.54	405611
421	3765.39	845.28	5922.4	1586.51	148.42	6.99	1.56	2.02	2.13e-05	0.00053	0.00354	1.25
	0.64	9.3	72.38	994.8	211.74	792.26	7773.75	195.23	4.94754e+06	14923.6	9684.54	394852
422	3140.09	921.46	3858.75	1543.63	100.47	9.89	0.86	1.04	4.42e-05	0.0008	0.00479	0.93
	0.68	7.18	133.21	340.36	539.48	409.7	4644.65	135.52	4.02755e+06	8989.96	5237.91	330326
423	2907.53	350.56	4278.59	440.58	244.34	9.21	1.53	1.89	9.6e-06	0.00045	0.00174	1.02
	0.7	5.34	60.77	422.2	357.21	692.58	6809.23	170.66	2.62666e+06	15469.8	7911	406869
424	3484.98	842.84	4860.45	1092.32	233.58	5.97	0.67	0.91	2.92e-05	0.00084	0.00681	2.62
	1.91	10.19	211.63	563.05	561.63	388.49	3197.54	198.89	2.77809e+06	8714.64	4144.43	462069
425	4304.62	887.64	5533.45	1334.45	262.99	8.74	1.69	2.47	2.19e-05	0.00026	0.00303	2.87
	2.26	6.14	186.73	783.83	854.55	284.32	4468.39	168.27	4.70818e+06	10093.4	5429.34	312014
426	3463.08	706.84	4430.95	1382.78	202.78	9.89	0.52	0.7	8.31e-05	0.00033	0.00079	2.18
	0.92	12.27	182.42	296.84	713.35	896.7	7664.78	185.18	3.60006e+06	10861.3	9509.82	312558
427	3187.29	423.74	5034.97	590.59	246.93	7.7	1.14	1.63	8.44e-05	0.0007	0.00362	2.75
	2.08	11.12	216.23	262.44	559.01	561.13	3208.68	136.02	3.54638e+06	9223.92	3994.26	443289
428	2873.9	336.36	3895.83	667.67	231.37	6.41	1.4	2.05	8.35e-05	0.00011	0.00132	2.45
	1.02	11.34	105.58	621.18	576.08	330.49	5411.79	191.23	4.54678e+06	15858.7	7628.59	439962

429	3412.59	232	4743.37	436.59	259.94	7.12	1.72	2.4	4.63e-05	0.00069	0.00407	1.16
	0.92	5.51	203.17	461.41	1210.73	331.7	7174.95	163.02	4.64354e+06	10540.8	10534	591088
430	4953.08	992.65	6394.61	1327.16	120.98	5.81	1.18	1.56	4.61e-05	0.0007	0.00253	1.76
	0.97	11.76	156.23	518.32	373.72	676.67	5466.84	147.6	2.97235e+06	17388.6	6265.96	429286
431	2495.08	930.81	3476.42	1722.71	139.93	7.01	0.58	0.75	2.42e-05	0.00093	0.00424	1.01
	0.75	7.63	61.91	563.57	151.91	529.04	4215.22	174.48	2.63379e+06	9756.4	6307.26	361031
432	2691.02	390.17	4165.5	724.29	198.3	5.47	0.98	1.46	4.87e-05	0.00076	0.00262	2.48
	1.7	5.32	109.47	516.28	242.28	810.3	3640.1	198.41	1.89594e+06	13967	4501.72	373032
433	3074.57	847.52	4587.47	1691.1	199.6	7.91	1.84	2.74	7.94e-05	0.0006	0.00404	1.99
	0.87	8.96	62.22	888.44	281.04	524.82	5836.16	191.19	4.60029e+06	11893.9	6804.57	265448
434	2374.45	573.57	2919.06	1002.5	112.17	5.77	1.97	2.93	1.26e-05	0.00025	0.00276	1.26
	0.92	9.41	103.53	550.6	295.41	243.44	5597.64	181.87	2.02508e+06	17420.1	6721.69	451199
435	3522.04	465.07	5587.65	581.18	251.33	6.95	1.31	1.85	2.24e-05	0.00015	0.00132	2.95
	2.1	5.35	180.91	630.23	1006.45	968.01	4964.8	158.76	3.07723e+06	7459.6	7054.8	353368
436	2342.86	391.86	3543.57	778.4	151	6.34	1.7	2.09	2.69e-05	0.00093	0.00604	1.57
	0.88	10.04	112.99	338.11	608.51	677.71	3148.79	177.79	4.81641e+06	8667.69	4677.34	283186
437	2806.78	644.31	4467.05	955.96	165.48	6.32	1.46	1.9	3.84e-05	0.00023	0.00144	1.94
	0.93	6.84	204.5	488.52	995.8	461.5	6597.65	157.4	3.65692e+06	17781.7	7917.65	410734
438	4123.21	320.32	6536.09	569.75	298.09	6.8	0.67	0.81	5.86e-05	0.00017	0.00139	1.18
	0.71	13.99	155.46	943.34	895.71	874.43	3916.09	158.28	4.18186e+06	10708	5457.66	496230
439	2026.42	336.41	2881.17	517.52	266.3	6.3	1.03	1.25	4.66e-05	0.00095	0.00802	1.07
	0.52	10.2	213.02	886.89	938.52	641.61	3385.08	123.08	4.04311e+06	11372.7	4958.16	382211
440	2049.35	448.43	3211.64	623	248.7	8.86	0.88	1.25	1.21e-05	0.00102	0.00332	2.44
	1.93	9.07	174.6	634.07	392.56	295.99	4922.39	123.76	4.99421e+06	10543.3	6691.05	354089
441	3312.38	868.7	4120.48	1636.3	232.39	6.44	1.14	1.53	4.79e-05	0.00085	0.00528	1.36
	0.8	11.39	200.84	337.34	737.51	786.84	5924.93	149.78	4.17155e+06	17104.3	8597.95	578895
442	2285.09	620.7	3283.6	1221.48	227.58	9.85	0.71	0.9	5.24e-05	0.00027	0.00062	1.07
	0.53	10.78	102.89	968.44	325.68	362.18	6435.72	181.72	2.03048e+06	16384.4	8426.7	261798
443	3884.09	812.22	6041.5	1550.38	149.23	9.98	1.15	1.46	9.52e-05	0.00103	0.0033	2.66
	1.24	9.1	54.05	830.83	276.17	507.14	6643.78	159.19	4.98164e+06	12503.8	8457.61	302509
444	4772.37	848.57	7550.14	1428.82	103.09	7.04	1.27	1.79	4.65e-05	0.0001	0.00073	0.92
	0.7	8.18	145.38	449.9	816.2	962.23	5534.13	139.97	3.63876e+06	13115.4	6532.82	487521
445	3577.54	753.79	5632.78	1383.04	254.5	8.2	1.87	2.8	6.28e-05	0.00052	0.00449	2.83
	1.89	12.38	106.26	733.94	266.76	679.53	4052.88	181.88	4.52571e+06	16201.1	5998.78	494140
446	3096.6	826.69	4848.36	1307.79	269.58	6.74	1.56	2.3	5.04e-05	0.00025	0.003	2.44
	1.74	11.81	164.01	941.87	383.98	785.17	3014.83	178.52	3.32788e+06	13581.8	4140.26	279627
447	4624.39	906.79	5742.7	1521.33	119.63	9.51	1.76	2.12	5.32e-05	0.00033	0.0011	1.12
	0.6	5.58	233.37	273.02	808.06	829.57	7412.45	197.74	3.11577e+06	16283.7	10185.8	400478
448	4221.82	595.39	5673.43	1033.13	159.04	5.89	1.61	2.22	8.08e-05	0.00034	0.00115	1.04
	0.72	8.73	190.17	529.84	1002.89	777.58	5721.16	185.64	2.08599e+06	11404.2	6352.95	473397
449	2712.41	933.24	3687.58	1598.62	185.08	9.27	1.6	2.4	7.67e-05	0.00069	0.0029	2.49
	1.98	8.21	136.93	213.44	814.79	905.06	3165.1	145.44	1.03163e+06	13587.4	4304.05	216977
450	2585.8	990.43	3259.4	1511.75	236.29	5.05	1.75	2.35	9.16e-05	0.00066	0.00324	1.85
	1.33	13.21	210.8	349.19	847.11	262.3	3379.6	179.01	4.224e+06	14205.6	4436.16	417391
451	4163.53	246.85	6321.6	423.54	242.59	7.68	1.47	1.98	2.97e-05	0.00021	0.00079	2.08
	0.99	8.73	83.41	241.58	406.42	692.32	6108.92	146.88	1.61201e+06	13634.5	8967.64	479405
452	3612.52	860.11	5500.12	1673.92	237.95	8.26	1.87	2.58	3.76e-05	0.00028	0.00235	1.74
	0.7	9	182.89	829.22	413.53	821.37	4047.4	144.44	3.59391e+06	10250.7	6004.61	389742
453	2647.27	906.32	3272.72	1740.95	165.94	7.26	1.25	1.76	5.16e-05	0.00075	0.00583	2.94
	2.25	6.71	86.8	896.99	501.86	482.82	3850.4	183.15	3.42025e+06	9948.64	5321.21	348621
454	3209.51	801.7	5042.13	1387.76	248.57	5	1.83	2.55	4.67e-05	0.00103	0.0036	1.42
	1.06	8.29	94.33	443.34	478.75	933.43	7926.65	141.51	4.73228e+06	12306.1	8988.4	478632
455	4407.2	312.31	6480.26	581.54	151.09	5.32	0.81	0.99	7e-06	0.00048	0.00097	2.7
	1.78	9.6	228.87	246.67	961.13	479.03	4129.24	197.95	3.64157e+06	18178.3	5248.57	255814
456	3007.18	514.03	4602.3	831.47	211.45	5.99	1.52	2.24	8.32e-05	0.0003	0.00141	0.91
	0.53	5.97	231.99	933.25	1079.72	706.44	7337.8	166.43	2.85609e+06	17567.9	9034.27	318976
457	2610.17	330.06	3659.83	410.03	205.28	5.88	1.45	1.96	3.68e-05	0.00028	0.00164	2.34
	1.54	12.19	222.36	484.32	645.75	659.14	5237.87	176.89	4.89832e+06	9024.9	7553.44	349240
458	3559.16	819.02	4309.14	1052.65	133.06	8.25	1.82	2.37	2.58e-05	0.00093	0.00216	2.52
	1.12	10.68	244.74	623.02	836.85	489.21	3456.99	165.66	2.43547e+06	8853.21	4984.67	426497
459	4178.5	723.6	5654.68	1141.44	241.75	5.54	1.19	1.43	3.76e-05	0.00061	0.00183	1.94
	0.92	8.3	95.28	570.66	437.48	283.72	5892.08	153.31	3.41202e+06	9525.6	8740.46	464397
460	4019.41	768.5	5809.42	1450.78	109.95	9.58	1.41	1.7	3.86e-05	0.0008	0.00199	1.19
	0.9	6.54	197.85	303.67	896.24	289.37	7833.43	177.11	3.41538e+06	18042.2	11531.6	443996
461	3757.79	435.85	5314.9	856.48	247.92	9.46	1.47	2.14	3.23e-05	0.00037	0.00097	1.21
	0.6	7.13	231.62	363.81	1115.6	996.06	4999.3	167.19	4.37844e+06	9714.51	7458.25	335854
462	2061.51	682.78	2921.07	1282.12	281.23	9.13	1.96	2.67	9.66e-05	0.00078	0.00753	2.18
	1.06	6.03	140.99	515.11	308.31	301.62	6703.94	128.03	4.79717e+06	8403.29	8376.19	306785
463	2119.87	959.8	2861.57	1348.43	272.44	6.27	1.7	2.13	7.68e-05	0.00028	0.00175	2.12
	1.49	9.83	237.3	980.38	987.35	793.57	7789.67	155.18	3.01241e+06	14147.3	10275.4	236509
464	2620	389.07	3785.05	755.45	262.52	8.48	1.12	1.57	1.12e-05	0.00023	0.00164	2.06
	1.36	11.69	200.54	844.05	1127.7	613.12	7650.21	177.35	2.56718e+06	9137.08	9169.27	380961
465	2796.59	356.83	4041.89	435.38	288.1	7.12	1.49	2.2	1.01e-05	0.00032	0.0012	1.52
	0.91	10.59	77.87	686.58	267.37	809.93	4469.76	171.09	4.05919e+06	13280.4	6656.02	286318
466	2332.61	884.05	3572.93	1211.06	278.12	6.43	0.89	1.09	2.59e-05	0.00021	0.0009	2.52
	2.01	8.86	51.57	724.87	115.75	410.36	7024.63	122.99	4.35126e+06	9633.77	8305.63	347793
467	2041.34	629.87	2924.45	1167.2	176.92	5.6	1.11	1.51	4.73e-05	0.00029	0.00131	1.28
	1	11	171.23	718.32	372.71	236.13	6641.71	148.46	3.57688e+06	15269.3	8844.43	228084
468	4488.79	863.79	7024.01	1384.47	217.69	8.5	1.04	1.27	6.08e-05	0.00019	0.00087	1.35
	0.7	12.92	226.84	897.53	1066.6	238.68	3721.64	163.59	2.3449e+06	11849.1	5128.02	238678
469	4400.22	499.48	5593.11	663.16	200.06	9.62	1.16	1.6	6.85e-05	0.00048	0.00193	2.25
	1.61	10.02	65.22	280.05	184.72	468.44	4529.45	184.03	4.51953e+06	10708.9	5054.57	286685
470	3600.01	362.89	4743.9	480.34	157.76	7.56	1.12	1.45	9.69e-05	0.0006	0.00353	2.54
	1.71	9.09	81.01	987.28	442.72	817.45	3087.24	128.59	4.97145e+06	11795.2	3985.61	521993
471	4595.55	244.25	7045.83	468.05	209.46	9.73	0.6	0.85	8.05e-05	0.0004	0.00087	1.28
	0.55	13.94	196.94	876.41	610.67	686.05	7966.41	146.54	3.33534e+06	17397	9715.57	388867
472	4654.99	415.72	6001.82	764.73	219.97	7.01	0.74	1.03	5.91e-05	0.0007	0.00278	2.56
	1.28	7.02	194.89	313.58	1044.15	918.64	3384.58	157.12	3.72119e+06	7811.08	4298.48	416018
473	4285.05	889.7	6787.6	1483.25	129.79	8.07	1.18	1.57	5.76e-05	0.0008	0.00459	2.01
	1.21	11.44	130.27	710.58	632.66	901.36	4296.16	195.64	4.30674e+06	13371.6	5623.94	482892
474	3001.18	911.56	4594.17	1226.37	239.64	9.29	0.71	0.9	5.34e-05	0.00097	0.00287	1.52
	0.84	12.72	126.77	318.16	507.82	234.61	5637.41	199.49	4.95154e+06	8700.97	6752.96	346032
475	3854.15	960.29	5266.33	1445.1	164.33	6.29	1.03	1.49	9.45e-05	0.00028	0.00318	2.9
	2.32	13.83	187.57	553.76	1096.88	917.65	6333.1	163	3.43536e+06	9818.65	9253.44	264065
476	2534.12	369.93	3663.93	505.86	197.78	6.33	0.86	1.11	3.22e-05	0.00056	0.00239	1.78
	1.4	13.59	174.54	495.25	525.37	741.24	5650.64	147.27	4.75687e+06	12490.1	6285.36	438553

477	2132.1	818.52	2654.78	1308.06	111.84	8.13	1.69	2.24	8.2e-06	0.0007	0.00375	2.88
	1.91	7.58	194.18	870.6	1138.39	827.81	5032.14	189.33	2.70554e+06	8736.67	7380.66	250685
478	3768.76	835.27	5425.21	1277.08	155.49	8.39	1.39	1.93	9.04e-05	0.00023	0.00183	1.67
	1.22	9.9	89.25	849.91	412.44	208.87	5403.94	129.04	3.58841e+06	16381.8	6208.85	257860
479	2271.85	947.67	3342.55	1532.59	270.04	6.05	1.28	1.87	8.03e-05	0.00048	0.00408	2.53
	1.47	6.94	244.88	928.93	669.31	604.27	6071.22	184.86	3.89474e+06	13670.2	7945.21	455902
480	3451.1	651.03	4260.43	940.27	151.54	5.52	1.2	1.65	3.09e-05	0.00038	0.00145	2.4
	1.7	8.9	94.73	278.87	409.49	940.82	5830.44	194.22	2.15303e+06	10834.2	8513.88	285703
481	2877	783.3	4102.36	1198.23	152.02	8.8	1.1	1.38	1.64e-05	0.00079	0.00767	2.3
	1.01	7.88	164.34	896.52	873	471.57	3542.28	192.78	3.62025e+06	12414.1	4771.88	492595
482	4216.26	719.25	6268.47	1260	200.82	6.99	1.64	2.1	9.24e-05	0.00022	0.00082	2.32
	1.63	12.2	83.45	492.77	298.82	548.82	6297.53	163.18	2.08692e+06	17573.8	7185.38	341818
483	3832.61	353.44	4649.49	638.11	243.7	7.42	0.73	0.93	3.15e-05	0.00018	0.00047	2.9
	1.4	13.84	172.19	914.11	700.15	869.41	5163.82	142.21	2.44613e+06	16527.8	7068.44	218445
484	2264.41	744.38	2889.83	1364.31	234.03	5.65	1.12	1.64	1.18e-05	0.00048	0.00159	2.93
	1.26	5.87	213.83	205.27	1265.1	434.7	7128.11	192.99	3.165e+06	17707.7	9613.79	306142
485	4165.36	547.79	6250.39	704.41	141.37	5.32	1.94	2.76	4.3e-05	0.00087	0.00412	2.86
	1.33	6.63	68.98	782.79	283.23	353.64	3469.36	135.91	3.77787e+06	15494.8	4437.58	312921
486	2097.87	887.96	2753.71	1306.59	295.36	9.35	0.65	0.95	2.62e-05	0.00036	0.00386	2.16
	1.18	10.3	186.25	541.87	646.3	641.82	7039.43	185.22	4.21978e+06	13476.8	8695.94	418999
487	2983.46	881.47	4421.01	1553.05	290.45	7.08	0.8	0.98	6.61e-05	0.00101	0.00204	1.46
	0.7	11.8	246.7	812.44	576.5	543.88	4301.67	185.53	3.32116e+06	17172.3	5192.75	443007
488	3317.15	954.94	3985.78	1747.29	133.84	5.91	1.52	2.1	0.0001005	0.0006	0.00464	1.03
	0.73	10.4	144.01	366.9	610.6	754.65	3929.01	182.58	4.1314e+06	12978.8	5285.21	541185
489	2246.68	654.64	2704.96	1145.63	238.27	5.53	0.86	1.19	1.34e-05	0.00014	0.00154	1.49
	0.97	8.89	186.98	290.87	993.86	276.76	6086.12	133.81	2.98279e+06	16423.3	7568.19	496995
490	2819.48	916.29	4446.18	1772.64	112.23	8.42	1.93	2.44	3.22e-05	0.00088	0.00591	1.61
	0.77	9.23	56.02	249.65	217.34	791.64	3748.52	165.08	2.32836e+06	17920.8	5356.05	384744
491	4791.1	291.01	7349.36	357.77	227.27	7.94	0.76	0.96	1.71e-05	0.00023	0.00117	2.46
	1.38	13.88	185.92	590.19	741.51	558.91	4582.22	177.5	4.53493e+06	11924	6586.82	487726
492	2491.65	624.43	3313.44	979.26	194.8	5.36	0.95	1.2	4.38e-05	0.00063	0.00601	1.91
	0.81	12.87	225.89	249.44	616.87	536.22	7574.11	140.65	4.84184e+06	15215.2	9591.19	480240
493	2198.29	881.96	3303.55	1107.37	261.85	7.05	1.29	1.92	4.61e-05	0.00079	0.00203	1.63
	1.06	10.01	185.07	696.41	860.83	894.22	4491.78	147.66	2.96848e+06	16099.3	5196.37	411224
494	3749.08	636.54	5645.21	880.4	235.25	7.87	1.94	2.37	1.52e-05	0.00067	0.00194	2.2
	1.59	11.87	246.94	758.09	1086.71	355.97	7542.46	174.03	3.04738e+06	16459.4	9418.63	396383
495	2475.89	533.29	3750.63	660.13	177.13	8.16	1.45	2.1	1.14e-05	0.00044	0.00113	2.64
	1.47	8.95	63.41	306.85	287.33	724.16	7289.55	193.63	1.67381e+06	16881.3	8797.58	467175
496	4295.8	939.88	5778.45	1621.22	186.47	9.18	1.62	2.06	2.41e-05	0.00079	0.00252	2.26
	1.28	9.63	216.78	588.35	724.05	283.17	5066.3	124.44	3.12281e+06	7476.11	6691.43	408420
497	2237.94	923.01	3030.87	1514.5	209.86	9.72	0.5	0.65	8.83e-05	0.0005	0.00587	2.97
	1.2	13.4	142.87	376.5	624.91	506.78	4715.23	123.02	2.17818e+06	15606	5997.58	462799
498	4440.2	738.79	6165.3	1442.27	283.17	8.38	1.29	1.74	8.12e-05	0.00013	0.00115	2.17
	1.67	13.83	129.44	329.6	520.57	961.31	6793.83	156.13	2.71847e+06	10085.1	7854.15	384895
499	4768.51	934.34	6052.41	1395.59	131.25	7.95	1.19	1.73	8.22e-05	0.00048	0.00192	2.24
	1.46	5.88	155.61	667.43	416.12	948.12	6511.32	120.02	3.41903e+06	9271.52	8736.81	368540
500	3975.58	866.81	5627.7	1589.6	122.05	6.47	1.86	2.72	7.63e-05	0.0011	0.0044	1.74
	1.08	10.8	133.97	668.87	681.64	973.89	3310.65	163.48	1.73521e+06	14975.7	4954.13	305428
501	3295.94	736.54	4267.51	1109.05	146.21	9.97	0.91	1.19	7.84e-05	0.00033	0.00152	1.24
	0.95	12.76	125.36	633.4	320.56	428.28	3026.31	163.93	4.83273e+06	10384.4	4475.98	252593
502	3372.02	776.28	4593.69	1088.67	241.89	7.43	1.77	2.2	3.67e-05	0.0003	0.00232	0.94
	0.65	13.94	224.93	555.83	1189.43	854.5	4923.12	155.11	4.40454e+06	12872.9	6482.94	401815
503	2640.58	763.76	3684.53	1104.42	213.83	5.35	1.59	2.13	4.94e-05	0.0007	0.00231	1.06
	0.53	6.15	72.17	329.31	365.36	980.05	4691.96	171.03	4.07104e+06	17475.2	6619.41	245156
504	2462.5	686.61	3642.13	891.6	129.09	5.05	1.79	2.39	5.77e-05	0.00032	0.00113	1.36
	0.83	11.41	84.36	916.98	307.2	749.39	5215.58	143.16	3.73734e+06	13502	7789.55	457442
505	2165.92	521.28	2711.33	951.22	158.48	8.13	0.91	1.14	5.77e-05	0.001	0.00344	2.42
	1.63	8.48	168.47	237.61	405.04	283.47	7415.5	133.16	3.91427e+06	18130.2	8176.65	218034
506	3095.54	551.64	4797.03	1080.4	186.25	7.47	1.81	2.54	4.77e-05	0.00044	0.00208	2.71
	2.04	12.05	164.52	227.74	426.67	653.85	5249.91	188.68	3.73161e+06	7501.23	6200.29	390117
507	3790.97	924.34	4959.67	1759.48	248.97	9.15	0.81	1.1	1.3e-05	0.00074	0.00728	2.54
	1.29	9.31	148.25	826.14	714.91	276.16	3190.75	154.76	3.55162e+06	8222.12	3805.03	371621
508	2091.08	479.5	3004.39	709.59	164.53	7.41	0.9	1.14	3.19e-05	0.00038	0.00243	2.94
	1.32	10.45	239.36	491.79	637.23	304.14	7865.71	176.62	4.76388e+06	15131.5	9283.15	441958
509	3861.39	842.56	6064.17	1377.69	100.29	8.08	0.54	0.78	3.67e-05	0.00077	0.003	0.94
	0.68	8.75	75.83	400.46	272.51	712.79	3988.58	171.83	4.46747e+06	7494.05	5474.96	460735
510	3535.04	424.89	5231.66	703.74	206.29	7.5	0.92	1.24	1.44e-05	0.00018	0.0008	2.05
	1.05	5.84	241.33	889.17	1065.68	694.54	6769.65	146.18	2.82457e+06	16907	9251.38	454009
511	3953.35	757.54	5617.99	1259.09	253.53	5.74	1.98	2.82	2.35e-05	0.00026	0.00222	1.48
	0.69	13.28	108.39	511.55	448.82	842.82	5756.6	177.63	3.49554e+06	7494.87	7011.87	406129
512	2643.18	918.04	4139.79	1746.17	160.89	7.41	0.8	1.03	2.82e-05	0.0008	0.00598	1.08
	0.86	9.58	135.91	769.69	451.42	816.14	4523.45	133.11	4.46397e+06	16268.1	6452.67	248016
513	4021.95	410.27	5863.29	800.33	155.9	6.5	1.34	1.86	7.26e-05	0.00014	0.00051	1.72
	1.3	9.5	206.83	694.84	606.62	293.24	4871.56	196.24	4.51046e+06	12197.9	7065.11	232967
514	2199.5	376.89	3273.92	503.31	176.35	7.3	1.8	2.49	2.51e-05	0.00081	0.00208	1.59
	0.83	9.19	209.75	320.55	1082.96	216.72	4516.22	192.65	3.17686e+06	11573.9	5004.86	311641
515	2909.4	739.05	3954.79	1164.8	257.83	6.35	0.96	1.36	5.8e-05	0.00099	0.00774	2.65
	1.97	10.23	177.55	532.75	376.42	841.93	3886.43	124.31	3.2653e+06	11333.8	4664.25	521678
516	2406.08	726.93	3793.54	974.79	129.62	6.28	1.17	1.55	5.96e-05	0.00034	0.00247	1.62
	1.26	12.57	108.07	576.13	422.02	323.29	3819.72	145.8	2.11629e+06	14985.3	4247.21	395687
517	3776.45	532.33	5484.24	722.49	154.9	8.47	1.68	2.28	9.61e-05	0.00014	0.00059	2.14
	1.69	10.27	193.35	272.45	915.34	937.5	7717.35	173.15	4.33774e+06	8807.33	11417.1	429499
518	3219.36	793.53	4152.06	1104.01	181.42	8.38	1.06	1.57	9.17e-05	0.00012	0.0012	2.11
	0.96	12.55	108.13	282.8	273.65	657.43	6895.4	143.3	1.87499e+06	16911.3	7907.92	364208
519	3730.6	531.84	4876.36	830.66	261.66	8.03	1.03	1.33	4.21e-05	0.00097	0.00319	2.17
	1.08	6.42	113.64	285.75	273.48	955.06	4957.28	187.87	2.70456e+06	13246.9	5672.56	463928
520	2121.03	540.26	2880.21	670.89	111.53	9.49	1.25	1.67	6.51e-05	0.0004	0.00262	1.93
	1.4	9.05	126.08	441.39	668.22	872.87	3577.61	156.17	2.145e+06	16898	4154.61	239270
521	2450.99	453.32	3763.08	843.3	156.24	7.53	1.4	1.98	7.64e-05	0.00034	0.00164	2.63
	1.5	8.25	131.16	860.54	680.54	555.67	5407.32	133.53	3.00171e+06	17387.6	6230.54	387161
522	4765.31	218.08	6440.13	404.96	282.79	7.33	1.84	2.46	6.14e-05	0.00083	0.00312	1.18
	0.78	9.95	184.93	803.26	820.54	662.02	6493.33	191.35	4.98034e+06	7358.12	8681.41	467922
523	2104.72	447.89	3259.01	797.52	206.65	7.47	1.27	1.71	6.4e-05	0.00079	0.00311	1.88
	0.85	13.13	159.55	940.26	859.89	647.55	4655.5	132.93	1.67254e+06	18084.3	5646.32	225342
524	3826.71	507.16	4944.03	736.44	284.09	5.75	0.62	0.77	8.3e-06	0.00048	0.00249	2.79
	1.59	5.35	205.99	946.36	473	553.91	4550.58	130.61	2.5331e+06	14995.5	5320.3	264258

525	4846.78	916.6	6110.02	1699.27	126.92	5.75	1.27	1.62	9.63e-05	0.00067	0.00261	2.51
	1.18	12.66	199.87	616.36	1013.69	933.72	3224.63	151.1	3.34749e+06	11077.5	3861.35	231952
526	2800.27	514.59	3584	670.34	117.9	7.79	1.08	1.55	1.31e-05	0.00045	0.00472	2.23
	1.2	11.33	87.65	376.84	434.25	371.74	3021.9	172.51	4.85399e+06	15528.3	3912.01	399681
527	3959.79	406.41	6202.99	580.04	272.3	7.4	1.11	1.34	9.62e-05	0.00019	0.00087	2.93
	1.65	10.63	146.96	809.6	738.45	585.95	5669.72	161.48	4.48179e+06	14041.2	7443.44	245634
528	4037.27	714.4	6187.11	1259.43	222.04	9.47	1.86	2.69	7.96e-05	0.00077	0.00271	1.18
	0.54	8.29	84.43	453.88	171.6	320.69	3513.58	149.07	4.18809e+06	16861.7	5192.14	326982
529	3552.6	552.92	4527.59	1104.33	245.42	7.51	1.98	2.59	5.06e-05	0.00087	0.00206	2.09
	1.03	7.54	127.95	535.7	653.66	760.83	4806.98	132.29	4.61431e+06	14426.6	5932.17	485652
530	2842.84	909.43	3592.79	1243.55	207.05	5	1.71	2.19	7.8e-06	0.00052	0.0028	1.13
	0.66	5.76	157.14	849.03	557.87	515.16	7133.08	137.73	2.40576e+06	16827.3	8969.24	516385
531	2689.1	645.07	3471.17	1095.73	266.01	9.11	1.83	2.24	6.69e-05	0.00098	0.01054	2.22
	1.21	12.88	140.21	934.3	377.25	947.69	3625.25	193.2	3.57074e+06	8800.67	4171.5	262669
532	2993.81	349.35	3639.19	677.33	295.04	8.74	1.9	2.66	6.42e-05	0.00102	0.00352	1.78
	1.18	12.12	158.37	643.04	768.02	781.53	3948.66	188.82	4.42772e+06	10499.1	5109.24	490888
533	4938.9	834.29	7077.39	1599.14	132.48	9.99	0.94	1.35	6e-05	0.00062	0.00151	0.9
	0.6	10.59	155.56	994.26	466.52	311.7	6697.17	175.4	4.38243e+06	13606.4	8945.86	422063
534	3376.46	438.15	4510.03	719.42	217.39	9.42	1.56	2	1.52e-05	0.00076	0.00292	2.85
	1.16	6.37	235.05	975.97	1214.87	519.51	3787.7	152.64	3.16947e+06	12347.2	5326.28	326201
535	2327.86	745.11	3632.82	1460.11	108.21	9.9	1.2	1.54	9.49e-05	0.00072	0.00194	1.79
	1.26	9.78	96.31	828.68	244.89	860.18	5217.97	166.35	3.32507e+06	10760.8	6173.52	409616
536	2183.65	726.65	2909.62	1073.56	200.39	5.59	0.58	0.7	1.98e-05	0.00051	0.00226	1.83
	1.38	6.78	206.62	426.24	656.96	515.58	6672.98	199.8	4.17795e+06	16053.7	8477.21	454841
537	3563.3	418.99	5632.75	711.49	185.26	9.6	1.91	2.48	9.81e-05	0.00052	0.00173	2.39
	1.76	9.69	125.49	273.69	598.68	993.65	3934.76	160.57	4.52799e+06	11459.1	4878.09	459667
538	2754.83	282.98	4018.38	425.09	271.33	9.14	1.63	2.43	3.82e-05	0.00022	0.00161	1.12
	0.81	10.73	241.25	532.34	1347.41	427.56	7374.72	200	4.18409e+06	11153	8346.23	541893
539	4675.68	473.79	6997.85	800.83	258.46	7.2	0.74	1.07	8.47e-05	0.00079	0.00397	2.45
	1.35	9.17	235.7	749.43	793.91	385.2	5295.04	147.9	4.38609e+06	12910.6	5945.73	497468
540	4471.43	718.75	5852.37	1328.5	135.93	8.33	1.08	1.5	7.72e-05	0.00103	0.00642	2.1
	1.56	5.21	63.2	913.45	291.65	771.15	3084.33	196.75	2.84914e+06	8158.28	4512.67	287074
541	4250.77	772.64	5633.64	985.77	134.15	7.83	1.98	2.73	3.3e-05	0.00012	0.0009	2.62
	1.56	12.37	160.68	974.69	468.11	307.74	7487.69	160.61	1.58777e+06	17735.3	9296.19	486244
542	3349.46	599.07	4157.85	1087.66	132.84	9.69	1.84	2.24	5.12e-05	0.00027	0.00096	1.69
	1.24	11.08	104.04	248.42	479.63	841.68	7232.17	176.84	2.17058e+06	11462.6	10820.9	214272
543	4132.45	582.23	6588.66	708.39	141.27	5.88	1.21	1.57	3.25e-05	0.00024	0.0011	2.99
	1.42	7.5	235.36	748.32	766.81	699.31	3693.75	138.72	3.75606e+06	14663.6	4524.32	364771
544	2163.46	584.3	2840.45	1122.78	268.93	6.6	1.04	1.49	7.92e-05	0.00082	0.0088	1.44
	0.94	12.32	178.84	622.22	358.83	901.76	4057.06	145.39	3.61313e+06	11051.8	5357.96	380792
545	2572.49	946.11	3319.24	1660.44	226.62	9.47	1.3	1.59	4.16e-05	0.00034	0.00185	1.08
	0.48	10.1	124.96	914.23	321.91	941.92	4776.4	185.43	4.53316e+06	16024.2	5817.34	285527
546	2756.05	481.8	4059.35	867.45	226.65	7.86	1	1.27	8.26e-05	0.00042	0.00274	1.84
	1.08	5.63	91.82	633.88	289.43	258.84	7840.48	175.41	4.92026e+06	11179.4	9666.46	210887
547	2918.69	506.5	3561.58	735.25	277.38	6.09	1.33	1.76	8.1e-06	0.00031	0.00219	1.33
	0.99	11.5	51.44	430.22	229.8	967.64	7567	136.9	4.10192e+06	12375.5	11026.5	248122
548	2854.46	934.51	4506.01	1733.7	116.34	5.21	1.37	1.95	1.81e-05	0.00024	0.0012	2.73
	1.94	13.01	106.04	956.63	306.79	213.74	5392.04	167.6	3.6117e+06	7325.69	7140.55	424266
549	3130.51	765.26	4733.85	1310.39	116.79	5.56	1.48	2.06	3.69e-05	0.0003	0.00084	1.51
	0.85	11.68	243.56	813.67	1214.74	892.32	4494.13	131.16	4.32137e+06	13045	6444.9	337598
550	2064.19	914.13	2663.49	1199.11	283.07	8.42	1.92	2.56	5.05e-05	0.00025	0.00282	2.97
	1.39	6.7	59.43	924.54	306.54	717.89	7407.11	135.58	2.71306e+06	15002.3	9136.85	438059
551	2463.95	859.47	3658.16	1492.98	273.83	8.34	1.23	1.72	9.41e-05	0.00049	0.00424	2.31
	1.34	9.66	225.53	275.16	909.75	359.34	4271.9	161.07	2.71733e+06	14080.6	5082.86	270193
552	3764.53	975.94	5174.09	1295.39	145.45	5.77	0.73	0.98	1.35e-05	0.0004	0.00101	2.48
	1.86	7.55	136.26	573.29	374.92	884.25	6740.75	194.42	2.21305e+06	11368.7	9606.49	447221
553	2658.98	209.17	4227.91	309.14	269.96	7.35	1.02	1.45	6.52e-05	0.0007	0.00186	1.67
	1.19	9.54	70.19	504.34	409.77	413.25	6024.49	129.97	3.21667e+06	12700.8	8459.95	437059
554	3910.67	580.49	5432.31	847.41	106.72	7.25	0.57	0.78	5.16e-05	0.00017	0.00067	2.78
	1.63	9.81	82.09	851.92	230.15	942.19	4392.93	140.15	1.40782e+06	9405.09	5851.76	284463
555	3202.53	728.03	4656.54	1443.81	278.6	6.46	0.71	0.91	4.05e-05	0.00106	0.01214	1.85
	1.22	12.36	129.92	449.15	471.84	977.12	3551.26	181.8	4.81078e+06	8090.33	4983.55	384539
556	2032	239.02	3054.04	335.26	243.45	8.86	1.8	2.29	9.6e-05	0.00033	0.0014	2.87
	1.39	11.56	98.53	279.87	281.05	996.27	6693.42	199.64	1.4786e+06	14765.7	7658.12	268364
557	2717.02	712.34	3481.96	1059.03	188.93	5.11	1.35	1.83	1.35e-05	0.00052	0.00116	2.09
	1.34	5.54	112.39	528.49	568.21	834.13	5696.84	188.46	2.15672e+06	18005	8542.77	340191
558	4183.07	546.82	6365.58	746.28	107.07	8.16	0.61	0.8	2.83e-05	0.00033	0.00107	1.48
	0.76	10.42	126.41	437.05	427.48	582.43	7556.1	183.14	3.71972e+06	14203.2	9787.27	373210
559	2408.94	401.81	3363.85	515.12	188.12	7.3	1.6	2.36	2.77e-05	0.0004	0.00407	2.74
	1.93	6.21	199.37	291.17	559.86	672.52	3051.84	187.47	4.58403e+06	9802.06	4213.12	469057
560	3027.16	524.82	4211.34	898.57	226	8.47	0.61	0.74	7.89e-05	0.00037	0.00152	1.84
	0.74	13.58	184.83	329.67	931.85	823.01	5882.62	151.05	1.49092e+06	16049.7	8412.5	302360
561	2322.97	281.26	3491.55	348.53	208.23	5.16	1.63	2.42	1.9e-06	0.00017	0.0019	2.01
	0.87	8.68	61.06	343.77	136.37	420.48	3769.1	185.63	3.31005e+06	7706.58	4815.49	325694
562	4452.79	852.35	6276.53	1437.78	133.41	5.49	1.24	1.83	8.11e-05	0.00107	0.00989	0.91
	0.37	13.23	200.39	239.85	979.21	419.56	3630.12	169.43	3.84909e+06	10844.4	5402.61	490890
563	3715.72	427	5754.87	744.67	111.58	8.61	1.71	2.38	2.7e-06	0.00011	0.00126	2.24
	1.72	9.72	69.56	847.98	199.76	303.6	3972.1	135.7	3.99777e+06	8911.6	4878.51	443256
564	4020.72	381.2	5226.48	563.52	160.7	5.34	1.28	1.68	7.85e-05	0.00011	0.0007	1.93
	0.94	6.19	130.99	587.28	738.07	222.97	4984.85	186.55	4.60214e+06	7923.57	6835.05	319267
565	3554.03	909.79	5562.91	1411.58	189.64	7.17	0.82	1.22	2.9e-06	0.00046	0.00228	1.88
	1.15	9.52	156.15	921.52	772.23	503.77	4454.95	183.03	2.5395e+06	14111.1	5123.82	364135
566	3261.63	692.87	4830.88	858.7	221.6	7.63	0.75	0.98	3.4e-06	0.00052	0.00353	1.34
	0.66	9.47	150.37	495.98	510.66	259.2	4261.7	142.24	1.59918e+06	17831.6	4981.37	392389
567	2080.41	926.56	3249.2	1628.7	206.82	5.11	1.13	1.62	5.97e-05	0.00092	0.00606	2.39
	1.02	11.41	225.59	420.27	714.42	497.74	4257.54	194.81	3.46626e+06	14131.2	6086.13	347261
568	2446.68	233.44	3498.31	455	153.49	7.8	0.6	0.87	8.57e-05	0.00047	0.00213	2.26
	1.53	7.19	144.19	485.92	646.09	879.63	3595.6	197.08	3.79827e+06	7840.17	4016.33	268344
569	3819.21	541.27	4722.03	1051.06	201.9	9.1	1.69	2.32	8.53e-05	0.00032	0.00202	2.54
	1.2	13.97	206.13	279.24	1145.79	624.13	6012.53	186.69	4.01687e+06	10797.5	8445.04	279835
570	2255.1	978.31	2773.2	1679.83	218.66	8.33	1.99	2.4	9.32e-05	0.00039	0.00386	2.74
	1.39	5.07	131.92	922.35	570.47	971.34	3455.87	163.24	4.7377e+06	16174.9	4619.31	313501
571	3231.97	242.45	4845.74	338.95	186.31	5.61	1.38	1.88	6.6e-06	0.00016	0.00079	1.31
	0.68	11.87	53.76	228.91	141.77	826.12	5989.38	198.57	4.95408e+06	14232.3	7699.38	330720
572	2968.87	805.14	4615.52	1135.12	264.41	5.43	0.72	0.93	2.19e-05	0.00018	0.002	2.99
	1.92	10.11	208.66	587.46	469.97	842.44	5801.74	121.22	3.18821e+06	17980.8	8464.16	395798

573	2954.23	958.2	4476.44	1483.26	127.83	5.69	0.7	0.9	7.11e-05	0.0002	0.002	1.48
	1.09	10.72	81.73	208.22	363.59	214.8	4995.04	173.47	3.86903e+06	8526.97	6879.78	291457
574	3850.59	289.97	5594.86	539.32	133.79	8.79	0.81	1.13	7.04e-05	0.00029	0.00072	1.3
	0.68	5.12	85.45	966.48	237.77	435.89	5958.77	178.9	2.80272e+06	11397	7999.39	335053
575	3647.48	707.54	5021.21	1207.51	167.38	9.2	0.82	1.17	9.3e-06	0.00016	0.00154	1.06
	0.47	13.95	182.94	779.95	864.16	319.83	5471.94	137.85	4.36709e+06	12161.1	6706.92	223178
576	3298.95	353.98	5136	543.19	117.43	6.07	0.6	0.76	9.11e-05	0.00048	0.00129	2.58
	1.07	10.7	90.18	990.03	205.22	516.14	3732.24	151.02	3.89374e+06	7348.43	4947.08	263078
577	3904.61	898.14	5479.04	1455.21	268.59	7.74	1.19	1.46	9.32e-05	0.00018	0.0016	2.49
	1.08	10	105.81	872.28	486.35	386.96	7852.77	180.01	3.78657e+06	13538.9	9135.77	447675
578	2687.83	434.52	3805.97	617.47	280.48	5.27	1.15	1.7	9.11e-05	0.00026	0.00176	2
	1.16	9.5	58.51	855.83	312.08	849.31	4731.2	147.86	1.69512e+06	15878.8	6914.48	270574
579	4499.81	671.94	5634.61	860.08	108.35	5.35	0.87	1.21	4.75e-05	0.00041	0.00192	2.17
	1.49	10.72	161.43	920.42	608.46	626.25	4783.39	183.85	1.54276e+06	11095.8	6611.53	422220
580	2074.07	461.86	2876.48	877.9	280.4	8.99	0.74	1.05	5.48e-05	0.00036	0.00208	1.18
	0.71	9.34	77.43	247.69	316.12	338.26	4430.54	152.89	4.71045e+06	10517.6	6263.1	332559
581	3651.12	961.78	5553.37	1594.19	279.4	7.96	1.17	1.7	9.28e-05	0.00079	0.00242	2.96
	1.63	10.67	176.57	638.05	899.87	800.79	5833.16	143.18	3.53521e+06	13285.1	6820.68	245833
582	2675.05	608.69	3738.79	961.19	101.83	9.07	0.98	1.25	8.36e-05	0.00044	0.00328	2.53
	1.95	8.65	184.62	690.54	453.34	964.18	6277.13	128.75	3.21073e+06	17652.1	6999.24	277328
583	4191.27	948.09	5284.39	1339.47	149.83	5.67	1.98	2.65	1.04e-05	0.00025	0.00237	1.38
	0.73	11.67	102.54	404.41	446.91	300.43	4750.76	154.6	3.9461e+06	7780.32	5697.26	365886
584	3788.29	625.92	4845.24	1108.93	221.63	5.46	1.14	1.53	2.86e-05	0.00018	0.00117	1.65
	0.72	13.17	58.64	575.16	229.34	776.6	3951.91	128.89	1.98631e+06	8335.79	5338.2	416540
585	2928.07	888.75	4526.48	1182.41	218.73	6.54	1.37	1.95	3.92e-05	0.00014	0.00128	2.34
	1.48	9.8	218.74	611.11	560.96	503.43	4160.24	156.09	1.05085e+06	9970.59	5672.92	356459
586	3729.64	816.05	5907.39	1418.92	158.84	5.79	1.29	1.61	8.52e-05	0.0008	0.00186	1.74
	1.28	7.09	73.55	380.77	429.41	924.32	5818.12	182.35	3.30801e+06	12092.6	7273.92	370765
587	2411.28	858.71	3222.65	1590.56	148.74	9.1	1.55	1.9	7.87e-05	0.00062	0.00554	1.75
	1.01	6.06	54.69	384.61	187.08	746.53	4718.46	184.6	2.69546e+06	14909.7	5990.73	481793
588	2387.96	926.67	3403.62	1291.69	260.8	6.84	1.03	1.35	1.59e-05	0.0008	0.00601	2.34
	1.8	10.1	173.33	742.91	776.07	491.09	3096.2	143.75	2.24528e+06	14095	4208.47	395267
589	4852.91	505.89	7015.04	869.69	249.69	9.22	0.55	0.76	9.4e-06	0.00096	0.00268	1.79
	0.96	10.42	74.97	328.54	338.25	354.22	5195.09	153.86	4.07246e+06	10781.8	7578.4	400917
590	3799.88	649.96	4726.5	883.86	145.52	9.88	1.8	2.34	6.69e-05	0.00065	0.00142	1.49
	0.72	7.67	99.39	235.61	522.51	693.64	5144.92	185.6	3.04133e+06	10345.4	6933.91	407102
591	3282.87	922.79	4514.31	1533.96	276.88	8.34	1.97	2.61	7.22e-05	0.00082	0.00944	2.97
	2.15	10.52	53.32	596.55	190.02	766.45	6916.36	181.01	4.72313e+06	14372	8142.74	528958
592	3594.5	952.82	5514.27	1442.44	291.36	8.51	1.36	1.86	6.5e-05	0.00096	0.00227	2.14
	1.19	6.04	81.11	421.08	234.31	857.56	3827.05	127.65	2.74194e+06	10636	5713.61	363231
593	2477.39	947.3	3404.92	1255.66	165.05	7.06	1.91	2.51	7.24e-05	0.00081	0.00722	0.94
	0.67	12.64	98.7	270.03	226.43	669.21	4357.53	158.14	4.96311e+06	15630.5	4965.95	233956
594	2473.46	782.24	3957.11	1150.91	119.56	6	1.2	1.47	8.91e-05	0.00059	0.00644	1.44
	0.83	8.07	136.01	360.96	455.21	876.75	3672.27	124.63	4.52344e+06	17317.6	4602.49	476637
595	4493.65	896.38	7097.61	1365.98	203.95	5.54	0.79	0.96	6.91e-05	0.00025	0.00151	2.06
	0.89	5.27	201.17	881.53	991.57	800.48	7593.05	185.77	2.67461e+06	16992.9	10668.2	374451
596	4101.22	566.87	6208.75	766.97	271.07	7.12	0.73	0.99	1.47e-05	0.00014	0.00085	1.65
	0.99	12.02	196.34	665.73	877.94	349.03	5902.68	153.22	3.1659e+06	16675.5	6607.41	373333
597	3404.3	641.6	4903.4	1160.1	245.91	7.13	0.81	1.02	9.39e-05	0.00051	0.00466	2.51
	1.33	12.34	208.37	401.33	570.33	473.89	4438.21	172.5	4.59502e+06	13023.8	5460.42	299044
598	2903.41	876.95	3864.37	1403.63	234.56	9.94	1.53	1.94	6.89e-05	0.00023	0.00154	1.8
	1.2	7.3	225.08	990.67	661.8	991.01	4840.99	168.07	2.74859e+06	13750.6	7210.8	453153
599	2736.8	635.1	4226.88	860.07	120.25	8.79	1.24	1.54	8.19e-05	0.00021	0.00164	2.74
	1.2	6.76	67.57	697.57	308.08	371.26	3828.48	156.7	3.62405e+06	10828.5	4611.73	223046
600	2311.08	383.58	3343.83	714.32	118.04	6.18	0.57	0.69	2.01e-05	0.00042	0.00222	1.49
	0.84	13.18	116.23	598.76	471.66	801.07	7825.71	142.2	3.33691e+06	10397	10308.8	417566
601	2088.31	390.25	2834.7	564.99	113.91	8.34	1.8	2.29	3.83e-05	0.00082	0.00308	1.75
	1.34	6.51	147.26	909.24	592.46	538.85	5038.96	139.11	3.44159e+06	12937.7	6067.42	428534
602	3535.98	696.02	4741.59	1286.33	184.34	5.22	0.62	0.91	0.0001002	0.00067	0.00248	2.63
	1.31	13.49	182.36	317.75	860.66	242.46	6795.41	127.04	3.1739e+06	14100.6	7741.83	238221
603	2178.27	631.49	3415.17	1184.39	200.85	5.13	0.51	0.74	5e-05	0.00045	0.00527	2.48
	1.51	11.92	248.03	665.56	1413.89	380.1	6171.46	136.76	2.85246e+06	16401.2	8393.41	366078
604	2552.44	879.24	3448.13	1144.17	290.86	9.54	1.12	1.55	4.21e-05	0.00076	0.0021	2.26
	1.48	10.12	148.82	526.37	561.9	354.67	4328.33	169.94	3.35683e+06	17402.6	5093.72	296816
605	4800.61	775.97	7476.87	1127.33	235.22	7.06	1.43	1.81	3.95e-05	0.00055	0.00438	1.05
	0.76	11.66	166.41	265.32	968.96	918.9	3776.94	146.08	3.76289e+06	10920.5	5232.43	498580
606	4764.01	709.35	5843.25	907.81	156.84	8.72	1.72	2.19	6.02e-05	0.00027	0.00138	2.46
	1.07	11.42	238.1	639.71	793.15	222.27	4521.47	172.45	3.55472e+06	15475.6	5632.15	546447
607	2137.05	634.72	2756.86	976.28	257.68	9.18	1.39	2.04	1.7e-05	0.00062	0.00389	2.1
	0.93	10.02	160.82	320.93	353.82	561.95	3776.11	152.33	3.70289e+06	12995.3	5252.53	232347
608	2120.74	660.22	2575.02	1035.17	147.73	6.22	1.22	1.46	6.03e-05	0.00026	0.00265	1.46
	0.79	13.67	84.97	980.05	176.58	646.91	3444.2	149.73	3.58355e+06	10549.2	4279.83	250113
609	3296.87	434.15	4414.16	776.75	235.37	5.24	1.84	2.59	8.07e-05	0.00045	0.00189	2.68
	1.77	5.85	124.18	864.79	258.19	833.16	7624.44	162.3	3.0906e+06	17273	8971.23	223858
610	3697.79	950.16	5318.45	1498.19	213.85	7.85	1.34	1.71	1.94e-05	0.00081	0.00972	2.12
	1.63	13.89	102.6	926.59	455.6	997.4	3233.35	187.74	4.57906e+06	9167.15	3830.19	310583
611	3310.65	590.78	5282.67	1024.16	297.14	6.43	0.89	1.09	8.76e-05	0.00099	0.00676	2.22
	0.92	6.35	212.53	701.83	787	661.42	4457.08	143.12	4.76445e+06	8671.37	6242.21	392946
612	2418.77	232.28	3087.32	400.51	245.47	8.53	1.92	2.65	5.44e-05	0.00064	0.00351	1.36
	1.06	9.11	132.61	263.16	553.97	726.14	7752.5	199.48	3.98244e+06	8902.83	10086.2	368293
613	3064.44	769.75	3760.76	1412.13	213.09	6.59	1.54	1.98	5.13e-05	0.00069	0.00176	1.67
	0.84	11.22	157.06	318.55	830.97	505.33	7322.03	170.35	2.13797e+06	15764.9	10440	489428
614	3502.82	833.95	4561.78	1313.34	232.8	6.03	1.77	2.23	6.12e-05	0.00097	0.00356	1.7
	1.08	8.53	53.51	870.01	203.84	593.97	5805.77	176.03	4.68806e+06	15338.3	6480.78	354695
615	2875.39	478.32	4267.16	743.55	171.61	5.61	1.86	2.46	6.88e-05	0.00025	0.00194	1.06
	0.43	8.76	174.23	260.34	634.59	899.6	5380.71	140.02	2.71014e+06	13074.8	6597.76	498065
616	3495.38	754.36	5389.29	1498.2	229.45	5.42	1.76	2.48	8.85e-05	0.0006	0.00128	1.91
	1.38	8.7	85.8	632.2	176.94	352.64	4259.29	126.88	3.96254e+06	14073.6	4903.7	378066
617	4753.14	631.76	6020.54	1103	109.66	8.12	1.09	1.4	3.8e-05	0.00025	0.00087	2.18
	1.37	12.71	125.99	814.05	393.76	916.09	4447.91	171.5	1.20704e+06	12580.3	6249.86	202733
618	3009.63	492.25	4478.29	933.41	257.7	7.9	0.89	1.13	9.49e-05	0.00021	0.00116	0.99
	0.41	8.77	230.3	224.51	1072.52	900.92	5641.66	177.13	3.40327e+06	7604.15	8419.48	383572
619	4172.2	652.74	5660.91	898.33	237.49	9.49	1.82	2.36	8.04e-05	0.00053	0.00233	1.97
	1.27	5.27	160.22	790.23	848.05	483.08	5768.08	148.58	4.54863e+06	7540.8	6945.32	367497
620	3291.21	816.55	4525.67	1059.8	127.79	6.47	1.66	2.28	4.5e-05	0.00108	0.00814	2.51
	1.06	6.06	123.49	591.52	654.55	654.75	4069.05	172.75	4.30314e+06	9720.55	5407.01	398916

621	2816.14	440.02	3455.91	692.49	278.16	6.14	1.48	1.8	9.5e-05	0.00051	0.00266	2.84
	2.06	8.94	230.1	353.99	1163.42	697.85	4290.93	178.04	2.64951e+06	14280.9	4844.56	381758
622	3492.86	930.76	4983.37	1237.42	121.21	9.73	1.79	2.44	7.72e-05	0.00029	0.00315	2.11
	0.94	11.49	147.13	515.41	418.98	690.18	4649.42	165.34	3.68314e+06	8522.49	5120.94	203713
623	4157.07	758.93	5870.17	931.35	147.3	5.42	1.82	2.6	3.04e-05	0.00015	0.00042	1.47
	0.62	10.72	236.81	580.34	937.35	346.13	5498.38	171.89	1.19238e+06	10805	6671.88	232112
624	4577.78	998.7	7219.96	1535.27	136.31	8.84	1.13	1.37	9.22e-05	0.00079	0.00232	2.8
	1.75	13.45	114.49	440.79	678.15	394.45	5572.81	169.33	2.78822e+06	7306.09	7386.04	431577
625	3417.98	256.52	5053.88	460.34	258.16	6.2	1.07	1.51	5.96e-05	0.00015	0.00111	0.94
	0.45	8.66	161.03	538.19	489.29	664.11	5093.47	135.35	4.48855e+06	13482.5	6437.35	474024
626	4068.66	627.87	6037.59	768.06	228.78	7.14	1	1.46	8.92e-05	0.00042	0.00162	1.66
	0.86	5.93	118.51	276.24	494.05	362.34	4548.47	127.5	1.38326e+06	14354.5	5064.64	460406
627	2289.18	408.13	3040.13	518.98	206.42	9.61	1.81	2.34	6.43e-05	0.00035	0.00407	2.16
	1.1	13.29	116.11	520.81	315	455.23	7426.87	188.51	2.98815e+06	7381.79	8201.42	406219
628	3679.48	225.51	4609.91	317.62	290.21	5.27	1.23	1.6	1.09e-05	0.00105	0.0024	1.6
	1.08	11.16	106.7	548.69	551.41	698.35	4440.25	139.56	2.02748e+06	15905.4	5207.12	416235
629	4183.44	371.18	5951.51	584.75	154.42	8.15	1.78	2.52	6.75e-05	0.00058	0.00184	1.16
	0.55	10.07	119.67	332.95	477.56	408.55	5623.07	145.11	1.75587e+06	13379.5	7901.73	475974
630	2487.56	816.68	3838.64	1170.42	190.11	6.54	1.57	1.9	9.52e-05	0.00018	0.00153	2.73
	1.2	8.42	85.22	756.17	296.53	306.28	7212.18	144.89	4.93877e+06	12131.4	10529.8	448357
631	4354.13	626.02	5870.1	1250.12	276.13	7.46	1.4	1.69	2.42e-05	0.00036	0.00161	1.5
	0.64	8.94	233.23	454.78	1016.21	994.25	3214.64	187.44	1.79589e+06	9286.56	4247.89	248569
632	3551.08	503.62	4433.94	801.72	209.57	7.66	0.84	1.18	5.03e-05	0.00017	0.00075	2.89
	2.09	8.95	231.13	747.81	1046.36	728.61	7700.44	187.36	1.34254e+06	16752.8	10521.5	339767
633	3716.66	862.86	5041.58	1407.52	287.97	9.79	1.84	2.27	9.95e-05	0.00087	0.00274	2.71
	1.57	7.5	143.88	718.15	706.1	981.62	5165.7	184.07	4.01216e+06	7774.96	7739.93	445777
634	3982.61	666.34	5634.77	1149.85	207.88	7.52	0.68	0.86	7.51e-05	0.00015	0.00122	1.79
	0.84	7.96	90.34	583.76	212.88	554.91	5105.2	158.33	4.83963e+06	17069	6582.77	219478
635	2971.83	689.2	4198.17	920.16	208.08	7.6	1.02	1.52	4.2e-05	0.00102	0.00319	2.29
	0.93	11.93	113.96	283.59	456.19	240.05	6170.47	128.11	4.39171e+06	10883.6	7595.01	497110
636	3382.12	945.75	5146.03	1717.87	212.43	7.28	1.91	2.75	4.89e-05	0.00069	0.0054	1.16
	0.88	13.86	149.94	548.35	861.05	227.61	3961.13	155.85	1.69073e+06	11905.5	4361.38	323049
637	2635	445.1	3451.56	630.16	260.07	9.31	0.71	1.05	7.46e-05	0.00083	0.00331	2.8
	1.36	7.52	75.85	654.77	221.3	651.15	5156.04	128.14	4.01057e+06	9811.31	6101.36	488581
638	4347.96	422.46	6005.8	766.17	160.13	7.3	1.1	1.61	4.28e-05	0.00096	0.00249	1.29
	0.82	5.43	222.71	256.51	524.24	984.52	3273.66	170.98	1.94643e+06	16541.2	4388.89	453658
639	2087.12	820.47	3122.63	1256.42	212.96	6.86	0.93	1.21	5.95e-05	0.00061	0.00719	2.91
	1.72	8.05	228.74	846.92	818.29	298.13	5298.39	180.29	1.90989e+06	12786.1	7896.19	491682
640	2210.3	788.27	3406.02	1490.31	258.88	5.68	0.71	1.04	2.5e-05	0.00049	0.00569	1.65
	0.99	10.71	54.75	272.04	118.35	854.62	4370.68	193.07	3.24796e+06	7851.26	6236.42	228985
641	2025.32	771.71	2853.65	1349.15	261.42	8.05	0.72	0.88	3.95e-05	0.00076	0.00564	2.58
	1.98	5.89	57.15	773.83	141.26	864.91	4432.55	178.36	2.57196e+06	13854.1	6299.61	434019
642	3891.28	941.74	5340.29	1732.75	190.05	8.73	1.25	1.83	8.14e-05	0.00043	0.00171	1.35
	0.96	5.51	208.71	865.38	559.87	217.63	7737.44	120.58	3.52437e+06	8255.93	10015.6	432411
643	2882.71	627.32	4288.31	991.99	155.52	6.36	1.93	2.7	4.45e-05	0.00078	0.00449	0.93
	0.67	5.54	243.02	731.68	595.38	265.15	4497.47	162.48	3.56992e+06	17796.6	6356.63	298340
644	2962.91	752.04	4173.15	1183.89	284.44	7.29	1.62	2.28	1.8e-06	0.00083	0.00413	2.27
	1.77	5.69	82.04	344.92	317.72	958.85	3768.35	141.68	4.23137e+06	11521.6	4630.12	407702
645	3357.95	618.67	5258.25	781.35	206.78	5.11	0.87	1.13	4.9e-06	0.0002	0.00155	2.15
	0.99	5.89	146.76	415.97	680.76	777.67	5732.54	153.42	2.82058e+06	17965.2	7962.82	435989
646	3197.94	784.93	4585.6	1500.97	180.92	9.12	1.25	1.59	5.9e-06	0.00078	0.00211	1.2
	0.66	5.99	146.8	745.37	418.58	705.94	6349.09	174.56	2.84569e+06	10290.5	8699.34	296852
647	3586.96	992.35	4472.65	1656.34	170.07	8.54	1.59	2.31	7.86e-05	0.00058	0.00352	2.45
	1.1	6.7	77.71	728.25	372.49	446.91	4150.15	130.29	4.71558e+06	9348.57	4692.43	451522
648	2826.57	279.13	3894.49	436.81	255.42	5.4	1.09	1.51	9.9e-05	0.00062	0.00576	2.89
	1.37	12.14	171.04	408.08	872.23	707.35	5676.74	193.31	2.8927e+06	9107.91	7651.94	493146
649	3769.8	882.48	5222.86	1706.27	209.16	8.4	0.61	0.9	6.65e-05	0.00067	0.00403	2.59
	1.98	6.72	220.73	985.83	527.7	639.67	3897.74	156.96	3.63237e+06	9177.26	5005.39	490330
650	2858.92	743.74	4472.22	1351.91	233.8	8.18	1.93	2.55	2.4e-05	0.00059	0.006	1.12
	0.5	5.87	76.96	697.14	305.69	540.18	4026.08	198.18	4.65662e+06	13110.9	4700.23	483917

The following table includes data for qsf-qsf case.

Data #	L_{hw} (ft)	L_f (ft)	L_x (ft)	L_y (ft)	h (ft)	ϕ_m (%)	ϕ_f (%)	SRV-ϕ_m (%)	k_m (md)	k_f (md)	SRV-k_m (md)	Δx_s (ft)
	SRV-Δx_s (ft)	S_{wf} (%)	V_{L-CH_4} (scf/ton)	P_{L-CH_4} (psi)	V_{L-CO_2} (scf/ton)	P_{L-CO_2} (psi)	P_i (psi)	T_i (F)	$q_{sf-prod}$ (scfd)	t_{prod} (days)	q_{sf-inj} (scfd)	P_{sf-inj} (psi)
1	3197.94	784.93	4585.6	1500.97	180.92	9.12	1.25	1.59	5.9e-06	0.00078	0.00211	1.2
	0.66	5.99	146.8	745.37	418.58	705.94	6349.09	174.56	2.84569e+06	10290.5	3.83021e+06	8699
2	3836.67	811.41	4856.19	1087.06	158.72	5.03	1.4	2.09	8.3e-06	0.00073	0.00167	1.41
	0.78	6.01	219.14	912.14	828.44	670.79	4279.34	124.03	4.4449e+06	14302.1	3.66445e+06	6126
3	3577.54	753.79	5632.78	1383.04	254.5	8.2	1.87	2.8	6.28e-05	0.00052	0.00449	2.83
	1.89	12.38	106.26	733.94	266.76	679.53	4052.88	181.88	4.52571e+06	16201.1	3.83534e+06	5999
4	2738	585.68	3612.55	932.49	129.66	7.7	1.39	2	5.22e-05	0.00104	0.00214	2
	1.54	7.3	51.36	899.04	172.33	470.17	5003.52	170.63	2.04999e+06	15777.1	889581	5728
5	2066.81	246.36	2651.42	399.28	168.28	6.02	1.75	2.27	1.8e-06	0.00101	0.00297	1.53
	0.64	13.18	167.62	248.27	772.95	791.84	3919.39	193.81	2.78601e+06	11647.5	1.12416e+06	5342
6	3696.14	499.75	5169.18	765.87	198.38	8.61	1.05	1.52	8.53e-05	0.00041	0.00255	1.72
	1.26	12.25	171.79	882.72	410.88	997.32	3570.21	188.92	3.93584e+06	13226.9	2.33366e+06	4067
7	2015.25	607.92	3087.3	736.92	191.65	5.83	1.44	2.12	4.27e-05	0.00095	0.01029	1.82
	1.27	8.3	101.2	513.32	282.59	741.97	4093.98	197.96	4.72861e+06	10064.7	2.31464e+06	4955
8	3619.8	377.76	4734.5	488.21	260.41	5.84	1.87	2.31	8.26e-05	0.00087	0.00556	2.3
	1.08	12.29	90.24	588.98	256.58	790.66	3471.46	146.2	2.22389e+06	16114.2	3.73715e+06	4282
9	2471.49	580.98	3612.67	788.32	189.12	9.95	1.37	2.05	1.24e-05	0.00038	0.00123	2.27
	1.34	13.39	216.15	610.91	1245.82	394.65	6717.42	161.79	3.43216e+06	12041	1.06307e+06	9719
10	3317.15	954.94	3985.78	1747.29	133.84	5.91	1.52	2.1	0.0001005	0.0006	0.00464	1.03
	0.73	10.4	144.01	366.9	610.6	754.65	3929.01	182.58	4.1314e+06	12978.8	1.96109e+06	5285
11	4858.15	872.53	6261.65	1616.59	172.74	6.73	1.83	2.6	3.45e-05	0.00061	0.00241	1.8
	1.22	10.07	149.98	591.89	574.17	973.01	5267.5	192.38	2.49403e+06	15578.9	2.54028e+06	7348
12	2811.11	758.19	3537.22	1328.99	262.59	8.11	0.85	1.23	5.89e-05	0.00094	0.0037	1.34
	0.82	7.64	117.69	447.61	587.86	513.84	5322.01	129.9	4.70774e+06	10136.6	2.04793e+06	7758
13	3818.26	734.72	4881.9	1420.01	270.67	9.09	0.74	1.08	7.55e-05	0.00035	0.00246	2.52
	2.01	9.38	204.33	217.08	1183.62	233.56	5896.93	188.6	3.2794e+06	14308.5	706530	6136
14	2652.69	983.09	3709.64	1388.51	248.46	8.29	0.65	0.88	3.7e-05	0.00047	0.00123	1.59
	1.15	10.85	102.45	796.85	283.36	834.22	7949.21	137.62	2.35843e+06	14592.4	2.41223e+06	10528
15	4768.51	934.34	6052.41	1395.59	131.25	7.95	1.19	1.73	8.22e-05	0.00048	0.00192	2.24
	1.46	5.88	155.61	667.43	416.12	948.12	6511.32	120.02	3.41903e+06	9271.52	2.79685e+06	8737
16	4131.64	916.9	5116.78	1226.55	288.85	5.97	1.4	1.71	1.4e-05	0.00095	0.00519	2.36
	1.74	10.87	179.87	483.72	452.58	870.92	4027.95	196.57	2.92102e+06	12152.5	2.11232e+06	4778
17	2830.43	863.28	3935.51	1136.64	120.75	9.09	1.79	2.16	7.59e-05	0.00033	0.00343	1.22
	0.68	10.5	175.67	266.07	639.44	553.4	4774.49	173.61	2.58664e+06	7607.85	2.21436e+06	5260
18	3442.22	424.51	5122.99	726.99	265.47	5.74	1.14	1.49	6.97e-05	0.00042	0.00212	1.84
	0.84	7.33	174.09	581.98	525.63	818.49	4405.32	166.93	1.56264e+06	10220.1	1.85046e+06	5679
19	4273.36	872.38	5191.26	1473.01	116.92	9.47	0.99	1.22	1.27e-05	0.00108	0.00331	2.79
	1.47	5.28	202.11	585.13	867.08	775.67	6293.52	145.74	4.22945e+06	7588.26	1.03405e+06	8308
20	4540.24	561.22	6379.74	1091.68	103.75	9.9	1.84	2.27	1e-06	0.00016	0.00071	2.26
	1.49	7.12	147.48	622.99	475.66	580.36	6087.63	192.29	3.16032e+06	10648.9	993710	7754
21	4101.22	566.87	6208.75	766.97	271.07	7.12	0.73	0.99	1.47e-05	0.00014	0.00085	1.65
	0.99	12.02	196.34	665.73	877.94	349.03	5902.68	153.22	3.1659e+06	16675.5	2.89141e+06	6607
22	3987.14	999.35	5695.24	1720.49	238.5	9.88	0.64	0.94	7.53e-05	0.00069	0.00563	1.33
	0.86	8.56	122.81	628.78	413.31	972.29	3510.53	144.56	3.2328e+06	16711.5	1.73919e+06	4418
23	4269.14	851.59	5622.32	1026.25	235	6.22	1.67	2.16	3.02e-05	0.00059	0.00145	2.56
	2.01	6.27	56.73	640.94	325.68	269.05	5309.96	161.23	3.77492e+06	17148.5	1.06414e+06	5695
24	2463.95	859.47	3658.16	1492.98	273.83	8.34	1.23	1.72	9.41e-05	0.00049	0.00424	2.31
	1.34	9.66	225.53	275.16	909.75	359.34	4271.9	161.07	2.71733e+06	14080.6	3.94635e+06	5083
25	4337.91	744.77	5475.56	1334.2	226.23	9.41	1.21	1.59	5.46e-05	0.0002	0.00086	2.95
	1.21	12.84	79.62	801.78	162.37	405.47	4344.58	148.66	3.6223e+06	7431.29	1.27261e+06	5686
26	3273.71	270.58	4236.18	435.56	223.85	9.08	1.2	1.55	9.09e-05	0.00037	0.00126	1.85
	1.34	9.23	201.68	784.55	1047.46	863.76	3160.13	150.34	2.72683e+06	17020.7	1.57092e+06	4250
27	2639.36	980.92	4208.58	1617.39	122.25	5.31	0.68	1.01	9.69e-05	0.00059	0.00379	2.93
	1.51	12.38	168.94	508.74	784.1	443.35	4812.28	129.65	1.78151e+06	13988.2	3.75481e+06	6902
28	3982.61	666.34	5634.77	1149.85	207.88	7.52	0.68	0.86	7.51e-05	0.00015	0.00122	1.79
	0.84	7.96	90.34	583.76	212.88	554.91	5105.2	158.33	4.83963e+06	17069	2.48284e+06	6583
29	3336.75	393.88	5148.18	599.85	255.97	6.17	0.71	0.9	6.46e-05	0.00062	0.00193	1.43
	0.59	13.22	71.37	755.67	250.27	723.38	5811.66	188.59	2.34963e+06	14222.1	2.66942e+06	6519
30	2792.54	938.36	3448.34	1525.91	145.02	7.61	1.3	1.63	7.08e-05	0.00061	0.00337	1.4
	0.68	13.17	56.79	289.03	232.14	527.31	3070.59	191.87	2.45429e+06	11317.2	694613	3817
31	3219.36	793.53	4152.06	1104.01	181.42	8.38	1.06	1.57	9.17e-05	0.00012	0.0012	2.11
	0.96	12.55	108.13	282.8	273.65	657.43	6895.4	143.3	1.87499e+06	16911.3	1.79056e+06	7908
32	2556.2	341.11	3787.06	628.94	220.75	6.35	1.51	2.27	4.63e-05	0.0009	0.00219	1.87
	1.49	7.55	236.68	672.48	561.76	445.55	3312.84	145.68	3.91853e+06	9544.9	1.61808e+06	3885
33	4132.45	582.23	6588.66	708.39	141.27	5.88	1.21	1.57	3.25e-05	0.00024	0.0011	2.99
	1.42	7.5	235.36	748.32	766.81	699.31	3693.75	138.72	3.75606e+06	14663.6	1.98674e+06	4524
34	2939.79	703.02	3596.96	1356.95	187.33	5.43	0.66	0.95	9.85e-05	0.00094	0.00206	2.05
	1.57	5.8	149.21	704.95	806.97	455.64	7851.33	142.98	4.20523e+06	16773.8	1.65819e+06	9845
35	3603.57	575.17	4620.53	1138.46	244.47	5.71	1.45	1.95	3.66e-05	0.00043	0.00281	0.93
	0.63	13.32	203.36	755.35	982.42	931.7	6964.7	123.47	4.30187e+06	14401.8	2.25289e+06	8762
36	2487.56	816.68	3838.64	1170.42	190.11	6.54	1.57	1.9	9.52e-05	0.00018	0.00153	2.73
	1.2	8.42	85.22	756.17	296.53	306.28	7212.18	144.89	4.93877e+06	12131.4	2.53377e+06	8238
37	2829.63	800.82	3968.86	1321.75	234.36	5.76	0.94	1.19	6.19e-05	0.00047	0.00501	2.75
	2.06	9.27	226.32	410.18	531.53	303.34	3236.36	167.73	1.68445e+06	10872.8	2.53299e+06	4656
38	3282.87	922.79	4514.31	1533.96	276.88	8.34	1.97	2.61	7.22e-05	0.00082	0.00944	2.97
	2.15	10.52	53.32	596.55	190.02	766.45	6916.36	181.01	4.72313e+06	14372	3.1506e+06	8143
39	2173.59	985.26	2856.64	1351.6	246.9	8.42	1.02	1.51	8.98e-05	0.00026	0.00111	1.27
	0.94	11.1	217.13	498.62	486.01	417.03	3269.59	130.89	2.39711e+06	17951.6	1.22577e+06	3700
40	2700.16	815.25	4082.04	1412.1	252.68	8.24	0.63	0.81	1.93e-05	0.0007	0.00258	2
	0.89	12.15	169.26	210.58	720.28	359	3782.37	163.71	3.69194e+06	8727.89	2.60334e+06	4693
41	4401.42	866.25	5302.43	1153.13	285.59	9.49	0.92	1.16	3.9e-06	0.00012	0.00137	1.78
	0.79	12.88	112.56	929.65	437.72	830.92	3086.15	199.28	3.10044e+06	8712.02	2.43517e+06	3468
42	2796.59	356.83	4041.89	435.38	288.1	7.12	1.49	2.2	1.01e-05	0.00032	0.0012	1.52
	0.91	10.59	77.87	686.58	267.37	809.93	4469.76	171.09	4.05919e+06	13280.4	1.41733e+06	6656
43	3140.09	921.46	3858.75	1543.63	100.47	9.89	0.86	1.04	4.42e-05	0.0008	0.00479	0.93
	0.68	7.18	133.21	340.36	539.48	409.7	4644.65	135.52	4.02755e+06	8989.96	2.77924e+06	5238
44	2595.04	303.81	3846.84	391.15	248.09	9.25	0.99	1.4	8.27e-05	0.00026	0.00054	2.34
	1.13	12.19	121.96	920.83	485.62	494.9	6849.1	134.48	4.46946e+06	17264.6	873585	9264

45	2751.91	882.95	4082.16	1233.6	112.06	9.9	1.84	2.55	9.67e-05	0.00083	0.0023	2.17
	1.02	11.84	217.62	953.2	1073.95	415.4	3367.51	144.92	2.58478e+06	13545.1	3.41198e+06	3785
46	2652.37	706.21	3754.41	1161.89	202.08	7.86	1.63	1.96	3.43e-05	0.00109	0.00397	1.51
	1.15	11.03	92.68	466.3	279.53	328.34	3854.82	194.7	1.46656e+06	8921.92	1.94367e+06	5050
47	2680.15	798.94	4145.83	1275.12	220.54	9.88	1.86	2.69	8.81e-05	0.00088	0.00693	2.33
	1.08	6.23	164.11	835.68	635.94	338.54	3600.33	143.3	1.49392e+06	13441.4	3.76364e+06	4750
48	2574	364.32	3434.58	712.89	239.65	7.56	1.37	1.7	7.31e-05	0.00053	0.00275	1.45
	0.96	9.76	207.02	457.12	461.84	295.37	3950.75	187.56	1.80961e+06	16104.9	3.54182e+06	5502
49	4089.04	616.74	6324.54	861.31	164.12	6.5	1.84	2.26	7.59e-05	0.00022	0.0013	2.65
	1.25	9.14	238.75	958.74	1188.67	502.4	4781.41	180.6	3.80396e+06	15572.1	2.57539e+06	7078
50	3520.72	910.37	5455.01	1300.36	148.94	6.73	0.96	1.41	5.84e-05	0.0007	0.0027	2.34
	1.31	8.88	209.49	678.93	1082.89	557.91	3311.42	127.14	2.44674e+06	10916.7	1.37467e+06	4486
51	4577.14	608.23	6982.97	1042.29	268.44	7.63	1.35	1.76	5.59e-05	0.0004	0.00137	1.24
	0.67	9.51	158.17	758.58	522.26	305.11	3011.23	153.71	1.92609e+06	16213.8	2.02127e+06	3967
52	2559.73	429.3	3800.55	767.36	136.07	8.12	0.97	1.25	7.32e-05	0.00062	0.00282	2.36
	1.61	9.95	55.22	757.79	301.26	439.01	5227	189.54	4.47659e+06	12548.3	1.10327e+06	5879
53	3768.76	835.27	5425.21	1277.08	155.49	8.39	1.39	1.93	9.04e-05	0.00023	0.00183	1.67
	1.22	9.9	89.25	849.91	412.44	208.87	5403.94	129.04	3.58841e+06	16381.8	2.63027e+06	6209
54	2273.47	724.33	3375.8	1094.57	125.39	5.89	0.53	0.68	5.08e-05	0.00054	0.00137	2.1
	1.19	5.18	66.36	822.34	346.5	737.87	4606.23	157.77	2.29565e+06	16274.6	1.16476e+06	6497
55	3586.96	992.35	4472.65	1656.34	170.07	8.54	1.59	2.31	7.86e-05	0.00058	0.00352	2.45
	1.1	6.7	77.71	728.25	372.49	446.91	4150.15	130.29	4.71558e+06	9348.57	640531	4692
56	2753.5	319.48	3333.11	537.34	139.59	9.83	1.33	1.65	8.47e-05	0.00028	0.0007	0.98
	0.77	10.93	229.47	462	928.33	775.12	5060.2	129.56	4.04496e+06	17305.1	1.21632e+06	5800
57	2414.03	432.87	3218.29	843.75	266.69	5.42	1.89	2.6	6.16e-05	0.00094	0.00896	2.41
	1.77	9.62	126.73	379.09	327.2	357.94	4312.37	153.03	2.07382e+06	17784.8	1.51395e+06	6400
58	3185.68	895.7	4381.53	1510.44	291.57	6.04	2	2.62	9.5e-06	0.00043	0.00107	2.03
	1.28	6.56	161.75	738.41	807.65	709.09	4434.59	195.93	2.8348e+06	8881.34	1.25499e+06	6457
59	4380.25	658.32	6054.92	1071.61	105.09	5.52	1.41	1.95	6.93e-05	0.00031	0.00144	1.97
	1.36	9.92	169	657.14	404.6	450.88	4613.72	132.12	1.31432e+06	16835.6	1.64952e+06	5290
60	2233.29	837.17	3019.59	1577.2	205.69	8.67	0.93	1.38	3.48e-05	0.00061	0.00432	2.15
	1.39	8	139.29	403.82	472.41	984.8	5452.56	191.38	3.14477e+06	14084.5	3.95415e+06	6294
61	3831.68	666.07	5946.38	844.78	228.94	7.02	1.02	1.51	7.92e-05	0.00109	0.00376	1.94
	1.41	9.81	50.49	637.2	287.11	207.87	3210.39	132.52	3.64536e+06	8762.94	2.89608e+06	4216
62	2062.27	925.59	2897.4	1704.76	286.13	7.77	0.56	0.82	9.07e-05	0.00091	0.00989	1.01
	0.78	8.67	191.09	919.43	539.94	294.08	5010.83	175.58	4.65135e+06	13085.4	3.51071e+06	5560
63	4019.41	768.5	5809.42	1450.78	109.95	9.58	1.41	1.7	3.86e-05	0.0008	0.00199	1.19
	0.9	6.54	197.85	303.67	896.24	289.37	7833.43	177.11	3.41538e+06	18042.2	1.62221e+06	9681
64	2912.59	738.17	3903.52	1235.7	186.05	5.41	1.32	1.9	9.71e-05	0.00062	0.00419	2.33
	1.54	6.67	134.39	774.64	363.26	313.61	3029.36	144.1	1.9484e+06	15490.1	1.26602e+06	4081
65	4998.36	422.88	7280.92	723.19	113.34	6.77	1.39	2.04	2.36e-05	0.00047	0.0013	1.15
	0.82	8.72	181.79	785.39	1032.38	759.02	5219.46	191.65	3.58545e+06	12044.4	3.74457e+06	5946
66	4117.33	888.56	6232.43	1477.28	181.52	7.68	1.82	2.42	2.74e-05	0.00011	0.0013	2.35
	1.04	8.46	240.14	726.89	784.53	501.72	5033.58	159.22	4.01926e+06	16351.6	3.51758e+06	5624
67	3687.21	890.6	4778.23	1447.93	162.13	7.87	1	1.29	7.63e-05	0.00036	0.00307	1.77
	1.29	6.76	225	255.01	1253.89	877.36	3741.82	169.02	4.27095e+06	16473	3.40292e+06	4506
68	4354.13	626.02	5870.1	1250.12	276.13	7.46	1.4	1.69	2.42e-05	0.00036	0.00161	1.5
	0.64	8.94	233.23	454.78	1016.21	994.25	3214.64	187.44	1.79589e+06	9286.56	1.2985e+06	4248
69	3484.98	842.84	4860.45	1092.32	233.58	5.97	0.67	0.91	2.92e-05	0.00084	0.00681	2.62
	1.91	10.19	211.63	563.05	561.63	388.49	3197.54	198.89	2.77809e+06	8714.64	2.73597e+06	4144
70	4172.2	652.74	5660.91	898.33	237.49	9.49	1.82	2.36	8.04e-05	0.00053	0.00233	1.97
	1.27	5.27	160.22	790.23	848.05	483.08	5768.08	148.58	4.54863e+06	7540.8	1.76818e+06	6945
71	2011.11	616.53	3040.42	926.65	291.78	9.52	0.82	0.98	5.14e-05	0.00039	0.0022	2.56
	2.03	10.91	177.56	728.55	762.14	841.19	4588.64	175.62	3.52147e+06	8758.74	1.76278e+06	5305
72	3474.79	838.95	4340.92	1570.26	295.66	9.53	1.04	1.52	6.87e-05	0.00015	0.0017	2.73
	1.58	8.69	78.32	350.57	378.94	821.13	6962.8	120.93	3.44407e+06	12750.7	1.26841e+06	9069
73	2473.46	782.24	3957.11	1150.91	119.56	6	1.2	1.47	8.91e-05	0.00059	0.00644	1.44
	0.83	8.07	136.01	360.96	455.21	876.75	3672.27	124.63	4.52344e+06	17317.6	3.10108e+06	4602
74	4357.66	774.36	5987.44	1515.1	230.35	6.82	1.95	2.75	6.2e-05	0.00099	0.00335	2.07
	0.93	5.08	187.47	802.35	545.12	914.28	3620.83	187.15	4.73584e+06	14114.4	2.18036e+06	5021
75	3552.6	552.92	4527.59	1104.33	245.42	7.51	1.98	2.59	5.06e-05	0.00087	0.00206	2.09
	1.03	7.54	127.95	535.7	653.66	760.83	4806.98	132.29	4.61431e+06	14426.6	1.81725e+06	5932
76	3910.67	580.49	5432.31	847.41	106.72	7.25	0.57	0.78	5.16e-05	0.00017	0.00067	2.78
	1.63	9.81	82.09	851.92	230.15	942.19	4392.93	140.15	1.40782e+06	9405.09	903412	5852
77	2176.09	374.69	2791.98	462.39	296.5	6.53	1.04	1.37	9.53e-05	0.00094	0.00659	2.13
	1.49	9.22	63.52	753.95	263.24	521.93	3612.63	128.37	4.25679e+06	10519.5	1.90934e+06	4404
78	2064.7	858.26	2778.28	1588.09	146.74	9.21	0.56	0.84	8.8e-06	0.00032	0.00305	2.69
	1.27	6.44	203.98	386.93	1219.76	790.06	6280.81	157.01	3.88166e+06	11824.4	2.54174e+06	8911
79	2747.05	696.52	3792.11	967.43	215.1	6.96	0.82	1.06	9.8e-06	0.00015	0.00148	2.86
	1.79	10.47	180.76	947.59	731.08	527.09	3694.78	184.61	1.54801e+06	8294.23	2.40427e+06	4268
80	4505.94	761.33	5578.07	1383.47	106.26	6.31	1.89	2.61	4.9e-05	0.00089	0.00283	1.13
	0.73	13.51	82.39	404.01	475.02	669.92	4495.69	155.83	3.40426e+06	14872.2	2.56847e+06	5695
81	2418.77	232.28	3087.32	400.51	245.47	8.53	1.92	2.65	5.44e-05	0.00064	0.00351	1.36
	1.06	9.11	132.61	263.16	553.97	726.14	7752.5	199.48	3.98244e+06	8902.83	3.12048e+06	9947
82	2640.58	763.76	3684.53	1104.42	213.83	5.35	1.59	2.13	4.94e-05	0.0007	0.00231	1.06
	0.53	6.15	72.17	329.31	365.36	980.05	4691.96	171.03	4.07104e+06	17475.2	2.63889e+06	6619
83	3605.14	794.96	4559.73	1396.69	159.25	6.74	1.96	2.9	8.55e-05	0.00072	0.00733	1.65
	1.06	7.89	203.03	802.61	1077.45	925.57	3608.81	165.68	4.00663e+06	12227.9	3.99728e+06	4996
84	2516.61	398.85	3999.83	587.48	297.8	5.92	0.92	1.25	8.41e-05	0.00085	0.00257	1.7
	0.7	10.16	193.22	376.67	551.77	259.66	4864.92	184.51	4.85879e+06	12105.6	3.73513e+06	5972
85	3840.75	345.61	4645.95	546.08	245.03	5.51	1.86	2.54	3.5e-05	0.00055	0.00238	1.25
	0.83	10.46	170.21	479.42	536.06	902.07	3195.6	161.82	3.83827e+06	8424.83	2.53763e+06	3641
86	2827.92	608.82	3822.03	1208.06	146.58	5.41	1.45	1.81	3.94e-05	0.00045	0.00199	1.65
	0.94	12.51	233.33	560.6	591.2	587.94	3567.85	140.83	3.55629e+06	14176.9	1.03813e+06	4367
87	2550.04	801.12	3953.42	1520.97	104.69	6.89	1.54	2.27	2.39e-05	0.00097	0.00624	2.74
	1.2	7.45	151.77	219.98	789.17	269.29	3659.7	148.05	3.29112e+06	15335.2	3.77719e+06	4982
88	2056.36	540.43	2764.42	649.59	258.66	7.78	1.8	2.59	2.29e-05	0.00039	0.00342	2.18
	1.54	11.81	77.92	943.04	164.86	396.35	7382.89	187.39	4.71628e+06	18141.4	1.65419e+06	10197
89	4683.95	888.85	7107.48	1775.88	167.83	5.83	0.89	1.09	1.74e-05	0.00033	0.00208	2.36
	1.31	11.53	223.21	738.62	825.71	411.11	7526.1	151.76	4.6717e+06	12348.3	3.40104e+06	10436
90	3372.02	776.28	4593.69	1088.67	241.89	7.43	1.77	2.2	3.67e-05	0.0003	0.00232	0.94
	0.65	13.94	224.93	555.83	1189.43	854.5	4923.12	155.11	4.40454e+06	12872.9	2.83299e+06	6483
91	2769.08	759.68	4079.07	1420.22	277.93	9.53	1.7	2.53	5.96e-05	0.00068	0.00654	1.83
	1.37	11.57	231.95	492.23	516.9	633.48	6893.54	125.99	4.27843e+06	9717.24	3.37821e+06	8920
92	3463.49	977.41	5524.7	1766.27	217.17	8.74	0.92	1.11	8.2e-05	0.00049	0.00438	1.08
	0.81	9.65	105.86	809.15	493.56	930.97	6677.71	198.63	4.47279e+06	10386.3	3.98913e+06	8736

93	4923.96	449.34	6523.87	878.21	155.35	5.62	1.51	1.96	1.13e-05	0.00014	0.00118	1.81
	0.87	11.53	194.33	488.7	981.17	990.3	4895.93	161.51	4.67907e+06	8032.55	1.6698e+06	7116
94	3310.65	590.78	5282.67	1024.16	297.14	6.43	0.89	1.09	8.76e-05	0.00099	0.00676	2.22
	0.92	6.35	212.53	701.83	787	661.42	4457.08	143.12	4.76445e+06	8671.37	1.19719e+06	6242
95	3837.3	544.78	5717.74	950.78	121.76	7.6	1.63	2	1.87e-05	0.00011	0.00113	2.31
	1.7	7.03	216.43	887.86	1116.37	690.65	5731.61	146.38	2.83847e+06	8720.48	1.62615e+06	7371
96	2258.69	944.65	3329.02	1801.1	210.95	5.38	1.16	1.52	7.33e-05	0.00025	0.00287	2.32
	1.29	13.31	168.85	747	680.21	603.3	7026.28	177.06	3.36544e+06	17162.6	2.61437e+06	8012
97	3600.75	280.36	4943.82	469.06	281.07	7.84	1.82	2.19	4.63e-05	0.00043	0.00324	2.13
	1.11	5.57	230	616.56	1180.29	886.5	6197.95	167.38	3.00666e+06	15315.2	3.97257e+06	9206
98	2116.48	439.34	2776.84	650.35	232.09	7.44	1.32	1.86	7.94e-05	0.00063	0.00252	2.42
	1.54	6.94	74.58	705.31	254.67	679.19	5318.6	198.22	2.39622e+06	15894.9	1.45032e+06	6643
99	2572.49	946.11	3319.24	1660.44	226.62	9.47	1.3	1.59	4.16e-05	0.00034	0.00185	1.08
	0.48	10.1	124.96	914.23	321.91	941.92	4776.4	185.43	4.53316e+06	16024.2	3.52541e+06	5817
100	3720.36	385.33	4651.32	764.34	184.93	7.95	1.92	2.42	9.17e-05	0.00017	0.00187	1.67
	0.7	8.84	169.47	237.86	829.57	309.79	4674.45	155.27	3.82347e+06	14735.7	3.48125e+06	6966
101	3591.03	873.55	5589.53	1728.78	162.51	8.45	1.35	1.67	1.73e-05	0.00039	0.0011	1.53
	1.03	6.81	95.22	721.98	478.56	237.71	7957.2	164.94	3.04995e+06	16271.7	2.58007e+06	9139
102	3997.43	475.28	6015.36	851.33	203.69	6.64	1.4	1.72	1.28e-05	0.0006	0.00174	1.26
	0.54	11.77	95.83	637.51	524.1	270.19	5373.42	155.14	4.09535e+06	9982.72	1.28505e+06	6355
103	4347.96	422.46	6005.8	766.17	160.13	7.3	1.1	1.61	4.28e-05	0.00096	0.00249	1.29
	0.82	5.43	222.71	256.51	524.24	984.52	3273.66	170.98	1.94643e+06	16541.2	1.54556e+06	4389
104	2097.87	887.96	2753.71	1306.59	295.36	9.35	0.65	0.95	2.62e-05	0.00036	0.00386	2.16
	1.18	10.3	186.25	541.87	646.3	641.82	7039.43	185.22	4.21978e+06	13476.8	3.12269e+06	8696
105	4250.77	772.64	5633.64	985.77	134.15	7.83	1.98	2.73	3.3e-05	0.00012	0.0009	2.62
	1.56	12.37	160.68	974.69	468.11	307.74	7487.69	160.61	1.58777e+06	17735.3	1.93237e+06	9296
106	2605.38	979.75	3399.06	1572.51	241.28	9.85	1.75	2.25	5.2e-05	0.00047	0.00336	1.59
	0.88	11.43	182.67	220.1	716.07	574.17	6052.34	161.15	4.28987e+06	10248.2	729950	7024
107	4179.33	512.2	5978.38	682.43	289.23	5.48	1.51	1.88	2e-06	0.00074	0.00387	2.66
	1.66	8.29	225.61	925.47	465.52	229.23	4149.61	170.26	4.58118e+06	9050.38	2.62027e+06	6224
108	2909.4	739.05	3954.79	1164.8	257.83	6.35	0.96	1.36	5.8e-05	0.00099	0.00774	2.65
	1.97	10.23	177.55	532.75	376.42	841.93	3886.43	124.31	3.2653e+06	11333.8	3.2738e+06	4664
109	2354.6	447.65	3174.77	832.09	289.01	5.02	1.23	1.55	5.11e-05	0.00062	0.00201	1.91
	1.31	7.85	195.12	996.92	741.57	776.5	4607.78	164.33	1.50657e+06	10387.9	2.15411e+06	6875
110	3864.19	540.64	5857.82	923.12	113.88	9.78	0.57	0.77	6.89e-05	0.00079	0.00188	1.33
	0.74	12.17	145.65	667.84	667.7	586.7	3884.88	179.83	3.23399e+06	13660.3	3.77161e+06	5760
111	3012.25	906.91	4711.39	1587.74	173.86	8.26	1.27	1.7	6.35e-05	0.0008	0.00354	2.21
	1.19	13.9	223.62	240.16	640.26	509.51	7983.38	186.82	3.37194e+06	9185.73	2.26952e+06	9127
112	2052.21	864.15	3151.85	1543.25	175.66	5.32	0.78	1.12	6.99e-05	0.00071	0.007	1.54
	1.02	11.36	106.7	764.98	346.81	971.57	4653.89	195.6	2.10763e+06	9204.38	3.30225e+06	5890
113	4778.94	644.48	5735.53	1154.95	228.8	9.4	1.43	1.84	7.13e-05	0.00085	0.00343	2.21
	1.43	9.45	232.34	850.13	695.6	550.87	4754.41	193.52	3.38772e+06	10852.6	3.73941e+06	5707
114	2692.46	509.61	4038.73	787.69	148.57	7.53	1.11	1.64	7.5e-06	0.00088	0.00208	2.99
	1.57	9.01	113.1	491.07	263.7	872.03	7075.66	121.27	3.73052e+06	15970.6	565524	9579
115	2005.25	813.37	2904.61	1158.31	226.77	6.53	1.51	2.16	3.52e-05	0.00036	0.0022	2.02
	1.37	11.46	231.4	909.75	1386.3	322.4	5737.54	179.68	1.80677e+06	8940.09	3.09601e+06	6991
116	4165.36	547.79	6250.39	704.41	141.37	5.32	1.94	2.76	4.3e-05	0.00087	0.00412	2.86
	1.33	6.63	68.98	782.79	283.23	353.64	3469.36	135.91	3.77787e+06	15494.8	3.81796e+06	4438
117	2548.19	493.59	3295.22	665.07	161.88	7.8	1.32	1.82	1.3e-06	0.00028	0.00162	1.31
	0.71	9.39	126.49	795.02	301.63	335.91	5382.96	167.33	2.42104e+06	15484.3	619064	6136
118	2023.1	654.28	3125.62	1073.82	183.69	6.33	1.37	1.96	6.65e-05	0.00044	0.00172	1.35
	0.96	12.4	152.36	321.96	545.93	579.03	4965.18	153.05	2.55703e+06	7444.55	947247	6667
119	2809.2	892.05	3855.01	1313.67	118.18	6.81	1.23	1.81	7.05e-05	0.00088	0.00365	1.07
	0.78	13.83	148.9	619.11	413.92	907.49	6671.01	180.72	3.96905e+06	17334.6	2.24426e+06	7432
120	2748.2	501.01	3932.54	615.72	210.73	5.57	1.51	2.09	1.71e-05	0.00066	0.00353	2.38
	1.64	9.95	238.57	492.54	960.56	362.78	4015.21	149.36	1.61461e+06	16677.8	3.61238e+06	4710
121	2068.05	551.82	3302.9	1007.55	236.94	9.38	1.13	1.62	6.56e-05	0.00061	0.00343	1.92
	0.93	8.52	181.1	564.98	367.46	651.91	3666.73	130.31	4.93343e+06	7498.72	1.37235e+06	4474
122	4437.26	646.86	5920.56	805.08	288.01	5.3	0.56	0.7	2.11e-05	0.00017	0.00116	2.6
	1.79	7.84	127.58	373.88	418.6	242.65	6163.54	191.08	3.4777e+06	11128.9	3.49952e+06	8435
123	3151.46	915.24	4438.17	1297.97	113.49	8.01	1.31	1.89	5.6e-06	0.00099	0.00566	1.7
	1.07	10.17	89.71	702.51	344.49	968.23	4303.53	135.38	3.47233e+06	18194	3.53781e+06	4911
124	4741.45	975.67	5881.03	1544.12	144.07	6.78	1.13	1.65	4.62e-05	0.00045	0.00298	2.77
	1.59	6.34	189	574.36	947.91	500.54	6019.91	158.38	3.03131e+06	11556.9	3.65458e+06	8850
125	4723.74	622.16	5893.16	1229.79	119.69	6.47	1.71	2.5	4.2e-06	0.00021	0.00105	1.44
	0.84	11.15	77.02	543.77	415.02	710.56	5831.88	122.39	3.82921e+06	14572.7	3.11445e+06	8316
126	2758.71	300.51	4304.5	599.5	232.25	8	1.66	2.38	7.21e-05	0.00033	0.00166	1.58
	0.84	10.36	129.74	909.47	763.92	219.69	7272.98	132.27	1.93772e+06	8487.77	1.79142e+06	7710
127	2500.6	577.66	3411.99	789.65	236.42	9.56	0.79	1.02	8.42e-05	0.00027	0.00285	2
	0.87	10.66	131.7	811.96	453.09	909.61	4244.2	187.54	2.3907e+06	12003.3	1.71369e+06	6327
128	3075	932.87	4352.31	1467.41	161.6	5.91	1.67	2.01	8.25e-05	0.00019	0.00077	2.06
	1.28	13.92	87.91	438.52	382.48	349.96	7644.68	120.58	2.14773e+06	17216.3	1.61029e+06	11167
129	2954.23	958.2	4476.44	1483.26	127.83	5.69	0.7	0.9	7.11e-05	0.0002	0.002	1.48
	1.09	10.72	81.73	208.22	363.59	214.8	4995.04	173.47	3.86903e+06	8526.97	2.43033e+06	6880
130	2643.57	840.95	4118.57	1189.62	242.15	9.03	0.61	0.82	6.25e-05	0.0007	0.00464	1.46
	0.8	13.35	141.06	435.87	801.83	986.56	3843.18	198.26	4.47361e+06	15743	2.66709e+06	5540
131	3378.79	657.69	4753.86	1273.13	257.87	7.8	1.83	2.75	1.3e-06	0.00039	0.00245	2.03
	1.37	12.8	236.54	534.53	1264.74	906.6	5783.14	185.51	4.4857e+06	18206.3	1.35566e+06	6971
132	4359.55	715.61	5604.25	1398.02	290.31	6.82	1.23	1.54	5.43e-05	0.00044	0.00203	2.98
	2.3	7.41	159.74	592.3	382.59	353.87	3320.9	156.33	3.89058e+06	13788.6	1.08826e+06	4549
133	4730.77	302.35	7293.87	447.64	204.13	5.25	0.66	0.89	9.27e-05	0.00051	0.00125	2.92
	2.21	6.8	235.21	458.37	1364.82	451.64	3540.81	120.42	2.72505e+06	12815.4	2.15874e+06	4687
134	4646.95	533.11	6306.29	1059.13	247.05	9.84	0.93	1.35	2.88e-05	0.00084	0.00248	1.29
	0.75	12.22	84.93	949.53	308.5	720.02	3177.41	161.57	4.19216e+06	14254.1	1.34573e+06	4064
135	3068.15	740.94	4719.11	991.85	191.34	5.55	0.74	0.95	8.57e-05	0.00021	0.00221	2.48
	1.39	11.33	239.51	797.15	773.27	669.03	4932.35	176.84	3.10219e+06	12409.7	1.58261e+06	6233
136	3966.85	833.76	5140.68	1341.4	155.27	8.29	1.38	1.97	2.36e-05	0.00059	0.00291	2.2
	1.38	9.38	179.35	229.49	670.58	217.03	5627.08	131.25	2.79666e+06	16857.6	2.77161e+06	7615
137	2797.74	704.51	3528.63	940.77	273.26	7.15	1.89	2.83	3.35e-05	0.00056	0.00209	2.68
	1.19	8.02	120.49	762.41	315.09	212.1	6583.74	121.38	4.93472e+06	14801.2	3.01805e+06	7601
138	4191.27	948.09	5284.39	1339.47	149.83	5.67	1.98	2.65	1.04e-05	0.00025	0.00237	1.38
	0.73	11.67	102.54	404.41	446.91	300.43	4750.76	154.6	3.9461e+06	7780.32	837442	5697
139	3012.55	904.42	4412.6	1719.25	260.56	5.71	0.78	1.09	7.85e-05	0.00077	0.00383	2.58
	1.96	6.89	161.84	687.68	771.97	983.38	3997.35	140.99	3.91973e+06	8696.45	2.87279e+06	4668
140	3453.74	630.55	5230.78	1042.61	251.78	6.88	1.15	1.42	3.05e-05	0.00019	0.00157	1.04
	0.5	9.9	139.52	731.23	308.57	499.37	6029.69	152.79	1.25281e+06	14332.7	3.56754e+06	6981

141	3734.54	771.13	5596.6	1174.86	123.99	7.42	0.92	1.36	2.7e-05	0.00025	0.0014	2.31
	1.07	11.54	221.33	996.48	1243.37	404.48	4592.02	176.76	2.4434e+06	9114.73	2.0788e+06	6111
142	2693.94	828.18	4094.58	1221.26	155.97	6	1.61	2.2	2.25e-05	0.00039	0.00439	2.97
	1.31	10.83	100.43	867.33	208.17	838.97	5763.29	185.05	4.47764e+06	11938.6	2.52857e+06	6396
143	2141.39	457.41	2664.19	913.51	240.5	9.23	1.66	2.13	4.7e-05	0.00028	0.0021	1.57
	0.95	6.11	102.64	582.88	516.02	819.2	3853.21	176.66	2.20016e+06	17857.9	2.54737e+06	5723
144	4182.33	599.72	5942.01	906.03	141.5	5.55	0.52	0.64	5.01e-05	0.00088	0.00331	2.32
	1.73	8.61	206.25	607.64	472.99	653.14	3698.73	198.96	1.39908e+06	17156.4	3.21635e+06	5287
145	3000.1	437.26	3797.91	843.32	124.68	5.69	1.98	2.63	6.72e-05	0.00105	0.00244	1.39
	0.73	11.71	193.06	502.47	533.29	742.95	4035.75	122.58	1.68722e+06	12912.1	1.95619e+06	5265
146	2591.1	400.17	3801.74	528.26	199.68	5.07	1.18	1.58	1.23e-05	0.00044	0.00147	2.62
	1.99	10.7	194.49	700.58	712.41	312.42	4209.2	138.82	1.76573e+06	7676.74	801384	4768
147	4791.1	291.01	7349.36	357.77	227.27	7.94	0.76	0.96	1.71e-05	0.00023	0.00117	2.46
	1.38	13.88	185.92	590.19	741.51	558.91	4582.22	177.5	4.53493e+06	11924	2.71121e+06	6587
148	2623.88	570.29	3772.16	1037.67	199.1	8.37	0.6	0.85	8.25e-05	0.00053	0.00269	1.54
	1.06	12.94	61.71	345.85	358.46	445.86	5343.5	199.11	3.70673e+06	10676.8	1.5321e+06	7324
149	2446.68	233.44	3498.31	455	153.49	7.8	0.6	0.87	8.57e-05	0.00047	0.00213	2.26
	1.53	7.19	144.19	485.92	646.09	879.63	3595.6	197.08	3.79827e+06	7840.17	1.69753e+06	4016
150	4624.39	906.79	5742.7	1521.33	119.63	9.51	1.76	2.12	5.32e-05	0.00033	0.0011	1.12
	0.6	5.58	233.37	273.02	808.06	829.57	7412.45	197.74	3.11577e+06	16283.7	2.21658e+06	8728
151	4619.31	394.6	6679.93	569.43	298.57	9.96	1.98	2.53	6.11e-05	0.00038	0.00192	1.15
	0.8	12.27	57.14	692.54	286.96	344.32	6924.3	122.44	2.63968e+06	13847.5	1.59304e+06	8688
152	4118.8	451.15	5572.05	641.79	219.5	7.33	1.53	2.15	7.37e-05	0.00054	0.00172	2.74
	1.13	8.86	201.73	258.46	1075	486.91	4016.58	149.57	1.75754e+06	8016.8	1.25806e+06	5098
153	3957.95	720.8	5146.57	1217.91	139.96	9.2	1.13	1.49	6.55e-05	0.00024	0.00166	2.03
	1.04	12.71	245.94	483.44	739.79	433.75	6119.77	126.35	3.17329e+06	12633.1	3.94785e+06	8656
154	4021.95	410.27	5863.29	800.33	155.9	6.5	1.34	1.86	7.26e-05	0.00014	0.00051	1.72
	1.3	9.5	206.83	694.84	606.62	293.24	4871.56	196.24	4.51046e+06	12197.9	1.65739e+06	7065
155	2521.95	949.5	3493.39	1723.11	154.65	6.37	1.68	2.08	9.08e-05	0.00073	0.00334	1.32
	0.61	6.13	153.74	993.12	518.86	215.71	3111.15	154.29	4.29764e+06	9951.56	843624	3451
156	2947.3	502.86	4118.62	929	281.28	7.46	0.87	1.12	1.8e-05	0.00032	0.00176	2.29
	1.38	11.22	214.8	973.75	1273.72	447.17	4251.81	133.75	1.55574e+06	17708.6	3.16198e+06	6130
157	3280.63	202.25	4782.85	392.82	293.67	6.57	1.29	1.57	3.6e-05	0.00085	0.00192	2.94
	1.84	5.59	154.14	510.66	891.92	840.1	6896.61	137.68	2.9013e+06	13625.4	3.95784e+06	9954
158	3603.47	207.39	4832.6	397.84	290.95	8.43	1.36	1.78	9.89e-05	0.00082	0.00349	1.31
	0.94	10.83	161.13	944.58	853.6	549.45	5854.17	169.13	4.63258e+06	10236.4	3.8735e+06	7304
159	2492.96	836.62	3942.39	1595.81	239.47	5.6	0.54	0.64	9.62e-05	0.00065	0.00529	2.15
	1.42	7.35	134	905.06	635.77	404.65	5852.07	179.23	4.26114e+06	9517.77	3.06854e+06	6857
160	3210.24	827.08	4085.43	1382.94	184.37	8.99	1.57	2.1	4.03e-05	0.00093	0.0061	2.43
	1.73	8.4	74.89	871.7	158.37	726.38	3104.35	148.63	4.45935e+06	8620.56	3.63118e+06	4232
161	3854.15	960.29	5266.33	1445.1	164.33	6.29	1.03	1.49	9.45e-05	0.00028	0.00318	2.9
	2.32	13.83	187.57	553.76	1096.88	917.65	6333.1	163	3.43536e+06	9818.65	3.61126e+06	8383
162	3153.76	832.84	3993.22	1522.07	282.58	9.64	0.84	1.18	4.4e-06	0.0008	0.00295	1.97
	1.39	8.8	90.9	421.29	366.84	262.02	6050.53	143.2	3.53983e+06	15568.7	928436	7037
163	4381.63	675.03	6787.17	1145.83	131.52	6.3	1.18	1.71	9.9e-06	0.00079	0.0018	2.96
	1.47	9.54	139.35	577.47	697.37	752.99	4627.4	176.09	3.22264e+06	11097.5	610787	6460
164	2398.59	702.84	2970.01	1233.28	125.63	6.08	1	1.5	5.2e-06	0.00045	0.00108	1.47
	1.08	6.9	120.82	737.63	371.74	382.56	4084.81	198.48	1.62217e+06	14956.9	1.09774e+06	4501
165	2803.47	343.72	4026.4	642.44	220.21	6.2	0.61	0.82	6.72e-05	0.0007	0.00303	1.89
	1.5	9.99	197.72	306.6	704.15	391.44	4839.85	156.93	3.58466e+06	9604.34	2.03783e+06	7222
166	3850.59	289.97	5594.86	539.32	133.79	8.79	0.81	1.13	7.04e-05	0.00029	0.00072	1.3
	0.68	5.12	85.45	966.48	237.77	435.89	5958.77	178.9	2.80272e+06	11397	1.65854e+06	7999
167	2436.47	968	3863.84	1181.72	166.75	7.98	0.79	1.15	9.4e-05	0.00086	0.00219	2.07
	1.06	9.42	234.12	436.21	938.1	648.9	4713.28	144.72	2.18647e+06	12430.2	2.17302e+06	5590
168	3837.74	560.65	5510.35	838.21	181.15	9.94	1.65	2.23	8.81e-05	0.00042	0.00239	0.97
	0.43	7.02	93.61	719.55	322.54	701.69	5102.12	135.9	2.98903e+06	13740.5	3.76646e+06	6390
169	2995.33	637.61	4450.14	859.1	167.29	7.42	0.98	1.35	2.48e-05	0.0003	0.00206	1.84
	1.35	6.76	249.73	323.19	1486.36	787.73	6548.44	121.07	4.12021e+06	9249.31	2.27826e+06	8285
170	4916.57	750.62	7327.76	974.33	203.57	8.7	1.31	1.6	5.91e-05	0.00017	0.00125	2
	1.38	7.61	225.45	592.61	1004.04	847.41	3215.81	130.55	1.11142e+06	12237.4	1.78057e+06	3975
171	3187.29	423.74	5034.97	590.59	246.93	7.7	1.14	1.63	8.44e-05	0.0007	0.00362	2.75
	2.08	11.12	216.23	262.44	559.01	561.13	3208.68	136.02	3.54638e+06	9223.92	973019	3994
172	4110.12	451.6	4969.31	754.64	276.72	7.44	1.62	1.94	6.71e-05	0.00012	0.00066	2.04
	1.47	7.97	105.98	328.07	567.87	230.98	3182.13	172.91	3.81519e+06	11720	511643	4633
173	3142.26	681.68	4094.11	1009.52	149.63	7.98	1.48	2.05	9.11e-05	0.00081	0.00424	2.24
	0.97	9.31	72.12	909.88	305.67	378.81	4159.33	152.05	4.5391e+06	7914.81	709622	4961
174	3068.9	673.67	4606.54	990.91	265.51	7.11	0.67	0.89	2.5e-05	0.00071	0.00231	1.5
	0.96	13.97	92.3	462.56	370.67	379.82	5539.04	122.34	2.22495e+06	8456.94	904514	8103
175	3125.53	453.84	4511.93	690.01	275.3	9.64	0.87	1.17	5.85e-05	0.0004	0.00299	1.08
	0.68	13.92	97.33	464.4	206.21	434.33	3374.13	152.08	2.88904e+06	11201.5	1.54446e+06	4779
176	2040.35	860.91	2886.98	1535.31	230.06	5.4	1.51	2.13	2.52e-05	0.00061	0.00318	1.2
	0.71	12.34	52.91	995.82	290.31	661.97	4973.96	153.64	3.34319e+06	10194.2	3.36209e+06	7043
177	4869.69	275.32	7315.09	385.06	283.28	9.71	1.38	1.93	1.3e-06	0.00095	0.00268	1.27
	0.76	13.5	161.24	905.81	534.87	600.34	4144.06	172.65	2.5968e+06	14932	1.7517e+06	5832
178	4308.69	910.58	6109.98	1319.81	107.27	8.24	1.55	2.01	9.45e-05	0.00032	0.00209	2.82
	1.27	10.41	51.82	938.89	192.54	851.7	4375.85	144.87	2.82949e+06	9516.55	2.13002e+06	5156
179	3709.31	485.11	5639.52	634.25	278.82	8.79	1.56	2	1.1e-05	0.00011	0.00033	2.44
	1.41	6.62	70.79	384	168.13	821.92	4689.97	175.8	4.07567e+06	9111.87	728184	5228
180	3334.55	757.12	5094.69	1008.56	264.09	6.24	1.61	2.33	4.74e-05	0.00044	0.00263	1.46
	1.06	12.67	56.56	400.14	203.67	461.71	5713.16	129.15	2.25068e+06	14093	633184	7328
181	2091.08	479.5	3004.39	709.59	164.53	7.41	0.9	1.14	3.19e-05	0.00038	0.00243	2.94
	1.32	10.45	239.36	491.79	637.23	304.14	7865.71	176.62	4.76388e+06	15131.5	1.99562e+06	8801
182	4218.64	993.23	6453.18	1337.04	230.96	8.31	0.52	0.72	6.37e-05	0.00019	0.00159	2.44
	1.11	5.08	222.12	316.74	1170.6	877.87	7671.69	198.92	4.70093e+06	10756.4	1.97198e+06	9594
183	2897.05	589.29	3741.24	777.68	220.84	9.74	1.85	2.35	8.15e-05	0.0009	0.00443	1.74
	0.76	11.84	75.78	953.47	281.16	589.09	6763.09	154.08	4.81456e+06	11655.8	3.91874e+06	9357
184	2210.3	788.27	3406.02	1490.31	258.88	5.68	0.71	1.04	2.5e-05	0.00049	0.00569	1.65
	0.99	10.71	54.75	272.04	118.35	854.62	4370.68	193.07	3.24796e+06	7851.26	2.23789e+06	6236
185	2811.72	722.69	4487.54	952.42	214	7.1	1.69	2.07	7.19e-05	0.00028	0.00268	2.78
	1.49	9.67	115.51	374.72	472.07	418.2	6270.11	173.19	2.75945e+06	13930	2.79372e+06	8843
186	2351.64	818.98	3051.23	1238.73	288.96	6.87	1.36	1.83	6.9e-06	0.00083	0.00884	2.68
	1.21	6.24	234.02	779.16	1323.92	485.83	6296.84	152.91	4.76087e+06	11200.2	1.55868e+06	7308
187	4844.06	730.97	6592.78	1029.92	253.05	8.89	1.06	1.44	1.57e-05	0.00036	0.00165	1.18
	0.7	13.91	190.82	240.41	532.98	734.25	7198.86	164.84	2.35196e+06	16748.1	1.06804e+06	8579
188	2729.72	931.48	4011.78	1585.7	265.81	7.97	1.97	2.89	9.31e-05	0.00108	0.00529	1.69
	1.35	8.05	229.86	845.18	608.69	409.56	3171.28	162.11	1.77817e+06	9194.4	3.39142e+06	4176

189	4183.44	371.18	5951.51	584.75	154.42	8.15	1.78	2.52	6.75e-05	0.00058	0.00184	1.16
	0.55	10.07	119.67	332.95	477.56	408.55	5623.07	145.11	1.75587e+06	13379.5	2.45654e+06	7290
190	2789.46	939.24	4336.99	1732.7	290.26	5.85	1.44	2.03	7.51e-05	0.00047	0.00146	1.45
	1.08	11.17	182.13	484.7	676.13	224.86	3164.7	192.77	3.2758e+06	8006.08	573113	3956
191	3403.17	590.44	4218.96	1063.48	189.42	7.91	1.32	1.83	5.81e-05	0.00064	0.003	2.13
	0.89	6.59	198.03	897.93	725.02	541.29	7145.02	199.13	4.43189e+06	17711.3	2.16201e+06	9668
192	2411.28	858.71	3222.65	1590.56	148.74	9.1	1.55	1.9	7.87e-05	0.00062	0.00554	1.75
	1.01	6.06	54.69	384.61	187.08	746.53	4718.46	184.6	2.69546e+06	14909.7	3.35619e+06	5991
193	3815.88	936.65	4688.16	1745.44	271.94	7.5	1.37	1.87	6.34e-05	0.00033	0.00106	2.53
	1.98	11.15	248.4	808.85	1233	476.77	3218.5	170.14	2.59151e+06	12114.6	1.91492e+06	4171
194	3962.77	714.9	5736.45	1026.3	294.44	9.16	0.71	0.98	9.58e-05	0.0002	0.00083	1.91
	1.39	8.41	190.66	775.91	1076.13	489.9	3432.97	134.81	2.90717e+06	16548.6	826655	5033
195	3429.37	424.66	4822.61	693.47	250.6	9.03	1.78	2.44	4.29e-05	0.00031	0.00188	2.35
	1.18	10.96	223.85	923.2	825.82	681.22	7401.39	174.6	4.94456e+06	17045.5	2.48582e+06	9023
196	3572.54	992.14	4919.87	1942.54	150.87	7.03	1.41	1.91	3.84e-05	0.00048	0.00486	1.91
	1.38	5.48	196.76	809.86	756.91	572.33	3263.83	135.26	2.00583e+06	17062.3	3.65581e+06	4526
197	2877	783.3	4102.36	1198.23	152.02	8.8	1.1	1.38	1.64e-05	0.00079	0.00767	2.3
	1.01	7.88	164.34	896.52	873	471.57	3542.28	192.78	3.62025e+06	12414.1	3.29584e+06	4772
198	2010.01	903.17	2720.59	1206.35	191.21	9.67	1.88	2.68	4.68e-05	0.00015	0.00094	2.46
	1.42	11.7	60.6	932.04	348.8	912.81	4112.96	143.97	3.92792e+06	11804.7	1.36307e+06	5162
199	2689.1	645.07	3471.17	1095.73	266.01	9.11	1.83	2.24	6.69e-05	0.00098	0.01054	2.22
	1.21	12.88	140.21	934.3	377.25	947.69	3625.25	193.2	3.57074e+06	8800.67	571752	3910
200	3209.51	801.7	5042.13	1387.76	248.57	5	1.83	2.55	4.67e-05	0.00103	0.0036	1.42
	1.06	8.29	94.33	443.34	478.75	933.43	7926.65	141.51	4.73228e+06	12306.1	1.95383e+06	8988
201	4962.2	414.17	6718.63	504.55	208.68	7.68	1.42	1.74	1.25e-05	0.00081	0.00307	1.2
	0.67	7.36	220.95	749.99	749.13	342.8	4377.83	126.54	2.98065e+06	16490	3.62068e+06	4595
202	2615.7	670.5	3507.37	905.3	109.81	8.18	1.39	1.84	7.76e-05	0.0003	0.00178	2.27
	1.71	11.87	223.17	762.61	554.07	370.04	6273	159.42	4.45801e+06	10631.6	996250	8402
203	2867.01	473.53	3450.89	731.09	236.38	7.93	1.95	2.36	3.66e-05	0.00058	0.00127	1.77
	1.05	9.21	159.2	253	584.84	934.19	7126.38	180.03	3.57348e+06	13387.8	965165	10151
204	3060.19	773.99	4856.13	1077.89	141.44	7.37	0.92	1.34	8.65e-05	0.00046	0.00256	2.87
	1.95	7.16	236.42	883.11	1319.58	496.03	7654.68	122.89	2.74413e+06	15985.4	3.44078e+06	11079
205	3403.3	755.98	5252.86	1006.58	263.8	9.11	1.45	1.84	7.97e-05	0.00101	0.00801	2.06
	1.06	6.29	245.05	307.97	556.27	467.89	3030.37	179	4.82768e+06	10080.1	3.86965e+06	3380
206	3498.29	659.6	4400	1161.61	261.61	8.33	0.99	1.36	2.07e-05	0.00083	0.00324	1.23
	0.89	5.85	191.92	746.02	825.11	305.21	4978.88	163.5	3.29276e+06	17457.8	1.48765e+06	5837
207	3102.28	700.47	3946.91	1353.18	156.64	7.65	1.55	2.3	6.44e-05	0.0009	0.00212	1.12
	0.66	12.98	135.39	271.25	568.24	296.81	6067.15	160.97	4.72366e+06	15268.8	2.87416e+06	7549
208	4421.69	890.83	5320.14	1238.2	188.33	7.96	1.2	1.79	2.86e-05	0.00079	0.00364	1.27
	0.75	7.32	60.21	230.42	128.83	615.58	3268.59	190.4	1.39785e+06	9446.58	1.3013e+06	4127
209	3716.66	862.86	5041.58	1407.52	287.97	9.79	1.84	2.27	9.95e-05	0.00087	0.00274	2.71
	1.57	7.5	143.88	718.15	706.1	981.62	5165.7	184.07	4.01216e+06	7774.96	3.54774e+06	7740
210	4058.38	428.64	6098.38	654.43	205.35	8.82	0.52	0.69	3.54e-05	0.00035	0.00164	1.85
	0.74	9.42	151.95	341.17	738.78	402.34	5753.13	157.89	4.59468e+06	16932.4	1.41652e+06	6661
211	2020	726.58	2456.71	1417.49	286.41	8.21	0.99	1.36	5.98e-05	0.00095	0.00445	2.29
	1.83	13.86	218.09	664.25	508.23	421.88	3411.29	154.88	2.91429e+06	14647.8	894224	4620
212	2851.26	942.95	4286.61	1691.5	286.88	5.79	0.98	1.31	7.73e-05	0.00027	0.00153	1.68
	0.79	11.48	166	521.24	912.52	588.86	7023.46	145.12	4.84913e+06	12183.2	3.26742e+06	9663
213	4046.23	889.26	5618.17	1206.45	287.1	5.12	1.75	2.16	6.86e-05	0.00043	0.00313	1.79
	0.94	7.37	109.11	661.12	410.5	696.73	4009.83	141.83	3.57787e+06	14933.3	1.43455e+06	5832
214	3230.43	523.99	4198.63	932.7	252.92	6.25	1.88	2.35	7.08e-05	0.00029	0.00151	2.76
	1.29	10.03	228.42	790.76	757.37	947.85	4914.01	126.51	3.02956e+06	13805.6	2.25375e+06	6466
215	3609.32	733.75	5292.73	945.99	203.78	7.57	1.98	2.72	7.27e-05	0.00105	0.00348	2.65
	2.04	6.3	66.74	207.73	226.11	382.22	3894.87	179.56	2.89477e+06	8019.8	3.00069e+06	5076
216	2372.69	897.17	2934.5	1782.63	254.42	5.79	1.67	2.44	4.87e-05	0.00082	0.00418	2.39
	1.66	9.19	216.18	949.78	1211.52	952.84	4767.36	175.03	4.61599e+06	16533.7	3.24315e+06	6046
217	3007.18	514.03	4602.3	831.47	211.45	5.99	1.52	2.24	8.32e-05	0.0003	0.00141	0.91
	0.53	5.97	231.99	933.25	1079.72	706.44	7337.8	166.43	2.85609e+06	17567.9	2.22144e+06	9034
218	3879.66	611.93	5284.32	1050.44	126.19	7.04	1.31	1.83	3.38e-05	0.0003	0.00175	1.39
	1.06	7.19	249.06	679.22	1424.39	573.78	3545.69	187.7	2.59579e+06	9117.51	1.79183e+06	4992
219	2540.26	760.6	3114.25	1277.62	263.71	9.44	0.89	1.17	4.21e-05	0.00015	0.00171	2.85
	1.85	8.73	88.03	302.98	476.9	437.01	5566.4	181.61	4.40124e+06	15242.4	820270	6449
220	2495.08	930.81	3476.42	1722.71	139.93	7.01	0.58	0.75	2.42e-05	0.00093	0.00424	1.01
	0.75	7.63	61.91	563.57	151.91	529.04	4215.22	174.48	2.63379e+06	9756.4	3.24807e+06	6307
221	4351.72	935.21	6020.03	1769.46	187.78	9.08	1.11	1.66	5.44e-05	0.0005	0.00156	2.8
	1.38	8.18	67.93	279.74	137.36	650.66	7255.65	167.66	2.88229e+06	16426.8	2.28827e+06	9812
222	2077.2	633.57	2627.83	1174.4	201.32	8.12	1.78	2.33	6.04e-05	0.00087	0.00895	1.19
	0.81	12.63	208.23	287.68	733.77	799.73	4802.3	144.54	4.79904e+06	14266.1	1.05932e+06	5536
223	3105.52	735.48	3798.03	993.41	115.07	6.77	1.35	1.97	4.5e-06	0.00037	0.00256	1.99
	1.5	5.63	78.57	658.91	357.03	999.08	3222.09	125.61	1.36372e+06	7375.37	959019	3811
224	2840.23	956.8	4525.36	1579.5	268.35	6	1.48	1.91	5.08e-05	0.00026	0.00064	1.22
	0.64	13.15	92.77	614.58	499.48	559.57	5389.24	148.99	3.54225e+06	13082.1	763794	7622
225	4074.85	795.49	5684.8	1512.35	236.59	6.86	1.41	1.95	9.7e-05	0.00028	0.00322	1.14
	0.68	9.85	216.92	648.69	615.17	440.76	6321.67	171.35	3.95532e+06	9808.93	1.90319e+06	8670
226	2882.71	627.32	4288.31	991.99	155.52	6.36	1.93	2.7	4.45e-05	0.00078	0.00449	0.93
	0.67	5.54	243.02	731.68	595.38	265.15	4497.47	162.48	3.56992e+06	17796.6	3.66816e+06	6357
227	3961.19	543.24	5791.11	858.57	216.65	8.55	0.74	0.89	2.17e-05	0.00055	0.00193	1.7
	1.17	9.35	55.05	348.43	210.66	282.67	4484.93	197.9	3.19586e+06	15503.4	2.20185e+06	5441
228	2057.53	620.96	2635.97	1163.57	131.86	9.7	1.38	2	7.31e-05	0.00089	0.00953	2.19
	1.65	5.62	183.42	305.97	751.92	623.07	3703.36	136.8	3.27328e+06	11897.6	3.31015e+06	4104
229	2738.45	434.65	3555.39	838.06	293.59	5.15	1.97	2.56	5.03e-05	0.0003	0.00364	2.04
	1.52	6.09	218.79	359.86	1255.81	836.25	5634.17	137.25	4.49865e+06	12122.5	955068	6741
230	2517.8	982.34	3727.72	1903.15	166.4	8.53	0.88	1.29	4.55e-05	0.00028	0.00272	2.86
	2.22	12.11	132.33	234.13	408.15	788.41	4916.99	154.43	1.94009e+06	15955.9	2.24062e+06	6150
231	4102.81	755.12	5309.78	1358.94	155.65	8.98	1.46	1.99	9.44e-05	0.00091	0.00424	1.7
	1.03	11.14	236.61	768.13	1372.56	970.79	4310.82	180.7	3.90302e+06	9153.08	1.68347e+06	5904
232	4678.34	904.08	6298.42	1636.24	125.73	5.04	1.39	1.83	2.31e-05	0.00058	0.00257	0.94
	0.55	5.81	141.94	396.53	823.95	261.06	7096.25	126.25	4.86162e+06	16650.6	3.46778e+06	7979
233	3099.93	363.39	4362.83	567.06	181.65	6.84	1.51	1.99	6.7e-05	0.00023	0.0008	2.68
	1.4	11.95	131.5	792.98	354.56	339.66	3152.23	124.41	3.23113e+06	12637.5	585480	3512
234	4919.59	537.24	6411.98	964.3	259.53	5.37	1.05	1.49	6.63e-05	0.00014	0.00039	2.72
	1.9	10.55	183.88	318.92	419.23	568.16	5090.04	175.88	3.28624e+06	11640.1	1.22113e+06	6603
235	3361.41	822.63	5185.02	1291.31	112.43	8.25	0.8	1.09	5.5e-06	0.00088	0.00641	2.2
	1.17	6.38	154.68	626.36	856.15	659.27	4341.93	164.3	4.09339e+06	9458.2	3.57515e+06	6343
236	3445.16	777.72	4492.34	940.55	172.36	9.86	1.68	2.21	3.39e-05	0.00027	0.00214	1.02
	0.77	8.06	168.74	998.14	627.55	534.52	3478.03	130.47	4.90158e+06	13032.7	872623	4211

237	3754.12	809.04	5646.4	1495.73	203.22	7.64	1.69	2.05	7.49e-05	0.00016	0.00086	1.62
	1.18	13.27	225.21	610.34	1170.83	473.05	7069.23	138.67	2.54211e+06	8044.04	2.23636e+06	8705
238	3303.48	680.59	4375.53	885.03	144.75	6.81	1.6	2.17	1.46e-05	0.00024	0.00056	2.55
	1.54	13.82	71.12	532.15	230.37	362.58	6053.22	173.69	3.7268e+06	13779	1.52205e+06	7522
239	4471.43	718.75	5852.37	1328.5	135.93	8.33	1.08	1.5	7.72e-05	0.00103	0.00642	2.1
	1.56	5.21	63.2	913.45	291.65	771.15	3084.33	196.75	2.84914e+06	8158.28	2.98076e+06	4513
240	2460.15	728.28	3334.44	1116.67	177.56	9.04	1.95	2.48	7.69e-05	0.00084	0.00426	1.51
	0.62	6.53	127.25	867.76	668.95	491.31	4792.95	146.84	4.86632e+06	15070.2	1.48411e+06	6509
241	2744.98	391.23	3815	682.45	255.83	6.77	1.52	1.83	3.92e-05	0.00038	0.00168	2.49
	1.97	6.31	112.72	734.76	477.1	692.74	5379.3	191.54	1.62455e+06	7837.1	1.48695e+06	7865
242	4186.27	798.14	6599.67	1581.27	268.77	5.15	0.53	0.74	5.71e-05	0.00031	0.00276	1.22
	0.58	10.21	175.62	675.41	699.39	816.41	4237.45	175.46	2.73264e+06	16365.1	2.91787e+06	5069
243	3959.79	406.41	6202.99	580.04	272.3	7.4	1.11	1.34	9.62e-05	0.00019	0.00087	2.93
	1.65	10.63	146.96	809.6	738.45	585.95	5669.72	161.48	4.48179e+06	14041.2	2.23864e+06	7443
244	3787.47	806.98	4853.56	1122.9	149.02	5.74	1.04	1.4	1.76e-05	0.00018	0.00121	0.93
	0.58	12.66	105.18	923.71	522.17	686.57	3689.55	124.53	3.47046e+06	7880.99	1.60338e+06	4387
245	2332.61	884.05	3572.93	1211.06	278.12	6.43	0.89	1.09	2.59e-05	0.00021	0.0009	2.52
	2.01	8.86	51.57	724.87	115.75	410.36	7024.63	122.99	4.35126e+06	9633.77	1.22626e+06	8306
246	2948.59	803.39	4132.81	1191.62	268.03	9.32	1.47	2.06	3.3e-05	0.00067	0.0021	1.79
	1.18	10.99	86.68	547.34	437.98	402.43	3983.3	174.91	3.3133e+06	11556.3	3.76275e+06	5272
247	3920.32	626.58	4946.86	1156.01	117.62	7.35	0.61	0.89	5.99e-05	0.00022	0.00177	0.98
	0.63	8.64	193.19	326.77	1042.42	327.45	6058.37	192.82	2.57909e+06	9572.11	3.72373e+06	8782
248	2108.86	449.6	3218.24	778.56	295.93	5.09	1.65	2.2	8.79e-05	0.00058	0.00507	2.1
	1.09	9.38	72	416.18	424.96	990.85	6799.3	180.52	3.13106e+06	15827.3	1.63416e+06	8613
249	4514.41	936.46	7033.7	1762.87	265.78	7.58	1.05	1.32	8.54e-05	0.00091	0.00341	1.24
	0.53	10.48	176.67	271.72	893.95	667.02	3783.05	160.64	3.91545e+06	11975.1	3.65023e+06	4743
250	3862.88	735.04	4811.06	1277.19	233.84	5.95	1.25	1.61	4.53e-05	0.00016	0.00072	1.97
	1	5	192.22	932.58	424.87	661.29	7619.03	173.28	2.80425e+06	12723.3	1.26403e+06	8551
251	3832.61	353.44	4649.49	638.11	243.7	7.42	0.73	0.93	3.15e-05	0.00018	0.00047	2.9
	1.4	13.84	172.19	914.11	700.15	869.41	5163.82	142.21	2.44613e+06	16527.8	1.02454e+06	7068
252	2104.72	447.89	3259.01	797.52	206.65	7.47	1.27	1.71	6.4e-05	0.00079	0.00311	1.88
	0.85	13.13	159.55	940.26	859.89	647.55	4655.5	132.93	1.67254e+06	18084.3	3.1568e+06	5646
253	3726.23	711.07	5880.88	1361.86	248.25	6.45	0.63	0.77	6.22e-05	0.00019	0.00202	0.93
	0.63	11.8	175.31	517.32	913.98	398.42	3335.05	190.26	1.24637e+06	16599	2.90063e+06	4283
254	3413.8	917.14	4858.7	1279.47	270.12	9.51	1.18	1.56	4.91e-05	0.00011	0.00038	2.15
	1.31	12.66	94.61	976.41	307.42	949.07	4760.25	153.2	3.70922e+06	16767.7	1.35161e+06	5936
255	2387.96	926.67	3403.62	1291.69	260.8	6.84	1.03	1.35	1.59e-05	0.0008	0.00601	2.34
	1.8	10.1	173.33	742.91	776.07	491.09	3096.2	143.75	2.24528e+06	14095	2.44291e+06	4208
256	4347.05	942.41	5952.35	1504.74	169.1	6.59	1.71	2.36	4.28e-05	0.00064	0.00309	2.04
	1.37	11.66	218.87	652.11	683.54	681.04	4905.89	142.6	3.83547e+06	9476.29	1.77829e+06	5543
257	4488.79	863.79	7024.01	1384.47	217.69	8.5	1.04	1.27	6.08e-05	0.00019	0.00087	1.35
	0.7	12.92	226.84	897.53	1066.6	238.68	3721.64	163.59	2.3449e+06	11849.1	3.04355e+06	5128
258	2026.42	336.41	2881.17	517.52	266.3	6.3	1.03	1.25	4.66e-05	0.00095	0.00802	1.07
	0.52	10.2	213.02	886.89	938.52	641.61	3385.08	123.08	4.04311e+06	11372.7	3.25791e+06	4958
259	2080.41	926.56	3249.2	1628.7	206.82	5.11	1.13	1.62	5.97e-05	0.00092	0.00606	2.39
	1.02	11.41	225.59	420.27	714.42	497.74	4257.54	194.81	3.46626e+06	14131.2	880527	6086
260	2252.43	541.01	3534.35	671.01	139.33	7.05	1.85	2.25	3.85e-05	0.00085	0.00493	2.31
	1.06	12.35	65.15	736.34	196.61	864.29	4420.86	140.8	3.85452e+06	9330.28	1.92445e+06	5074
261	4379.14	505.73	6232.03	984.27	162.79	9.66	1.25	1.85	8.46e-05	0.00058	0.00178	2.96
	1.77	12.28	167.65	709.18	571.11	451.55	3143.51	136.77	1.07229e+06	13400.4	2.11153e+06	4332
262	2883.51	624.2	4217.13	826.77	210.92	8.35	1.31	1.81	9.04e-05	0.00037	0.00285	1.37
	0.56	5.36	127.61	347.98	579.43	363.59	5025.54	166	1.1761e+06	9393.07	1.68483e+06	5672
263	3757.79	435.85	5314.9	856.48	247.92	9.46	1.47	2.14	3.23e-05	0.00037	0.00097	1.21
	0.6	7.13	231.62	363.81	1115.6	996.06	4999.3	167.19	4.37844e+06	9714.51	1.86143e+06	7458
264	2630.9	625.35	3946.21	983.48	220.74	7.72	1.45	1.91	8.03e-05	0.0004	0.00417	2.43
	1.32	5.56	67.12	342.79	250.75	577.26	3232.3	156.12	2.81664e+06	14324	3.8119e+06	3769
265	3276.77	776.73	4969.43	1018.55	231.66	9.05	1.33	1.62	4.2e-05	0.00056	0.00445	2.87
	1.53	6.47	101.94	333.48	411.54	457.64	5102.89	157.73	3.75797e+06	11713.8	3.44954e+06	5651
266	3871.18	638.02	5886.45	980.74	209.54	7.53	0.84	1.16	7.86e-05	0.00014	0.00113	1.3
	0.8	13.6	201.98	784.09	745.91	502.67	6553.51	138.93	4.32789e+06	10171	2.20573e+06	7552
267	2266.6	964.42	3316.85	1905.88	179.56	6.4	1.75	2.28	6.02e-05	0.00083	0.00823	2.13
	1.29	6.43	69.87	931.43	298.88	243.37	4203.07	140.4	4.99033e+06	10220.9	1.3735e+06	5070
268	2520.36	519.62	3682.53	694.23	217.25	9.76	1.76	2.47	6.87e-05	0.00104	0.0082	2.47
	1.83	10.95	180.42	917.67	371.25	220.02	3334.73	161.11	3.21879e+06	12592.5	1.43707e+06	4285
269	2907.53	350.56	4278.59	440.58	244.34	9.21	1.53	1.89	9.6e-06	0.00045	0.00174	1.02
	0.7	5.34	60.77	422.2	357.21	692.58	6809.23	170.66	2.62666e+06	15469.8	3.16715e+06	7609
270	3679.48	225.51	4609.91	317.62	290.21	5.27	1.23	1.6	1.09e-05	0.00105	0.0024	1.6
	1.08	11.16	106.7	548.69	551.41	698.35	4440.25	139.56	2.02748e+06	15905.4	3.62284e+06	5207
271	2968.87	805.14	4615.52	1135.12	264.41	5.43	0.72	0.93	2.19e-05	0.00018	0.002	2.99
	1.92	10.11	208.66	587.46	469.97	842.44	5801.74	121.22	3.18821e+06	17980.8	551075	8464
272	2628.85	979.12	4099.74	1520.69	249.94	9.46	0.64	0.86	4.37e-05	0.00031	0.00109	2.26
	1.69	11.67	145.71	620.17	442.1	653.56	5888.48	188.65	3.11078e+06	7508.94	1.71359e+06	8657
273	4675.68	473.79	6997.85	800.83	258.46	7.2	0.74	1.07	8.47e-05	0.00079	0.00397	2.45
	1.35	9.17	235.7	749.43	793.91	385.2	5295.04	147.9	4.38609e+06	12910.6	3.63004e+06	5946
274	4852.91	505.89	7015.04	869.69	249.69	9.22	0.55	0.76	9.4e-06	0.00096	0.00268	1.79
	0.96	10.42	74.97	328.54	338.25	354.22	5195.09	153.86	4.07246e+06	10781.8	3.43884e+06	7578
275	2873.9	336.36	3895.83	667.67	231.37	6.41	1.4	2.05	8.35e-05	0.00011	0.00132	2.45
	1.02	11.34	105.58	621.18	576.08	330.49	5411.79	191.23	4.54678e+06	15858.7	510547	6119
276	4657.48	962.21	7297.84	1372.7	172.42	9.43	1.34	1.93	6.94e-05	0.00027	0.00094	2.74
	1.78	9.84	147.69	786.97	773.95	341.72	5670.98	132.07	3.43417e+06	13933.8	614285	7557
277	2163.46	584.3	2840.45	1122.78	268.93	6.6	1.04	1.49	7.92e-05	0.00082	0.0088	1.44
	0.94	12.32	178.84	622.22	358.83	901.76	4057.06	145.39	3.61313e+06	11051.8	3.23751e+06	5358
278	2831.01	754.66	3528.18	1271.84	279.01	7.92	0.75	0.92	2.73e-05	0.00065	0.00426	2.01
	1.09	11.32	210.56	997.18	425.68	611.02	3998.5	152.1	2.13876e+06	17076.2	715001	4487
279	2327.86	745.11	3632.82	1460.11	108.21	9.9	1.2	1.54	9.49e-05	0.00072	0.00194	1.79
	1.26	9.78	96.31	828.68	244.89	860.18	5217.97	166.35	3.32507e+06	10760.8	1.90514e+06	6174
280	2107.75	752.22	2939.83	1005.81	177.23	5.38	1.83	2.23	9.25e-05	0.00066	0.0014	2.92
	1.46	7.09	51.01	964.67	218.28	636.31	4938.1	133.36	2.82335e+06	12519.2	558717	6997
281	3089.01	704.17	4588.65	980.11	263.44	9.32	0.96	1.25	2.69e-05	0.00073	0.00338	1.36
	0.87	12.62	63.9	290.21	141.05	882.99	3870.86	134.91	1.81778e+06	10296.2	3.19588e+06	5152
282	2768.57	645.92	3874.68	1278.04	223.89	7.79	1.55	1.96	1.81e-05	0.00047	0.00459	0.92
	0.47	6.23	71.55	688.96	240.43	615.18	3725.69	138.12	3.48751e+06	10088.6	2.82514e+06	4393
283	3377.94	956.02	4178.71	1806.07	166.65	8.84	0.74	0.92	7.18e-05	0.0003	0.00175	2.68
	1.91	10.32	153.76	263.43	555.96	332.82	6739.65	131.02	3.83349e+06	18054.7	3.21181e+06	9639
284	3357.95	618.67	5258.25	781.35	206.78	5.11	0.87	1.13	4.9e-06	0.0002	0.00155	2.15
	0.99	5.89	146.76	415.97	680.76	777.67	5732.54	153.42	2.82058e+06	17965.2	1.06084e+06	7963

285	2741.91	487.96	3693.29	800.18	276.79	7.06	1.71	2.38	3.46e-05	0.00071	0.00261	1.59
	0.74	8.54	247.63	431.27	1187.74	435.73	3248.68	126.64	4.18612e+06	12931.7	3.35048e+06	4624
286	4839.69	500.81	6287.37	884.59	297.85	6.32	1.66	2.31	1.02e-05	0.00042	0.00251	1.02
	0.79	11.98	210.44	332	914.59	556.98	3068.8	126.12	3.25197e+06	14325.3	3.00183e+06	3396
287	3064.44	769.75	3760.76	1412.13	213.09	6.59	1.54	1.98	5.13e-05	0.00069	0.00176	1.67
	0.84	11.22	157.06	318.55	830.97	505.33	7322.03	170.35	2.13797e+06	15764.9	3.91164e+06	8869
288	3399.7	556.31	5051.92	1045.68	297.2	9.01	1.42	1.74	8.09e-05	0.00107	0.00278	2.36
	1.79	8.78	243.85	878.01	553.18	877.05	4795.78	194.54	2.69019e+06	14047.7	3.45175e+06	6343
289	4238.05	941.1	5689.44	1692.14	271.66	5.18	1.74	2.11	8.05e-05	0.00041	0.00122	3
	1.57	6.14	159.26	375.81	594.47	280.91	4032.29	195.88	1.57755e+06	17482.4	3.5092e+06	4859
290	2892.67	853.99	3791.19	1429.21	247.58	6.08	1.21	1.46	2.43e-05	0.00067	0.00484	1.36
	0.99	9.93	133.14	559.97	334.45	719.67	4786.38	134.96	4.3614e+06	8973.01	1.42419e+06	7040
291	4067.12	766.46	6041.82	1128.59	110.99	9.95	1.02	1.53	5.33e-05	0.00027	0.00241	1.75
	1.02	7.05	68.82	989.33	377.42	921.12	6514.16	195.99	4.28827e+06	8639.05	2.59225e+06	7962
292	4846.78	916.6	6110.02	1699.27	126.92	5.75	1.27	1.62	9.63e-05	0.00067	0.00261	2.51
	1.18	12.66	199.87	616.36	1013.69	933.72	3224.63	151.1	3.34749e+06	11077.5	1.12326e+06	3861
293	2942.41	586.44	4073.68	849.38	193.73	6.17	0.76	1.07	8.7e-05	0.0002	0.00187	2.1
	1.43	7.82	184.11	465.2	1084.2	447.88	4245.93	127.45	2.751e+06	8041.21	1.82784e+06	4687
294	4825.84	816.37	7276.12	1309.38	111.96	9.73	0.91	1.26	1.74e-05	0.00017	0.00078	1.71
	0.85	13.17	173.65	680.91	1011.15	508.08	6263.39	194.41	3.35839e+06	8818.99	2.53183e+06	9349
295	4435.33	800.68	5587.55	1273.5	126.62	7.18	1.33	1.93	4.92e-05	0.00066	0.0023	2.17
	1.21	11.61	207.96	273.43	950.39	718.38	3799.22	137.24	2.29281e+06	16990.4	2.65204e+06	4906
296	2983.46	881.47	4421.01	1553.05	290.45	7.08	0.8	0.98	6.61e-05	0.00101	0.00204	1.46
	0.7	11.8	246.7	812.44	576.5	543.88	4301.67	185.53	3.32116e+06	17172.3	1.39104e+06	5193
297	3747.7	854.3	5924.8	1070.28	270.24	8.59	0.7	0.92	9.77e-05	0.00032	0.0015	2.71
	1.14	12.83	157.19	387.67	686.62	903.34	6690.08	190.4	4.91177e+06	8869.95	1.72967e+06	9365
298	3326	742.58	5020.6	1251.37	115.24	9.55	2	2.83	3.98e-05	0.0002	0.00184	1.63
	0.65	12.88	249.38	520.21	631.49	765.38	3571.69	145.36	4.70413e+06	17531.1	1.23714e+06	5223
299	3878.91	998.84	4662.53	1985.29	121.69	7.26	1.52	1.89	5.97e-05	0.00059	0.00295	2.24
	1.6	13.49	248.55	426.4	645.3	235.85	4018.75	151.74	3.56299e+06	10353.7	1.91691e+06	5186
300	4522.44	824.82	6791.23	1314.26	107.03	6.25	0.67	0.81	1.65e-05	0.0007	0.00341	2.8
	1.58	6.45	57.03	645.39	163.06	802.36	6697.76	194.7	4.54568e+06	13793.5	854180	8578
301	2416.86	696.27	3714.07	1090.44	163.45	9.03	1.7	2.29	6.96e-05	0.00064	0.00733	2.67
	1.36	12.83	223.29	920.38	1293.88	530.34	3235.18	147.45	2.95645e+06	14710.2	1.94086e+06	4287
302	3041.72	258.48	4484.03	324.02	252.09	7.7	1.51	1.92	2.02e-05	0.00026	0.00233	1.26
	0.71	10.34	236.72	408.84	1132.88	922.76	3808.73	190.28	4.62676e+06	11834.9	3.95092e+06	4749
303	2480.88	563.87	3687.56	1106.87	170.15	5.13	1.07	1.36	3.44e-05	0.0004	0.00137	1.37
	0.63	6.22	69.98	350.01	366.77	424.14	6346.13	174.35	4.70559e+06	18081.4	1.77171e+06	7019
304	2435.73	523.53	3324.09	820.11	222.28	5.18	0.6	0.85	1.77e-05	0.00048	0.00163	1.6
	0.85	9.18	216.33	313.01	536.51	541.17	7245.05	129.31	3.21114e+06	11797.8	762651	10163
305	2169.73	783.59	3305.57	1436.88	260.18	8.1	0.58	0.72	0.000101	0.00059	0.00374	2.57
	2.04	9.76	141.74	489.28	764.92	497.01	3059.51	142.51	2.63227e+06	11917.8	1.91654e+06	4484
306	2647.27	906.32	3272.72	1740.95	165.94	7.26	1.25	1.76	5.16e-05	0.00075	0.00583	2.94
	2.25	6.71	86.8	896.99	501.86	482.82	3850.4	183.15	3.42025e+06	9948.64	1.50938e+06	5321
307	3749.08	636.54	5645.21	880.4	235.25	7.87	1.94	2.37	1.52e-05	0.00067	0.00194	2.2
	1.59	11.87	246.94	758.09	1086.71	355.97	7542.46	174.03	3.04738e+06	16459.4	3.47987e+06	9419
308	3537.25	383.73	5456.81	601.49	181.37	5.79	0.53	0.7	4.65e-05	0.0006	0.00228	1.25
	0.78	7.5	101.24	862.26	234.8	424.98	3635.02	196.89	2.30769e+06	13163.9	1.52316e+06	4326
309	2858.92	743.74	4472.22	1351.91	233.8	8.18	1.93	2.55	2.4e-05	0.00059	0.006	1.12
	0.5	5.87	76.96	697.14	305.69	540.18	4026.08	198.18	4.65662e+06	13110.9	2.50891e+06	4700
310	2546.75	771.85	3963.59	1405.93	260.8	9.68	1.85	2.75	6.97e-05	0.00061	0.0052	2.42
	1.61	6.51	128.61	422.46	345.66	212.95	3325.29	143.62	3.52993e+06	10550.3	931396	4508
311	2289.18	408.13	3040.13	518.98	206.42	9.61	1.81	2.34	6.43e-05	0.00035	0.00407	2.16
	1.1	13.29	116.11	520.81	315	455.23	7426.87	188.51	2.98815e+06	7381.79	3.02058e+06	8201
312	3629.8	979.28	5584.53	1823.27	154.03	8.15	1.35	1.91	1.88e-05	0.00102	0.00538	3
	2.39	10.32	187.95	247.33	1119.65	493.03	4072.62	125.69	3.96793e+06	16281.1	501416	4763
313	4119.7	233.3	5572.4	282.59	269.28	8.03	1.15	1.58	8.4e-06	0.00068	0.00143	2.26
	1.02	12.21	184.36	203.96	650.54	833.82	5089.94	156.91	3.23769e+06	12379.3	3.39516e+06	7186
314	3446.96	770.03	5343.15	956.87	264.17	5.3	1.15	1.44	2.59e-05	0.00091	0.0022	2.13
	0.93	10.66	155.03	401.53	623.09	951.28	4174.03	188.66	3.15505e+06	10574.2	1.89966e+06	5070
315	2113.01	511.15	3195.54	928.68	278.79	9.34	0.7	1.02	8.18e-05	0.00071	0.00322	1.92
	1.17	5.94	199.18	244.34	716.65	255.34	5112.65	196.86	2.18329e+06	8369.73	827794	7189
316	2555.08	605.72	3749.73	1194.53	217.07	7.57	1.62	2.18	9.69e-05	0.00049	0.00287	1.38
	0.67	11.21	60.14	730.91	339.83	949.35	5019.85	155.82	3.78003e+06	7308.82	1.74362e+06	6889
317	3412.05	469.33	4369.06	878.52	160.91	6.95	1.35	1.98	3.04e-05	0.0008	0.0028	1.53
	0.84	10.26	247.16	385.36	807.96	411.71	3970.69	124.48	1.7542e+06	14829.3	2.75444e+06	4405
318	3950.78	822.38	5145.64	1494.65	145.43	9.93	0.82	1.18	8.27e-05	0.00062	0.00153	1.14
	0.91	9.26	116.65	282.26	251.19	275.99	6007.62	127.94	2.60575e+06	18173.7	3.52721e+06	7834
319	2687.83	434.52	3805.97	617.47	280.48	5.27	1.15	1.7	9.11e-05	0.00026	0.00176	2
	1.16	9.5	58.51	855.83	312.08	849.31	4731.2	147.86	1.69512e+06	15878.8	1.12058e+06	6914
320	3718.8	571.51	5185.28	897.79	173.81	9.87	0.92	1.29	5.31e-05	0.00058	0.00156	1.58
	1.12	8.6	197.63	227.84	773.66	720.23	3493.04	136.52	3.06062e+06	10255.3	1.34265e+06	4579
321	3572.93	517.37	4365.02	820.18	274.55	8.04	1.46	2.03	2.85e-05	0.00026	0.00057	2.49
	1.29	13.52	157.84	958.47	870.41	805.48	3774.32	146.45	2.78991e+06	15511.1	1.74725e+06	5410
322	2378.72	615.07	3080.68	976.86	256.89	5.87	1.26	1.66	5.41e-05	0.00075	0.00701	1.64
	0.93	12.97	246.36	971.63	955.37	823.59	5374.68	146.25	3.46448e+06	8363.48	2.2419e+06	6766
323	4661.74	510.34	6821.08	853.11	180.78	7.35	1	1.35	5.8e-06	0.00096	0.00327	2.39
	1	11.79	108.26	822.12	648.03	902.95	3991.79	145.29	4.78307e+06	8481.96	1.13563e+06	5896
324	2261.3	876.64	3348.64	1365.67	202.23	9.03	0.77	1.01	9.15e-05	0.00061	0.00328	0.97
	0.5	10.45	154.25	842.32	536.26	656.61	5088.74	171.72	4.15316e+06	11410.6	2.5997e+06	6586
325	4892.07	481.98	6588.87	903.79	212.89	8.72	1.19	1.57	3.82e-05	0.00031	0.00124	1.48
	0.67	8.83	67.66	371.17	307.32	348.73	6107.64	131.7	4.10629e+06	14405.9	2.79734e+06	8354
326	4818.98	890	6978.92	1240.17	135.26	8.63	0.69	0.86	8.61e-05	0.00022	0.00105	2.76
	1.61	13.62	246.33	253.39	1376.66	797.83	7541.19	141.46	3.82047e+06	8815.98	704959	9539
327	2650.36	854.62	3646.36	1367.36	246.43	9.49	1.06	1.44	3.9e-05	0.00053	0.00217	2.46
	1.2	13.76	109.56	411.3	335.42	970.15	5604.43	180.38	3.60452e+06	14791.4	952851	7321
328	3264.25	407.88	4683.23	660.1	268.81	5.12	1.09	1.5	8.48e-05	0.00068	0.00583	1.14
	0.89	11.57	137.21	211.89	323.68	791.26	3849.85	138.08	2.92188e+06	14679.8	1.10115e+06	4486
329	3983.51	966.08	4880.47	1868.52	180.03	9.65	1.82	2.41	4.98e-05	0.00078	0.00577	2.98
	1.22	9.1	140.85	597.96	613.46	971.65	3228.99	147.48	4.97424e+06	17117	3.1723e+06	4566
330	3264.7	887.55	4457.12	1741.56	140.22	7.33	1.24	1.78	5.4e-06	0.00068	0.00334	1.31
	0.59	9.43	242.66	625.34	590.6	245.39	6017.54	141.99	4.31844e+06	18093.8	2.38806e+06	7822
331	4525.09	701.95	6703.21	1132.16	220.58	9.79	0.96	1.39	7e-06	0.0002	0.00112	2.88
	1.76	13.19	152.68	345.17	556.98	765.03	4229.75	169.98	4.40798e+06	11433.5	1.8254e+06	5588
332	2818.27	931.83	4298.91	1527.26	212.52	8.24	1.38	1.67	4.86e-05	0.00019	0.00199	1.66
	0.7	12.04	224.83	246.92	1139.84	747.72	3282.37	130.8	3.29681e+06	10661.2	2.83235e+06	4303

333	2023.68	525.38	2719.09	940.41	250.5	6.19	1.83	2.63	2.26e-05	0.00069	0.0052	2.31
	1.71	6.13	71.33	222.75	261.1	488.26	3872.85	171.46	1.72207e+06	14042.9	2.49536e+06	4688
334	4954.17	685.14	7232.69	1130.99	200.04	7.81	1.74	2.26	6.28e-05	0.0001	0.00055	2.63
	1.24	9.66	194.75	771.96	1047.92	536.07	6054.71	126.71	3.1966e+06	14264	983218	6847
335	3479.48	746.32	4469.56	1093.19	187.9	5.68	1.44	1.78	9.16e-05	0.00058	0.00267	0.97
	0.74	12.49	244.37	552.12	621.05	223.8	4439.92	192.02	4.50327e+06	8948.27	3.9932e+06	5577
336	3233.42	943.06	5062.3	1838.02	146.07	9.65	1.01	1.51	5.63e-05	0.00018	0.00058	1.73
	0.71	9.06	155.52	518.86	593.4	952.16	4276.79	171.54	4.14093e+06	14728.7	1.59621e+06	5222
337	3953.35	757.54	5617.99	1259.09	253.53	5.74	1.98	2.82	2.35e-05	0.00026	0.00222	1.48
	0.69	13.28	108.39	511.55	448.82	842.82	5756.6	177.63	3.49554e+06	7494.87	3.55723e+06	7012
338	3517.21	809.52	4240.94	1468.89	270.98	8.36	1.02	1.26	5.2e-05	0.00036	0.00241	1.7
	1.25	5.5	78.53	299.71	283.01	271.16	4401.85	135.93	4.18282e+06	12514.4	1.195e+06	5869
339	2412.63	501.91	3469.58	819.15	207.17	5.2	1.65	2.42	1.37e-05	0.0006	0.0068	1.75
	1.07	9.66	140.86	391.21	588.1	305.41	3466.42	187	2.96528e+06	10940	2.15131e+06	4805
340	3611.27	951.4	4795.36	1640.68	224.81	8.3	1.65	2.43	8.8e-06	0.00092	0.0019	2.11
	1.55	5.94	124.56	214.05	420.87	708.42	4201.16	190.74	1.57383e+06	16705.9	602968	6140
341	3154.58	981.36	4327.43	1196.05	254.56	6.07	1.24	1.59	0.0001009	0.00059	0.00404	2.55
	1.61	12.97	73.06	772.85	174.06	794.37	3171.18	170.91	4.09356e+06	14415.2	2.75939e+06	3880
342	3372.88	867.09	4626.23	1330.82	276.94	6.4	1.51	2.1	9.21e-05	0.00041	0.00195	1.28
	0.87	10.02	164.58	960.38	501.53	408.78	4294.29	175.25	4.59252e+06	10999	1.33207e+06	5708
343	4231.04	685.91	6418.72	1023.44	206.38	8.61	1.86	2.4	3.83e-05	0.00068	0.00162	1.72
	0.75	8.97	91.24	727.85	303.49	719.25	4573.59	136.5	3.99139e+06	15643	2.82785e+06	5093
344	2657.49	913.16	3411.15	1707.74	202.72	6.88	0.79	1.05	9.57e-05	0.00051	0.00314	2.16
	1.17	8.18	151.04	833.11	811.65	580.07	5827.57	151.1	4.79459e+06	16624.5	3.97108e+06	8612
345	2754.83	282.98	4018.38	425.09	271.33	9.14	1.63	2.43	3.82e-05	0.00022	0.00161	1.12
	0.81	10.73	241.25	532.34	1347.41	427.56	7374.72	200	4.18409e+06	11153	2.42274e+06	8346
346	3283.57	523.26	4854.97	699.71	257.98	7.36	0.66	0.93	3.33e-05	0.0001	0.00121	2.32
	1.46	9.22	129.03	736.18	692.27	514.77	3876.3	178.61	2.1891e+06	13130.9	3.83663e+06	5615
347	4466.58	897.21	5757.28	1272.59	211.22	7.23	1.76	2.29	8.85e-05	0.00027	0.0025	0.91
	0.48	6.6	187.18	364.18	564.81	726.78	5387.87	165.7	2.72209e+06	15787.8	3.89186e+06	7338
348	2430	765.48	3141.3	993.35	178.55	7.45	1.24	1.77	4.3e-06	0.0008	0.00246	1.4
	0.97	11.04	208.42	306.16	496.27	263.13	3779.24	188.39	3.39331e+06	10004.9	2.19638e+06	4734
349	4717.22	787.14	7115.36	1136.74	224.08	5.63	1.09	1.32	8.04e-05	0.00015	0.00073	1.91
	1.21	9.69	118.85	336.62	479.09	739.4	3055.07	138.48	2.75206e+06	18080.3	2.41026e+06	4376
350	2280.95	735.72	2855.75	1412.5	195.54	9.21	1.73	2.39	5.6e-05	0.00048	0.00272	1.3
	0.95	12.8	232.38	295.1	650	361.86	6566.09	136.3	2.53466e+06	15582.9	690090	8606
351	4255.7	884.71	5190.38	1547.95	218.51	5.44	1.91	2.62	8.17e-05	0.00083	0.00552	1.55
	0.64	11.62	68.73	965.83	300.64	420.93	3079.91	129.91	3.75563e+06	12838	2.30115e+06	3867
352	2364.27	838.73	3019.36	1448.45	254.33	9.01	1.6	1.98	0.0001008	0.00084	0.00652	2.41
	1.49	10.5	198.18	755.18	1000.97	873.24	4721.39	161.38	3.07355e+06	17367.6	2.35151e+06	6792
353	4110.52	630.08	6250.95	860.6	298.74	5.66	1.56	2.11	9.74e-05	0.00011	0.00089	1.85
	0.97	5.36	72.34	377.16	344.72	917.59	3174.47	167.52	2.24203e+06	16284.8	927131	4009
354	3975.58	866.81	5627.7	1589.6	122.05	6.47	1.86	2.72	7.63e-05	0.0011	0.0044	1.74
	1.08	10.8	133.97	668.87	681.64	973.89	3310.65	163.48	1.73521e+06	14975.7	664769	4954
355	4722.2	971.44	7047.2	1401.05	287.3	8.6	1.3	1.57	5.56e-05	0.00033	0.00255	1.21
	0.58	8.42	214.04	873.72	1135.29	205.14	3424.54	172.61	2.85739e+06	9059.92	1.07757e+06	4261
356	3594.5	952.82	5514.27	1442.44	291.36	8.51	1.36	1.86	6.5e-05	0.00096	0.00227	2.14
	1.19	6.04	81.11	421.08	234.31	857.56	3827.05	127.65	2.74194e+06	10636	686673	5714
357	3295.94	736.54	4267.51	1109.05	146.21	9.97	0.91	1.19	7.84e-05	0.00033	0.00152	1.24
	0.95	12.76	125.36	633.4	320.56	428.28	3026.31	163.93	4.83273e+06	10384.4	1.31276e+06	4476
358	3974.93	525.02	5857.49	915.02	150.65	7.49	1.61	2.14	6.83e-05	0.00041	0.00231	2.33
	1.64	12.66	157.97	324	834.21	472.66	3733.1	165.42	3.42629e+06	9291.85	3.57083e+06	4953
359	3004.5	954.74	4524.88	1765.19	193.03	8.85	1.71	2.25	6.14e-05	0.00082	0.00522	2.69
	1.54	11.06	185.79	363.57	1012.26	256.82	6726.39	181.8	3.9297e+06	12677.7	2.42966e+06	9665
360	2928.07	888.75	4526.48	1182.41	218.73	6.54	1.37	1.95	3.92e-05	0.00014	0.00128	2.34
	1.48	9.8	218.74	611.11	560.96	503.43	4160.24	156.09	1.05085e+06	9970.59	1.38908e+06	5673
361	2225.92	734.12	3389.81	1090.58	252.89	8.18	1.99	2.89	1.04e-05	0.00084	0.00213	2.41
	1.16	10.49	77.35	204.73	318.41	500.98	7997.14	181.24	3.84002e+06	13014.5	2.3807e+06	10199
362	2834.86	446.17	3405.48	847.45	183.83	9.09	1.88	2.82	7.11e-05	0.0002	0.00109	2.7
	1.59	9.59	130.41	794.81	735.39	310.52	4133.45	143.59	3.42492e+06	14718.2	1.01849e+06	6022
363	2675.05	608.69	3738.79	961.19	101.83	9.07	0.98	1.25	8.36e-05	0.00044	0.00328	2.53
	1.95	8.65	184.62	690.54	453.34	964.18	6277.13	128.75	3.21073e+06	17652.1	1.35955e+06	6481
364	4024.92	792.95	5950.33	1352.67	108.78	9.45	1.49	1.93	5.75e-05	0.0001	0.00031	1.95
	1.28	10.08	207.94	267.31	941.63	382.83	6731.24	142.82	1.83101e+06	12457.9	1.27018e+06	7796
365	4871.73	297.31	5920.42	485.35	278.23	8.38	1.05	1.45	2.94e-05	0.00018	0.00102	1.46
	0.62	12.24	167.85	444.48	404.38	484.75	3158.66	199.23	2.95041e+06	13944	1.71614e+06	3556
366	2785.27	695.8	4393.1	1007.01	276.61	5.46	0.72	0.91	5.51e-05	0.00034	0.00388	2.23
	1.12	13.5	70.07	639.55	330.85	974.5	6165.13	143.26	4.27965e+06	16377.2	3.84016e+06	8735
367	4924.26	869.48	6939.02	1698.02	123.28	9.59	1.37	1.8	4.64e-05	0.00072	0.00219	0.97
	0.55	9.73	178.21	904.68	570.36	264.83	7410.58	148.92	3.06621e+06	12820.4	2.83887e+06	9253
368	2598.52	938.93	3560.19	1413.48	230	7.65	1.41	1.75	7.6e-06	0.00047	0.00256	2.12
	1.01	9.24	244.56	399.91	1148.5	904.48	7204.87	189.02	3.28735e+06	17697.8	948135	9903
369	3027.16	524.82	4211.34	898.57	226	8.47	0.61	0.74	7.89e-05	0.00037	0.00152	1.84
	0.74	13.58	184.83	329.67	931.85	823.01	5882.62	151.05	1.49092e+06	16049.7	2.51158e+06	8413
370	3376.46	438.15	4510.03	719.42	217.39	9.42	1.56	2	1.52e-05	0.00076	0.00292	2.85
	1.16	6.37	235.05	975.97	1214.87	519.51	3787.7	152.64	3.16947e+06	12347.2	2.01259e+06	5326
371	3535.98	696.02	4741.59	1286.33	184.34	5.22	0.62	0.91	0.0001002	0.00067	0.00248	2.63
	1.31	13.49	182.36	317.75	860.66	242.46	6795.41	127.04	3.1739e+06	14100.6	3.96459e+06	7742
372	2508.6	598.97	3504.94	972.22	286.3	8.66	1.26	1.71	4.24e-05	0.00039	0.00162	2.16
	0.89	8.11	179.99	865.16	536.12	963.83	6791.64	182.36	1.78653e+06	15653.7	3.35078e+06	9814
373	2114.17	803.05	3111.51	1249.18	150.85	7.86	1.86	2.39	7.26e-05	0.00062	0.00357	1.05
	0.52	5.97	245.49	890.02	1160.41	606.82	4769.89	180.35	4.05738e+06	9532.68	1.03022e+06	7071
374	4799.78	679.24	6593.45	862.03	262.2	6.15	1.9	2.65	2.3e-05	0.0005	0.003	2.81
	1.32	7.25	154.56	427.28	840.56	909.12	3984.6	156.44	2.85816e+06	8119.36	2.69462e+06	4805
375	2819.48	916.29	4446.18	1772.64	112.23	8.42	1.93	2.44	3.22e-05	0.00088	0.00591	1.61
	0.77	9.23	56.02	249.65	217.34	791.64	3748.52	165.08	2.32836e+06	17920.8	712175	5356
376	4354.46	664.3	5705.6	1038.05	295.47	6.61	0.88	1.2	3.81e-05	0.00058	0.00547	1.61
	1.08	9.7	235.16	403.34	1277.98	677.29	4399.27	166.16	4.58615e+06	10686.6	2.46573e+06	5236
377	4359.01	885.7	6462.47	1268.31	267.45	8.36	1.25	1.65	2.09e-05	0.00021	0.00181	2.71
	1.25	13.14	217.37	777.44	1290.79	480.32	7747.14	158.2	4.87776e+06	15795.1	2.96244e+06	9919
378	2471.96	782.43	3667.61	1031.39	197.74	5.61	1.54	1.96	7.74e-05	0.001	0.00674	2.18
	1.64	14	68.13	705.61	203.4	954.22	3438.76	196.4	3.13274e+06	9483.12	3.44138e+06	4095
379	3096.6	826.69	4848.36	1307.79	269.58	6.74	1.56	2.3	5.04e-05	0.00025	0.003	2.44
	1.74	11.81	164.01	941.87	383.98	785.17	3014.83	178.52	3.32788e+06	13581.8	2.81343e+06	4140
380	3165.06	797.68	4932.67	1282.2	237.35	5.96	0.84	1.03	9.51e-05	0.00044	0.00191	1.47
	1.16	13.83	60.69	335.15	243.02	653.6	4138.76	165.51	2.37704e+06	17668.9	1.77485e+06	5074

381	3941.12	724.93	4739.89	1430.66	192.51	9.55	1.72	2.49	3.81e-05	0.00018	0.00192	1.65
	0.99	14	178.96	594.67	391.52	483.79	3406.31	194.92	4.61665e+06	8236.91	1.70747e+06	3802
382	2918.69	506.5	3561.58	735.25	277.38	6.09	1.33	1.76	8.1e-06	0.00031	0.00219	1.33
	0.99	11.5	51.44	430.22	229.8	967.64	7567	136.9	4.10192e+06	12375.5	1.04551e+06	10320
383	4285.05	889.7	6787.6	1483.25	129.79	8.07	1.18	1.57	5.76e-05	0.0008	0.00459	2.01
	1.21	11.44	130.27	710.58	632.66	901.36	4296.16	195.64	4.30674e+06	13371.6	1.31818e+06	5624
384	4295.8	939.88	5778.45	1621.22	186.47	9.18	1.62	2.06	2.41e-05	0.00079	0.00252	2.26
	1.28	9.63	216.78	588.35	724.05	283.17	5066.3	124.44	3.12281e+06	7476.11	3.92588e+06	6691
385	3261.63	692.87	4830.88	858.7	221.6	7.63	0.75	0.98	3.4e-06	0.00052	0.00353	1.34
	0.66	9.47	150.37	495.98	510.66	259.2	4261.7	142.24	1.59918e+06	17831.6	3.80746e+06	4981
386	3810.89	662.13	5253.62	1136.48	251.59	8	1.1	1.64	3.81e-05	0.00092	0.00318	0.91
	0.43	6.17	65.89	992.55	188.65	564.43	5509.36	189.87	4.03109e+06	9899.77	666933	7277
387	2085.16	998.26	3029.16	1847.65	179.45	5.04	1.51	1.86	1.63e-05	0.0007	0.00514	1.71
	1.31	9.18	106.62	277.97	478.79	289.02	6731.3	189.23	3.56195e+06	9022.53	2.4339e+06	7585
388	2375.01	812.82	3132.52	1451.91	162.21	9.07	0.93	1.23	4.93e-05	0.00022	0.00139	1.1
	0.74	11.51	231.69	663.65	822.29	997.06	6786.24	132.15	4.24039e+06	17564.9	1.72495e+06	8608
389	4630.98	674.96	5557.64	999.9	176.46	5.33	1.55	1.98	7.89e-05	0.00047	0.00244	2.95
	2.27	9.33	163.47	625.88	669.23	222.72	3651.83	172.83	3.9895e+06	14137.2	3.90388e+06	5228
390	2410.27	927.77	3089.58	1333.84	165.56	7.97	0.81	1.06	3e-06	0.00065	0.00479	1.66
	1.07	7.5	96.66	831.88	439.01	505.1	4501.34	163.29	3.48008e+06	16252.4	547563	5874
391	4800.61	775.97	7476.87	1127.33	235.22	7.06	1.43	1.81	3.95e-05	0.00055	0.00438	1.05
	0.76	11.66	166.41	265.32	968.96	918.9	3776.94	146.08	3.76289e+06	10920.5	1.11639e+06	5232
392	4710.09	639.43	6864.97	1169.26	113.02	7.76	0.72	1.01	4.26e-05	0.00027	0.00087	1.83
	1.04	5.7	63.39	858.71	231.05	331.11	3061.23	158.53	1.94112e+06	8541.04	1.95844e+06	4404
393	3996.98	713.08	6230.5	1303.03	123.44	9.88	1.65	2.02	1.02e-05	0.00104	0.00452	1
	0.53	13.12	156.77	457.67	808.43	602.68	3822.67	176.98	3.43706e+06	11477.6	3.22018e+06	5520
394	2001.76	621.48	2976.71	1186.76	122.67	6.82	0.85	1.05	2.75e-05	0.00098	0.00444	1.94
	1.36	11.07	115.46	432.07	615.44	262.42	3903.67	160.06	1.60599e+06	17803.9	1.96653e+06	4647
395	3842.57	605.26	6140.42	888.2	272.19	7.39	0.59	0.85	4.02e-05	0.0003	0.00073	1.2
	0.51	12.32	213.45	972.36	535.46	298.27	3824.01	183.32	1.91606e+06	15667.6	1.32798e+06	5604
396	3492.86	930.76	4983.37	1237.42	121.21	9.73	1.79	2.44	7.72e-05	0.00029	0.00315	2.11
	0.94	11.49	147.13	515.41	418.98	690.18	4649.42	165.34	3.68314e+06	8522.49	1.02262e+06	5121
397	3222.38	617.42	5152.23	1181.54	178.91	7.73	1.95	2.74	3.1e-05	0.00034	0.00299	1.97
	1.28	9.16	222.67	407.06	1114.23	657.98	5135.38	156.37	3.67859e+06	14598.9	3.52399e+06	7291
398	3143.19	561.88	4152.26	838.58	149.11	5.99	1.54	2.16	4.8e-05	0.00068	0.0018	1.8
	0.8	12.79	125.68	327.98	432.61	842.04	6390.71	193.41	3.74104e+06	14394	1.63497e+06	9448
399	3822.45	957.62	5048.43	1336.7	241.24	9.66	1.02	1.35	8.71e-05	0.00021	0.00077	1.24
	0.78	6.11	103.18	892.05	574.79	573.35	7936.87	184.8	4.72528e+06	8301.36	2.92297e+06	10009
400	2891.97	503.33	4557.89	678.76	211.61	9.66	1.41	1.84	5.64e-05	0.00026	0.00163	2.33
	1.52	11.9	106.37	746.45	393.75	624.87	7898.56	190.62	2.13254e+06	12320.7	1.53833e+06	9359
401	3595.47	382.63	5551.69	474.7	186.81	6.11	0.91	1.23	9.42e-05	0.00066	0.00242	2.77
	2	11.59	237.56	860.94	876.02	675.97	4679.41	175.22	4.66484e+06	8078.74	2.35676e+06	5364
402	4239.59	518.47	5893.34	867.73	165.67	8.44	0.72	0.97	4.6e-05	0.0005	0.00132	2.16
	1.49	8.09	195.04	741.46	670.88	911.72	5646.11	140.32	2.11553e+06	17495.3	3.3135e+06	6995
403	3986.43	483.63	5583.46	954.09	117.16	6.43	0.81	1.15	8.2e-06	0.00084	0.00283	2.1
	0.87	5.87	76.16	555.51	420.13	818.65	4614.86	180.84	3.26043e+06	16739.8	2.84849e+06	5813
404	4946.43	762.13	6296.77	1279.59	196.96	8.13	0.71	1	8.06e-05	0.00018	0.00108	2.14
	1.71	6.4	195.45	240.73	566.41	428.42	3650.16	184.53	3.15222e+06	13885.7	3.4956e+06	5454
405	4304.62	887.64	5533.45	1334.45	262.99	8.74	1.69	2.47	2.19e-05	0.00026	0.00303	2.87
	2.26	6.14	186.73	783.83	854.55	284.32	4468.39	168.27	4.70818e+06	10093.4	3.38149e+06	5429
406	2597.43	965.19	3670.18	1166.01	268.1	8.8	1.17	1.63	1.56e-05	0.00038	0.00308	2.86
	1.96	11	193.01	814.55	1099.72	537.69	5068.54	194.35	4.64754e+06	13278.4	3.88926e+06	7225
407	3404.3	641.6	4903.4	1160.1	245.91	7.13	0.81	1.02	9.39e-05	0.00051	0.00466	2.51
	1.33	12.34	208.37	401.33	570.33	473.89	4438.21	172.5	4.59502e+06	13023.8	2.51655e+06	5460
408	2264.41	744.38	2889.83	1364.31	234.03	5.65	1.12	1.64	1.18e-05	0.00048	0.00159	2.93
	1.26	5.87	213.83	205.27	1265.1	434.7	7128.11	192.99	3.165e+06	17707.7	3.73426e+06	9614
409	3769.8	882.48	5222.86	1706.27	209.16	8.4	0.61	0.9	6.65e-05	0.00067	0.00403	2.59
	1.98	6.72	220.73	985.83	527.7	639.67	3897.74	156.96	3.63237e+06	9177.26	2.74662e+06	5005
410	3788.29	625.92	4845.24	1108.93	221.63	5.46	1.14	1.53	2.86e-05	0.00018	0.00117	1.65
	0.72	13.17	58.64	575.16	229.34	776.6	3951.91	128.89	1.98631e+06	8335.79	917901	5338
411	2218.91	567.62	2751.05	933.34	117.69	8.2	1.04	1.3	8.75e-05	0.00062	0.0049	2.73
	1.99	13.51	127.41	673.48	392.35	928.84	3091.1	141.48	1.7279e+06	14807.8	506258	4027
412	2996.69	587.97	3650.51	871.89	153.24	8.42	1.89	2.71	5.32e-05	0.00013	0.00049	2.54
	1.31	6.56	224.09	253.99	858.28	366.23	6466.12	176.52	3.05173e+06	8605.92	1.10378e+06	7947
413	2838.43	994.72	3801.46	1283.51	246.58	7.35	1.8	2.67	1.58e-05	0.00012	0.00035	2.7
	1.87	11.14	187.69	620.96	391.78	541.94	6765.9	169.19	2.03542e+06	12173.9	1.18421e+06	8019
414	4127.8	461.57	6574.96	590.04	245.99	9.21	1.66	2.07	2.3e-05	0.00051	0.00191	1.79
	0.91	13.62	152.41	885.59	811.45	848.69	7222.35	132.84	4.13804e+06	14247.5	1.82076e+06	9458
415	3675.46	603.71	5289.34	995.76	100.84	6.55	1.38	1.94	3.29e-05	0.00053	0.0022	2.15
	1.17	13.4	243.13	465.73	1357.3	896.91	7518.35	171.76	4.00945e+06	8360.43	1.91158e+06	9509
416	3463.08	706.84	4430.95	1382.78	202.78	9.89	0.52	0.7	8.31e-05	0.00033	0.00079	2.18
	0.92	12.27	182.42	296.84	713.35	896.7	7664.78	185.18	3.60006e+06	10861.3	1.41045e+06	9510
417	3614.68	535.4	5652.18	692.16	212.32	5.66	0.97	1.37	2.47e-05	0.00025	0.00113	2.59
	1.43	6.52	88.67	392.06	308.76	571.25	6720.73	157.22	4.5401e+06	9428.12	909841	9671
418	3025.18	649.27	3794.45	1207.71	265.69	5.1	1.66	2.03	7.79e-05	0.00031	0.00176	0.9
	0.65	8.84	170.34	373.02	402.59	666.29	4068.74	162.99	1.47047e+06	10997.1	2.1022e+06	4755
419	4827.78	985.94	6391.64	1666.76	144.95	5.41	0.62	0.79	3.31e-05	0.00072	0.0026	0.95
	0.4	10.64	140.9	877.2	663.54	622.79	4383.8	177.99	2.81121e+06	8738.8	2.9043e+06	6243
420	4856.41	920.25	7006.78	1807.16	267.3	5.78	1.63	2.4	9.59e-05	0.00085	0.00333	0.92
	0.69	6.07	207.2	558.4	1063.04	469.24	6761.98	158.28	4.17452e+06	9366.17	2.69963e+06	9477
421	2962.91	752.04	4173.15	1183.89	284.44	7.29	1.62	2.28	1.8e-06	0.00083	0.00413	2.27
	1.77	5.69	82.04	344.92	317.72	958.85	3768.35	141.68	4.23137e+06	11521.6	2.7504e+06	4630
422	2557.24	308.09	3938.43	440.55	284.9	5.88	1.47	2.01	9.4e-05	0.00065	0.0022	1.57
	0.84	13.46	179.77	678.22	622.27	833.7	3901.96	142.33	4.00141e+06	17238.8	766826	4375
423	2643.18	918.04	4139.79	1746.17	160.89	7.41	0.8	1.03	2.82e-05	0.0008	0.00598	1.08
	0.86	9.58	135.91	769.69	451.42	816.14	4523.45	133.11	4.46397e+06	16268.1	2.34087e+06	6453
424	3805.4	350.66	4922.44	517.62	127.93	6.95	1.58	1.98	3.13e-05	0.00097	0.00272	2.88
	2.03	11.02	117.51	976.32	497.44	576.01	5829.92	188.9	3.74871e+06	10373	3.36893e+06	6790
425	2169.4	345.04	2976.57	636.28	175.25	7.6	1.49	1.99	8.8e-05	0.00045	0.00113	2.16
	1.21	7.72	72.64	760.62	426.58	764.26	3604.16	122.07	2.99485e+06	16111.2	864935	4798
426	2132.1	818.52	2654.78	1308.06	111.84	8.13	1.69	2.24	8.2e-06	0.0007	0.00375	2.88
	1.91	7.58	194.18	870.6	1138.39	827.81	5032.14	189.33	2.70554e+06	8736.67	3.45411e+06	7381
427	3535.04	424.89	5231.66	703.74	206.29	7.5	0.92	1.24	1.44e-05	0.00018	0.0008	2.05
	1.05	5.84	241.33	889.17	1065.68	694.54	6769.65	146.18	2.82457e+06	16907	1.74902e+06	9251
428	4775.92	508.84	6491.89	894.52	160.59	7.91	1.41	1.8	7.95e-05	0.00107	0.0032	2.16
	1.41	7.86	195.69	766.71	469.27	969.31	3141.67	159.74	4.54267e+06	10869.4	829735	4331

429	3286.17	604.08	4358.32	893.24	102.14	8.48	1.79	2.38	9.14e-05	0.00019	0.00086	2.79
	2.16	5.19	106.24	856.82	344.55	779.35	7614.25	125.84	2.05737e+06	11289.8	760560	9699
430	3382.12	945.75	5146.03	1717.87	212.43	7.28	1.91	2.75	4.89e-05	0.00069	0.0054	1.16
	0.88	13.86	149.94	548.35	861.05	227.61	3961.13	155.85	1.69073e+06	11905.5	2.99218e+06	4361
431	4458.89	918.84	6710.24	1363.02	192.82	6.91	1.57	2.27	3.36e-05	0.00047	0.00328	0.94
	0.73	13.09	101.67	905.21	467.94	420.14	4631.39	121.95	4.14748e+06	13890.8	3.77513e+06	5600
432	3180.05	669.2	3923.87	1180.62	295.53	7.88	1.48	2	2.31e-05	0.0003	0.00306	2.67
	1.55	13.31	104.64	472.22	233.05	982.53	5530.86	133.29	3.83141e+06	9929.72	1.42034e+06	7410
433	4278.68	710.83	6350.69	1127.55	256.37	5.13	1.89	2.71	3.04e-05	0.00063	0.00439	2.65
	1.69	12.93	202.08	857.72	407.54	233.15	3584.34	171.06	3.92482e+06	8446.43	3.1652e+06	5336
434	4228.08	684.09	5595.27	1045.21	136.23	6.03	1.77	2.37	5.41e-05	0.00029	0.00185	1.52
	0.86	7.11	86.39	555.65	379.11	202.71	5438.03	180.23	3.15716e+06	7825.96	1.26016e+06	6238
435	3766.01	968.22	5632.49	1483.3	175.91	9.78	1.17	1.62	4.48e-05	0.00024	0.00181	2.26
	1.69	7.94	111.04	336.43	324.94	684.32	5737.27	148.42	3.72984e+06	7988.4	3.01301e+06	6445
436	4886.85	731.53	6811.95	1306.89	146.14	9.98	0.56	0.68	5.69e-05	0.00045	0.00306	2.96
	2.1	12.46	129.32	956.57	637.05	253.9	3098.51	136.83	4.87161e+06	14027	3.74736e+06	3519
437	3039.57	853.66	4641.68	1533.97	195.88	5.55	1.21	1.61	1.6e-06	0.00081	0.00246	1.56
	0.79	7.83	161.65	392.92	766.82	770.15	7387.33	133.47	4.90945e+06	16555.3	661326	9441
438	3203.24	356.49	4825.3	453.7	224.46	6.9	1.66	2.36	6.88e-05	0.00088	0.00206	1.41
	1.07	8.79	61.27	576.25	306.08	690.89	5975.98	139.63	3.50934e+06	8913.91	1.34885e+06	6834
439	4588.44	359.61	6475.29	706.36	127.38	7.41	1	1.42	3.28e-05	0.00042	0.0015	0.98
	0.51	5.2	93.24	646.28	292.51	476.97	3058.7	191.91	1.76986e+06	15544.1	1.53087e+06	3866
440	4488.18	994.18	6354.67	1814.87	162.32	8.69	0.9	1.28	6.6e-05	0.00021	0.001	2.02
	1.41	9.98	86.41	840.27	269.15	796.54	5964.04	120.52	3.02378e+06	15697.8	2.21403e+06	8811
441	3729.64	816.05	5907.39	1418.92	158.84	5.79	1.29	1.61	8.52e-05	0.0008	0.00186	1.74
	1.28	7.09	73.55	380.77	429.41	924.32	5818.12	182.35	3.30801e+06	12092.6	1.87567e+06	7274
442	4365.71	977.17	5587.97	1466.38	275.98	8.86	1.27	1.69	6.42e-05	0.00044	0.00097	2.18
	0.96	9.61	142.49	640.12	617.35	592.01	4907.64	165.9	1.99278e+06	12070.2	1.46804e+06	7292
443	3791.88	949.96	4787.12	1747.17	186.38	5.31	0.74	1.03	7.4e-06	0.00059	0.00151	2.41
	0.99	10.84	220.51	538.67	1110.6	571.57	6250.21	122.75	2.6244e+06	15278.2	2.24646e+06	7932
444	3009.63	492.25	4478.29	933.41	257.7	7.9	0.89	1.13	9.49e-05	0.00021	0.00116	0.99
	0.41	8.77	230.3	224.51	1072.52	900.92	5641.66	177.13	3.40327e+06	7604.15	1.84621e+06	8419
445	4178.5	723.6	5654.68	1141.44	241.75	5.54	1.19	1.43	3.76e-05	0.00061	0.00183	1.94
	0.92	8.3	95.28	570.66	437.48	283.72	5892.08	153.31	3.41202e+06	9525.6	2.55653e+06	8110
446	2009.17	933.98	2854.43	1717.11	127.64	8.64	1.57	2.2	4.48e-05	0.00053	0.00294	2.48
	1.56	9.41	221.38	530.13	628.27	797.27	7475.91	172.69	3.60618e+06	15066.1	2.03443e+06	9715
447	3821.52	473.82	5525.63	654.77	231.41	9.09	1.01	1.3	9.89e-05	0.00064	0.00132	2.32
	1.7	13.81	156.88	576.82	659.07	822.11	7397.69	159.16	4.44648e+06	13202.6	2.12477e+06	9337
448	2031.11	880.08	2937.95	1219.37	189.04	9.2	1.05	1.27	5.02e-05	0.00034	0.00303	2.66
	1.7	9.03	219.31	442.6	995.52	446.38	3800.83	162.43	1.73803e+06	13542.3	2.11824e+06	4249
449	2871.93	983.75	3664.33	1418.43	272.56	7.62	0.93	1.14	4.91e-05	0.00056	0.00306	2.73
	1.9	12.8	206.7	394.09	455.48	657.2	4112.14	154.32	4.34277e+06	15508	857397	4924
450	2668.53	881.25	3363.56	1534.88	100.8	8.27	0.93	1.25	5.7e-06	0.00051	0.00415	1.71
	0.72	8.74	141.2	316.51	688.78	343.21	3371.53	149.45	4.1281e+06	18016.3	2.27438e+06	4407
451	4620.72	856.91	5597.93	1110.37	274.82	5.34	1.72	2.27	7.9e-06	0.00105	0.00331	2.13
	1.33	11.58	239.07	540.43	1106.23	753.88	3031.84	124.92	3.79085e+06	18233.2	3.95135e+06	4294
452	2335.35	728.55	2828.55	1031.78	140.82	5.42	1.83	2.22	3e-06	0.00028	0.00118	2.85
	2.27	9.56	117.73	236.42	635.51	610.03	5765.97	162.9	2.73539e+06	17158	599342	7578
453	3502.82	833.95	4561.78	1313.34	232.8	6.03	1.77	2.23	6.12e-05	0.00097	0.00356	1.7
	1.08	8.53	53.51	870.01	203.84	593.97	5805.77	176.03	4.68806e+06	15338.3	1.47679e+06	6481
454	3290.21	995.17	4440.38	1807.06	164.98	5.23	1.43	1.95	1.82e-05	0.00033	0.00175	1.71
	0.73	6.85	174.32	845.23	817.28	665.04	3347.81	143.52	2.21656e+06	8277.18	3.3532e+06	4965
455	3305.01	682.44	4225.9	1116.21	282.89	9.59	1.77	2.64	9.15e-05	0.00014	0.00095	2.56
	1.33	5	145.14	382.7	792.99	471.16	3344.23	151.25	3.78539e+06	8312.05	1.13443e+06	4375
456	2978.78	504.65	3634.01	646.09	279.17	9.98	1.52	1.92	3.47e-05	0.00062	0.00348	2.85
	2.04	9.19	70.22	867.41	374.23	586.56	3039.79	199.43	1.05477e+06	10201.9	595340	3272
457	2570.52	656.76	3491.39	967.84	240.31	9.71	0.55	0.74	9.97e-05	0.00038	0.00289	0.91
	0.43	12.4	76.22	871.35	230.79	536.88	4400.54	127.7	3.89969e+06	11208.4	1.60923e+06	5577
458	2561.51	521.63	3083.43	1020.87	166.32	6.07	1.88	2.78	4.52e-05	0.00012	0.00048	1.41
	0.6	10.37	59.48	938.77	300.81	647.79	7457.54	157.3	4.62202e+06	17289.7	724266	8769
459	4197.81	499.01	6066.42	867.77	169.54	8.27	0.96	1.36	5.57e-05	0.00089	0.00366	1.4
	1.08	5.04	183.3	693.21	520.87	251.44	3622.02	158.85	4.31146e+06	8570.71	3.67484e+06	4123
460	2787.81	659.96	3642.13	800.69	267.85	9.78	1.51	2.14	3.95e-05	0.00026	0.0019	2.86
	1.99	13.85	55.73	896.38	236.05	217.36	7620.28	129.64	2.76948e+06	7548.61	3.25304e+06	9633
461	3055.96	814.89	4235.03	1392.16	165.8	8.46	1.16	1.66	3.39e-05	0.00078	0.00227	1.22
	0.69	9.52	52.14	644.07	124.36	554.38	3287.23	124.67	2.65631e+06	11566.4	2.55018e+06	4618
462	2889.97	503.45	3789.28	914.38	160.98	5.67	0.84	1.15	4.85e-05	0.0005	0.005	2.07
	0.99	12.03	51.87	554.95	274.53	642.21	3551.21	173.89	4.22238e+06	9839.13	742396	4793
463	3819.21	541.27	4722.03	1051.06	201.9	9.1	1.69	2.32	8.53e-05	0.00032	0.00202	2.54
	1.2	13.97	206.13	279.24	1145.79	624.13	6012.53	186.69	4.01687e+06	10797.5	2.38147e+06	8445
464	2082.9	888.12	2603.25	1368.93	205.36	5.88	0.9	1.21	8.84e-05	0.00098	0.0065	1.63
	0.71	10.56	126.2	535.95	258.92	514.22	3989.79	164.98	4.49237e+06	15480.6	3.16556e+06	5892
465	3312.38	868.7	4120.48	1636.3	232.39	6.44	1.14	1.53	4.79e-05	0.00085	0.00528	1.36
	0.8	11.39	200.84	337.34	737.51	786.84	5924.93	149.78	4.17155e+06	17104.3	2.92211e+06	8598
466	2756.05	481.8	4059.35	867.45	226.65	7.86	1	1.27	8.26e-05	0.00042	0.00274	1.84
	1.08	5.63	91.82	633.88	289.43	258.84	7840.48	175.41	4.92026e+06	11179.4	915711	9666
467	4660.78	350.38	5716.37	511.84	223.07	5.31	0.68	0.82	5.79e-05	0.00011	0.00095	1.56
	1.05	12.12	223.93	713.92	1099.59	773.93	4255.77	161.37	4.462e+06	8619.34	1.27654e+06	4873
468	3030.7	933.69	3938.63	1387.55	131	8.31	1.61	2.06	3.14e-05	0.00079	0.0038	1.61
	0.69	9.92	197.18	260.18	626.53	384.35	3180.27	194.07	3.64933e+06	7467.79	2.58166e+06	4029
469	3991.19	775.69	4891.22	1299.83	187.19	9.75	1.2	1.62	1.78e-05	0.00038	0.00243	2.63
	1.56	13.57	107.65	307.27	442.2	604.08	6490.42	131.89	4.58329e+06	7939.23	2.79589e+06	8745
470	3173.59	425.17	4666.47	625.16	283.84	9.24	0.81	1.01	4.92e-05	0.00029	0.00248	2.22
	1.45	12.27	217.55	842.02	1157.05	478.54	5519.62	177.04	2.91809e+06	17384.4	2.54272e+06	6703
471	4868.02	863.51	6871.6	1519.06	223.37	8.16	1.62	2.3	6.8e-06	0.00012	0.00125	2.95
	1.87	12.7	193.86	628.81	891.72	799.99	6640.34	127.55	3.92195e+06	17430.3	1.92794e+06	7454
472	2544.32	299.88	3418.02	427.54	207.98	7.35	0.83	1.1	6.68e-05	0.00055	0.00152	1.97
	1.08	13.61	146.54	985.53	783.08	840.66	4080.05	159.45	2.12596e+06	11771.5	795082	4656
473	2578.17	656.13	4030.51	1182.56	263.06	6.29	1.52	1.99	2.16e-05	0.00036	0.00111	1.04
	0.66	10.29	241.73	816.64	873.34	867.54	6960.5	131.48	2.83307e+06	16305.3	917251	10292
474	3451.1	651.03	4260.43	940.27	151.54	5.52	1.2	1.65	3.09e-05	0.00038	0.00145	2.4
	1.7	8.9	94.73	278.87	409.49	940.82	5830.44	194.22	2.15303e+06	10834.2	3.23861e+06	8514
475	4180.86	934.01	5747.89	1781.25	274.1	7.73	1.88	2.75	4.23e-05	0.0002	0.00128	1.13
	0.74	8.69	206.5	219.45	657.24	403.29	5234.65	150.84	4.47111e+06	12557	3.4487e+06	5825
476	4587.02	953.13	5847.43	1812.44	104.05	8.85	1.93	2.56	7.77e-05	0.00061	0.00235	2.74
	1.42	6.48	220.01	431.54	1257.1	301.05	5620.5	190.05	3.82575e+06	7438.48	2.64666e+06	6944

477	2336.78	894.06	3053.59	1474.32	267.82	7.09	1.03	1.28	5.9e-06	0.00082	0.00809	1.68
	0.68	5.81	74.62	923.07	226.98	627.39	3314.52	160.01	4.3417e+06	14867.8	1.99841e+06	4903
478	2011.29	905.9	3187.2	1292.67	273.59	9.77	1.31	1.81	2.73e-05	0.00095	0.01109	2.06
	1.07	6.6	229.02	707.43	795.52	513.38	3587.69	171.33	3.51583e+06	16977.3	1.7617e+06	4894
479	4191.56	967.64	6216.23	1830.57	143.65	9.13	0.73	0.92	9.09e-05	0.00023	0.00195	2.74
	2.03	10.82	242.44	907.54	1214.9	288.74	4852.88	129.84	2.03987e+06	7351.33	2.38966e+06	6477
480	2342.86	391.86	3543.57	778.4	151	6.34	1.7	2.09	2.69e-05	0.00093	0.00604	1.57
	0.88	10.04	112.99	338.11	608.51	677.71	3148.79	177.79	4.81641e+06	8667.69	2.85219e+06	4677
481	3095.54	551.64	4797.03	1080.4	186.25	7.47	1.81	2.54	4.77e-05	0.00044	0.00208	2.71
	2.04	12.05	164.52	227.74	426.67	653.85	5249.91	188.68	3.73161e+06	7501.23	855597	6200
482	3884.09	812.22	6041.5	1550.38	149.23	9.98	1.15	1.46	9.52e-05	0.00103	0.0033	2.66
	1.24	9.1	54.05	830.83	276.17	507.14	6643.78	159.19	4.98164e+06	12503.8	735541	8458
483	3790.97	924.34	4959.67	1759.48	248.97	9.15	0.81	1.1	1.3e-05	0.00074	0.00728	2.54
	1.29	9.31	148.25	826.14	714.91	276.16	3190.75	154.76	3.55162e+06	8222.12	1.56579e+06	3805
484	4400.22	499.48	5593.11	663.16	200.06	9.62	1.16	1.6	6.85e-05	0.00048	0.00193	2.25
	1.61	10.02	65.22	280.05	184.72	468.44	4529.45	184.03	4.51953e+06	10708.9	1.07894e+06	5055
485	3831.23	901.79	6048.83	1754.59	246.52	6.95	1.77	2.14	1.84e-05	0.00058	0.00247	1.02
	0.54	5.36	243.19	636.29	1255.03	580.87	5172.33	181.39	4.20007e+06	11222.1	1.93565e+06	7250
486	2422.28	455.4	3095.71	757.47	271.63	8.47	1.08	1.53	7.52e-05	0.00063	0.00224	1.34
	0.88	6.77	98.21	209.44	540.74	336.52	3396.86	173.31	3.42858e+06	11271.5	608874	4154
487	4276.66	902.64	6342.18	1491.68	199.57	5.58	1.79	2.45	0.0001005	0.0003	0.00154	2.55
	1.5	11.09	75.29	733.17	169.78	740.93	6059.48	166.21	4.54336e+06	7752.27	3.00516e+06	8156
488	2069.47	208.83	2916.42	335.03	242.42	5.58	1.45	1.96	8.93e-05	0.00057	0.00137	2.65
	1.6	9.13	243.33	764.07	516.3	556.45	4860.15	138.24	4.76911e+06	8187.2	1.09895e+06	6392
489	2257.15	235.29	3587.1	307.19	140.52	8.43	1.13	1.41	7.9e-05	0.00085	0.00186	2.86
	1.92	6.71	232.09	490.35	998.54	471.85	5807	185.55	3.73297e+06	11537.6	1.46036e+06	7036
490	2866.46	619.48	4418.28	825.62	276.03	6.11	1.02	1.48	3.96e-05	0.00046	0.00467	2.63
	1.66	7.7	91.32	779.6	452.07	608.22	3781.16	195.36	1.98263e+06	16463.1	3.2522e+06	4426
491	2971.83	689.2	4198.17	920.16	208.08	7.6	1.02	1.52	4.2e-05	0.00102	0.00319	2.29
	0.93	11.93	113.96	283.59	456.19	240.05	6170.47	128.11	4.39171e+06	10883.6	2.99562e+06	7595
492	4791.54	280.92	7078.83	506.99	210.85	5.06	0.89	1.11	4.79e-05	0.00093	0.0036	1.5
	0.61	10.17	206.99	540.27	537.75	535.52	5004.61	179.79	4.41056e+06	7481.99	1.35632e+06	5319
493	3559.16	819.02	4309.14	1052.65	133.06	8.25	1.82	2.37	2.58e-05	0.00093	0.00216	2.52
	1.12	10.68	244.74	623.02	836.85	489.21	3456.99	165.66	2.43547e+06	8853.21	3.62722e+06	4985
494	3350.61	599.29	4299.19	974.41	174.89	7.43	1.67	2.18	2.68e-05	0.00016	0.00067	1.87
	1.08	10.15	69.82	259.67	276.63	596.71	5706.14	147.84	3.54763e+06	15102.4	1.00253e+06	6652
495	2164.62	864.95	3372.96	1120.1	276.69	9.27	0.77	1.09	6.6e-06	0.00081	0.00801	2.41
	1.22	12.8	98.12	396.87	355.64	837.79	4693.75	181.12	2.85374e+06	9880.38	1.73208e+06	5324
496	4275.57	490.99	5251.11	720.18	144.6	5.92	1.8	2.38	9.72e-05	0.00071	0.00235	2.22
	1.29	7.07	111.69	690.39	375	810.71	4768.54	179.72	2.05182e+06	14785.2	3.17882e+06	5923
497	2183.65	726.65	2909.62	1073.56	200.39	5.59	0.58	0.7	1.98e-05	0.00051	0.00226	1.83
	1.38	6.78	206.62	426.24	656.96	515.58	6672.98	199.8	4.17795e+06	16053.7	2.6728e+06	8477
498	4765.31	218.08	6440.13	404.96	282.79	7.33	1.84	2.46	6.14e-05	0.00083	0.00312	1.18
	0.78	9.95	184.93	803.26	820.54	662.02	6493.33	191.35	4.98034e+06	7358.12	2.17456e+06	6808
499	2776.43	420.97	3740.31	773.38	228.19	8.21	0.74	1.08	6.9e-06	0.00022	0.00115	2.12
	0.87	9.78	217.15	783.43	1116.46	370.84	7450.53	135.73	2.42765e+06	16011.3	1.32193e+06	11043
500	2763.72	658.45	3956.03	948.46	279.46	8.1	1.33	1.93	2.4e-06	0.00015	0.00052	2.83
	2.01	12.12	88.11	296.29	315.06	913.89	3930.84	180.64	4.15722e+06	14900.5	618629	4396
501	4682.58	455.46	6685.56	560.3	151.67	6.01	1.21	1.5	3.6e-05	0.00049	0.00165	1.15
	0.89	7.15	180.09	556.69	975.25	387.83	5174.45	131.66	3.67703e+06	7520.25	2.40323e+06	7609
502	2766.16	908.54	4082.05	1174.31	229.75	5.48	1.4	2.07	8.59e-05	0.00056	0.00278	2.87
	2.2	5.03	242.62	986.66	1289.33	478.03	4212.63	152.69	4.11504e+06	12250.5	2.08152e+06	4959
503	2292.45	301.29	3185.99	527.6	284.94	8.37	1.34	1.75	2.28e-05	0.00061	0.0033	2.17
	1.16	8.32	80.64	728.09	411.8	585.32	6114.66	160.18	4.81175e+06	14063.1	2.38308e+06	9057
504	4953.08	992.65	6394.61	1327.16	120.98	5.81	1.18	1.56	4.61e-05	0.0007	0.00253	1.76
	0.97	11.76	156.23	518.32	373.72	676.67	5466.84	147.6	2.97235e+06	17388.6	2.24999e+06	6266
505	2270.07	322.39	3012.64	459.4	221.38	7.55	0.99	1.36	4.49e-05	0.00043	0.00412	2.98
	1.67	5.53	150.12	990.44	324.02	789.54	4413.32	161.35	1.77723e+06	16196.1	1.57206e+06	5374
506	4817.72	836.93	6086.03	1577.66	209.05	5.96	1.88	2.5	9.22e-05	0.00061	0.0017	1.17
	0.68	12.47	198.72	466.63	595.83	371.88	3885.75	123.83	4.8215e+06	9424.06	989796	5269
507	2122.74	529.63	3093	910.76	152.96	7.32	1.25	1.75	5.55e-05	0.00018	0.00066	2.98
	2.29	5.9	244.4	207.38	1272.92	778.33	6854.94	186.11	1.81471e+06	11778.3	961939	8458
508	4123.21	320.32	6536.09	569.75	298.09	6.8	0.67	0.81	5.86e-05	0.00017	0.00139	1.18
	0.71	13.99	155.46	943.34	895.71	874.43	3916.09	158.28	4.18186e+06	10708	1.29742e+06	5458
509	4663.05	918.34	6437.69	1696.88	130.2	7.63	1.79	2.51	6.11e-05	0.00014	0.00081	2.55
	1.18	6.73	199.47	275.81	505.85	693.04	5583.78	128.34	3.31517e+06	14433.3	536690	7849
510	3016.37	470.27	3960.59	771.58	215.97	7.25	1.14	1.49	9.5e-05	0.00064	0.00306	2.36
	1.01	5.75	179.94	870.82	1071.14	665.26	6498.48	159.53	4.21293e+06	17684.5	2.2921e+06	8664
511	3826.71	507.16	4944.03	736.44	284.09	5.75	0.62	0.77	8.3e-06	0.00048	0.00249	2.79
	1.59	5.35	205.99	946.36	473	553.91	4550.58	130.61	2.5331e+06	14995.5	1.4706e+06	5320
512	4866.75	785.69	5908.94	1551.56	294.05	5.95	1.12	1.51	9.27e-05	0.00017	0.00097	2.47
	1.66	6.2	158.41	509.03	347.84	912.51	5387.03	177.44	3.46895e+06	15812.2	600673	7220
513	2672.97	564.73	3879.06	859.51	297.02	7.59	1.69	2.1	8.81e-05	0.00072	0.00305	1.82
	0.95	9.51	231.3	203.38	894.99	612.05	4913.66	148.44	4.87449e+06	13151.6	2.72308e+06	6959
514	3296.87	434.15	4414.16	776.75	235.37	5.24	1.84	2.59	8.07e-05	0.00045	0.00189	2.68
	1.77	5.85	124.18	864.79	258.19	833.16	7624.44	162.3	3.0906e+06	17273	2.78158e+06	8971
515	2592.84	599.51	4088.17	1127.98	169.33	7.88	1.48	2.1	4.2e-06	0.00046	0.00367	1.05
	0.79	10.26	222.94	541.3	825.96	277.55	7170.7	168.12	4.59848e+06	17287.3	1.29243e+06	7935
516	2903.41	876.95	3864.37	1403.63	234.56	9.94	1.53	1.94	6.89e-05	0.00023	0.00154	1.8
	1.2	7.3	225.08	990.67	661.8	991.01	4840.99	168.07	2.74859e+06	13750.6	3.21874e+06	7211
517	3239.99	550.64	4788.22	722.41	254.65	7.85	1.52	1.93	5.7e-06	0.00014	0.00134	2.77
	1.55	13.87	222.53	520.72	575.64	744.67	7623.42	177.5	2.27351e+06	12796.6	2.94897e+06	8492
518	2645.05	582.68	3289.63	1033.98	101.89	8.51	0.61	0.8	9.81e-05	0.00022	0.00233	1.04
	0.42	11.36	196.15	678.55	480.88	541.49	3377.47	134.86	3.03666e+06	16493.8	988050	4319
519	4037.27	714.4	6187.11	1259.43	222.04	9.47	1.86	2.69	7.96e-05	0.00077	0.00271	1.18
	0.54	8.29	84.43	453.88	171.6	320.69	3513.58	149.07	4.18809e+06	16861.7	2.31963e+06	5192
520	4574.84	653.58	7191.43	1037.46	179.3	7.12	1.32	1.76	1.15e-05	0.0004	0.00281	2.53
	1.57	12.93	215.9	974.88	833.77	208.15	3348.8	139.94	4.35702e+06	10179.2	2.51595e+06	4345
521	2971.08	485.69	4074.56	662	276.05	5.09	1.15	1.52	6.93e-05	0.00012	0.00135	1.5
	1.11	10.46	194.62	710.71	895.61	311.42	4385.15	173.86	2.59022e+06	12688.6	3.27667e+06	6492
522	3493.44	504.4	4775.84	626.25	255.27	8.15	1.89	2.75	6.85e-05	0.00051	0.00412	2.26
	1.64	13.57	130.24	414.35	353.76	880.79	4524.61	164.9	3.92093e+06	14461.8	2.07395e+06	4786
523	4449.51	476.76	7089.34	751.22	283.77	8.91	0.88	1.18	8.9e-06	0.00025	0.00062	1.4
	0.88	10.01	219.86	984.92	1126.61	386.33	7769.77	134.72	3.08404e+06	17576.7	878123	8592
524	4262.89	832.61	6520.5	1173.68	230.88	9.43	0.73	0.91	6.31e-05	0.00067	0.00145	1.26
	0.83	10.7	189.54	451.66	741.61	238.53	3292.76	175.72	1.85965e+06	16055.5	1.5146e+06	3959

525	2061.51	682.78	2921.07	1282.12	281.23	9.13	1.96	2.67	9.66e-05	0.00078	0.00753	2.18
	1.06	6.03	140.99	515.11	308.31	301.62	6703.94	128.03	4.79717e+06	8403.29	2.37996e+06	8376
526	4861.93	480.04	7177.09	957.74	122.11	7.06	0.92	1.24	7.99e-05	0.00021	0.00113	1.66
	1.16	9.62	238.86	364.46	1370.05	229.42	6699.96	132.81	3.65944e+06	9732.78	3.07739e+06	7965
527	4654.99	415.72	6001.82	764.73	219.97	7.01	0.74	1.03	5.91e-05	0.0007	0.00278	2.56
	1.28	7.02	194.89	313.58	1044.15	918.64	3384.58	157.12	3.72119e+06	7811.08	2.94266e+06	4298
528	2610.17	330.06	3659.83	410.03	205.28	5.88	1.45	1.96	3.68e-05	0.00028	0.00164	2.34
	1.54	12.19	222.36	484.32	645.75	659.14	5237.87	176.89	4.89832e+06	9024.9	1.63784e+06	7553
529	4228.3	787.93	5680.74	1108.16	221	8.91	1.62	2.28	5.05e-05	0.00106	0.00441	2.21
	1.72	9.04	162.02	742.02	435.05	662.79	3447.15	140.53	2.79285e+06	9336.46	828263	4208
530	3086.62	776.89	4840.86	1342.02	204.65	9.64	0.8	1.03	4.41e-05	0.00093	0.00471	1.25
	0.86	7.04	237.53	289.37	1374.99	657.63	4320.13	170.36	4.85574e+06	16852.2	1.93262e+06	5020
531	4355.97	999.92	6393.73	1386.34	232.86	9.92	0.98	1.35	4.15e-05	0.0005	0.00312	2.05
	0.82	8.27	145.64	477.24	461.92	542.97	5763.97	199.93	4.16834e+06	12524.7	1.17703e+06	7603
532	2497.15	412.7	3915.64	612.91	292.79	7.01	0.77	0.95	1.7e-06	0.00051	0.00161	1.23
	0.64	13.1	52.61	825.12	137.01	460.31	3305.05	142.78	4.95245e+06	10909.3	1.62526e+06	3750
533	3401.74	974.44	5344.46	1611	111.71	6.26	1.48	1.99	7.37e-05	0.00039	0.00271	1.16
	0.57	7.73	202.39	274.07	520.62	574.86	5223.01	146.31	4.84376e+06	15122.7	830783	5853
534	3425.67	585.98	5420.11	1037.69	140.4	5.1	1.36	2.03	3.08e-05	0.00025	0.00052	2.88
	1.57	8.78	68.77	727.13	338.12	563.15	6615.78	182.69	3.53123e+06	13301.8	1.41558e+06	8463
535	2853.6	571.97	3495.13	1075.39	154.98	8.28	1.07	1.41	1.65e-05	0.0007	0.00195	2.24
	1.32	8.35	157.89	846.07	748.14	726.94	4074.96	160.25	2.37574e+06	7820.11	2.37541e+06	5203
536	3765.39	845.28	5922.4	1586.51	148.42	6.99	1.56	2.02	2.13e-05	0.00053	0.00354	1.25
	0.64	9.3	72.38	994.8	211.74	792.26	7773.75	195.23	4.94754e+06	14923.6	1.27701e+06	9685
537	4744.72	978.05	6869.35	1224.88	163.91	8.3	1.24	1.75	9.7e-06	0.00068	0.00269	1.73
	0.98	5.3	84.29	589.23	341.78	524.44	3538.86	164.62	1.67562e+06	14138.7	2.46754e+06	4771
538	2839.35	647.95	4225.13	1266.93	148.97	7.81	0.96	1.25	4.4e-05	0.00026	0.00265	1.98
	1.08	7.4	200.95	676.57	940.06	278.19	3616.74	146.16	4.96088e+06	12012.6	1.56029e+06	4012
539	2184.79	960.62	3287.58	1177.57	170.55	9.26	1.42	2.03	6.86e-05	0.00083	0.00988	1.38
	0.93	7.6	143.04	617.36	408.31	502.08	4021.47	142.4	4.03759e+06	9256.47	2.75516e+06	5367
540	3018.48	781.83	3998.9	1189.77	208.53	6.32	1.16	1.64	6.65e-05	0.00072	0.00408	1.45
	0.79	11.63	58.01	879.13	168.86	510.26	4540.28	195.49	3.53817e+06	8307.71	3.72626e+06	6754
541	2717.02	712.34	3481.96	1059.03	188.93	5.11	1.35	1.83	1.35e-05	0.00052	0.00116	2.09
	1.34	5.54	112.39	528.49	568.21	834.13	5696.84	188.46	2.15672e+06	18005	781447	8543
542	2750.41	497.61	4281.72	810	129.35	6.41	1.8	2.69	5.18e-05	0.00026	0.00193	2.26
	0.97	10.65	80.41	253.44	373.69	340.12	7279.68	175.49	4.50764e+06	13343.9	1.54568e+06	8658
543	3891.28	941.74	5340.29	1732.75	190.05	8.73	1.25	1.83	8.14e-05	0.00043	0.00171	1.35
	0.96	5.51	208.71	865.38	559.87	217.63	7737.44	120.58	3.52437e+06	8255.93	2.23115e+06	10016
544	3015.38	695.22	3796.57	955.13	299.67	5.95	1.05	1.35	7.2e-06	0.00035	0.00073	2.15
	1.02	7.73	171.62	278.29	822.87	378.2	7726.65	136.04	3.4618e+06	11500.8	1.55328e+06	9737
545	2550.92	773.59	3658.84	1458.58	240.16	6.91	0.77	1.03	1.44e-05	0.00091	0.0089	1.32
	0.65	12.98	101.08	690.83	372.5	275.64	4099.87	178.13	3.52869e+06	9326.18	2.4852e+06	4951
546	2477.39	947.3	3404.92	1255.66	165.05	7.06	1.91	2.51	7.24e-05	0.00081	0.00722	0.94
	0.67	12.64	98.7	270.03	226.43	669.21	4357.53	158.14	4.96311e+06	15630.5	813354	4966
547	4372.42	209.26	6584.7	406.39	234.41	9.87	1.81	2.63	6.76e-05	0.00026	0.00086	2.09
	1.19	11.18	184.86	960.05	374.28	358.12	7104.63	179.91	1.88502e+06	15452.4	2.15737e+06	9767
548	2178.27	631.49	3415.17	1184.39	200.85	5.13	0.51	0.74	5e-05	0.00045	0.00527	2.48
	1.51	11.92	248.03	665.56	1413.89	380.1	6171.46	136.76	2.85246e+06	16401.2	1.71919e+06	8393
549	2299.45	695.64	3311.76	1173.19	167.96	5.58	0.64	0.84	9.64e-05	0.00031	0.00204	2.19
	1.08	7.47	85.38	554.03	283.65	753.41	6071.78	189.16	3.83883e+06	17686.3	1.44118e+06	8234
550	3939.34	528.08	5765.94	917.85	227.24	6.24	1.66	2.26	2.25e-05	0.00098	0.00378	2.72
	1.67	12.14	185.53	895.3	713.89	907.37	3415.17	168.12	3.26665e+06	13376.6	3.06676e+06	3913
551	3554.03	909.79	5562.91	1411.58	189.64	7.17	0.82	1.22	2.9e-06	0.00046	0.00228	1.88
	1.15	9.52	156.15	921.52	772.23	503.77	4454.95	183.03	2.5395e+06	14111.1	981501	5124
552	3291.21	816.55	4525.67	1059.8	127.79	6.47	1.66	2.28	4.5e-05	0.00108	0.00814	2.51
	1.06	6.06	123.49	591.52	654.55	654.75	4069.05	172.75	4.30314e+06	9720.55	1.42201e+06	5407
553	2115.06	854.96	3153.14	1287.93	192.39	7.51	1.09	1.43	8.7e-05	0.00018	0.00077	0.98
	0.44	11.35	75.42	858.02	330.79	735.35	6218.17	129.76	4.31052e+06	11971.5	1.25687e+06	9085
554	2310	578.95	3217.44	1029.45	105.62	8.72	0.53	0.67	5.49e-05	0.00023	0.00102	1.8
	0.89	10.71	235.12	597.11	901.37	698.9	5394.45	179.59	1.93388e+06	9501.46	1.05492e+06	6903
555	4737.84	223.26	7524.97	295.11	232.99	6.36	1.58	2.36	3.08e-05	0.00043	0.00088	2.15
	0.96	11.96	168.02	466	453.99	794.93	4998.17	187.99	4.68994e+06	7822.45	2.26685e+06	5687
556	3678.57	793.19	5313.08	1077.99	183.54	8.98	0.99	1.41	9.01e-05	0.00077	0.00308	2.87
	1.24	5.13	64.88	854.08	137.5	393.69	5427.32	162.52	4.91857e+06	9666.11	3.21741e+06	7934
557	4694.52	936	6707.47	1320.6	163.04	8.57	1.26	1.76	1.61e-05	0.0005	0.00245	1.81
	0.74	6.83	66.65	468.88	177.88	352.33	4064.66	144.83	1.7272e+06	11061.4	3.03217e+06	5113
558	2064.19	914.13	2663.49	1199.11	283.07	8.42	1.92	2.56	5.05e-05	0.00025	0.00282	2.97
	1.39	6.7	59.43	924.54	306.54	717.89	7407.11	135.58	2.71306e+06	15002.3	3.18649e+06	9137
559	3512.52	356.28	5310.68	535.87	282.39	5.81	1.53	2.06	7.06e-05	0.00054	0.00121	2.07
	1.32	10.23	208.34	853.04	431.47	626.12	4471.18	126.23	2.54978e+06	17689.2	1.85102e+06	4932
560	2537.06	635.23	3246.83	893.08	127.42	7.58	1.99	2.73	6.66e-05	0.001	0.00287	2.55
	1.93	13.07	234.58	822.7	975.22	859.33	7151.59	136.02	3.13031e+06	17945.4	3.31244e+06	10147
561	4319.07	388.46	5728.6	698.33	194.41	7.01	1.83	2.73	7.67e-05	0.00079	0.003	1.65
	0.87	11.47	191.01	202.92	748.57	613.21	6954.19	186.12	4.36516e+06	11435.1	2.7668e+06	8048
562	4612.72	907.3	6681.04	1170.57	226.31	9.82	0.81	1.06	8.71e-05	0.0002	0.00049	1.01
	0.78	7.45	54.92	627.47	218.83	595.06	3664.25	165.85	1.26978e+06	15802	584307	4489
563	3754.74	427.25	5335.35	755.15	191.46	5.54	1.4	2.05	4.64e-05	0.00037	0.00162	2.27
	1.03	9.76	82.96	573.17	193.66	745.1	4408.04	156.22	4.49749e+06	15850.6	1.43302e+06	5095
564	4838.06	935.07	7447.35	1735.61	202.91	9.17	1.11	1.63	2.78e-05	0.00036	0.00244	2.85
	1.98	8.17	208.81	770.12	956.44	761.86	5686	139.04	4.16005e+06	13064.1	3.4628e+06	7549
565	3305.89	807.48	4784.5	1012.34	243.1	7.02	1.03	1.41	4.78e-05	0.00048	0.00538	1.75
	0.72	12.27	70.84	903.08	239.25	447.49	3023.8	177.19	2.45552e+06	17098.3	3.3609e+06	4128
566	3707.81	932.63	5791.99	1524.17	195.96	6.45	0.65	0.96	8.5e-05	0.00078	0.00565	1.52
	1.03	5.25	113.54	752.35	361.88	772.09	4845.39	133.15	4.74249e+06	13396.7	1.15787e+06	5475
567	2342	593.74	3500.16	879.89	268.16	6.9	1.71	2.31	8.11e-05	0.00023	0.00209	1.25
	0.75	5.1	229.41	353.12	1023.03	715.89	5275.15	161.27	1.72364e+06	9548.88	3.02571e+06	5844
568	2348.47	722.17	2944.43	1283.5	261.79	6.28	1.34	1.97	1.53e-05	0.00073	0.00191	1.72
	0.84	12	80.59	489.83	286.17	237.41	6889.86	187.32	2.52823e+06	10535.2	2.23387e+06	8667
569	4790.67	681.1	6894.63	1059.33	203.43	5.57	1.83	2.51	6.37e-05	0.00025	0.00146	2.67
	1.29	9.41	215.54	734.13	1052.12	629.55	3129.07	151.57	3.52064e+06	15668.8	1.05834e+06	3625
570	3651.12	961.78	5553.37	1594.19	279.4	7.96	1.17	1.7	9.28e-05	0.00079	0.00242	2.96
	1.63	10.67	176.57	638.05	899.87	800.79	5833.16	143.18	3.53521e+06	13285.1	1.32766e+06	6821
571	2087.12	820.47	3122.63	1256.42	212.96	6.86	0.93	1.21	5.95e-05	0.00061	0.00719	2.91
	1.72	8.05	228.74	846.92	818.29	298.13	5298.39	180.29	1.90989e+06	12786.1	3.3827e+06	7896
572	2394.47	663.4	3419.94	944.24	161.77	9.22	1.26	1.85	1.56e-05	0.00033	0.00307	2.36
	1.34	7.12	184.56	819.4	865.11	972.71	6768.37	130.17	3.1098e+06	15140.4	2.22845e+06	9310

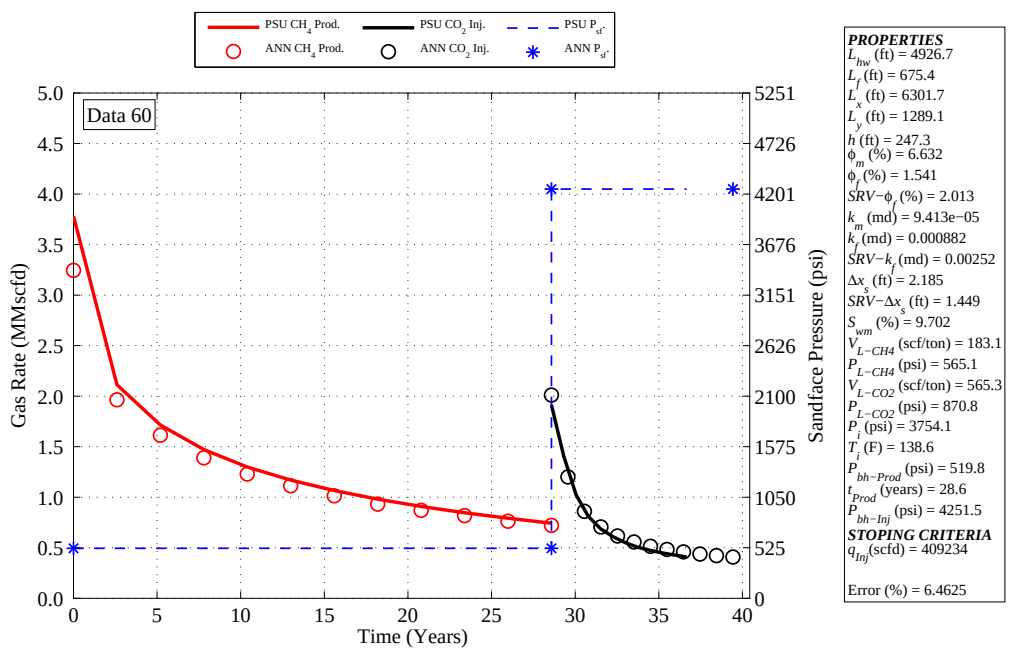
573	2192.21	715.02	3102.25	1364.48	256.06	7.6	1.06	1.33	7.64e-05	0.00021	0.00233	1.08
	0.75	6.38	249	528.95	737.14	235.68	7532.66	163.13	3.39867e+06	17235.1	1.14406e+06	9838
574	3668.82	901.45	5570.19	1668.7	118.58	6.75	0.56	0.79	9.38e-05	0.00021	0.00203	2.96
	2.34	12.8	80.76	887.46	471.83	981.26	7157.18	121.08	3.0205e+06	14898.5	2.55731e+06	8012
575	3777.5	465.47	4867.78	674.84	264.34	6.83	1.88	2.38	1.53e-05	0.00036	0.00106	1.04
	0.51	5.1	189.07	943.4	535.89	528.77	4759.61	183.73	1.12674e+06	11850.9	738776	6972
576	4872.31	302.09	7766.78	478.86	264.7	9.02	1.09	1.41	6.19e-05	0.00059	0.002	1.33
	0.56	7.61	79.12	495.67	427.99	940.52	4504.39	144.2	1.85617e+06	8046.59	3.98506e+06	5155
577	2429.21	448.34	2967.21	737.57	288.46	5.64	1.93	2.76	8.28e-05	0.00055	0.00481	2.29
	1.74	8.35	198.21	380.96	426.19	421.51	7668.09	152.54	2.9166e+06	11979.2	3.64154e+06	8721
578	3473.05	855.61	5068.24	1380.49	101.96	5.08	1.32	1.71	1.63e-05	0.00088	0.00855	1.9
	1.21	10.55	163.71	971.06	637.59	998.98	3605.26	178.55	3.40931e+06	17789.7	3.55139e+06	5018
579	3552.04	879.78	4780.86	1191.09	229.98	7.57	0.72	0.99	9.66e-05	0.00021	0.0009	2.89
	1.38	12.55	124.06	205.16	456.98	704.91	5961.25	172.9	1.25625e+06	14665.3	2.69424e+06	8828
580	2889.06	815.93	4490.16	1009.53	168.44	7.23	1.34	1.92	8.8e-05	0.00106	0.00285	1.61
	1.27	5.86	244.95	451.92	1137.32	849.63	5919.61	175.94	2.43134e+06	8315.83	1.47431e+06	8311
581	4493.65	896.38	7097.61	1365.98	203.95	5.54	0.79	0.96	6.91e-05	0.00025	0.00151	2.06
	0.89	5.27	201.17	881.53	991.57	800.48	7593.05	185.77	2.67461e+06	16992.9	914110	8480
582	3202.53	728.03	4656.54	1443.81	278.6	6.46	0.71	0.91	4.05e-05	0.00106	0.01214	1.85
	1.22	12.36	129.92	449.15	471.84	977.12	3551.26	181.8	4.81078e+06	8090.33	3.71262e+06	4984
583	2552.44	879.24	3448.13	1144.17	290.86	9.54	1.12	1.55	4.21e-05	0.00076	0.0021	2.26
	1.48	10.12	148.82	526.37	561.9	354.67	4328.33	169.94	3.35683e+06	17402.6	3.48218e+06	5094
584	2255.1	978.31	2773.2	1679.83	218.66	8.33	1.99	2.4	9.32e-05	0.00039	0.00386	2.74
	1.39	5.07	131.92	922.35	570.47	971.34	3455.87	163.24	4.7377e+06	16174.9	2.91974e+06	4619
585	3904.61	898.14	5479.04	1455.21	268.59	7.74	1.19	1.46	9.32e-05	0.00018	0.0016	2.49
	1.08	10	105.81	872.28	486.35	386.96	7852.77	180.01	3.78657e+06	13538.9	1.68676e+06	9136
586	3880.8	793.62	5627.47	1243.42	263.83	8.55	0.54	0.75	2.15e-05	0.00015	0.00137	1.73
	0.71	7.78	144.55	908.97	525.57	637.13	5267.1	140.32	2.8408e+06	17408.2	1.88493e+06	7028
587	2119.87	959.8	2861.57	1348.43	272.44	6.27	1.7	2.13	7.68e-05	0.00028	0.00175	2.12
	1.49	9.83	237.3	980.38	987.35	793.57	7789.67	155.18	3.01241e+06	14147.3	2.89295e+06	10275
588	2736.8	635.1	4226.88	860.07	120.25	8.79	1.24	1.54	8.19e-05	0.00021	0.00164	2.74
	1.2	6.76	67.57	697.57	308.08	371.26	3828.48	156.7	3.62405e+06	10828.5	1.07522e+06	4612
589	3718.17	749.75	5078.39	948.14	176.81	6.48	0.65	0.93	2.92e-05	0.00059	0.00319	2.56
	1.51	12.7	64.38	790.52	141.03	375.94	4228.74	128.67	3.87619e+06	13053.5	3.60965e+06	4699
590	4294.2	736.31	5991.49	961.86	152.79	6.38	1.61	2.13	4.07e-05	0.00101	0.0029	1.38
	1.04	9.82	109.42	548.81	395.35	394.19	4622.12	159.02	1.92482e+06	8544.21	2.98951e+06	6109
591	2628.31	966.29	3419.06	1433.93	143.76	5.93	1.18	1.53	9.12e-05	0.00067	0.00387	2.3
	1.07	13.14	208.53	834.68	800.49	909.21	5302.74	130.81	2.67643e+06	16355.3	2.64209e+06	6908
592	2952.47	943.39	3668.81	1443.98	268.27	6.98	1.84	2.44	2.76e-05	0.00101	0.0072	1.75
	1.29	6.08	119.5	310.36	341.35	359.85	4415.65	160.31	4.68709e+06	15547.8	2.89988e+06	6507
593	2237.94	923.01	3030.87	1514.5	209.86	9.72	0.5	0.65	8.83e-05	0.0005	0.00587	2.97
	1.2	13.4	142.87	376.5	624.91	506.78	4715.23	123.02	2.17818e+06	15606	1.89884e+06	5998
594	3349.46	599.07	4157.85	1087.66	132.84	9.69	1.84	2.24	5.12e-05	0.00027	0.00096	1.69
	1.24	11.08	104.04	248.42	479.63	841.68	7232.17	176.84	2.17058e+06	11462.6	1.57588e+06	9175
595	3314.11	889.86	5101.93	1572.27	181.28	9.22	0.58	0.76	8.01e-05	0.0001	0.00108	1.27
	0.73	9.35	90.36	757.92	396.63	506.27	7582.88	162.74	1.99587e+06	14787.5	2.9092e+06	10089
596	2193.71	987.46	2715.08	1894.84	274.29	5.82	1.92	2.36	7.96e-05	0.00027	0.00283	1.83
	0.87	6.36	185.62	407.28	404.91	343.62	4785.92	142.37	4.21652e+06	13030.2	769195	5635
597	2288.5	675.29	3021.42	1210.31	215.3	6.01	1.03	1.26	3.49e-05	0.00084	0.00398	2.6
	1.44	10.33	218.19	598.51	1019.3	489.75	6403.44	193.96	2.77931e+06	17006.7	2.90333e+06	8430
598	2890.87	335.56	4584.71	666.05	291.86	5.06	1.4	1.74	7.1e-06	0.00024	0.00252	2.53
	1.68	5.05	65.92	565.3	325.96	302.1	3189.17	178.84	2.91529e+06	15434.5	3.14988e+06	4007
599	2440.26	488.5	3146.64	689.03	229.33	7.78	1.46	1.83	3.54e-05	0.00052	0.00539	2.06
	1.56	9.57	186.2	756.41	612.86	856.44	3435.81	175.57	1.38864e+06	11829.1	1.50243e+06	4315
600	2967.46	763.23	4586.73	1140.75	162.96	5.21	1.81	2.36	4.9e-05	0.00039	0.00212	1.58
	0.91	9.64	76.64	770.63	367.78	525.53	6169.68	148.4	2.54731e+06	8011.1	3.03377e+06	8029
601	2786.07	923.93	4171.21	1169.83	172.7	7.88	0.91	1.31	1.85e-05	0.00014	0.00131	2.12
	1.42	9.34	210.5	669.57	944.75	498.7	3498.56	130.67	3.75384e+06	15721.3	925273	5231
602	4577.78	998.7	7219.96	1535.27	136.31	8.84	1.13	1.37	9.22e-05	0.00079	0.00232	2.8
	1.75	13.45	114.49	440.79	678.15	394.45	5572.81	169.33	2.78822e+06	7306.09	629319	7386
603	2962.04	358.15	3797.59	655.74	226.52	8.17	1.62	2.02	8e-06	0.00041	0.00173	0.94
	0.62	9.83	71.06	901.69	380.68	812.59	6853.65	198.31	2.20258e+06	8759.4	723026	7689
604	2865.99	575.65	3848.6	1020.18	186.27	6.08	1.5	2.13	1.68e-05	0.00013	0.00095	1.81
	0.74	11.17	186.28	936.27	818.86	695.42	5367.07	151.65	3.34878e+06	15422.1	1.80664e+06	6224
605	2444.11	529.93	3167.66	721.17	109.03	5.96	1.06	1.27	2.31e-05	0.00058	0.00214	1.22
	0.77	8.52	65.51	369.72	213.55	671.37	6316.2	193.45	2.94512e+06	17196.7	815013	8712
606	4434.47	467.83	5550.4	689.18	242.65	8.37	1.56	2.2	2.77e-05	0.00067	0.00155	2.46
	1.13	9.88	129.13	294.45	636.67	536.43	6459.85	139.77	4.43293e+06	13579.7	1.2319e+06	7112
607	2271.85	947.67	3342.55	1532.59	270.04	6.05	1.28	1.87	8.03e-05	0.00048	0.00408	2.53
	1.47	6.94	244.88	928.93	669.31	604.27	6071.22	184.86	3.89474e+06	13670.2	1.94222e+06	7945
608	4966.82	859.23	7622.05	1685.11	153.63	5.58	1.64	2.05	5.54e-05	0.00094	0.0019	1.65
	0.75	9.38	152.22	257.83	528.91	809.64	5614.49	169.72	2.11309e+06	13006.1	3.78243e+06	7469
609	2287.03	478.1	2814.23	816.57	285.77	9.54	1.26	1.77	8.9e-06	0.00107	0.0035	1.25
	0.55	13.42	200.66	284.53	1138.17	959.34	4745.94	124.45	4.45529e+06	9476.53	2.975e+06	6945
610	3945.27	768.62	5450.91	1370.48	263.99	6.7	1.79	2.26	4e-05	0.00038	0.00149	1.54
	0.96	7.64	175.96	766.34	685.75	798.86	5745.9	166.66	2.4825e+06	8863.69	2.5901e+06	7805
611	2100.91	727.14	2778.76	1237.13	134.08	7.37	1.81	2.72	5.84e-05	0.00061	0.00572	2.59
	1.27	9.89	228.76	547.56	859.91	725.28	3004.92	166.33	4.429e+06	14725.8	3.025e+06	3925
612	2070.84	843.62	3244.67	1223.8	272.6	9.08	1.96	2.43	6.7e-06	0.00105	0.00269	2.46
	1.18	5.94	237.06	619.48	533.8	939.9	4682.97	134.04	3.61671e+06	9370.73	974902	6042
613	2585.8	990.43	3259.4	1511.75	236.29	5.05	1.75	2.35	9.16e-05	0.00066	0.00324	1.85
	1.33	13.21	210.8	349.19	847.11	262.3	3379.6	179.01	4.224e+06	14205.6	3.80766e+06	4436
614	2816.14	440.02	3455.91	692.49	278.16	6.14	1.48	1.8	9.5e-05	0.00051	0.00266	2.84
	2.06	8.94	230.1	353.99	1163.42	697.85	4290.93	178.04	2.64951e+06	14280.9	2.11546e+06	4845
615	4938.9	834.29	7077.39	1599.14	132.48	9.99	0.94	1.35	6e-05	0.00062	0.00151	0.9
	0.6	10.59	155.56	994.26	466.52	311.7	6697.17	175.4	4.38243e+06	13606.4	1.40619e+06	8946
616	3558.4	481.19	5101.71	761.63	178.53	5.49	1.08	1.39	1.68e-05	0.00018	0.00089	1.4
	1.12	10.74	125.03	245.91	686.75	803.53	5893.16	131.35	2.55639e+06	13658.1	576178	7635
617	3587.24	687.07	5093.06	1093.03	192.98	9.45	1.98	2.68	1.18e-05	0.00091	0.00478	2.6
	2.07	13.19	93.87	623.35	387.92	608.08	3138.71	197.78	2.32167e+06	11147.7	541319	3850
618	4742.15	850.74	5853.31	1214.56	228.36	6.85	0.66	0.88	4.86e-05	0.0004	0.00204	1.61
	0.92	9.85	125.15	526.86	528.06	220.47	3020.43	176.27	1.506e+06	7737	1.77253e+06	3246
619	2364.62	678.72	3429.53	890.64	225.24	8.78	1.47	2.17	6.88e-05	0.00029	0.00134	2.61
	1.72	6.79	117.82	603.43	572.42	598.69	3649.45	133.86	4.92411e+06	15203	543346	4488
620	3799.88	649.96	4726.5	883.86	145.52	9.88	1.8	2.34	6.69e-05	0.00065	0.00142	1.49
	0.72	7.67	99.39	235.61	522.51	693.64	5144.92	185.6	3.04133e+06	10345.4	1.83149e+06	6934

621	2326.58	513.27	3093.2	876.31	237.72	6.1	0.93	1.35	2.9e-05	0.00098	0.00582	1.57
	0.83	13.45	240.35	934.81	914.55	663.57	6845.38	162.49	4.76016e+06	11374.6	3.77303e+06	8368
622	4452.79	852.35	6276.53	1437.78	133.41	5.49	1.24	1.83	8.11e-05	0.00107	0.00989	0.91
	0.37	13.23	200.39	239.85	979.21	419.56	3630.12	169.43	3.84909e+06	10844.4	2.60607e+06	4477
623	2137.05	634.72	2756.86	976.28	257.68	9.18	1.39	2.04	1.7e-05	0.00062	0.00389	2.1
	0.93	10.02	160.82	320.93	353.82	561.95	3776.11	152.33	3.70289e+06	12995.3	3.35901e+06	5253
624	2491.65	624.43	3313.44	979.26	194.8	5.36	0.95	1.2	4.38e-05	0.00063	0.00601	1.91
	0.81	12.87	225.89	249.44	616.87	536.22	7574.11	140.65	4.84184e+06	15215.2	1.30541e+06	8336
625	3249.44	672.11	4797.96	1141.86	164.29	9.27	1.7	2.16	4.4e-06	0.00018	0.00083	1.1
	0.46	7.16	231.48	781.19	1031.46	823.28	7811.39	166.14	3.31637e+06	7772.25	521626	9292
626	3214.27	821.67	4223.78	1530.94	258.35	5.3	1.04	1.52	9.68e-05	0.00093	0.00214	2
	1.25	8.82	206.07	838.66	691.34	455.1	4450.63	144.26	2.22884e+06	16181.7	1.16571e+06	5932
627	2406.08	726.93	3793.54	974.79	129.62	6.28	1.17	1.55	5.96e-05	0.00034	0.00247	1.62
	1.26	12.57	108.07	576.13	422.02	323.29	3819.72	145.8	2.11629e+06	14985.3	2.07685e+06	4247
628	2943.55	489.83	4103.43	883.86	152.24	9.95	0.69	0.97	4.7e-06	0.00069	0.00242	2.64
	1.39	7.76	59.83	572.85	133.72	666.47	5744.31	190.49	2.88833e+06	11176	1.5561e+06	8368
629	4134.58	741.4	6432.69	1316.79	279.82	7.81	0.77	1.11	8.43e-05	0.0008	0.00496	1.37
	0.79	11.53	154.63	528.71	853.67	860.47	4617.12	168.35	4.60633e+06	9005.95	1.73453e+06	6178
630	3522.04	465.07	5587.65	581.18	251.33	6.95	1.31	1.85	2.24e-05	0.00015	0.00132	2.95
	2.1	5.35	180.91	630.23	1006.45	968.01	4964.8	158.76	3.07723e+06	7459.6	1.31141e+06	7055
631	2563.83	615.49	3752.17	962.43	294.96	7.97	1.67	2.44	6.54e-05	0.00034	0.00374	2.93
	1.26	8.37	89	779.39	514.1	806.69	4078.49	145.94	1.04614e+06	14644.5	3.42746e+06	4703
632	2599.96	382.35	3338.09	651.24	262.26	5.28	1.06	1.29	8.58e-05	0.00055	0.00489	1.59
	0.89	5.71	144.62	395.24	843.39	951.1	4941.1	156.81	1.97879e+06	17133.8	2.10401e+06	6326
633	4850.77	867.82	7242.83	1246.34	267.02	9.06	1.58	2.16	3.75e-05	0.00054	0.0035	2.98
	1.62	10.56	137.51	367.3	469.92	934.38	4567.23	184.26	4.88991e+06	12880.1	1.35035e+06	5254
634	3375.1	845.18	4805.06	1553.54	103.15	7.07	1.08	1.47	4.01e-05	0.00065	0.00228	1.54
	0.86	12.53	146.22	952.85	715.3	521.34	7721.93	123.99	3.97366e+06	16699.8	3.11741e+06	10182
635	3612.52	860.11	5500.12	1673.92	237.95	8.26	1.87	2.58	3.76e-05	0.00028	0.00235	1.74
	0.7	9	182.89	829.22	413.53	821.37	4047.4	144.44	3.59391e+06	10250.7	2.79907e+06	6005
636	2875.39	478.32	4267.16	743.55	171.61	5.61	1.86	2.46	6.88e-05	0.00025	0.00194	1.06
	0.43	8.76	174.23	260.34	634.59	899.6	5380.71	140.02	2.71014e+06	13074.8	2.46082e+06	6598
637	2677.8	775.18	3588.34	1214.61	286.26	9.66	1.88	2.58	6.2e-05	0.00038	0.00401	2.75
	2.12	5.92	201.36	537.22	588.14	457.27	7829.92	148.32	3.69016e+06	11711.6	3.05702e+06	9418
638	2622.67	595.58	3566.32	1156.2	249.4	9.04	1.32	1.69	3.89e-05	0.00026	0.00281	2.42
	1.81	5.04	178.17	577.63	742.55	278.49	7317.96	159	4.04914e+06	9193.59	736962	9172
639	2053.13	702.34	3220.29	1068.62	293.4	8.08	0.92	1.36	8.78e-05	0.00048	0.00316	1.82
	1.07	9.04	181.41	997.86	528.66	318.86	3452.15	136.53	1.10342e+06	12115.8	575230	4308
640	2489.17	461.34	3419.9	759.22	184.71	6.37	1.24	1.76	8.24e-05	0.00061	0.00175	1.62
	1.27	6.53	178.03	881.93	1005.38	645.46	7355.18	130.36	2.84891e+06	13881.6	1.30865e+06	8823
641	2642.58	678.36	3661.91	1114.64	158.99	8.19	0.71	0.94	2.16e-05	0.00084	0.00183	2.19
	0.97	9.84	205.85	630.82	856.85	442.48	6166.65	138.77	2.23132e+06	16891.4	1.52659e+06	9236
642	3134.64	935	3983.16	1747.75	224.35	9.67	1.3	1.85	8.27e-05	0.00021	0.00161	1.71
	1.16	13.07	121.76	467.26	517.66	294.29	4498.8	133.61	4.6538e+06	16086.4	1.58225e+06	6504
643	2461.47	780.49	3360.28	1556.21	280.68	7.22	1.15	1.4	8.35e-05	0.0006	0.00219	2.16
	1.11	13.74	93.25	269.69	532.48	224.42	6393.91	159.77	2.06779e+06	14825.6	1.61882e+06	7409
644	2951.38	730.68	3996.52	1273.41	289.61	7.54	1.79	2.31	7.99e-05	0.00024	0.00085	2.35
	0.98	12.61	55.16	517.44	223.89	252.89	3528.66	180.08	3.52303e+06	11494.7	759036	5252
645	4216.26	719.25	6268.47	1260	200.82	6.99	1.64	2.1	9.24e-05	0.00022	0.00082	2.32
	1.63	12.2	83.45	492.77	298.82	548.82	6297.53	163.18	2.08692e+06	17573.8	1.32601e+06	7185
646	2560.48	449.84	3674.71	844.91	157.53	8.19	1.99	2.88	7.27e-05	0.00027	0.00259	1.88
	0.79	11.62	231.72	936.69	809.98	201.97	3944.79	189.14	2.1948e+06	13097.4	623359	5729
647	4442.74	654.19	6129.68	1044.31	192.86	6.55	1.84	2.28	6.52e-05	0.00016	0.00118	1.5
	1.13	5.31	157.38	346.16	453.31	247.25	3468.73	123.98	1.23182e+06	10065.2	2.52267e+06	4410
648	2616.32	625.62	3354.49	856.62	105.59	7.25	2	2.92	6.33e-05	0.00077	0.0044	2.16
	1.6	5.05	61.75	394.71	269.56	859.68	5488.62	162.04	3.91084e+06	16958.1	1.30596e+06	6752
649	2292.79	713.77	2994.64	1138.89	168.01	7.24	1.84	2.41	9.86e-05	0.00085	0.00217	1.92
	1.15	5.55	126.57	984.55	465.95	781.33	5947.75	198.11	2.49974e+06	9513.65	2.16554e+06	7006
650	3085.73	431.74	4523.25	617.86	292.22	6.22	1.57	2.01	3.23e-05	0.00066	0.00405	1.08
	0.58	6.82	199.33	439.65	1088	638.56	5160.1	139.85	4.30083e+06	8377.02	2.18153e+06	7088

Appendix B

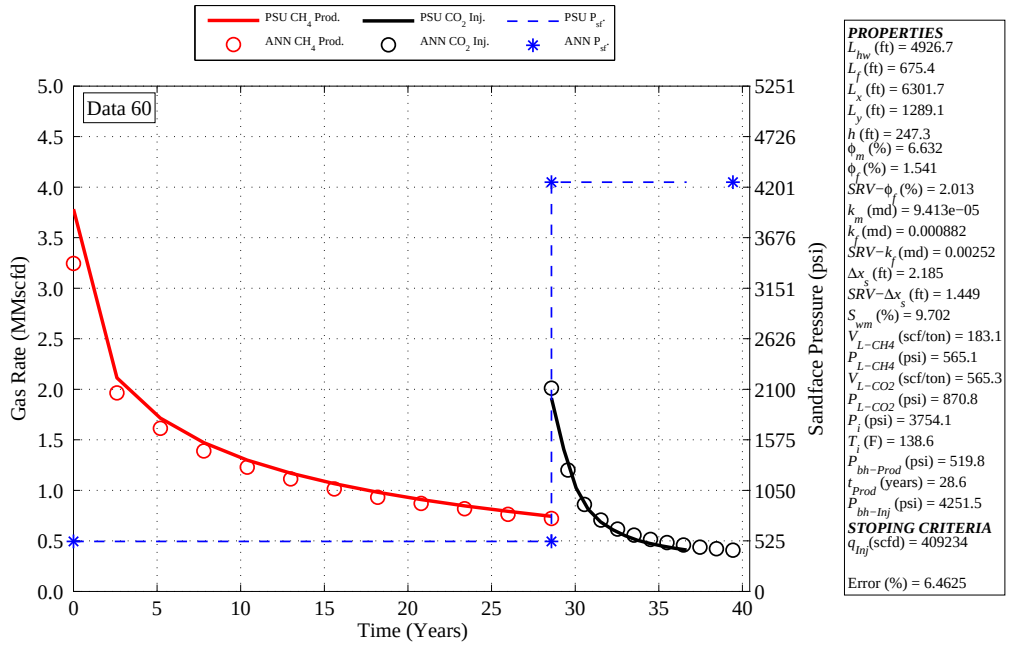
Additional Testing Results

This appendix includes some the testing data set plots generated by the ANN tools.

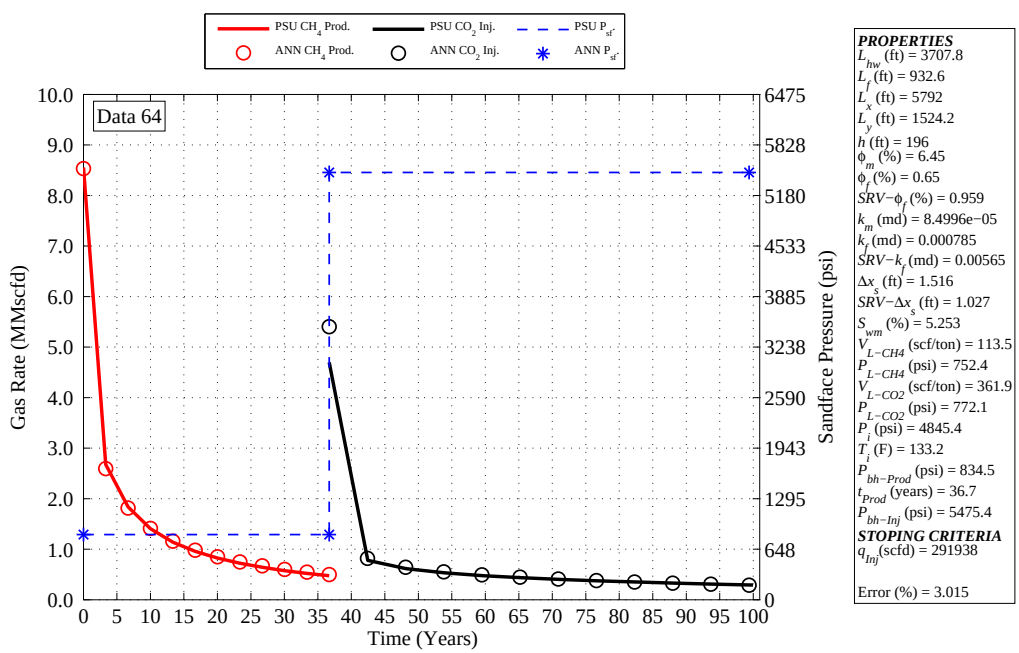


(e) Case 5

Figure B.1. Additional Predictions for Psf-Psf forward case

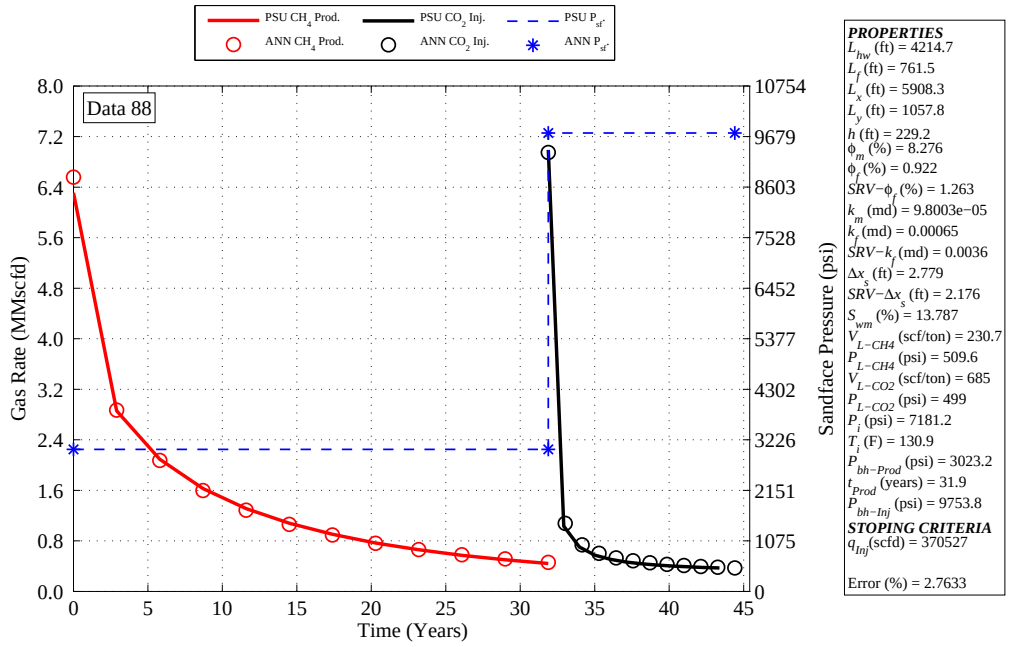


(f) Case 6

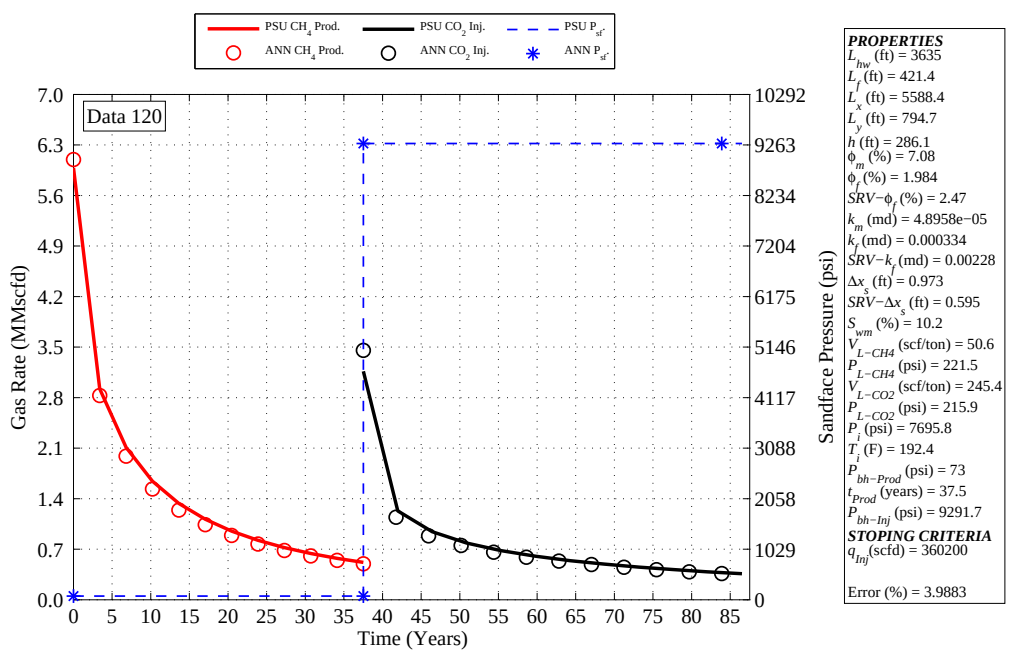


(g) Case 7

Figure B.1. (continued) Additional Predictions for Psf-Psf forward case

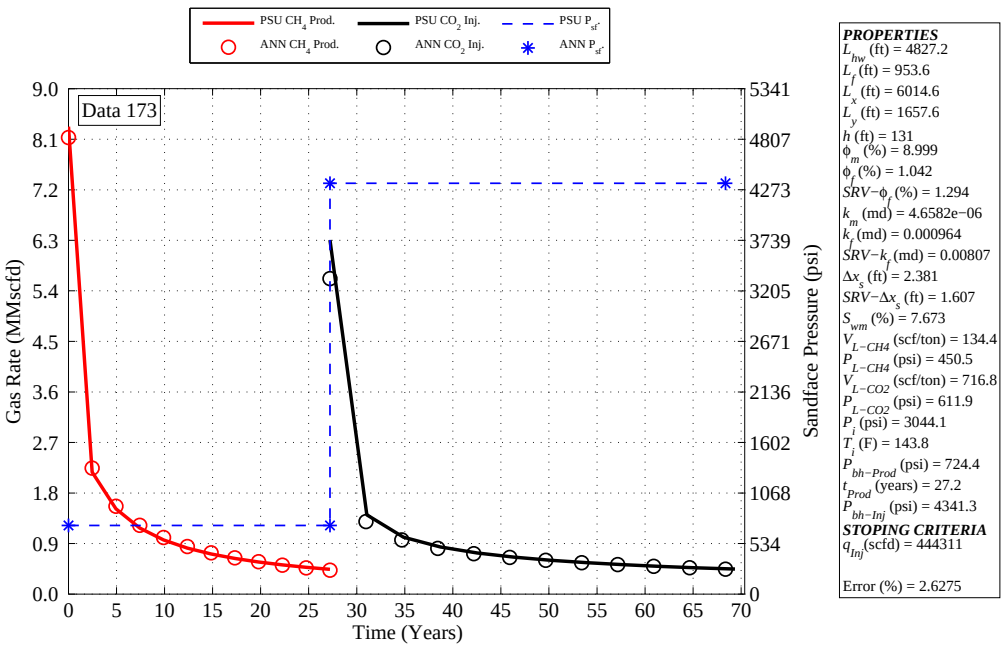


(h) Case 8



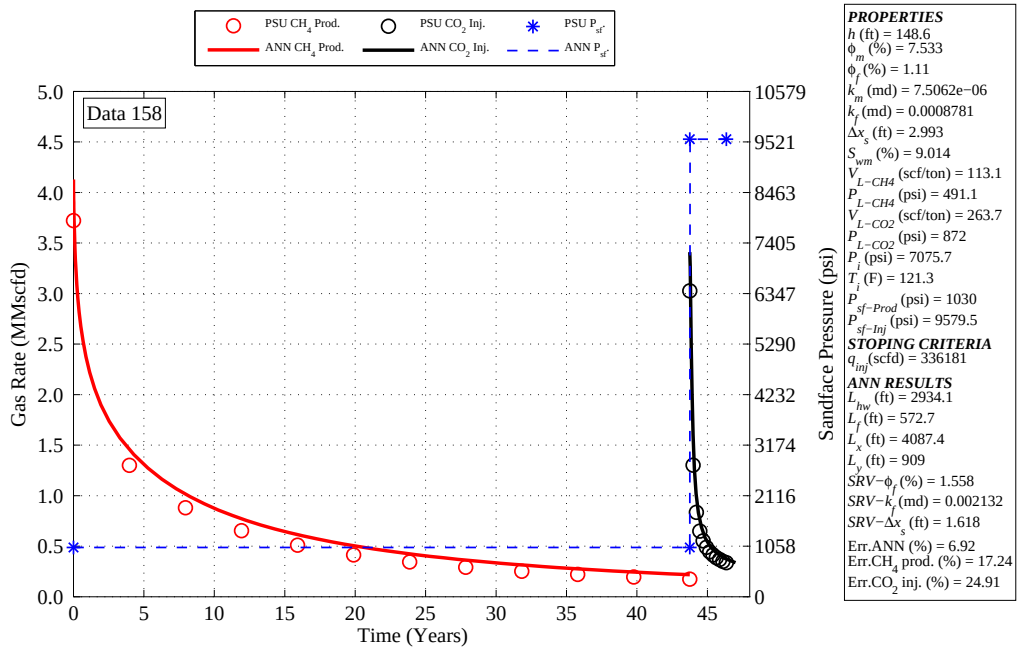
(i) Case 9

Figure B.1. (continued) Additional Predictions for Psf-Psf forward case

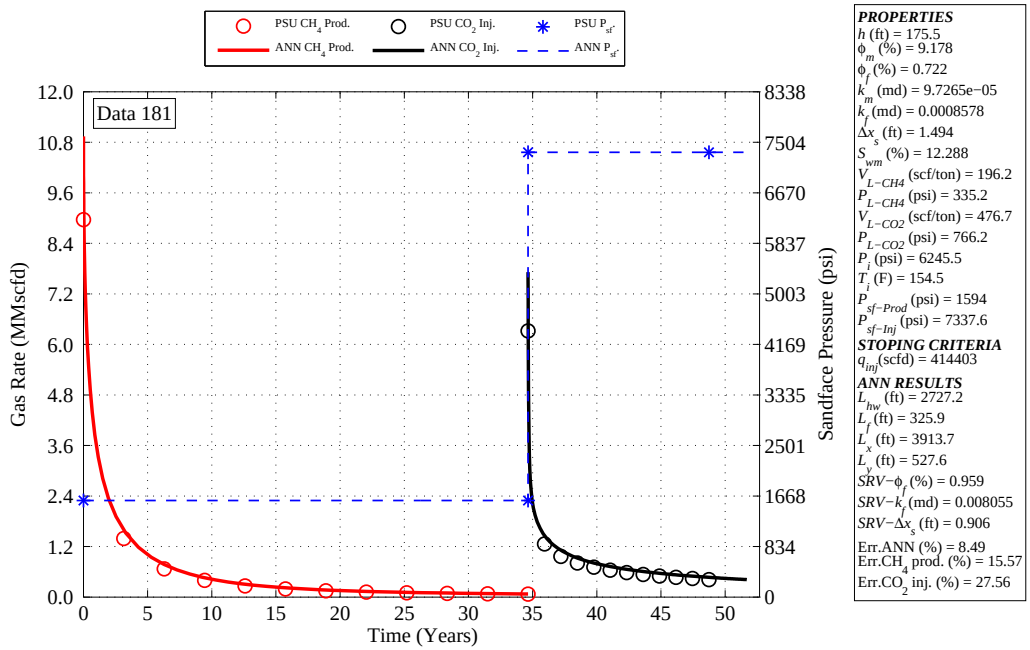


(j) Case 10

Figure B.1. (continued) Additional Predictions for Psf-Psf forward case

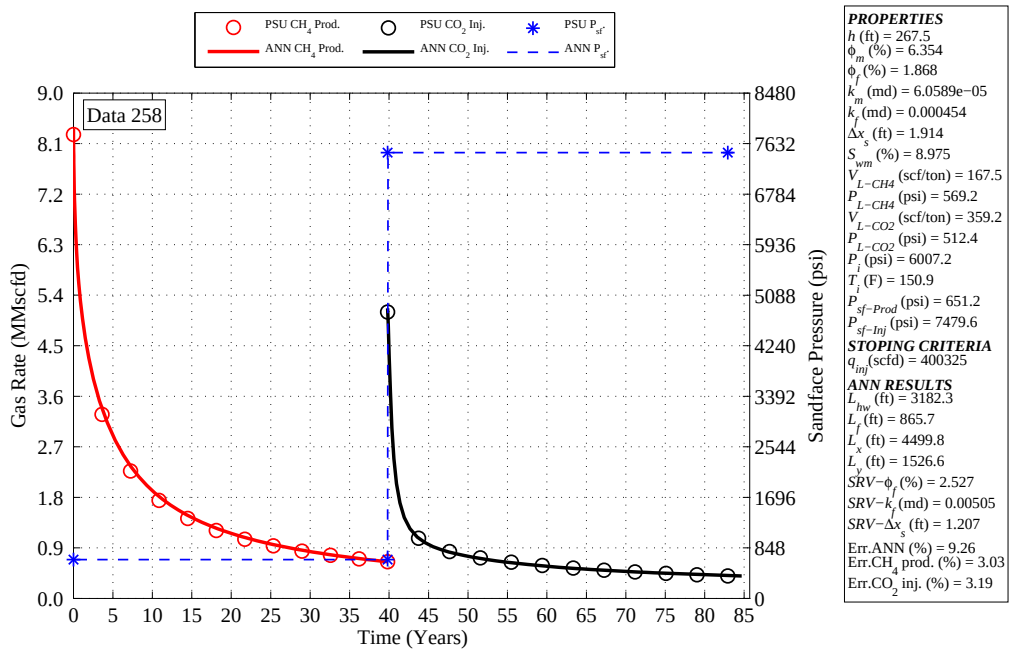


(a) Case 5

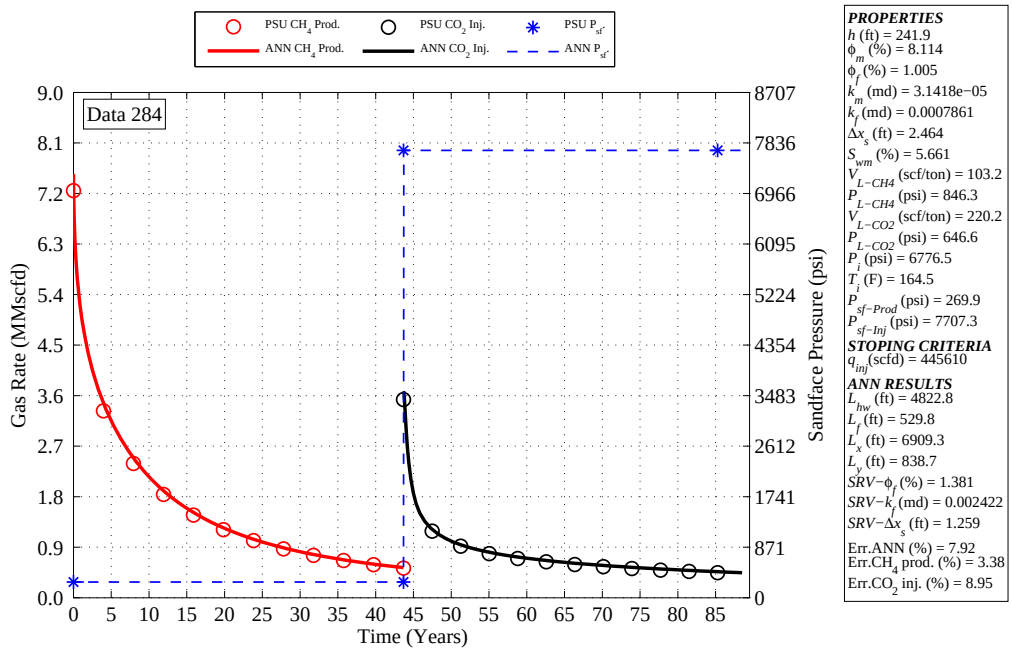


(b) Case 6

Figure B.2. Additional Predictions for Psf-Psf design case

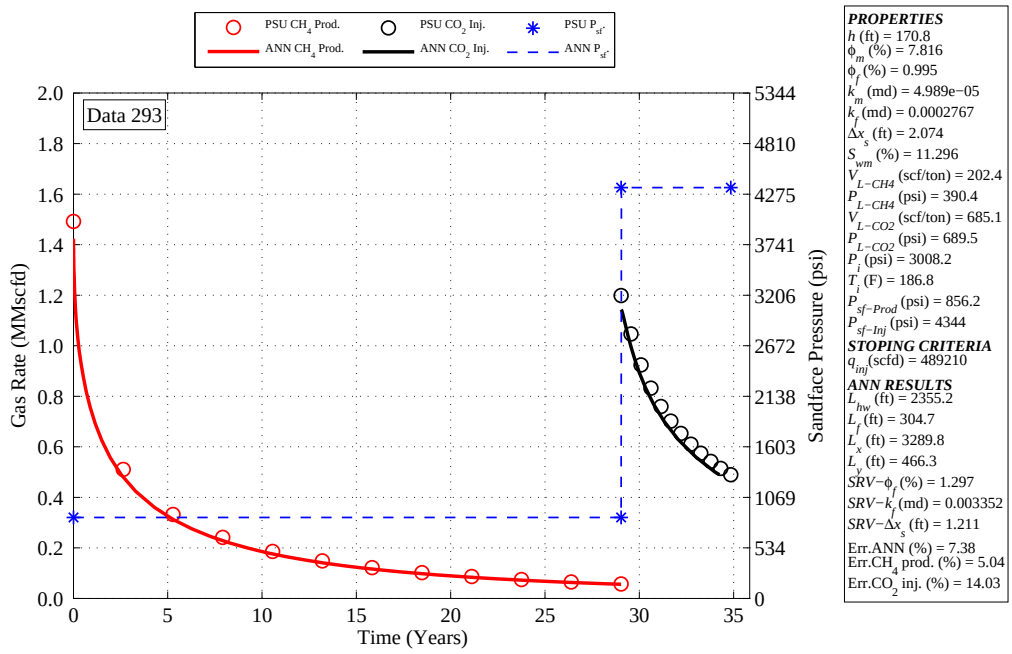


(c) Case 7

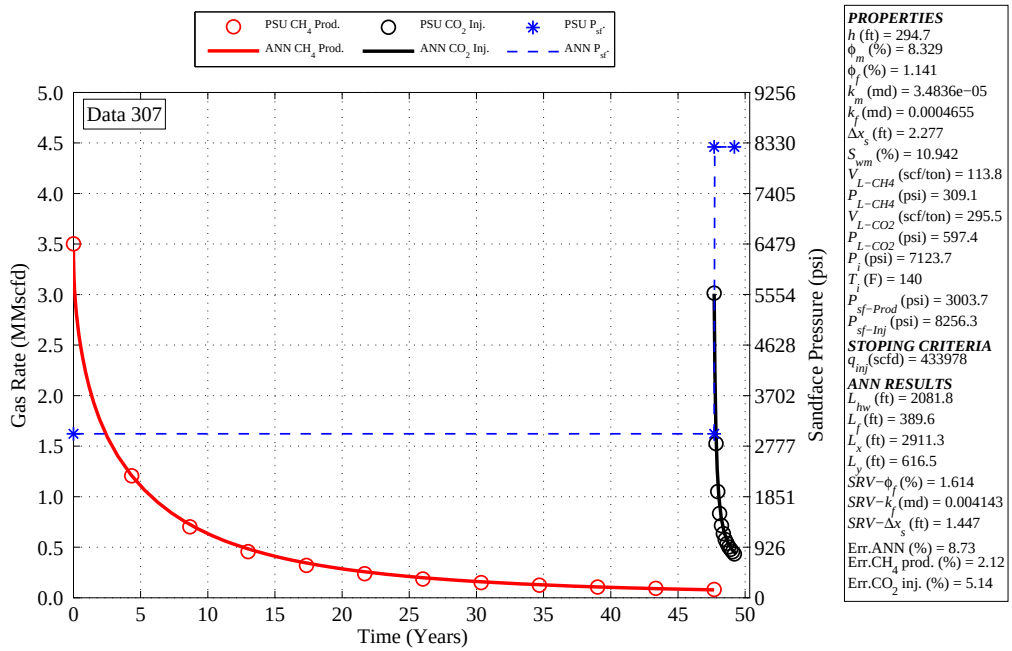


(d) Case 8

Figure B.2. (continued) Additional Predictions for Psf-Psf design case

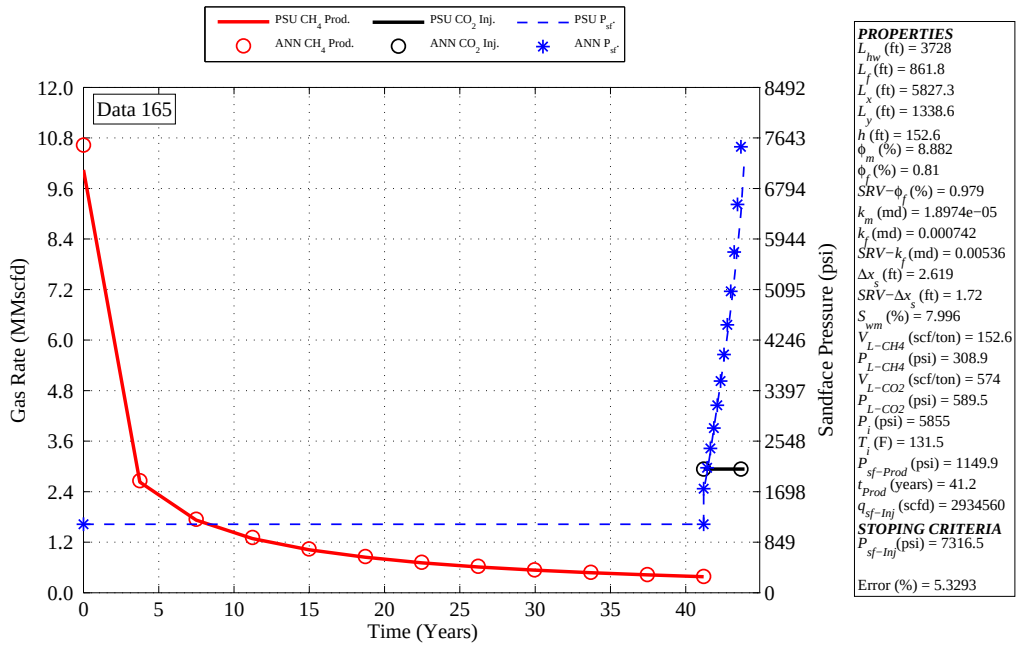


(e) Case 9

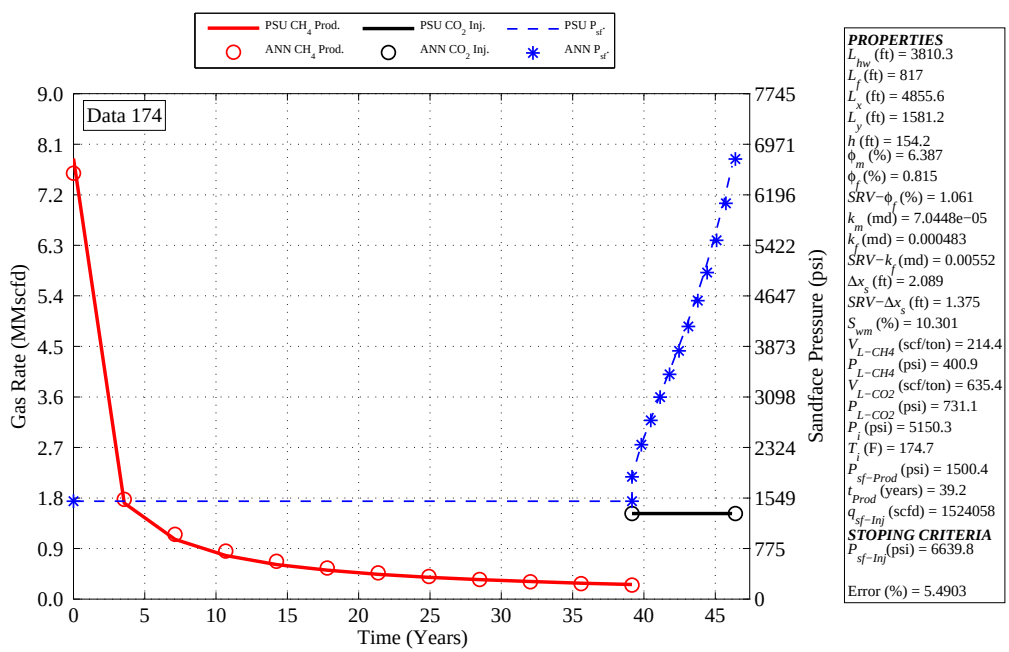


(f) Case 10

Figure B.2. (continued) Additional Predictions for Psf-Psf design case

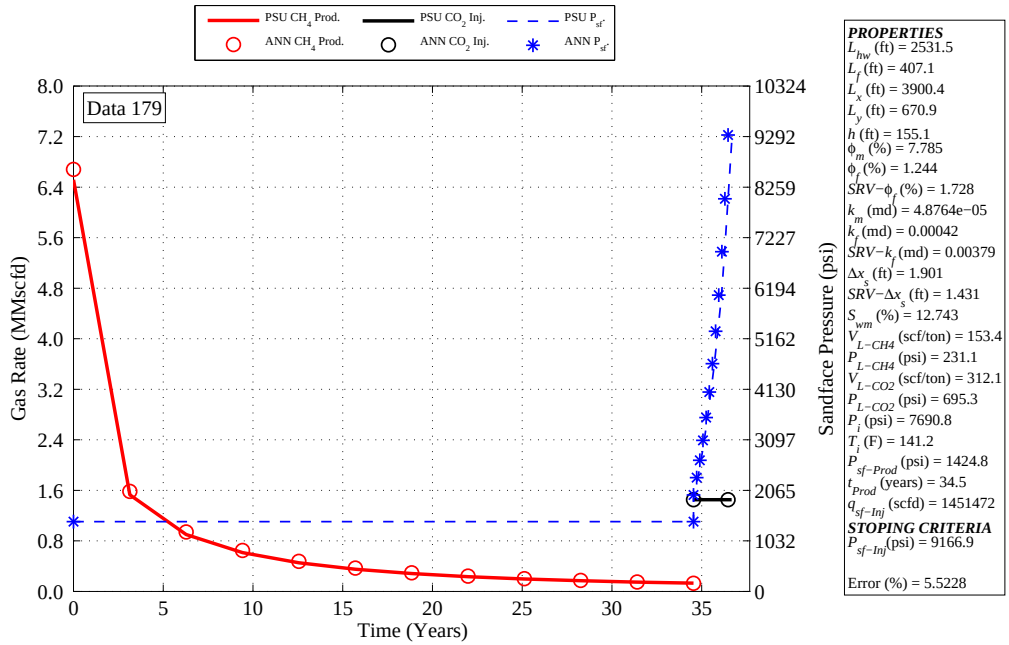


(a) Case 5

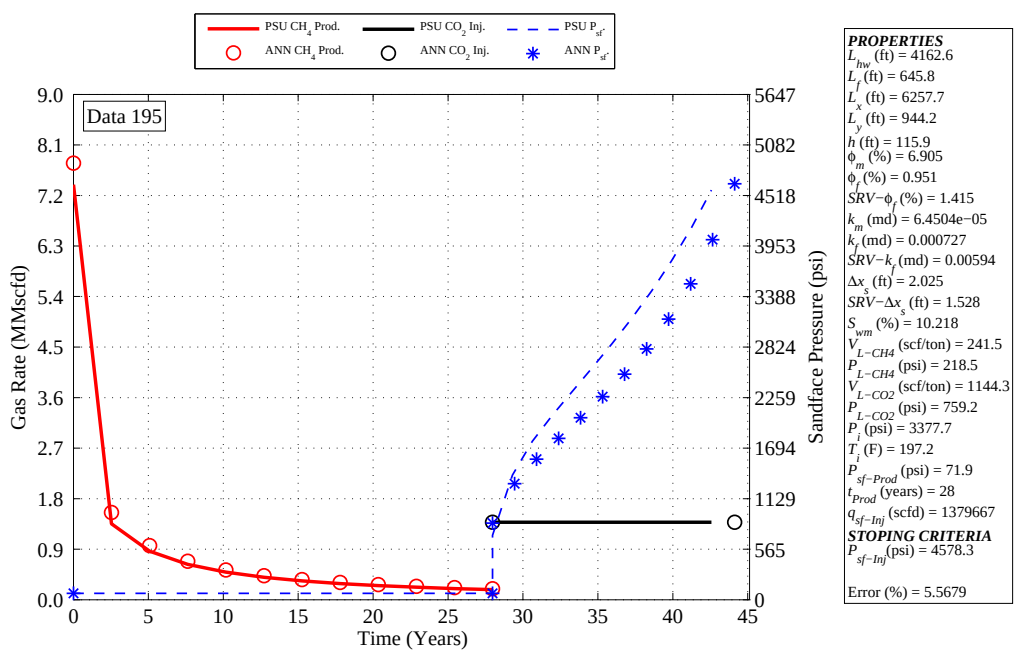


(b) Case 6

Figure B.3. Additional Predictions for Psf-qsf forward case

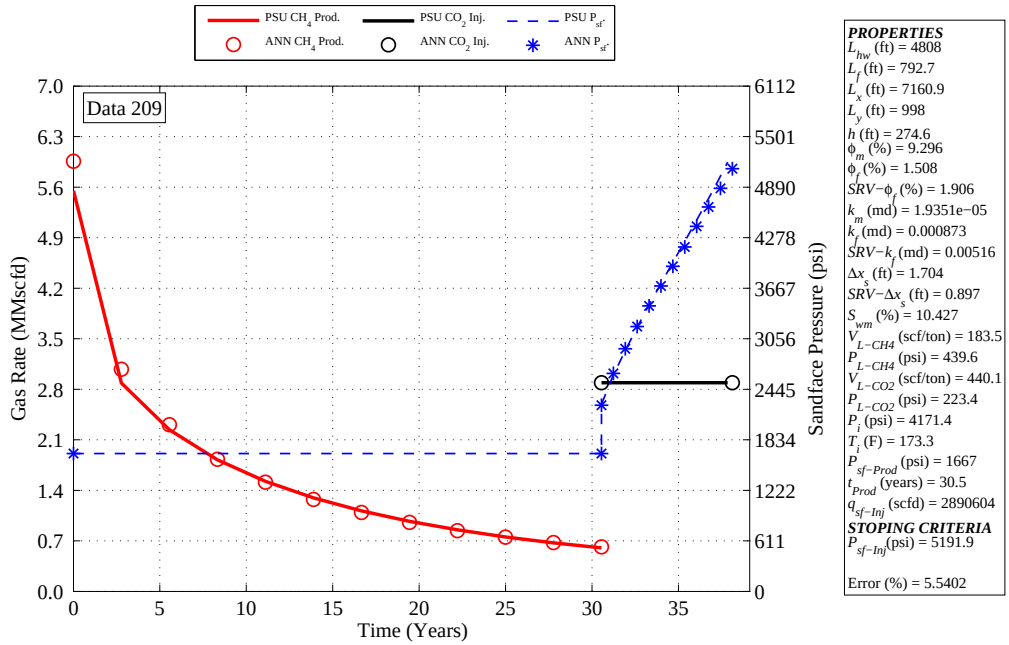


(c) Case 7

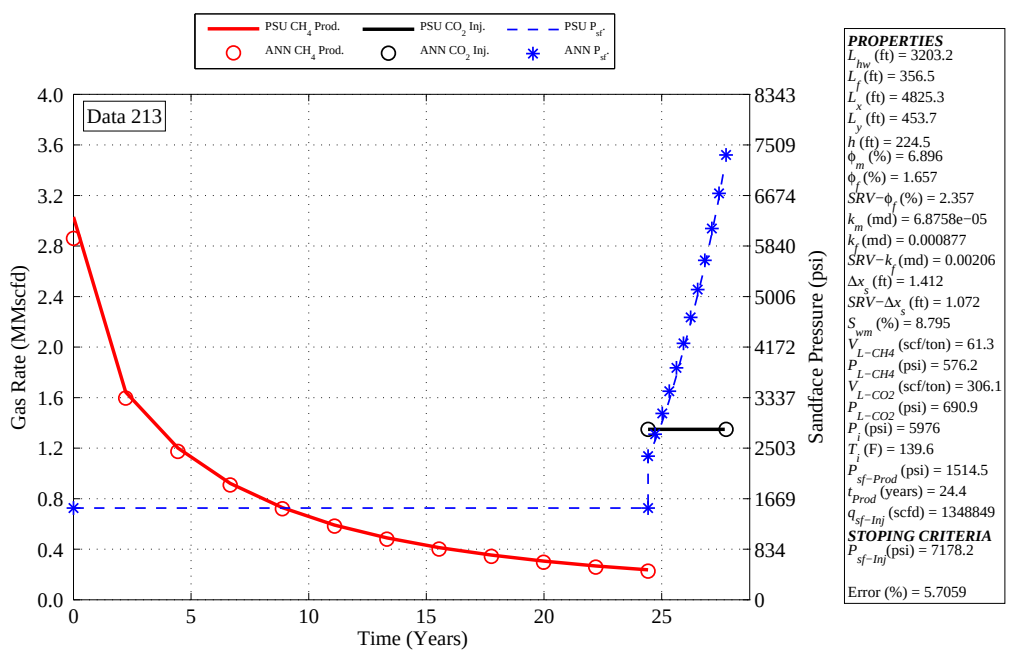


(d) Case 8

Figure B.3. (continued) Additional Predictions for Psf-qsf forward case

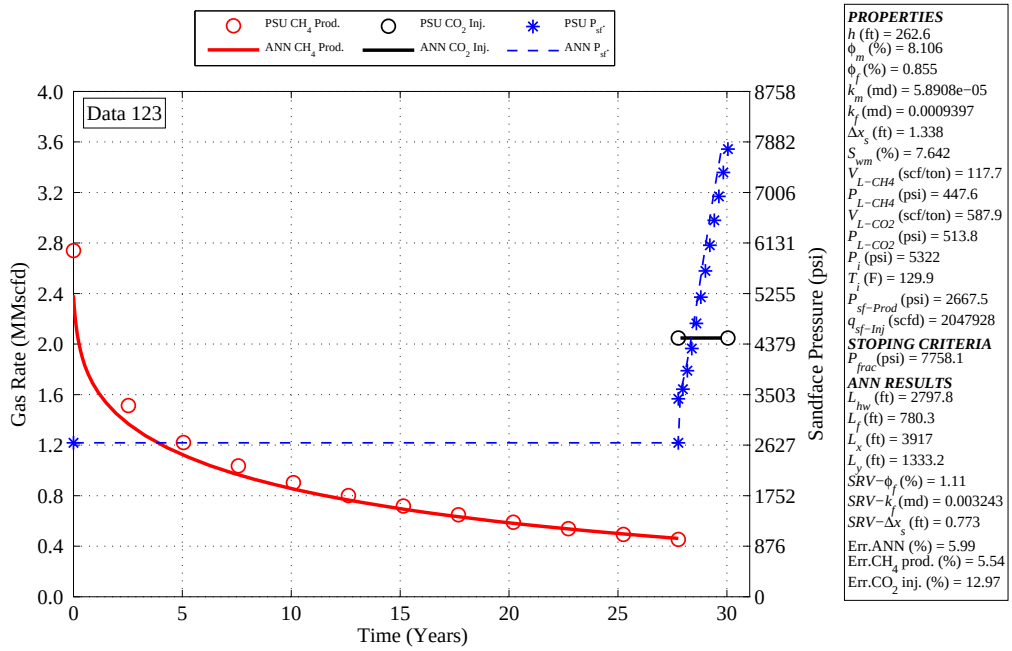


(e) Case 9

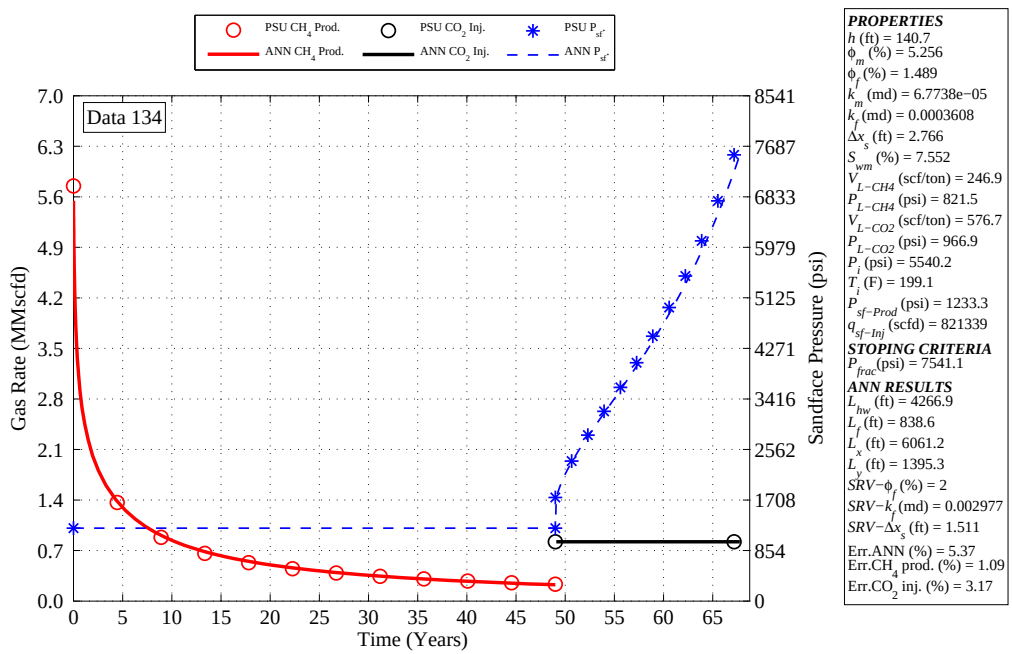


(f) Case 10

Figure B.3. (continued) Additional Predictions for Psf-qsf forward case

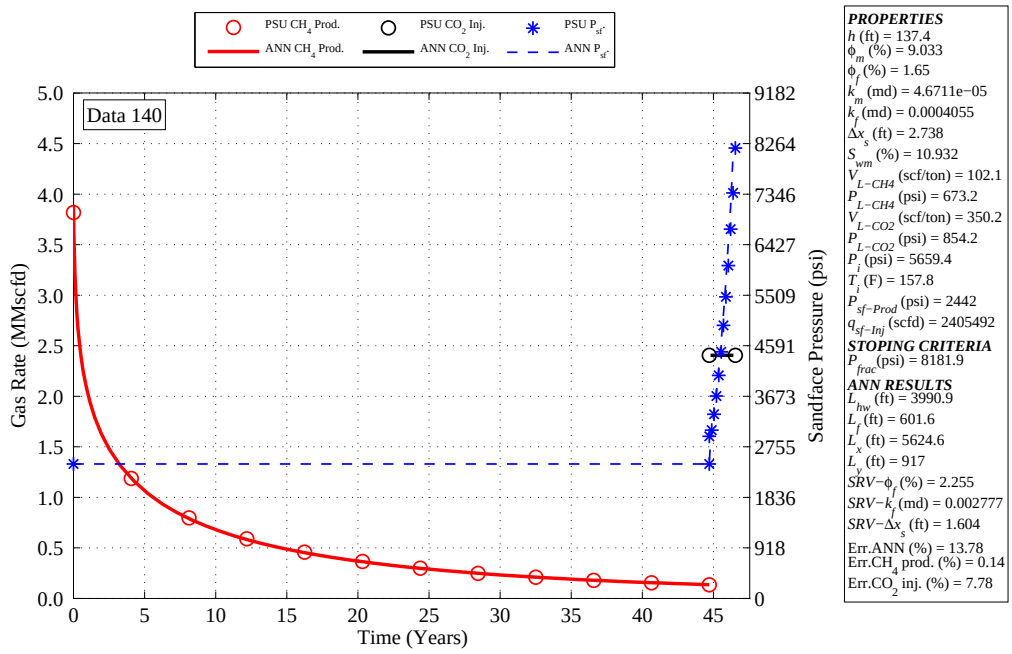


(a) Case 5

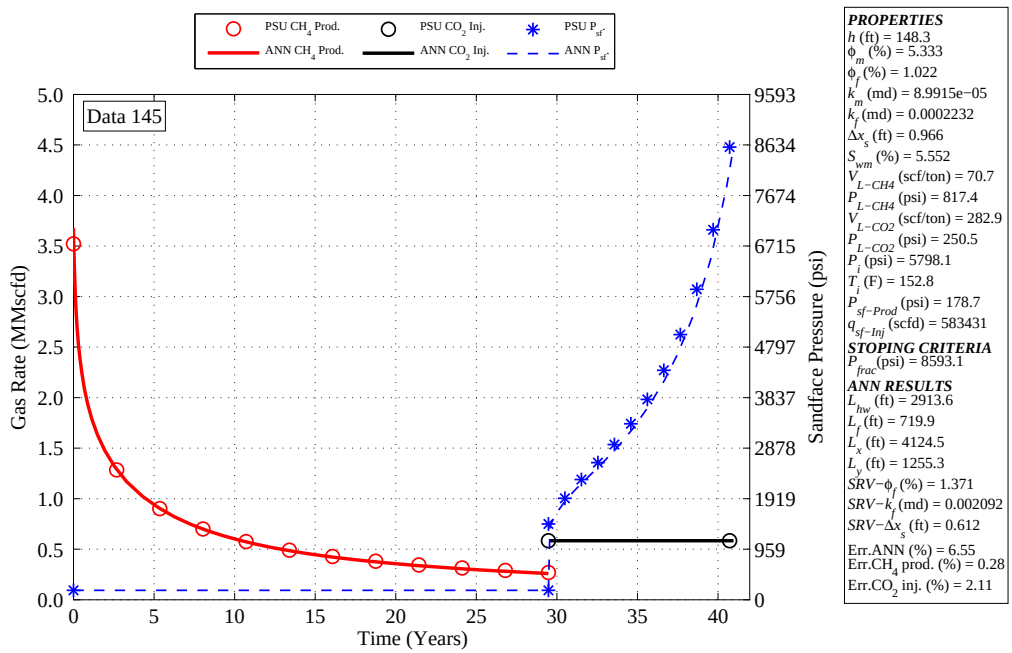


(b) Case 6

Figure B.4. Additional Predictions for Psf-qsf design case

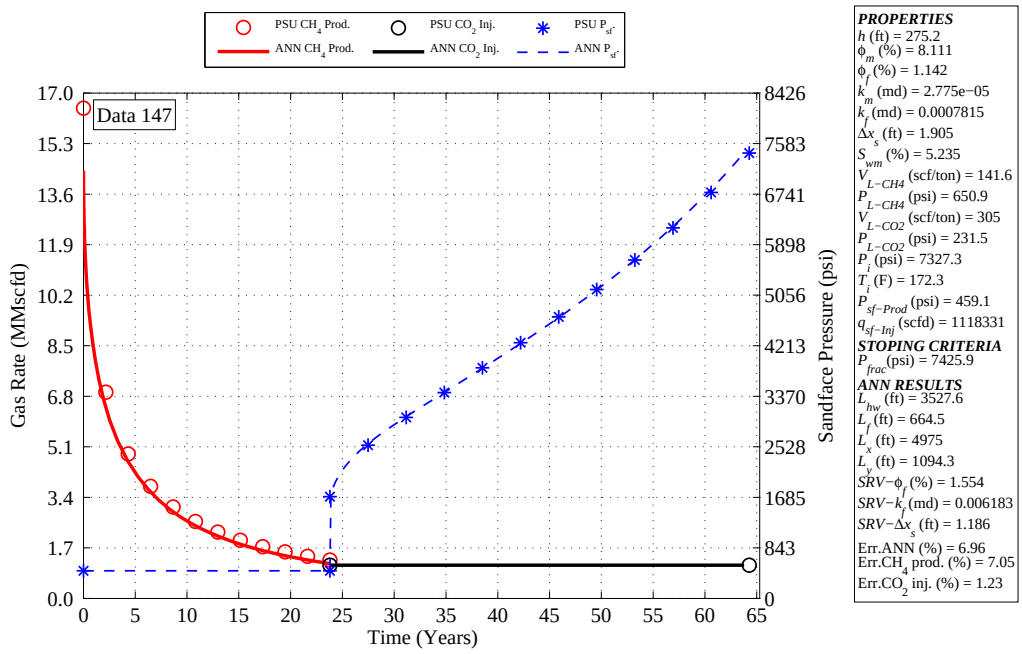


(c) Case 7

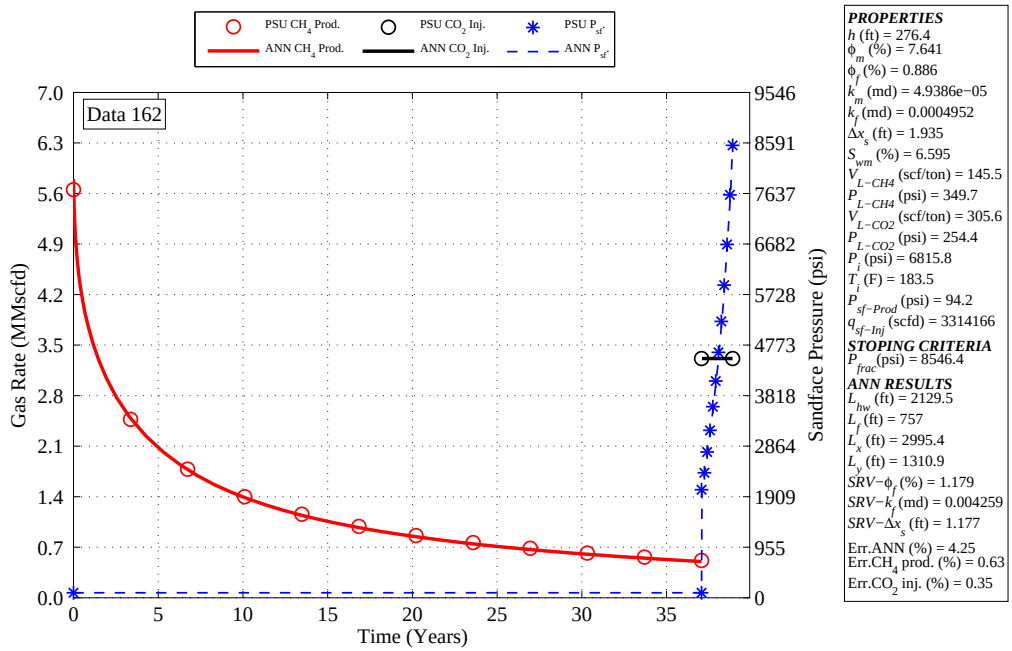


(d) Case 8

Figure B.4. (continued) Additional Predictions for Psf-qsf design case

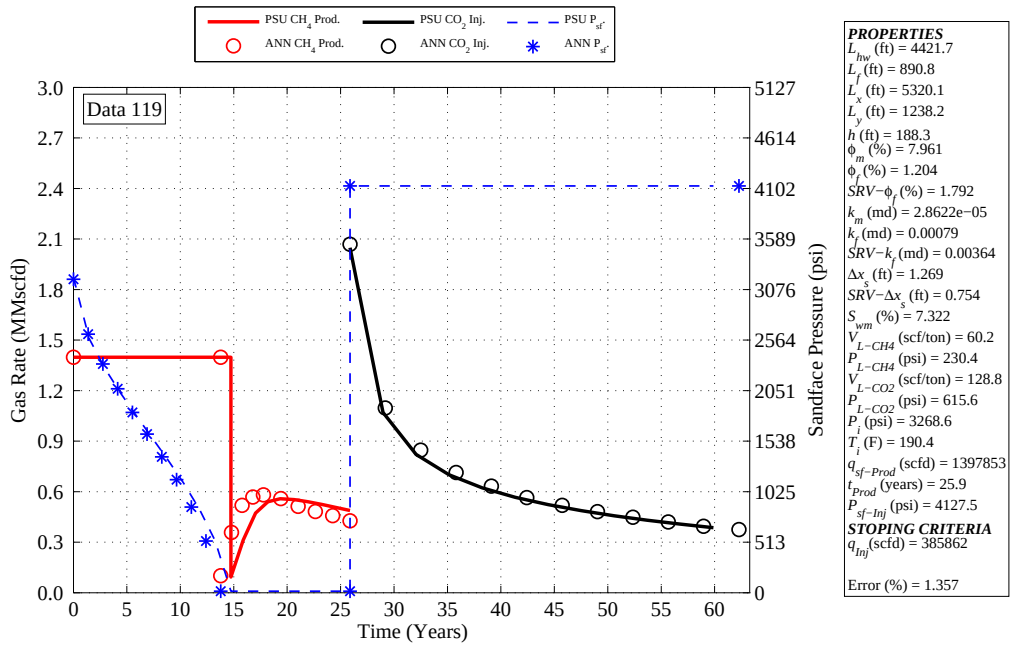


(e) Case 9

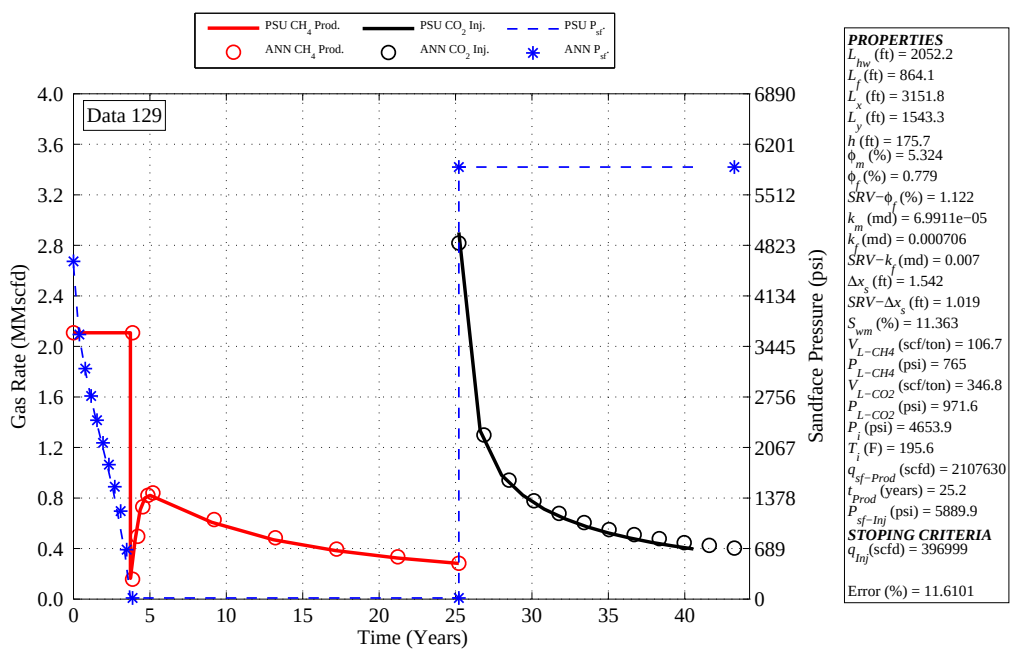


(f) Case 10

Figure B.4. (continued) Additional Predictions for Psf-qsf design case

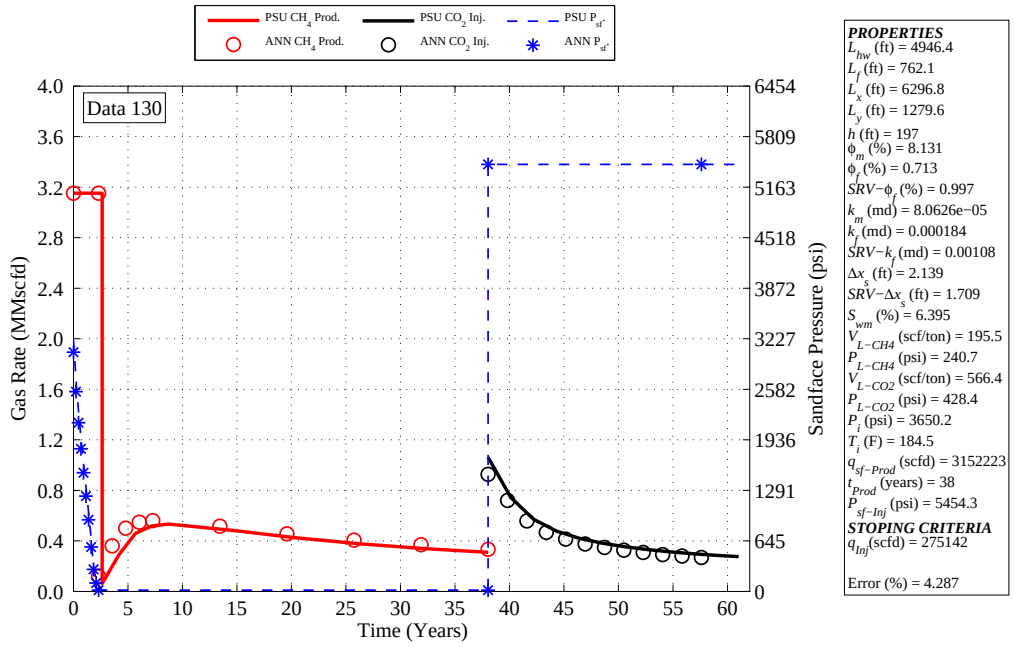


(a) Case 5

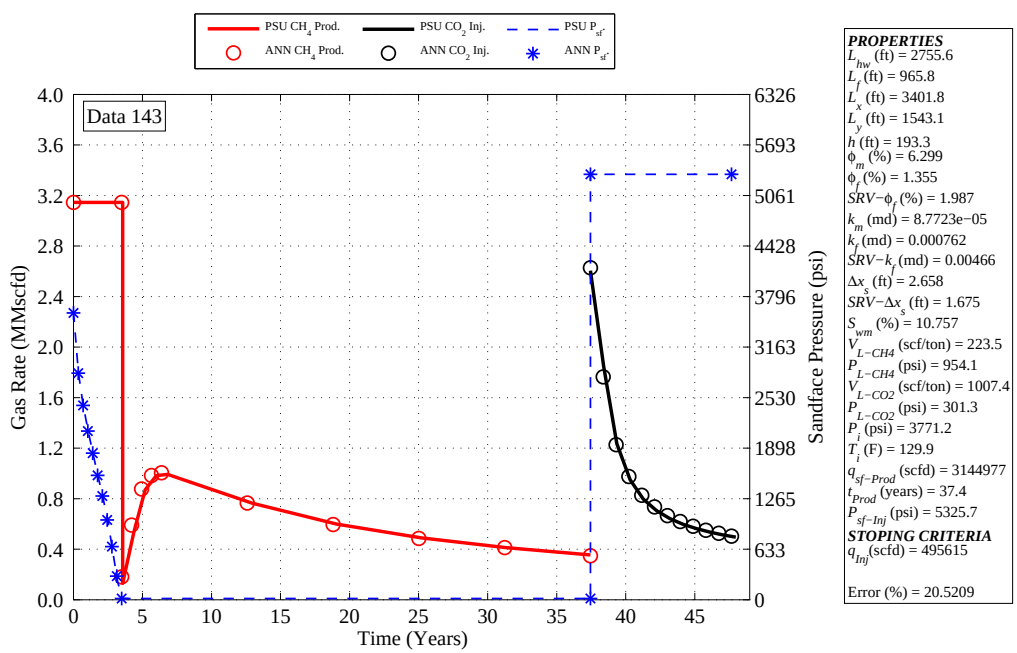


(b) Case 6

Figure B.5. Additional Predictions for qsf-Psf forward case

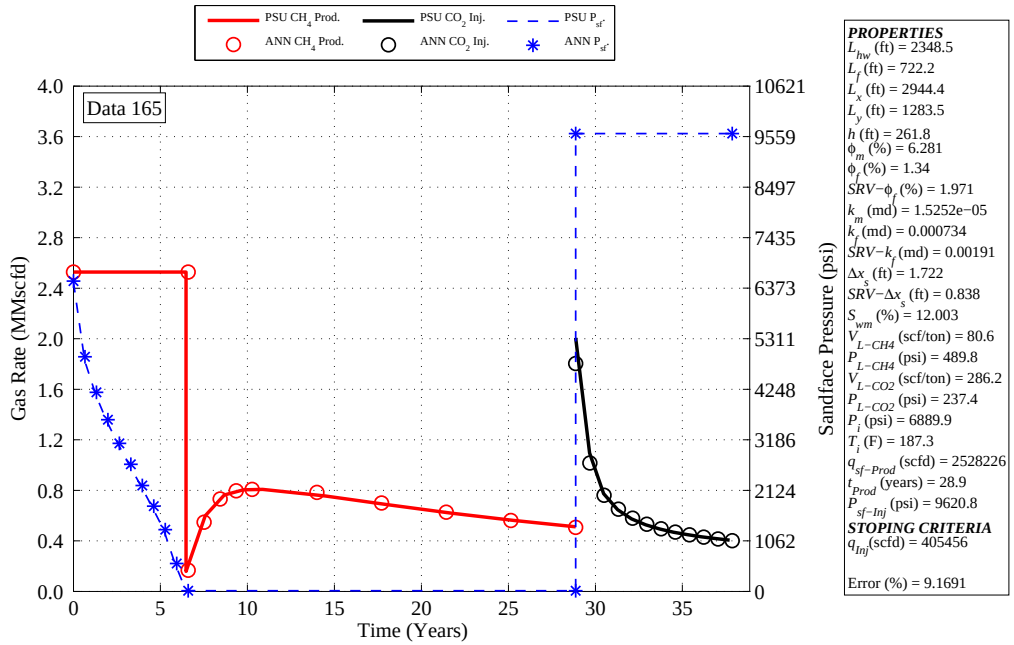


(c) Case 7

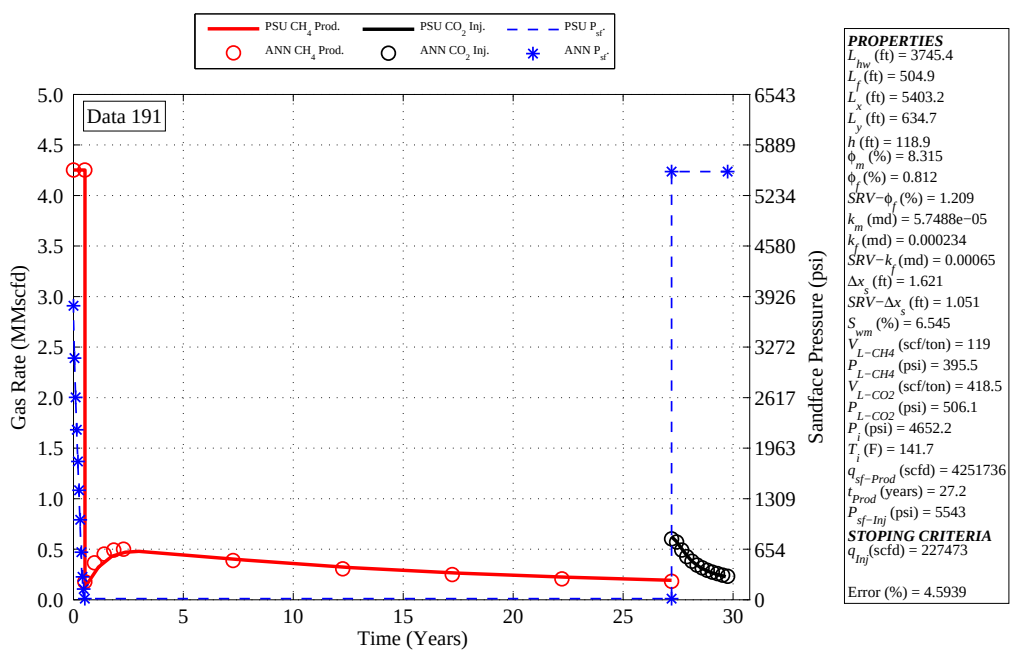


(d) Case 8

Figure B.5. (continued) Additional Predictions for qsf-Psf forward case

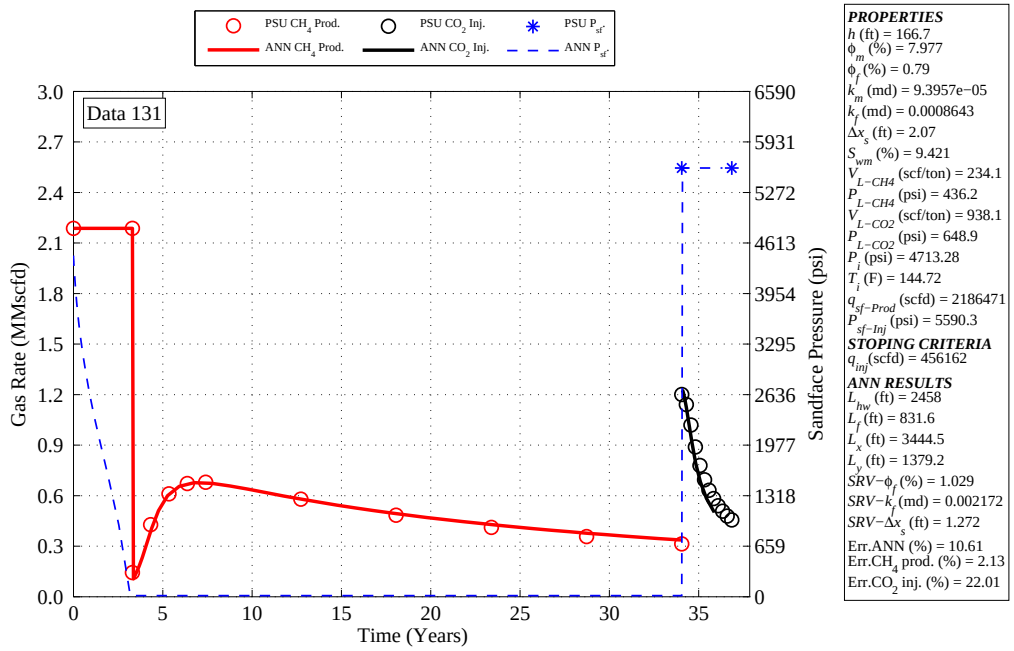


(e) Case 9

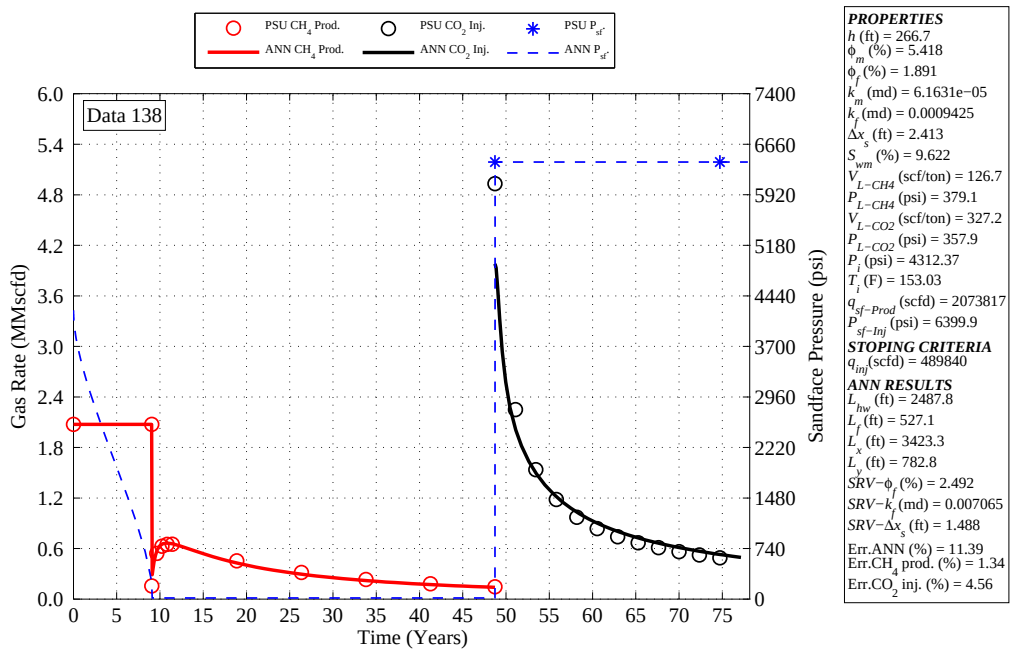


(f) Case 10

Figure B.5. (continued) Additional Predictions for qsf-Psf forward case

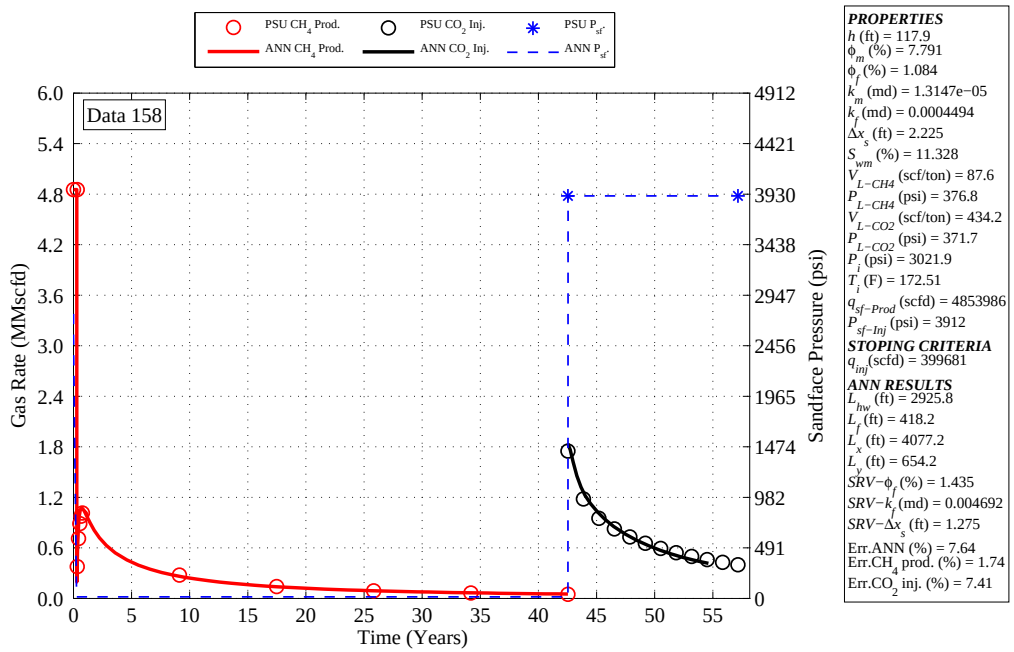


(a) Case 5

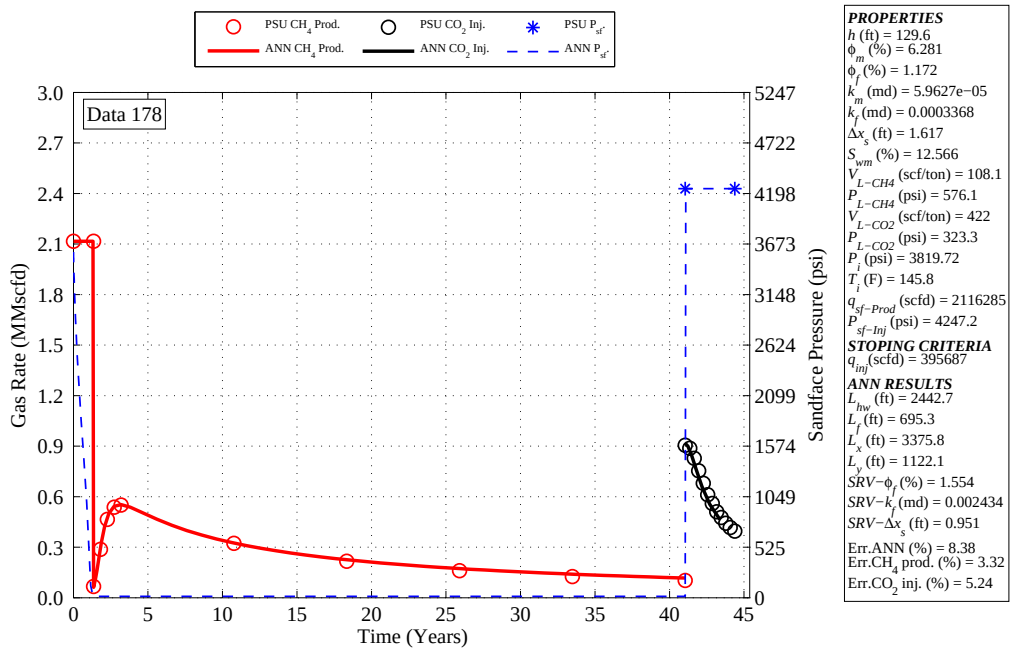


(b) Case 6

Figure B.6. Additional Predictions for qsf-Psf design case

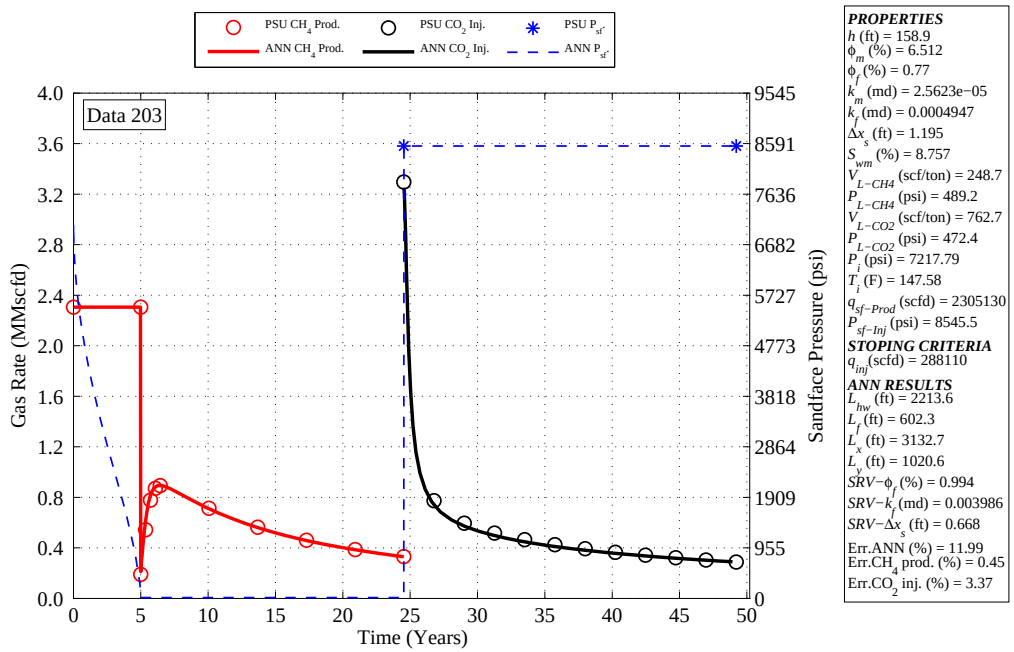


(c) Case 7

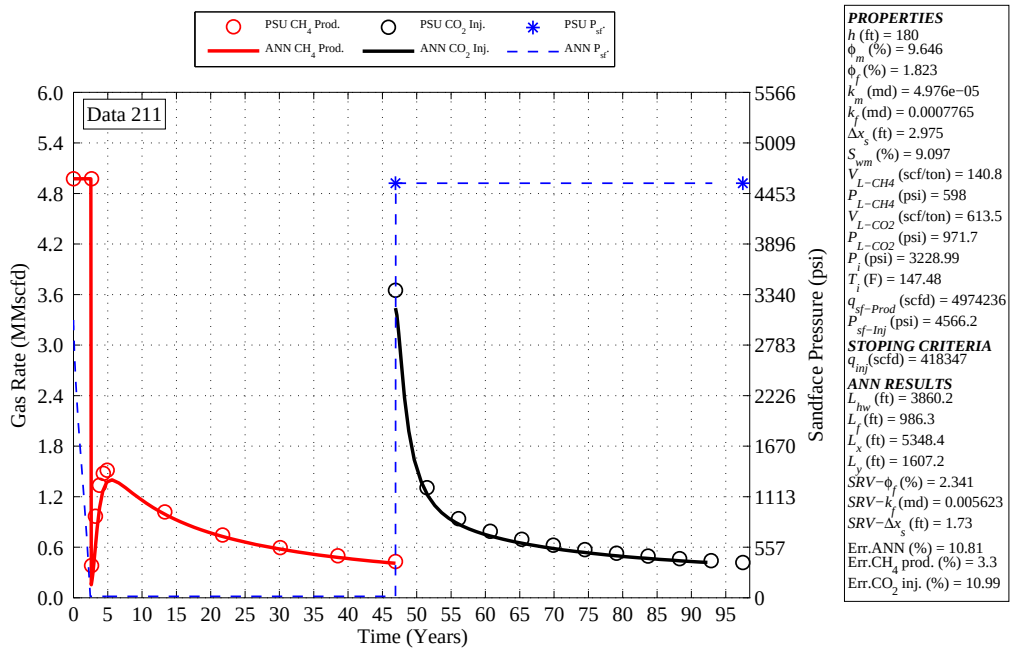


(d) Case 8

Figure B.6. (continued) Additional Predictions for qsf-Psf design case

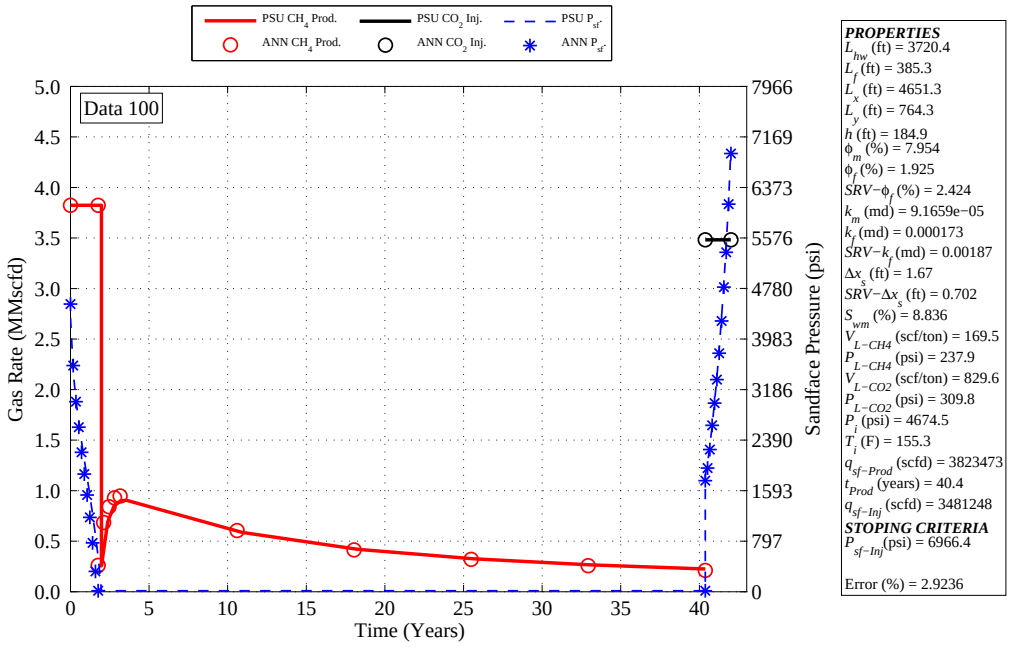


(e) Case 9

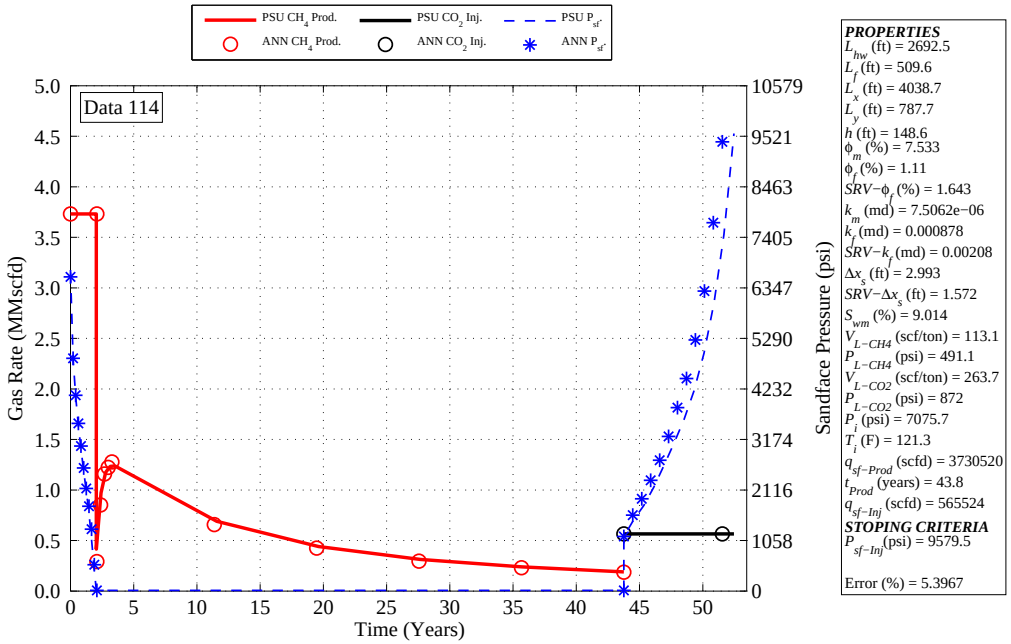


(f) Case 10

Figure B.6. (continued) Additional Predictions for qsf-Psf design case

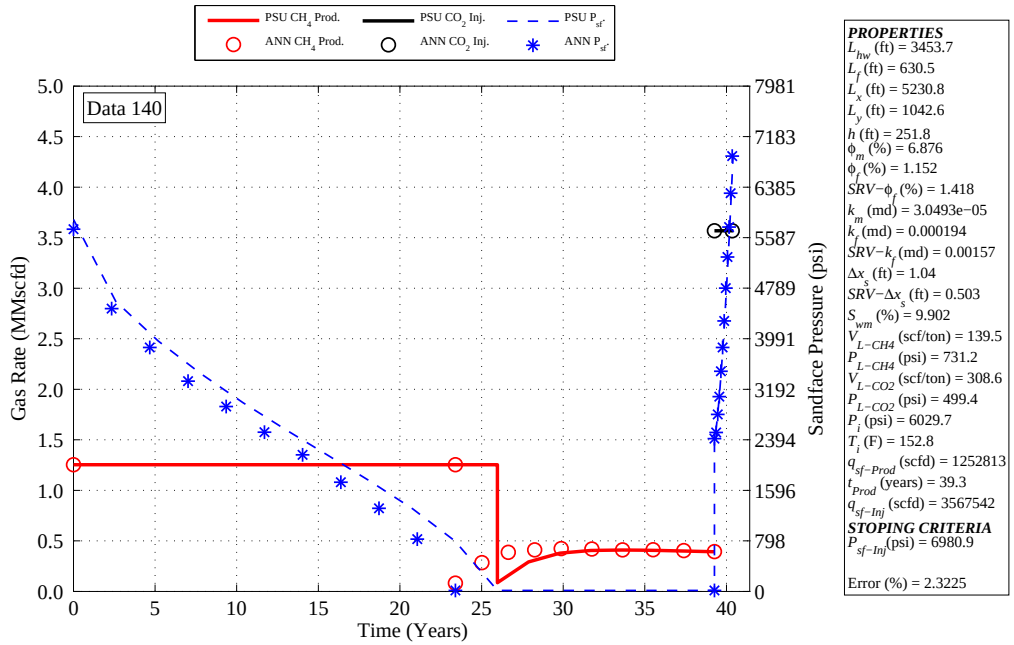


(a) Case 5

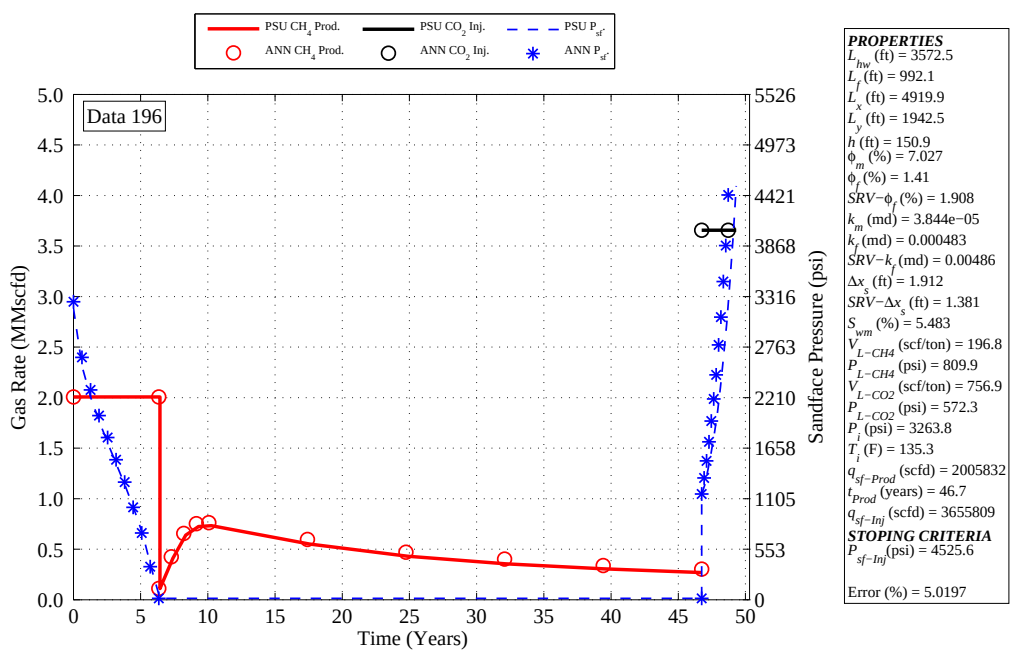


(b) Case 6

Figure B.7. Additional Predictions for qsf-qsf forward case

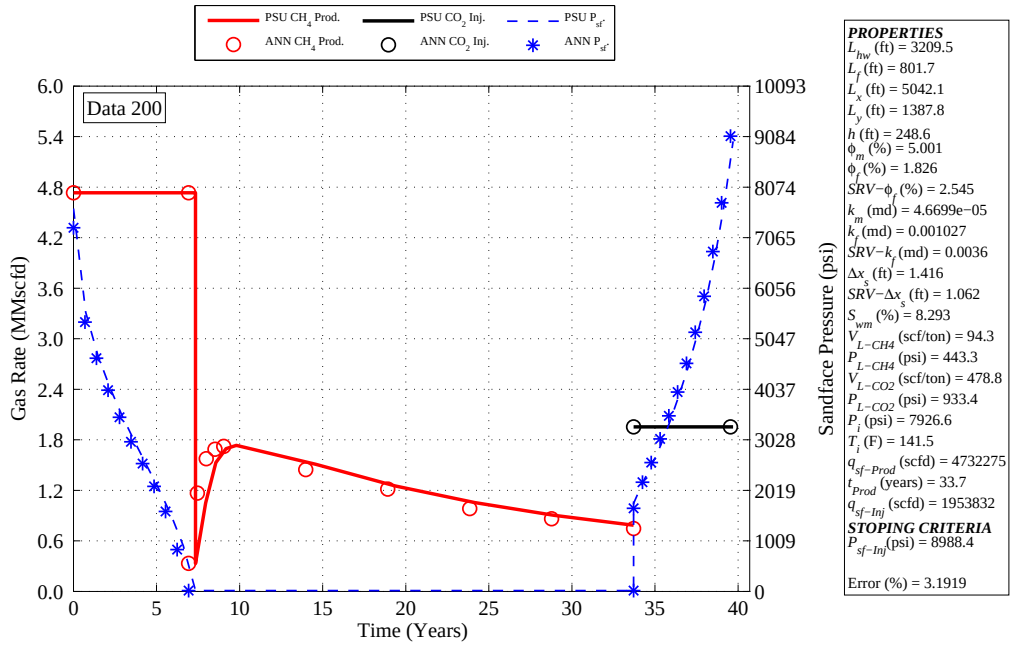


(c) Case 7

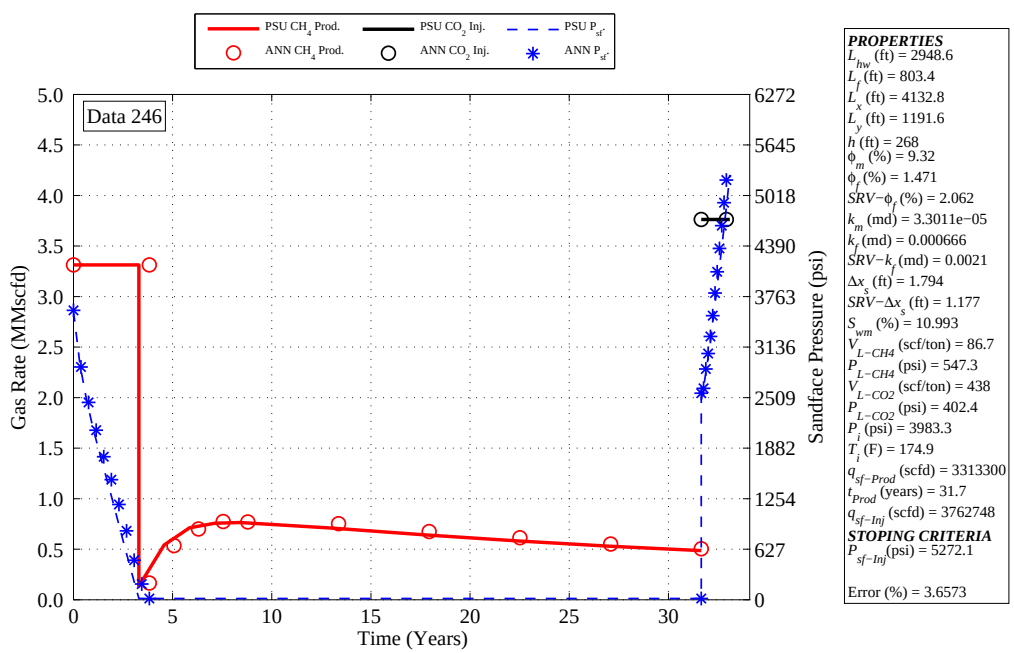


(d) Case 8

Figure B.7. (continued) Additional Predictions for qsf-qsf forward case

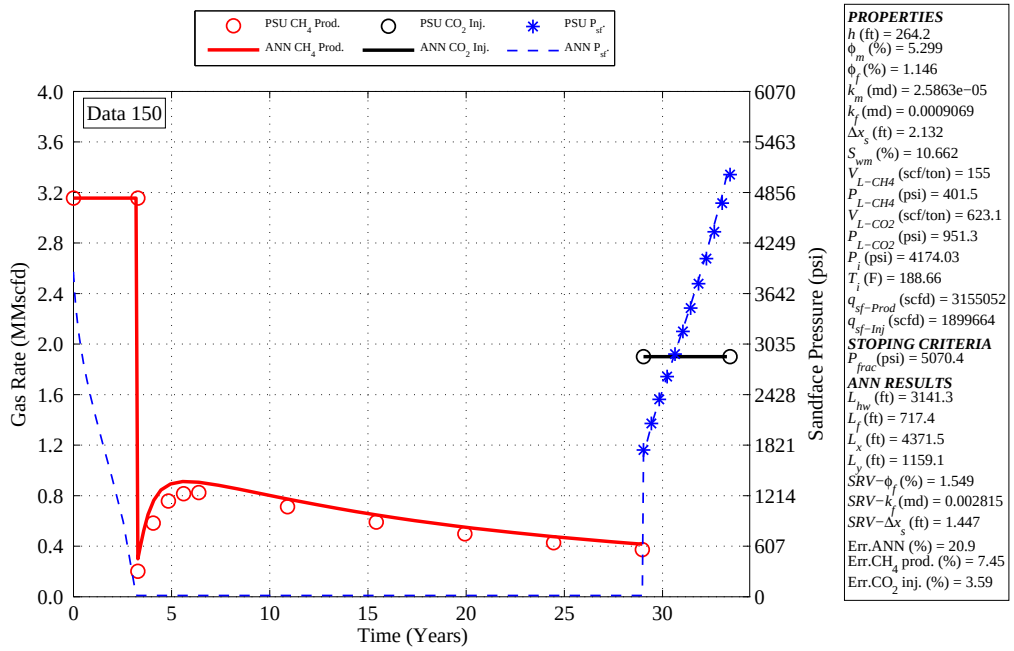


(e) Case 9

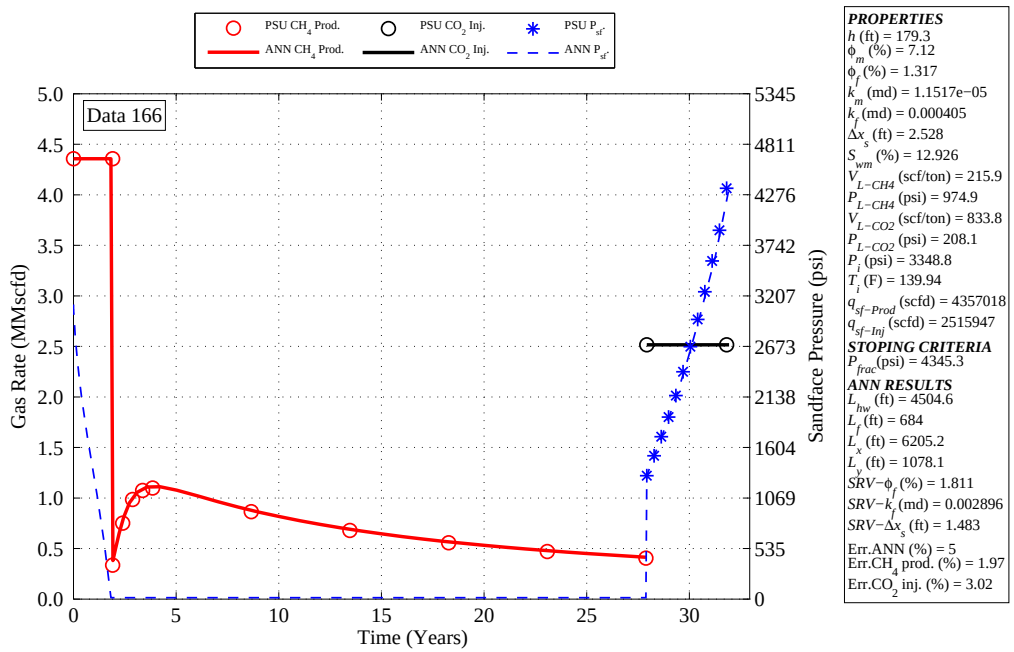


(f) Case 10

Figure B.7. (continued) Additional Predictions for qsf-qsf forward case

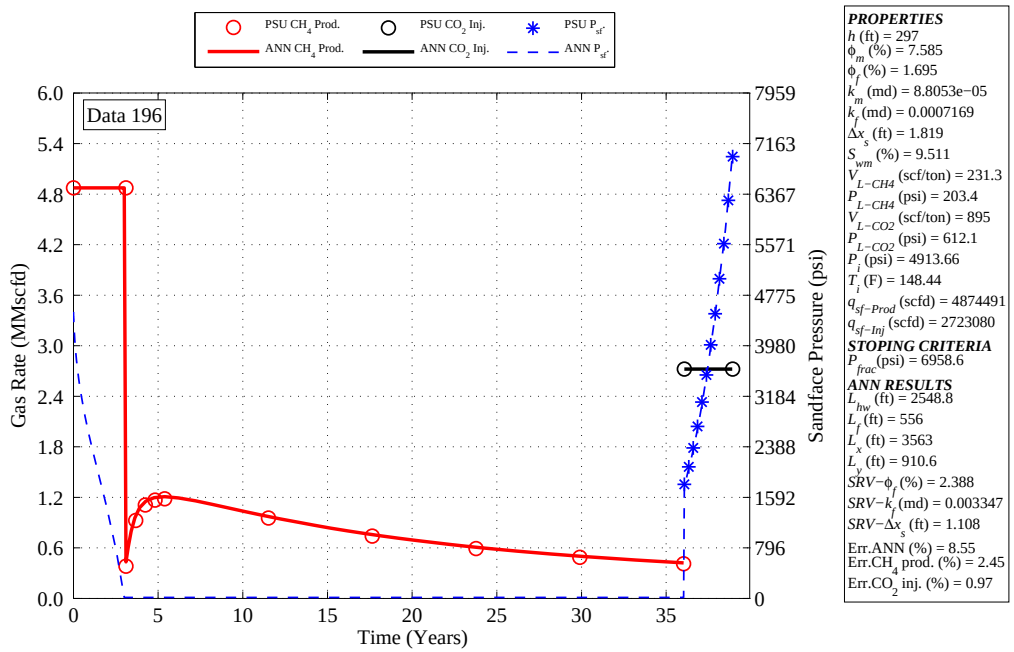


(a) Case 5

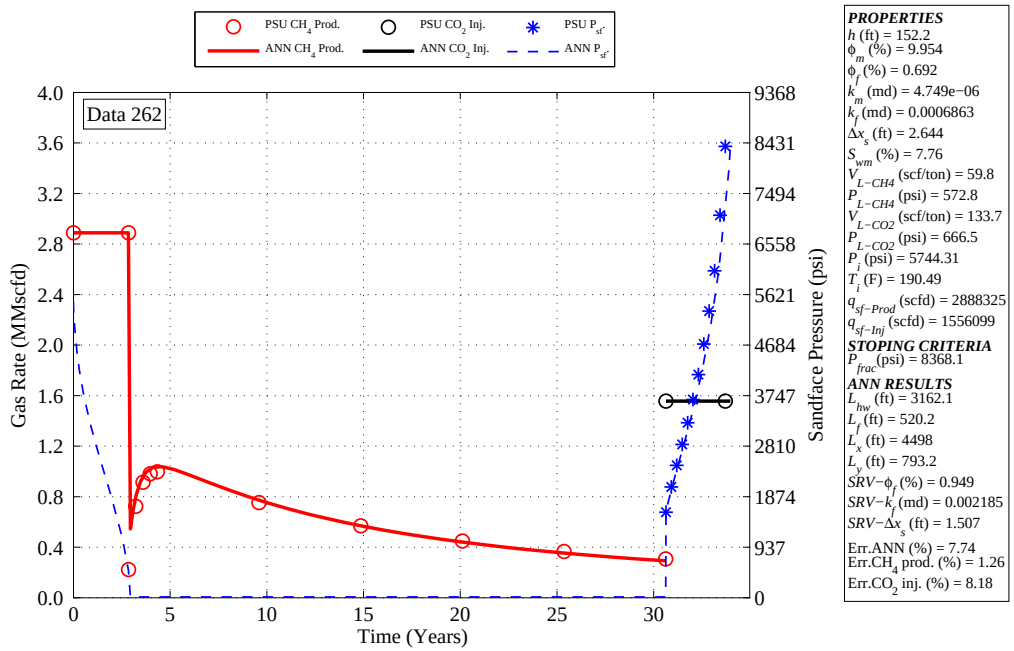


(b) Case 6

Figure B.8. Additional Predictions for qsf-qsf design case

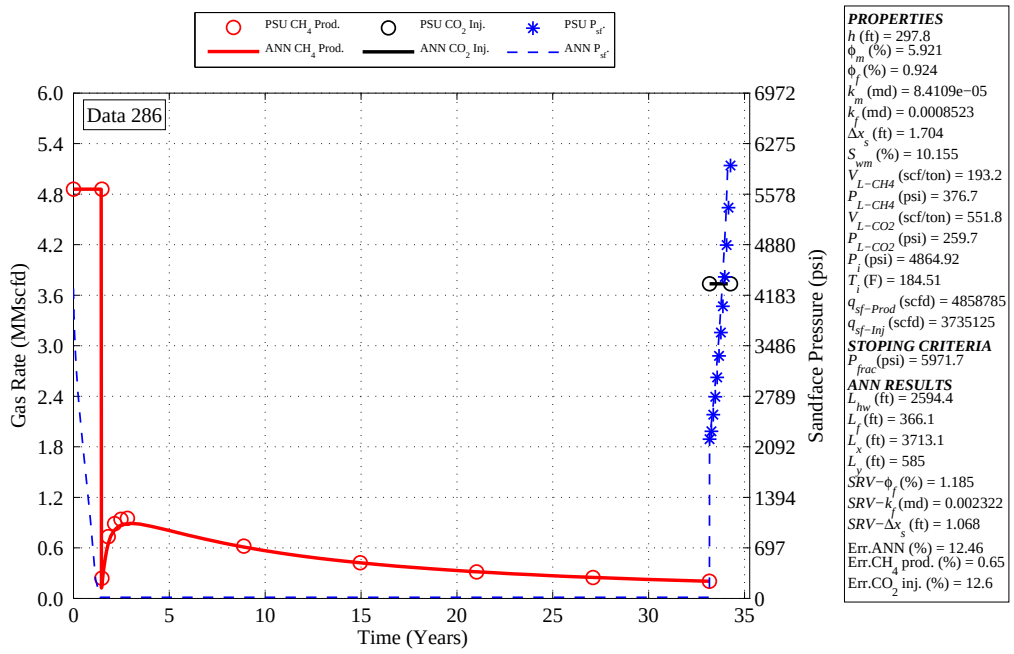


(c) Case 7

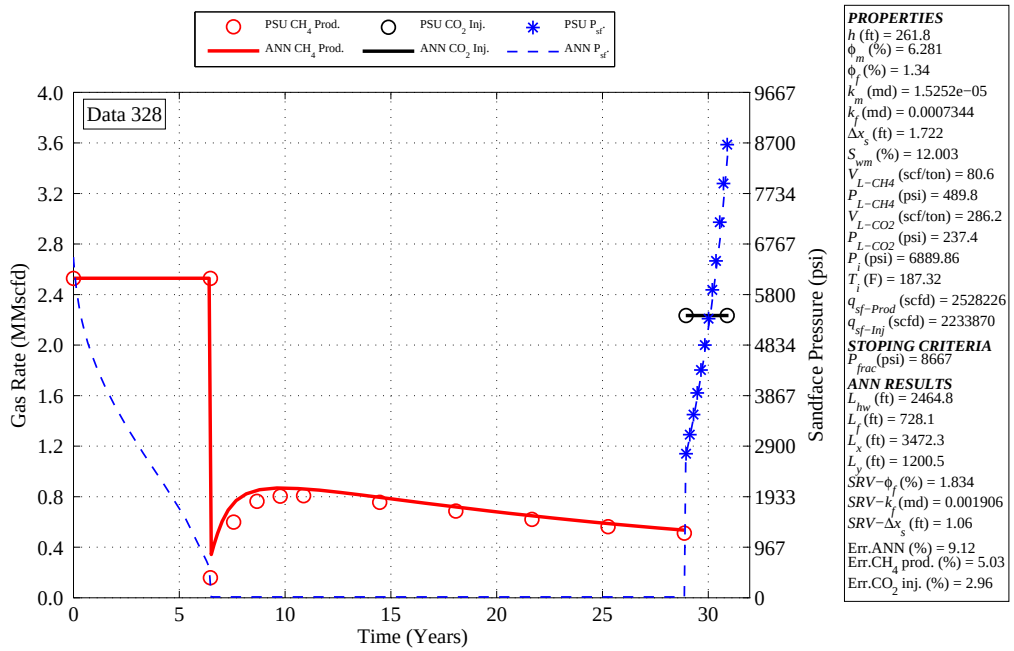


(d) Case 8

Figure B.8. (continued) Additional Predictions for qsf-qsf design case



(e) Case 9



(f) Case 10

Figure B.8. (continued) Additional Predictions for qsf-qsf design case

Appendix C

The Work Flow of Generating Results

Part A of Appendix C includes the workflow of generating results in UNIX clusters by using PSU-SHALECOMP. Part B of Appendix C covers the protocol of ANN development. It is the first time that UNIX cluster are employed in a development of ANN in Petroleum and Natural Gas Engineering Department of The Pennsylvania State University. This protocol helps to generate the best possible tool by training every possible ANN design within a given range in terms of neurons in hidden layers. The advantage of this method is the automation of trail and error step of ANN development, which is done manually in general in previous studies. If one follows this protocol, can save time because the protocol is automated and more efficient. Also, best model can be selected out of number of trained ANN designs (20,000 cases in average for one tool in this study) by checking the average errors. By using this protocol, 8 highly complex ANN tools were developed successfully.

C.1 Part A: Protocol of Using UNIX Clusters for PSU-SHALECOMP

This section introduces the scripts that can be used for PSU-SHALECOMP users. The Pennsylvania State University has very advanced and relatively new UNX clusters that are accessible for its researchers. One can generate more results by using these clusters in shorter period of times. Without the use of UNIX, this study would not be as successful in many ways. This section covers the protocol that is followed in our Monte Carlo Study; 2,000 simulations were run by using PSU-SHALECOMP.

C.1.1 Step 1A: Generating random numbers for the PSU-SHALECOMP input files

Generating well distributed numbers is important in Monte Carlo Simulations. The following code is a way to do it. This step can be run on UNIX clusters by using its MATLAB module.

```
% %%%% Data Input Generation
%%%%% for PSU-SHALECOMP
clear
clc
format long
%% Number of Cases for CMG
n = 2000;
m = 1:1:n;
nx = 25;
nHWL = 15;
nSRVx = nHWL+2;
ny = 13;
nSRVy = 7;
%% Length of Horizontal Wellbore
LHW= 3000;
dHWL = LHW/nHWL;
LSRVx = dHWL*nSRVx;
%% X edge
edge_x = 5000;
unLSRVx = edge_x - LSRVx;
undSRVx = (edge_x-LSRVx)/(nx-nSRVx);
%% Wing Size
Lf = 750;
dLf = Lf/nSRVy;
%% Y edge
edge_y = 2000;
unLSRVy = edge_y - Lf;
undSRVy = (edge_y-Lf)/(ny-nSRVy);
%% Thickness
h = 100 + 200*lhsdesign(n,1)';
%% phi_m
phi_m = 6 + 5*lhsdesign(n,1)';
%% sw_m
sw_m = 6 + 7*lhsdesign(n,1)';
%% phi_f
phi_f = 0.6 + 0.9*lhsdesign(n,1)';
%% SRV_phi_f
SRV_phi_f = 1.2 + 0.3 * lhsdesign(n,1)';
SRV_phi_f = phi_f.*SRV_phi_f;
%% xs
xs = 0.9 + 1.6*lhsdesign(n,1)';
%% SRV_xs
SRV_xs = 0.4 + 0.4 * lhsdesign(n,1)';
SRV_xs = xs.*SRV_xs;
%% CH4 Lang Vol
Vl_ch4 = 50 + 200*lhsdesign(n,1)';
Vl_ch4 = Vl_ch4/759200;
%% CH4 Lang Pres
Pl_ch4 = 200 + 800*lhsdesign(n,1)';
%% CO2 Lang Vol
Vl_co2 = 2 + 4*lhsdesign(n,1)';
Vl_co2 = Vl_co2.*Vl_ch4;
%% CO2 Lang Pres
Pl_co2 = 200 + 800*lhsdesign(n,1)';
%% Pi
Pi = 3940;% + 5000*lhsdesign(n,1)';
%% kf
kf = 7e-4 + 2.3e-3*lhsdesign(n,1)';
%% SRV_kf
SRV_kf = 2 + 10*lhsdesign(n,1)';
SRV_kf = kf.*SRV_kf;
%% km
km = 3e-4 + 6e-4*lhsdesign(n,1)';
if km>kf
   kf = km*1.2;
end
%% P_frac
P_frac = 1.1 + 0.9*lhsdesign(n,1)';
P_frac = Pi.*P_frac;
%% data = Compilation of All Parameters
input=[h;phi_f;SRV_phi_f;phi_m;kf;SRV_kf;km;xs;...
 SRV_xs; sw_m;Vl_ch4;Pl_ch4; Vl_co2;Pl_co2;P_frac;];
%% Exporting Files
save('A0_input.txt','input', '-ASCII')
```

C.1.2 Step 2A: Generating PSU-SHALECOMP input files

This script creates PSU-SHALECOMP input files by using the randomly generated numbers for the varied parameters, i.e. the script used in Step 1A. This step can be run on UNIX clusters by using its MATLAB module, which generates folders and files faster.

```
clc
clear
%% Inputs for this code
load A0_input.txt
dHWL = 200;
undSRVx = 200;
dLf = 150;
undSRVy = 150;
Ti = 142;
Pi = 4000;
Pbh = 14.7;
Psf_inj = 6000;
length(A0_input(1,:))
%% Create CMG files for the case
for i=1:5000%length(A0_input(1,:));
   numb= num2str(i);
   temp=['data.dat'];
   fid=fopen(temp,'wt');
   fprintf(fid,'***');
   fprintf(fid,'\n@NXNYNZ');
   fprintf(fid,'\n25   13  1');
   fprintf(fid,'\n');
   fprintf(fid,'\n@DX');
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx1
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx2
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx3
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx4
   fprintf(fid,'\n%10.8f',dHWL);%dHWL1
   fprintf(fid,'\n%10.8f',dHWL);%dHWL2
   fprintf(fid,'\n%10.8f',dHWL);%dHWL3
   fprintf(fid,'\n%10.8f',dHWL);%dHWL4
   fprintf(fid,'\n%10.8f',dHWL);%dHWL5
   fprintf(fid,'\n%10.8f',dHWL);%dHWL6
   fprintf(fid,'\n%10.8f',dHWL);%dHWL7
   fprintf(fid,'\n%10.8f',dHWL);%dHWL8
   fprintf(fid,'\n%10.8f',dHWL);%dHWL9
   fprintf(fid,'\n%10.8f',dHWL);%dHWL10
   fprintf(fid,'\n%10.8f',dHWL);%dHWL11
   fprintf(fid,'\n%10.8f',dHWL);%dHWL12
   fprintf(fid,'\n%10.8f',dHWL);%dHWL13
   fprintf(fid,'\n%10.8f',dHWL);%dHWL14
   fprintf(fid,'\n%10.8f',dHWL);%dHWL15
   fprintf(fid,'\n%10.8f',dHWL);%dHWL16
   fprintf(fid,'\n%10.8f',dHWL);%dHWL17
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx1
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx2
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx3
   fprintf(fid,'\n%10.8f',undSRVx);%undSRVx4
   fprintf(fid,'\n');
   fprintf(fid,'\n@DY');
   fprintf(fid,'\n%10.8f',undSRVy);%undSRVy1
   fprintf(fid,'\n%10.8f',undSRVy);%undSRVy2
   fprintf(fid,'\n%10.8f',undSRVy);%undSRVy3
   fprintf(fid,'\n%10.8f',dLf);%dLf1
   fprintf(fid,'\n%10.8f',dLf);%dLf2
   fprintf(fid,'\n%10.8f',dLf);%dLf3
   fprintf(fid,'\n%10.8f',dLf);%dLf4
   fprintf(fid,'\n%10.8f',dLf);%dLf5
   fprintf(fid,'\n%10.8f',dLf);%dLf6
   fprintf(fid,'\n%10.8f',dLf);%dLf7
   fprintf(fid,'\n%10.8f',undSRVy);%undSRVy1
   fprintf(fid,'\n%10.8f',undSRVy);%undSRVy2
   fprintf(fid,'\n%10.8f',undSRVy);%undSRVy3
   fprintf(fid,'\n');
   fprintf(fid,'\n@DZ-U');
   fprintf(fid,'\n%10.8f',A0_input(1,i)');%h
   fprintf(fid,'\n');
   fprintf(fid,'\n@TOPDEPTH-U');
   fprintf(fid,'\n6500');
```

```
   fprintf(fid,'\n');
   fprintf(fid,'\n@SRV_DISTRIBUTION');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  1  1  1  1  1  1  1  1  1  1  1
1  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  1  1  1  1  1  1  1  1  1  1  1  1
1  1  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  1  1  1  1  1  1  1  1  1  1  1  1  1
1  1  1  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  1  1  1  1  1  1  1  1  1  1  1  1
1  1  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  1  1  1  1  1  1  1  1  1  1  1  1
1  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n0   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  ');
   fprintf(fid,'\n');
   fprintf(fid,'\n@POROSITY_F');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f '   ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
```

(a) Step 2A-1

```
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)  ,A0_input(3,i)
,A0_input(3,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
```

```
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)
,A0_input(2,i)  ,A0_input(2,i)  ,A0_input(2,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@POROSITY_M-U');
   fprintf(fid,'\n%10.8f',A0_input(4,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@PERMX_F');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)
,A0_input(5,i)  ,A0_input(5,i)  ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
```

(b) Step 2A-2

```
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
```

```
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@PERMY_F');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
```

(c) Step 2A-3

```
,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@PERMZ_F');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
```

(d) Step 2A-4

```
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i) ,A0_input(6,i)
,A0_input(6,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)
,A0_input(5,i) ,A0_input(5,i) ,A0_input(5,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@PERMX_M-U');
   fprintf(fid,'\n%10.8f',A0_input(7,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@PERMY_M-U');
   fprintf(fid,'\n%10.8f',A0_input(7,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@PERMZ_M-U');
   fprintf(fid,'\n%10.8f',A0_input(7,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@FRAC_SPACING_X');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
```

(e) Step 2A-5

```
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
```

```
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@FRAC_SPACING_Y');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f   %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f  %10.8f
%10.8f  %10.8f  %10.8f  '   ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
```

(f) Step 2A-6

```
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
```

```
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n');
   fprintf(fid,'\n@FRAC_SPACING_Z');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f '  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(9,i)
,A0_input(9,i)  ,A0_input(9,i)  ,A0_input(8,i)  ,A0_input(8,i)
,A0_input(8,i)  ,A0_input(8,i)  ,A0_input(8,i)');
   fprintf(fid,'\n%10.8f  %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
```

(g) Step 2A-7

```
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i) ,A0_input(9,i)
,A0_input(9,i) ,A0_input(9,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f %10.8f
%10.8f %10.8f %10.8f ' ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)
,A0_input(8,i) ,A0_input(8,i) ,A0_input(8,i)');
  fprintf(fid,'\n');
  fprintf(fid,'\n@ROCKDENSITY-U');
```

```
  fprintf(fid,'\n1.435');
  fprintf(fid,'\n');
  fprintf(fid,'\n@TEMP');
  fprintf(fid,'\n%10.8f',Ti);%Ti
  fprintf(fid,'\n');
  fprintf(fid,'\n@PGINIT_M-U');
  fprintf(fid,'\n%10.8f',Pi);%Pi
  fprintf(fid,'\n');
  fprintf(fid,'\n@PGINIT_F-U');
  fprintf(fid,'\n%10.8f',Pi);%Pi
  fprintf(fid,'\n');
  fprintf(fid,'\n@SWINIT_M-U');
  fprintf(fid,'\n%10.8f',A0_input(10,i));%Pi
  fprintf(fid,'\n');
  fprintf(fid,'\n@SWINIT_F-U');
  fprintf(fid,'\n0.1');
  fprintf(fid,'\n');
  fprintf(fid,'\n@NGASCOMP');
  fprintf(fid,'\n2');
  fprintf(fid,'\n');
  fprintf(fid,'\n@SORPTION');
  fprintf(fid,'\n1');
  fprintf(fid,'\n1   1');
  fprintf(fid,'\n20000');
%    fprintf(fid,'\n9.6154e-05 726');%,A0_input(7,i),A0_input(8,i)');
  fprintf(fid,'\n%10.8f %10.8f',A0_input(11,i),A0_input(12,i)');
%    fprintf(fid,'\n%8.8f 400',A0_input(7,i));
  fprintf(fid,'\n%10.8f %10.8f',A0_input(13,i),A0_input(14,i)');
  fprintf(fid,'\n');
  fprintf(fid,'\n@DIFFX_F');
  fprintf(fid,'\nCH4');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\nCO2');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\n');
  fprintf(fid,'\n@DIFFY_F');
  fprintf(fid,'\nCH4');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\nCO2');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\n');
  fprintf(fid,'\n@DIFFZ_F');
  fprintf(fid,'\nCH4');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\nCO2');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\n');
  fprintf(fid,'\n@DIFFX_M');
  fprintf(fid,'\nCH4');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\nCO2');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\n');
  fprintf(fid,'\n@DIFFY_M');
  fprintf(fid,'\nCH4');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\nCO2');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\n');
  fprintf(fid,'\n@DIFFZ_M');
  fprintf(fid,'\nCH4');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\nCO2');
  fprintf(fid,'\n0.0000001');
  fprintf(fid,'\n');
  fprintf(fid,'\n@FREEGASCOMPINIT_F-U');
  fprintf(fid,'\n99.99');
  fprintf(fid,'\n0.01');
  fprintf(fid,'\n');
```

(h) Step 2A-8

```
fprintf(fid,'\n@FREEGASCOMPINIT_M-U');
fprintf(fid,'\n99.99');
fprintf(fid,'\n0.01');
fprintf(fid,'\n');
fprintf(fid,'\n@GASPROP');
fprintf(fid,'\nCH4');
fprintf(fid,'\n16.043   666.4   -116.67 0.0104');
fprintf(fid,'\nCO2');
fprintf(fid,'\n44.01    1071.33 87.873  0.2667');
fprintf(fid,'\n');
fprintf(fid,'\n@GASBIP');
fprintf(fid,'\n0    0.0559');
fprintf(fid,'\n0.0559   0');
fprintf(fid,'\n');
fprintf(fid,'\n@INDEX-IJK');
fprintf(fid,'\n6    7      1      -1');
fprintf(fid,'\n7    7      1      -1');
fprintf(fid,'\n8    7      1      -1');
fprintf(fid,'\n9    7      1      -1');
fprintf(fid,'\n10   7      1      -1');
fprintf(fid,'\n11   7      1      -1');
fprintf(fid,'\n12   7      1      -1');
fprintf(fid,'\n13   7      1      -1');
fprintf(fid,'\n14   7      1      -1');
fprintf(fid,'\n15   7      1      -1');
fprintf(fid,'\n16   7      1      -1');
fprintf(fid,'\n17   7      1      -1');
fprintf(fid,'\n18   7      1      -1');
fprintf(fid,'\n19   7      1      -1');
fprintf(fid,'\n20   7      1      -1');
fprintf(fid,'\n-1');
fprintf(fid,'\n');
fprintf(fid,'\n@WELLDATA');
fprintf(fid,'\n0');
fprintf(fid,'\n 1');
fprintf(fid,'\n well_1');
fprintf(fid,'\n 1   -1  1   0   14.7    0.25    0');
fprintf(fid,'\n-1');
fprintf(fid,'\n 1');
fprintf(fid,'\n 0   0   1   1   10950');
fprintf(fid,'\n 1   1   2   0   %10.8f  0.25    0.0',Psf_inj);
fprintf(fid,'\n-1');
fprintf(fid,'\n-1');
fprintf(fid,'\n');
fprintf(fid,'\n@TABLEDATA');
fprintf(fid,'\n0');
fprintf(fid,'\n0');
fprintf(fid,'\n3');
fprintf(fid,'\n0    0');
fprintf(fid,'\n0.5  0.0005');
fprintf(fid,'\n1    0.001');
fprintf(fid,'\n');
fprintf(fid,'\n@TABLEDATA');
fprintf(fid,'\n1');
fprintf(fid,'\n0');
fprintf(fid,'\n3');
fprintf(fid,'\n0    0');
fprintf(fid,'\n0.5  0.5');
fprintf(fid,'\n1    1');
fprintf(fid,'\n');
fprintf(fid,'\n@TABLEDATA');
fprintf(fid,'\n2');
fprintf(fid,'\n1');
fprintf(fid,'\n2');
fprintf(fid,'\n0    0');
fprintf(fid,'\n1    0');
fprintf(fid,'\n');
fprintf(fid,'\n@TABLEDATA');
fprintf(fid,'\n6');
```

```
fprintf(fid,'\n1');
fprintf(fid,'\n2');
fprintf(fid,'\n15   0.607');
fprintf(fid,'\n50000    0.607');
fprintf(fid,'\n');
fprintf(fid,'\n@SORPTIMECONS-U');
fprintf(fid,'\n2419200');
fprintf(fid,'\n2419200');
fprintf(fid,'\n ');
fprintf(fid,'\n@SALINITY');
fprintf(fid,'\n0');
fprintf(fid,'\n');
fprintf(fid,'\n@IASPGRG');
fprintf(fid,'\n1');
fprintf(fid,'\n');
fprintf(fid,'\n@EPSILON');
fprintf(fid,'\n1.00E-09 1.00E-09    1.00E-13');
fprintf(fid,'\n            ');
fprintf(fid,'\n@CONVCRIT');
fprintf(fid,'\n0.001    1   25');
fprintf(fid,'\n');
fprintf(fid,'\n@TIMESTEP');
fprintf(fid,'\n365  36500');
fprintf(fid,'\n');
fprintf(fid,'\n@OUTPUTFLAG');
fprintf(fid,'\n21   0');
fprintf(fid,'\n22   0');
fprintf(fid,'\n23   0');
fprintf(fid,'\n24   0');
fprintf(fid,'\n25   0');
fprintf(fid,'\n26   0');
fprintf(fid,'\n27   0');
fprintf(fid,'\n28   0');
fprintf(fid,'\n29   0');
fprintf(fid,'\n30   0');
fprintf(fid,'\n35   0');
fprintf(fid,'\n36   0');
fprintf(fid,'\n37   0');
fprintf(fid,'\n38   0');
fprintf(fid,'\n50   0');
fprintf(fid,'\n51   0');
fprintf(fid,'\n52   0');
fprintf(fid,'\n53   0');
fprintf(fid,'\n54   0');
fprintf(fid,'\n55   0');
fprintf(fid,'\n56   0');
fprintf(fid,'\n57   0');
fprintf(fid,'\n58   0');
fprintf(fid,'\n59   0');
fprintf(fid,'\n-1');
fprintf(fid,'\n');


fclose(fid);
baseFolderName = sprintf('%4.4d', i);

mkdir(baseFolderName);
movefile('data.dat',['../Psf/' baseFolderName '']);
%     movefile('data.dat',['../' numb '']);
        end
```

(i) Step 2A-9

C.1.3 Step 3A: Copying PBS files in the folders

This scripts copies and pastes 'Portable Batch System' files (PBS) into folders that contain PSU-SHALECOMP input files. Following script shows the PBS script that is used in this workflow. This file can be found on PSU RCC web-page. WinSCP, SSH Secure SHELL or PUTTY softwares can be used to carry out this step.

```
# This is a sample PBS script. It will request 1 processor on 1
node
# for 4 hours.
#
#   Request 1 processors on 1 node
#
#PBS -l nodes=1:ppn=1
#
#   Request 4 hours of walltime
#
#PBS -l walltime=24:00:00
#
#   Request 1 gigabyte of memory per process
#
#PBS -l pmem=1gb
#
#   Request that regular output and terminal output go to the
same file
#
#PBS -j oe
```

```
#
#   The following is the body of the script. By default,
#   PBS scripts execute in your home directory, not the
#   directory from which they were submitted. The following
#   line places you in the directory from which the job
#   was submitted.
#
cd $PBS_O_WORKDIR
#

module load mkl
module load openmpi/intel

echo " "
echo " "
echo "Job started on `hostname` at `date`"
mpirun /gpfs/home/ibk102/work/pcbm/cbm.x
echo " "
echo "Job Ended at `date`"
echo " "
```

The SHELL script below copies and pastes the PBS file above into every single folder that need to be run for the Monte Carlo simulation. It can be used in any other study that needs to run multiple simulations. This script is needed to be run on UNIX command window simple by typing './auto_copy.sh', assuming that it is named as 'auto_copy.sh'.

```
#!/bin/bash
#copy the excutables & PBS script to directories
file_list=$(ls /gpfs/work/i/ibk102/2014_06/qsf)
for x in {4351..5000}
```

```
do
    cp -r /gpfs/home/ibk102/work/pcbm/PBS
/gpfs/work/i/ibk102/2014_06/qsf/$x
done
exit
```

C.1.4 Step 4A: Running Simulations on UNIX

Following script simply sends the simulations on UNIX clusters. Depending on the number of people using the clusters, the number of simulations that can be run at a time vary. In this study, it is observed that from 32 to 200 simulations can be run at a time; 2,000 simulations is obtained in 10 days. Typing './auto_run.sh' on the command window is needed to run the script.

```
#!/bin/bash
file_list=$(ls /gpfs/work/i/ibk102/2014_06/qsf)
for x in {1..2000}
do
    cd /gpfs/work/i/ibk102/2014_06/qsf/$x
    dos2unix data.dat
    if [ -a PBS ]
```

```
        then
        mv PBS qsf_$x
    fi
    qsub qsf_$x
done
exit
```

C.2 Part B: Protocol of Using UNIX Clusters for ANN Development

The scripts that are used in the development of ANN tools can be found in this section. Subsections C.1.1 (Step 1A) and C.1.2 (Step 2A) are the same and can be used to generate PSU-SHALECOMP simulations that are used in the development of an ANN tool. After collecting the data via PSU-SHALECOMP that is used for ANN development, following steps can be employed.

C.2.1 Step 3B: Running Simulations on UNIX

In this step, generation of ANN training files is shown. Following script simply generates number of folders for different ANN structures that have 3 hidden layers. It generates 1331 design and folders for this specific case, which has a range within 20 to 30 neurons for three hidden layers.

```
clear
clc
%% Inputs for this code
% m_vals = [1,1];
% m_increment = 1;
% m_diff = m_vals(2)-m_vals(1);
% m_iterations = m_diff/m_increment+1;
n_vals = [20,30];
n_increment = 1;
n_diff = n_vals(2)-n_vals(1);
n_iterations = n_diff/n_increment+1;
o_vals =  [20,30];
o_increment = 1;
o_diff = o_vals(2) - o_vals(1);
o_iterations = o_diff/o_increment+1;
q_vals  = [20,30];
q_increment = 1;
q_diff = q_vals(2) - q_vals(1);
q_iterations = q_diff/q_increment+1;
design_rows = q_iterations*o_iterations*n_iterations;
% for m = 1:m_iterations
   for n = 1:n_iterations
      for o = 1:o_iterations
         for q = 1:q_iterations
                        design((n-
1)*o_iterations*q_iterations+(o-1)*q_iterations+q,:) ...
                = [n_vals(1)+(n_increment*(n-
1));o_vals(1)+(o_increment*(o-
1));q_vals(1)+(q_increment*(q-1))];
%               design((m-
1)*n_iterations*o_iterations*q_iterations+(n-
1)*o_iterations*q_iterations+(o-1)*q_iterations+q,:) ...
%                  = [m_vals(1)+(m_increment*(m-
1));n_vals(1)+(n_increment*(n-
1));o_vals(1)+(o_increment*(o-
1));q_vals(1)+(q_increment*(q-1))];
         end
      end
   end
% end

counter = 0;
%% Create CMG files for the case
for i=1:length(design(:,1));
   i
```

```
   numb= num2str(i);
   temp=['ANN.m'];
   fid=fopen(temp,'wt');
   fprintf(fid,'\n clc ');
   fprintf(fid,'\n clear   ');
   fprintf(fid,'\n %%  ');
   fprintf(fid,'\n file =
strcat(["/gpfs/work/i/ibk102/ANN/qsf_Psf/forward/fine/A000
0_ANN.txt"]); ');
   fprintf(fid,'\n load (file)');
   fprintf(fid,'\n data = A0000_ANN;   ');
   fprintf(fid,'\n %%  ');
   fprintf(fid,'\n r = 730;    ');
   fprintf(fid,'\n %%  ');
   fprintf(fid,'\n input = data(1:r,1:24); ');
   fprintf(fid,'\n input1 = transpose(input);  ');
   fprintf(fid,'\n input = log(input1);    ');
   fprintf(fid,'\n     ');
   fprintf(fid,'\n output = data(1:r,25:end);  ');
   fprintf(fid,'\n output1 = transpose(output);    ');
   fprintf(fid,'\n output = log(output1);  ');
   fprintf(fid,'\n     ');
   fprintf(fid,'\n %%  ');
   fprintf(fid,'\n P = input;  ');
   fprintf(fid,'\n T = output; ');
   fprintf(fid,'\n [Pn,ps] = mapminmax(P,0,1); % gives all
values between 0 & 1    ');
   fprintf(fid,'\n [Tn,ts] = mapminmax(T,0,1); % gives all
values between 0 & 1    ');
   fprintf(fid,'\n     ');
   fprintf(fid,'\n [mi,ni] = size(Pn); ');
   fprintf(fid,'\n [mo,no] = size(Tn); ');
   fprintf(fid,'\n     ');
   fprintf(fid,'\n N_in = mi; % number of inputs in the
network    ');
   fprintf(fid,'\n N_out = mo; % number of outputs in the
network  ');
   fprintf(fid,'\n Tot_in = ni; %total no. of simulations  ');
   fprintf(fid,'\n N_train = 699;  ');
   fprintf(fid,'\n % N val = 50;   ');
   fprintf(fid,'\n N_test = 80;    ');
   fprintf(fid,'\n %seperating training, testing & validation
data when random ');
   fprintf(fid,'\n %selection command is available through
higher version dividing random  ');
```

(a) Step 3B-1

```
    fprintf(fid,'\n
[Pn_train,Pn_val,Pn_test,trainInd,valInd,testInd] =
dividerand(Pn,0.9,0.05,0.05);   ');
    fprintf(fid,'\n [Tn_train,Tn_val,Tn_test] =
divideind(Tn,trainInd,valInd,testInd);  ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n [rowtest, coltest]=size(Tn_test);   ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n val.T = Tn_val; ');
    fprintf(fid,'\n val.P = Pn_val; ');
    fprintf(fid,'\n test.T = Tn_test;   ');
    fprintf(fid,'\n test.P = Pn_test;   ');
    fprintf(fid,'\n %Initiating network parameters  ');
    fprintf(fid,'\n NNeu1 = %d;',design(i,1)');
    fprintf(fid,'\n NNeu2 = %d;',design(i,2)');
    fprintf(fid,'\n NNeu3 = %d;',design(i,3)');
    fprintf(fid,'\n % nntraintool("close")    ');
    fprintf(fid,'\n % creating the cascade backpropagation
network  ');
    fprintf(fid,'\n net = newff(Pn,Tn,[NNeu1,NNeu2,NNeu3]...
');
    fprintf(fid,'\n
,{"tansig","tansig","tansig","purelin"},"trainscg","learngdm","
msereg");  ');
    fprintf(fid,'\n %setting training parameters for the network
');
    fprintf(fid,'\n net.trainParam.goal = 0.0001; %accuracy
within this range   ');
    fprintf(fid,'\n net.trainParam.epochs = 10000; % number of
iteration sets   ');
    fprintf(fid,'\n net.trainParam.show = 1;    ');
    fprintf(fid,'\n net.trainParam.showWindow=0;    ');
    fprintf(fid,'\n net.trainParam.max_fail = 250;  ');
    fprintf(fid,'\n NET.efficiency.memoryReduction = 60; %to
reduce memory requirements ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n [net,tr] =
train(net,Pn_train,Tn_train,[],[],test,val); ');
    fprintf(fid,'\n plotperf(tr)    ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n Tn_train_ann = sim(net,Pn_train);   ');
    fprintf(fid,'\n Tn_test_ann = sim(net,Pn_test); ');
    fprintf(fid,'\n %denormalizing the data sets obtained   ');
    fprintf(fid,'\n %output reversal    ');
    fprintf(fid,'\n T_train = mapminmax("reverse",Tn_train,ts);
');
    fprintf(fid,'\n T_test = mapminmax("reverse",Tn_test,ts); ');
    fprintf(fid,'\n T_train_ann =
mapminmax("reverse",Tn_train_ann,ts);   ');
    fprintf(fid,'\n T_test_ann =
mapminmax("reverse",Tn_test_ann,ts); ');
    fprintf(fid,'\n % %input reversal   ');
    fprintf(fid,'\n Pn_train =
mapminmax("reverse",Pn_train,ps);  ');
    fprintf(fid,'\n Pn_val = mapminmax("reverse",Pn_val,ps);
');
    fprintf(fid,'\n Pn_test = mapminmax("reverse",Pn_test,ps);
');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n %% Coefficient Errors   ');
    fprintf(fid,'\n %time_x, add functional links   ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n for j = 1:length(output1(:,1))  ');
    fprintf(fid,'\n     for i=1: length(testInd(1,:))   ');
    fprintf(fid,'\n         errors(j,i) = abs((output1(j,testInd(1,i)) -
exp(T_test_ann(j,i)))./output1(j,testInd(1,i)))*100;');
    fprintf(fid,'\n         errors_mean(j,1) = mean(errors(j,:));   ');
    fprintf(fid,'\n     end ');
    fprintf(fid,'\n end ');
    fprintf(fid,'\n  error_all = mean(errors_mean(1:35));   ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n %%  ');
    fprintf(fid,'\n tested = exp(T_test_ann);   ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n %%  ');
    fprintf(fid,'\n     ');
    fprintf(fid,'\n error_all1 = [error_all;errors_mean];   ');
    fprintf(fid,'\n save("errors.txt", "error_all1","-ascii")');
    fprintf(fid,'\n save("testInd.txt", "testInd","-ascii")');
    fprintf(fid,'\n save("T_test_ann.txt", "T_test_ann","-ascii")');
    fclose(fid);
    baseFolderName = sprintf('%4.4d', i);
    mkdir(baseFolderName);
    movefile('ANN.m',['../fine/' baseFolderName '']);
end
```

(b) Step 3B-2

C.2.2 Step 4B: Running ANN Files on UNIX

This scripts copies and pastes 'Portable Batch System' files (PBS) into folders that contain MATLAB ANN files. Following script shows the PBS-MATLAB script that is used in this workflow. This file can be found on PSU RCC webpage. WinSCP, SSH Secure SHELL or PUTTY softwares can be used to carry out this step.

```
#PBS -l nodes=1:ppn=1
#PBS -l walltime=2:00:00
#PBS -l pmem=1gb
#PBS -j oe
cd $PBS_O_WORKDIR
# load module and then run matlab script ANN.m
module load matlab
matlab -nosplash -nodisplay -r ANN
echo " "
echo " "
echo "Job started on `hostname` at `date`"
echo " "
echo "Job Ended at `date`"
echo " "
```

The SHELL script below copies and pastes the PBS-MATLAB file above into every single folder that need to be run for the training of ANN. This script is needed to be run on UNIX command window simple by typing './matlab_auto_copy.sh', assuming that it is named as 'matlab_auto_copy.sh'.

```
#!/bin/bash
#copy the excutables & PBS script to directories
file_list=$(ls /gpfs/home/ibk102/work/ANN/ANN1)
for x in {0001..1331}
do
    cp -r
/gpfs/home/ibk102/work/MATLAB/MATLAB_PBS
/gpfs/home/ibk102/work/ANN/ANN1/$x
done
exit
```

C.2.3 Step 5B: Running Simulations on UNIX

Following script simply sends the ANN simulations on UNIX clusters. Depending on the number of people using the clusters, the number of simulations that can be run at a time vary. In this study, it is observed that from 32 to 200 simulations can be run at a time; 1,331 simulations is obtained within 4 hours. Typing './matlab_auto_run.sh' on the command window is needed to run the script.

```
#!/bin/bash
file_list=$(ls /gpfs/home/ibk102/work/ANN/ANN1)
for x in {0001..1331}
do

    cd /gpfs/home/ibk102/work/ANN/ANN1/$x
    dos2unix data.dat
    if [ -a PBS ]
        then
        mv PBS $x
    fi
    qsub $x
done
exit
```

Vita

I. Burak Kulga

Burak Kulga was born in Ankara, Turkey on January 3, 1979. Mr. Kulga enrolled at the Middle East Technical University and graduated with a Bachelor of Engineering degree in petroleum and natural gas engineering in August 2004. He started working in August 2004 at PEMI which was the operating company of Selmo Oil Field, Batman, Turkey. He worked for PEMI for 3.5 years as a petroleum engineer. Responsibilities included reserves estimation, project economic analysis, well depletion plan for infill drilling projects, capacity/production forecast, well surveillance, production optimization and well problem analysis. Then, he attended the Pennsylvania State University and received a Master of Science in petroleum and natural gas engineering in May 2010. He continued his education at the Pennsylvania State University where he pursued a doctoral degree in petroleum and natural gas engineering.

During his studies at the Pennsylvania State University, he worked as a teaching/research assistant and he was responsible for assisting undergraduate and graduate courses including petroleum engineering design, reservoir modeling, numerical reservoir simulation. Mr. Kulga received a Graduate Student ExxonMobil Award in May 2009 for demonstrating superior academic achievement in petroleum and natural gas engineering

Mr. Kulga also worked as a petroleum engineering intern for Chevron Energy Technology Company during summer 2009. He has authored and co-authored multiple publications in the areas of artificial neural network applications development for field development and analysis of the efficacy of carbon dioxide sequestration in depleted shale gas reservoirs.