Exploring the Sensitivity of Lunar Interior Structure from Geophysical and Geochemical Constraints

Heidi Haviland[1], Paul M. Bremner[1], Ananya Mallik[2], Matthew R. Diamond[3], Sanja Panovska[4], and Simon J. Lock[5]

[1]NASA Marshall Space Flight Center
[2]The University of Arizona
[3]University of California
[4]6GFZ Helmholtz-Zentrum Potsdam
[5]California Institute of Technology

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Abstract

Abstract The key to evaluating the formation history and evolution of the Moon lies in understanding the current state of its interior. We used a multidisciplinary approach to explore the current day lunar structure and composition with the aim of identifying signatures of formation and early evolution. We constructed a large number of 1D lunar interior models to explore a wide range of potential structures and identified those models that match the present day mass, moment of inertia, and bulk silicate composition of the Moon. In an advance on previous studies, we explicitly calculate the physical and elastic properties of the varying mineral assemblages in the lunar interior using multicomponent equations of state. We considered models with either a compositionally homogeneous mantle or a stratified mantle that preserved remnants of magma ocean crystallization, and tested thermal profiles that span the range of proposed selenotherms. For the models that reproduced the observed mass and moment of inertia, we found a narrow range of possible metallic (iron) core radii (269-387 km) consistent with previous determinations. We explored the possibility of an ilmenite bearing layer both below the crust and at the core-mantle boundary as a potential tracer of magma ocean solidification and overturn. We observed a trade-off between the mass of the upper and lower ilmenite-bearing layers and structures that have undergone mantle overturn are both consistent with present observations. Plain Language Summary In order to understand how the Moon formed, along with the following history including the processes that change and shape it, the current state of the lunar interior offers a lot of valuable information or clues. We used several different computer simulation tools from different disciplines to calculate the Moon's interior structure. We then compared our calculations with observations of the Moon's mass and moment of inertia (a measure of how its weight is distributed through the interior) and the average composition and chemistry of the Moon. We considered a Moon that is well mixed and one that has preserved layers from its early history and tried different temperature structures. We find that the Moon has to have a small dense iron core and that it may have a hot soft layer just above the core that can dampen moonquakes.

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H. Fuqua Haviland[1*], P. M. Bremner[1*], A. Mallik[3,4*], M. R. Diamond[5*], S. Panovska[6], S. J. Lock[7]

[1]Heliophysics and Planetary Science Branch, Marshall Space Flight Center.

[3]Bayerisches Geoinstitut, University of Bayreuth, Bayreuth, Germany.

[4]Department of Geosciences, University Arizona.

[5]Earth and Planetary Science Department, University of California, Berkeley.

[6]GFZ Helmholtz-Zentrum Potsdam.

[7]Division of Geological and Planetary Sciences, California Institute of Technology.

Corresponding author: Heidi Fuqua Haviland (heidi.haviland@nasa.gov)

**These authors contributed equally.*

Key Points:

- Joint geophysical and geochemical analysis places constraints on lunar interior structure, including core size and ilmenite-bearing volume within the mantle.
- Elastic properties are calculated for multiphase minerals enabling a wide range of temperature and composition constraints to be self-consistently explored.
- A compositionally homogeneous lunar mantle is likely only possible with elevated mantle temperatures.

Abstract

The key to evaluating the formation history and evolution of the Moon lies in understanding the current state of its interior. We used a multidisciplinary approach to explore the current day lunar structure and composition with the aim of identifying signatures of formation and early evolution. We constructed a large number of 1D lunar interior models to explore a wide range of potential structures and identified those models that match the present-day mass, moment of inertia, and bulk silicate composition of the Moon. In an advance on previous studies, we explicitly calculate the physical and elastic properties of the varying mineral assemblages in the lunar interior using multicomponent equations of state. We considered models with either a compositionally homogeneous mantle or a stratified mantle that preserved remnants of magma ocean crystallization, and tested thermal profiles that span the range of proposed selenotherms. For the models that reproduced the observed mass and moment of inertia, we found a narrow range of possible metallic (iron) core radii (269-387 km) consistent with previous determinations. We explored the possibility of an ilmenite bearing layer both below the crust and at the core-mantle boundary as a potential tracer of magma ocean solidification and overturn. We observed a trade-off between the mass of the upper and lower ilmenite-bearing layers and structures that have undergone mantle overturn are both consistent with present observations.

Plain Language Summary

In order to understand how the Moon formed, along with the following history including the processes that change and shape it, the current state of the lunar interior offers a lot of valuable information or clues. We used several different computer simulation tools from different disciplines to calculate the Moon's interior structure. We then compared our calculations with observations of the Moon's mass and moment of inertia (a measure of how its weight is distributed through the interior) and the average composition and chemistry of the Moon. We considered a Moon that is well mixed and one that has preserved layers from its early history and tried different temperature structures. We find that the Moon has to have a small dense iron core and that it may have a hot soft layer just above the core that can dampen moonquakes.

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1. Introduction

Studying the current state of the Moon's interior structure is critical to unlocking its past, including its formation (Jaumann et al., 2012; Yang & Zhao, 2015) and thermal and tidal evolution (Ćuk et al., 2016; Ćuk & Stewart, 2012; Tian et al., 2017; Wisdom & Tian, 2015; Touma & Wisdom, 1994). Despite considerable effort to constrain the physical and geochemical properties of the lunar interior, prominent open questions remain, including the possible existence of a lower mantle partial-melt layer; the precise size, state, and composition of the core; and the consequence and evolution of crystallization of the magma ocean (MO) (Garcia et al., 2011, 2012; Khan et al., 2013; Neal, 2009; Stevenson & Halliday, 2014; Weber et al., 2011; Wieczorek et al., 2006). These phenomena have geophysical and geochemical implications for lunar evolution and are explored in this paper.

A variety of independent geophysical methods have provided key insights to our understanding of the Moon's interior structure. Analyses of Apollo seismograms have found a differentiated lunar interior with a small dense iron core (Garcia et al., 2011, 2012; Lognonné & Johnson, 2007; Nakamura et al., 1978; Weber et al., 2011). The lower degree observations of mass; moment of inertia (MOI); and tidal Love numbers, k2 and h2; place rough constraints on the global stratigraphy of the Moon (e.g., Williams et al., 2001, 2014). The existence of a lunar core is consistent with the strong magnetic fields measured in lunar rocks (Shea et al., 2012; Tikoo et al., 2014; Weiss & Tikoo, 2014; Tikoo et al., 2017; Evans et al., 2018) which suggest at least part of a metallic core was once molten. A partially molten layer at the core-mantle boundary (CMB) has been suggested to explain the lack of observed far-side quakes (Nakamura et al., 1973; Nakamura, 2005), the observation of weak reflected phases from deep moonquakes (Weber et al., 2011), and the dissipation of tidal energy within the deep interior (Harada et al., 2014; Williams et al., 2001). Gravity and topography measurements, from GRAIL and LRO, have constrained the average crustal thickness to be ~40 km (Wieczorek et al., 2013).

Analysis of lunar meteorites and samples returned by the Apollo missions have been used to constrain the chemical structure and bulk composition of the Moon (e.g., Ringwood, 1979; Taylor, 1982). It is inferred that the Moon was once at least partially molten and that the magma ocean MO fractionally crystallized to form an olivine-pyroxene rich mantle, a plagioclase floatation crust, and a potential iron- and titanium-rich (Fe+Ti-rich), or equivalently ilmenite-bearing, sub-crustal layer which has been proposed to form during the final stages (i.e., the last ~5%) of the MO crystallization (Charlier et al., 2018; Elardo et al., 2011; Elkins-Tanton et al.,

2011; Lin et al., 2017a, 2017b; Snyder et al., 1992). One proposed origin of the partially molten basal mantle layer is that a portion of a sub-crustal ilmenite-bearing layer that formed during MO solidification sank to the CMB due to its higher density relative to the surrounding mantle (e.g., Dygert et al., 2016; Hess & Parmentier, 1995; Li et al., 2019; Yu et al., 2019; Zhong et al., 2000). Sinking of such an ilmenite-bearing layer into the deep lunar mantle is supported from multiple saturation studies of Fe+Ti-rich picritic red, black, and orange glasses from Apollo 12, 14, and 17, respectively. These experiments suggest that the glasses were sourced from depths of 300-500 km (Brown & Grove, 2015; Elkins Tanton et al., 2002; Krawczynski & Grove, 2012). This implies that ilmenite-bearing heterogeneities exist at depths within the lunar mantle, contradicting the sequence predicted by MO fractional crystallization models unless this subcrustal layer sank deep into the lunar mantle caused by a mantle overturn event. The ilmenite-bearing layer is likely enriched in heat-producing incompatible elements such as K, U and Th (Jolliff et al., 2000) and has a lower solidus temperature than magnesian, olivine, and peridotite (the potential compositions of the lunar lower mantle). Hence, a partially molten basal mantle layer could result from the presence of ilmenite-bearing heterogeneities at the CMB (Mallik et al., 2019; Yao & Liang, 2012) and emplaced by overturn.

The aim of this paper is to explore the structure of the present-day lunar interior using combined geochemical and geophysical models. We constructed a large number of 1D lunar interior models to explore a wide range of potential structures and identified those models that match the present-day mass, moment of inertia, and bulk silicate composition of the Moon. In an advance on previous studies, we explicitly calculate the physical and elastic properties of the varying mineral assemblages in the lunar interior using multicomponent equations of state.To do this, we have constructed a novel routine, *Selenoman,* which uses the BurnMan [Cottaar et al., 2014, 2016] algorithm to calculate the properties of mineral assemblages within the pressure and temperature range of the lunar interior. To constrain the range of plausible interior structure models, we combine estimates of the bulk lunar composition derived from Apollo samples with GRAIL measurements of mass and MOI. Our approach provides the first self-consistent mineral physics calculations of the lunar interior and explores a wide range of possible compositions and temperature profiles, or selenotherms. Our interdisciplinary approach allows us to assess the sensitivity of the lunar interior to composition and temperature and the consequences of a full range of possible crystallization scenarios and subsequent mantle evolution. In particular, we consider the existence of ilmenite-bearing layers at the bottom and/or top of the mantle as a

probe of the efficiency of mantle overturn during or after mantle solidification, as the presence of an ilmenite-bearing basal mantle layer provides suggestive evidence of mantle overturn.

Section 2 provides a background of previous lunar geophysical analyses which motivate this project. In Section 3, we present the methods used to construct simplified 1D radial compositional models informed by thermoelastic constraints of phase equilibria, and describe the search methods used for exploring the range of potential lunar structures. Our results are presented in Section 4 and discussed in Section 5. Lastly, our conclusions are summarized in Section 6. A glossary of key terms along with additional figures and text is provided in the supplementary materials.

2. Background

We review the current state of knowledge of the lunar interior, concentrating on the core and partial melt layer.

The presence of a small, dense metallic core has been demonstrated by several studies. These include a compositional modeling analysis by Yan et al. (2015) suggesting that the most plausible lunar core radius and density are 370 km and 5.0×10^3 kg/m^3, respectively, for a three-layer (crust, mantle, core) model using a Monte Carlo method constrained by mean MOI, mantle density, crustal thickness and density. This radius is consistent with the inference of a metallic core of radius 340 ± 90 km by electromagnetic sounding observations (Hood et al., 1999; Shimizu et al., 2013) and with size estimates from seismic observations of an iron alloy (Garcia et al. 2011, 2012). Weber et al. (2011) infer a differentiated core with a solid inner core of radius 240 ± 10 km and density 8.0×10^3kg/m^3, and a less dense fluid outer core with a 330 ± 20 km radius containing less than 6% light elements. Apollo samples show that the lunar magnetic dynamo produced surface fields of ~50 μT between approximately 4.25 - 3.56 Ga (Laneuville et al., 2014, 2018; Shea et al., 2012; Tikoo et al., 2014; Weiss & Tikoo, 2014), and continued in a weakened state (< ~5 μT) until ~2.5 Ga, possibly powered by a secondary mechanism (Tikoo et al., 2017). However, a recent analysis shows lunar core convection alone does not produce enough energy to sustain a dynamo for longer than 28 Myr (Evans et al., 2018), thus, the mechanism for dynamo generation meeting the observed magnitude and duration is currently unknown.

The existence and origin of a partially molten layer above the CMB has not reached a consensus. This layer would inhibit core cooling (Stegman et al., 2003, Harada et al., 2014) and have implications for global thermal evolution of the planet (e.g., Laneuville et al., 2018). In

addition, the high temperatures required to maintain a partially molten layer pose a challenge to our current understanding of the brittle-ductile fault source mechanism of the deep moonquakes (Kawamura et al., 2017). Weber et al. (2011) inferred that the existence of such a layer is based on the observation of reflections from deep moonquakes showing a seismically distinct layer near the CMB with slow S-wave velocity, indicative of the presence of partial melt. Nimmo et al. (2012), however, modelled the tidal response of potential lunar interior structures and conclude that melt is not necessary to explain the observed dissipation factor and tidal Love numbers of the Moon, and that dissipation due to elevated CMB temperatures alone is sufficient to match the observations. In contrast, Khan et al. (2014) reasserted that a deep mantle partial melt layer likely exists based on joint inversions of electrical conductivity, seismic, MOI, and mass observations. Harada et al. (2014) use viscoelastic tidal simulations and geodetic observations to constrain the viscosity of this layer to be extremely low (2×10^{16} Pa s) and found that tidal dissipation is concentrated in this layer. Matsuyama et al. (2016) took a Bayesian approach to invert for a five-layer interior structure model and found no conclusive evidence for a low rigidity transition layer at the CMB. The contrasting conclusions of previous studies demonstrate the need for further investigation of the existence and geophysical properties of a rheologically and seismically distinct. Moreover, the core and interior layers will have geophysical and chemical signatures that can be observed and tested.

3. Methodology: Current-day lunar internal structure constraints from Mass, MOI, and Bulk Composition

In order to constrain the present-day structure of the lunar interior, we generated an ensemble of candidate compositions that were tested for viability. First, we constructed three different geochemically-informed models of the lunar interior stratigraphy consisting of layers of distinct mineralogical assemblages. Next, we calculated the geophysical and geochemical over different combinations of thicknesses of each of the stratigraphic layers and compared the resulting lunar structure models to observational constraints. For each model, we calculated physical material properties based on the radial profiles of mineralogy and imposed temperature. In the following sections we describe these methods used to generate and assess each lunar model candidate.

Section 3.1 describes how we calculated physical mineralogical properties. Section 3.2 describes the construction of three laterally averaged 1D compositional profiles from which we

defined three model classes. We utilized three different selenotherms that span the proposed range (Section 3.3) for each model class, yielding nine total distinct model subclasses. Within each, we employed a grid search, a random sampling, and a differential evolution genetic search to locate lunar candidate compositions that are consistent with geophysical observations of the Moon (Section 3.4). Finally, we calculated the fit to the bulk chemistry as an additional, previously unutilized constraint (Section 3.5).

3.1 Selenoman: Calculation of Lunar Model Properties

To calculate material properties of composition candidate models, we have developed a new computational routine called *Selenoman* (available at https://github.com/geodynamics/burnman). Within *Selenoman*, physical parameters were forward calculated utilizing BurnMan algorithms, which we extended to include lunar mineral assemblages. *Selenoman* iteratively calculates aggregate isotropic thermoelastic moduli (properties of the composite rock) via a third-order Birch-Murnaghan thermoelastic EOS model for specified mineralogy applying the Voigt-Reuss-Hill average for multiphase assemblages. Convergence was typically achieved within five iterations.

3.2 Construction of Compositional Model Classes

The extent of mixing in the solid mantle during and after MO crystallization is uncertain (Elkins-Tanton, 2011; Maurice et al., 2017; Boukare et al., 2018; Morison et al., 2019, although there are indications that chemically heterogeneous domains exist (Brown & Grove, 2015; Elkins Tanton et al., 2002). To explore the range of possible compositional structures, we constructed three models of mantle compositional stratigraphy (Figure 1). Each model was assumed to have either a compositionally homogeneous mantle (CH; Figure 1a, b) or a compositionally stratified mantle (CS; Figure 1c). For the CH models, we considered models with two different bulk mantle compositions based on estimates of the composition of the bulk silicate Moon from Taylor (1982) (CH-T) and Hauri et al., (2015) (CH-H). In both cases we removed the contribution of the lunar crust. In both, the mantle is assumed to be well-mixed via efficient whole-mantle convection post MO crystallization. In the CS case, we assumed that a lack of vigorous whole-mantle convection preserved the MO crystallization stratigraphy until present day.

For each model, the mantle was divided into a number of mineralogically distinct layers. To investigate the possible overturn of an ilmenite-bearing layer (e.g., Elkins Tanton et al., 2002), in both CH and CS models we allowed for the existence of both upper (below the anorthositic crust) and lower (at the CMB) ilmenite-bearing layers (see Figure 1 for a description

of the mineralogy of the ilmenite-bearing layers). All three model classes included a 40 km anorthite crust, and a pure iron inner (Fe-fcc) and outer (Fe-bcc) core approximated as a fluid by setting the shear modulus to zero. The crustal thickness was fixed, but the thicknesses of all other layers varied independently (detailed in Section 3.4). The CH classes contain eight stratigraphic layers, and the CS contains ten.

3.2.1 Compositionally Homogeneous (CH)

In order to describe the mantle mineral assemblages across an isentropic selenotherm, we constructed layer compositions using the Gibbs-free energy minimization software alphaMELTS using the pMELTS calibration (Ghiorso et al., 2002) to compute equilibrium phase assemblages at isentropic decompression steps (0.005 GPa from 4 to 0.5 GPa). Given the wide range of temperature estimates at the CMB (see Section 3.3) from 730 - 1480 °C (Gagnepain-Beyneix et al., 2006; Khan et al., 2006, 2007), we chose an average value of 1250 °C as the temperature at 4 GPa, corresponding to approximately 1,010 km depth (Garcia et al., 2011, 2012). The oxygen fugacity was imposed to that of equilibrium between metallic iron and wüstite at 4 GPa, and allowed to evolve during isentropic decompression in alphaMELTS.

In each stratigraphy corresponding to a unique bulk composition (CH-H and CH-T), the mantle layers were grouped into three distinct 1D radial sections: upper, middle and lower mantle (Figure 1, Table S1). All three mantle sections contained olivine, orthopyroxene, clinopyroxene, and minor spinel. The boundary between the upper and middle sections was defined by the appearance of garnet at 1.35 GPa. The lower boundary was set to 2.0 GPa to account for the gradually shifting alphaMELTS phase assemblages at higher pressures. The phase assemblage of each layer was assumed fixed for the structure calculations, regardless of the layer's thickness.

3.2.2 Compositionally Stratified (CS)

Our CS model was constructed from two resources. First, we adopted the stratigraphy of the "MO Equilibrium + Fractional Crystallization" sequence from Snyder et al. (1992) for the upper mantle from the sub-crustal ilmenite-bearing layer to the bottom of the mid-mantle. These layers were determined by the upper mantle cumulate compositions as a function of percent MO crystallization. Second, for the lower mantle composition, we adopted the result of Elardo et al. (2011) for the composition of the cumulate pile after 50% MO crystallization of a Taylor (1982) bulk mantle.

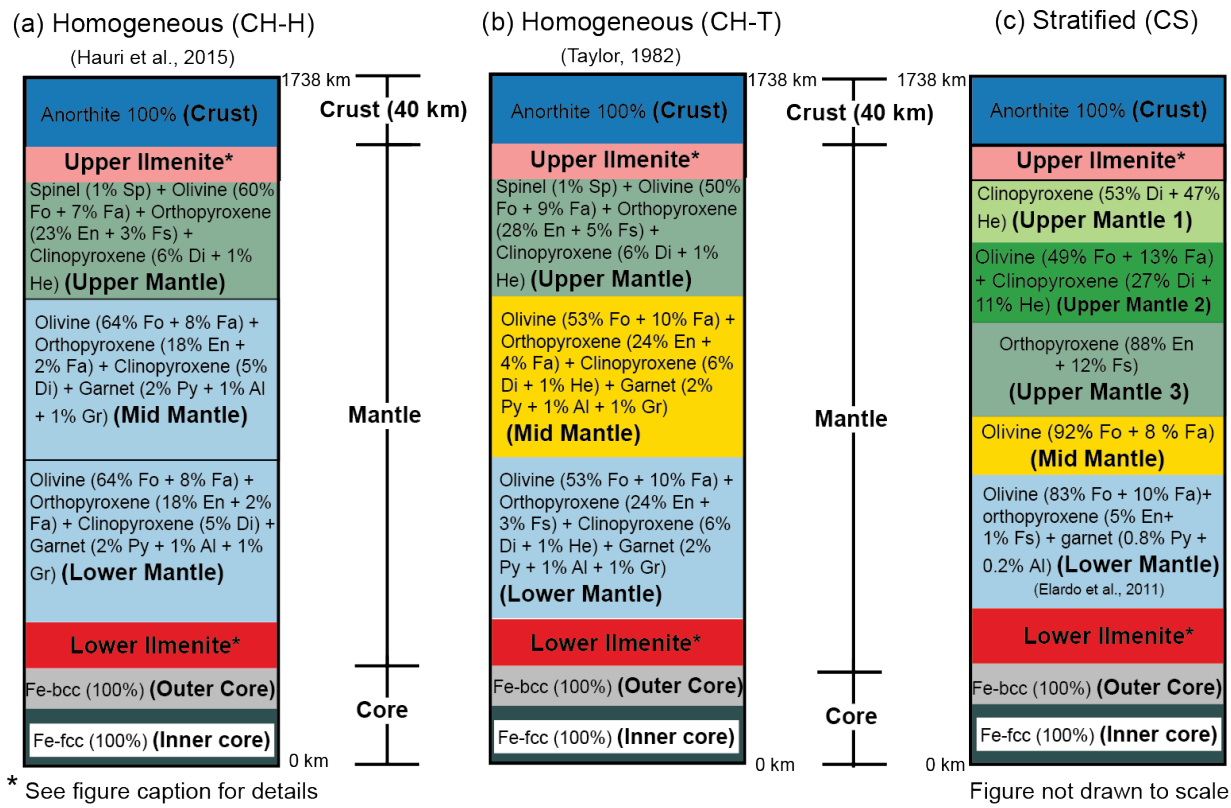

Figure 1. Lunar mantle compositional model classes: (**a**) Compositionally homogeneous Taylor (CH-T), (**b**) Compositionally homogeneous Hauri (CH-H), (**c**) Compositionally stratified (CS). The thickness of the anorthite crust is fixed, and all other layers are allowed to vary. *[Abbreviations: He - Hedenbergite, Di - Diopside, Sp - Spinel, Hc - Hercynite, Fo - Forsterite, Fa - Fayalite, En - Enstatite, Fs - Ferrosilite, Py - Pyrope, Al - Almandine, Gr - Grossular, Fe-bcc - Iron metal Body Centered Cubic, Fe-Fcc - Iron metal Face Centered Cubic]*. The mineralogy of the upper and lower ilmenite-bearing layers from Snyder et al. (1992) are: Clinopyroxene (60% He + 14% Di) + Ilmenite (23%) + Anorthite (2%).

3.3 Selenotherms: Lunar Temperature Profiles

A selenotherm is required to calculate the mineral properties (e.g., density) as a function of depth. The only direct thermal observation is from the Apollo heat flow measurements (Langseth et al., 1971, 1976), but these are point measurements on the surface that do not provide a strong constraint on the temperature at depth. Estimates of the selenotherm have been constructed using a variety of approaches including: an inversion of Apollo seismic velocities (Gagnepain-Beyneix et al., 2006), an inversion of Apollo dayside electromagnetic transfer functions (Khan et al., 2006), and a joint inversion of Apollo seismic and Lunar Prospector gravity observations (Khan et al., 2007). These profiles vary considerably and include large uncertainties (Figure 2). We therefore constructed three new selenotherms that span the range of proposed selenotherms: a hot Moon given by taking the upper bounds of published estimates at

each depth (MaxT), a cold Moon case defined by similarly taking the lower bounds (MinT), and the mean of the hot and cold cases (MeanT). For comparison, Kawamura et al. (2017) is closer to the MinT profile, while Khan et al. (2014) is closer to the MaxT profile. We extended each profile through the core by calculating a conductive thermal profile with a thermal conductivity of 30 [W/m K] (Konôpková et al., 2016; Stegman et al., 2003). Recent analysis has placed experimental constraints on the CMB temperature to be 1603-1743 K, if Fe-Ti-rich partial melt are present and neutrally buoyant (Mallik et al., 2019), which is between MeanT and MaxT. Also, another recent study based on the conductivity of hydrous olivine (Zhang et al.. 2019) proposed a CMB temperature of 1663 - 1883 K, which is closest to the MaxT profile. Each one of these individual temperature profiles is not a self-consistent selenotherm but we chose to take the extremum to explore the maximum possible effect of temperature on the inferred lunar structure. Within *Selenoman*, we imposed the three temperature profiles to each of the three compositional model classes, for a total of nine subclasses.

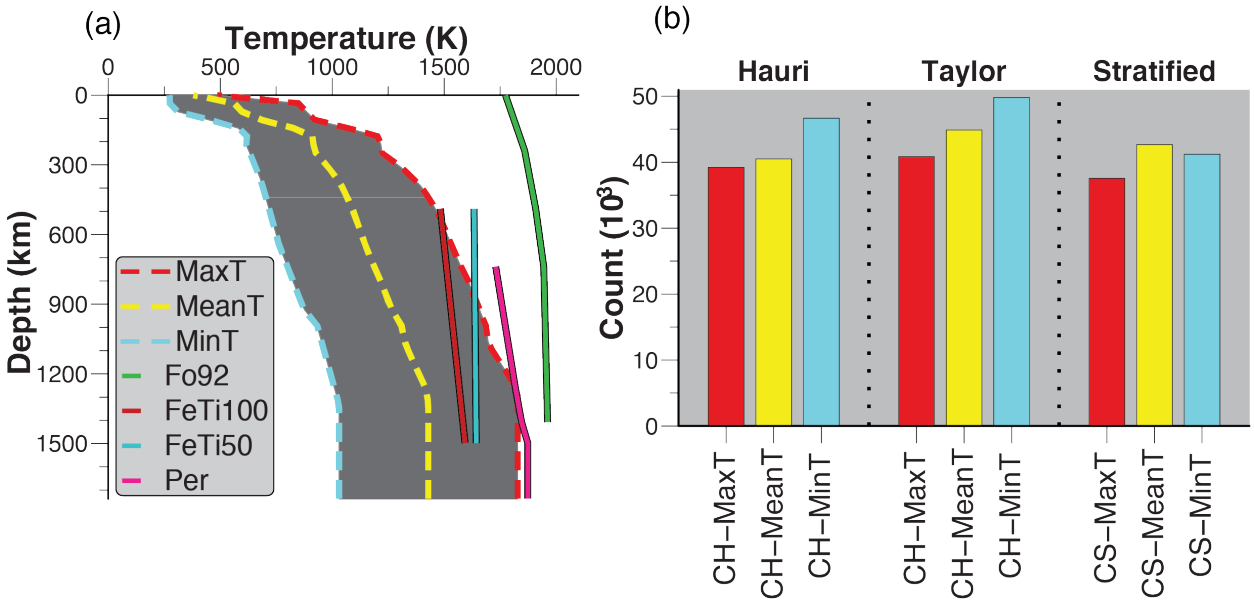

Figure 2. (**a**) Three temperature profiles are considered, bounding the proposed range of selenotherms: MaxT, MeanT, and MinT (dashed lines). The solidus curves for olivine of Forsterite 92% (Fo92, green), peridotite (Per, pink), Fe+Ti-rich ilmenite-bearing cumulates (FeTi100, red), and a mixture of 50% Fe+Ti-rich il-bearing cumulate +50% T82 mantle composition (FeTi50, cyan) (Mallik et al., 2019) are shown for reference. For each solidus curve, the P-T data are converted to depth-T via a P-profile using the model of Weber et al. (2011). (**b**) Number of models run by subclass, for a total of 383,234.

3.4 Search for Geophysically Consistent Models

For each subclass, we employed a series of search methods to find a suite of lunar candidate models consistent with observational constraints. First, we aimed to find models that could satisfy the mass (*M*) and the distribution of that mass throughout the interior (MOI) as these values are well constrained by the GRAIL mission (Williams et al., 2014; Table S3). We characterized the Mass and MOI misfit of each lunar candidate model from the reference values as a *zscore*, or the number of standard deviations ($n\sigma$) of the model *value* from the reference (*ref*) values normalized by each reported measurement error (*stderr)*:

$$zscore = n\sigma = \frac{value - ref}{stderr} \quad (8)$$

We then determined the model's overall fit to the geophysical observational constraints by calculating the root-mean-square of the (*G-RMSND* or G_{RMS}) individual *zscores* for mass and MOI:

$$G\text{-}RMSND = \left[\frac{1}{2}([zscore_{MOI}]^2 + [zscore_M]^2)\right]^{\frac{1}{2}} \quad (9)$$

New lunar candidate models were generated by varying the thickness of individual stratigraphic layers. As detailed below, we conducted the search in three stages: (1) a grid search that systematically stepped through a wide range of initial minimum and maximum thickness of each layer, (2) a random sampling of layer thickness configurations in order to "fill-in" between the steps of the coarse grid search, and (3) a differential evolution genetic search to specifically search for models with good fit to the geophysical constraints (a low *G-RMSND*). In total, we generated ~40,000 lunar compositional models per model subclass (Figure 2b).

3.4.1 Grid Search with Added Random Sampling

As a wide initial exploration of geophysical model space, we conducted a coarse grid search varying each layer's thickness over the ranges in Table 1. The intent of this initial search was to explore the full extent of the parameter space and identify structures to be used for the initialization of the differential evolution search.

The thickness of the majority of the compositional layers were allowed to range from zero to the full radial extent of the Moon minus the crust (R_L - R_{crust}). Our range of sampled lunar models allowed for both a solid inner and fluid outer core. Previous work has determined an upper bound on the radius of a dense electrically-conducting core to be ~400 km (Garcia et al., 2011, 2012; Hood et al., 1999; Shimizu et al., 2013; Weber et al., 2011; Yan et al., 2015). To be

conservative, we extended this range and sampled core sizes within 0-600 km for both inner and outer cores. We included a lower ilmenite-bearing layer ranging 0-500 km thick, which encompasses the observation made by Weber et al. (2011) of a 150 km-thick partial melt layer, assuming that a lower ilmenite-bearing layer may be responsible for the presence of partial melt near the CMB (Mallik et al., 2019). For each candidate model, the upper ilmenite-bearing layer thickness is the difference between the R_L and the sum of the other layers. We excluded stratigraphic configurations that exceeded the radius of the Moon.

Table 1. Range of layer thicknesses considered in the grid search.

Layer Names	***CH Model***		***CS Model***	
	Range (*km*)	**Increment (*km*)**	**Range (*km*)**	**Increment (*km*)**
Inner Core	0 – 600	100	0 – 600	100
Outer Core	0 – 600	100	0 – 600	100
Lower Ilmenite	0 – 500	100	0 – 500	100
Lower Mantle	0 – 1,698	200	0 – 1,698	300
Mid Mantle	0 – 1,698	200	0 – 1,698	300
Upper Mantle 3 *(CS only)*	--		0 – 1,698	300
Upper Mantle 2 *(CS only)*	--		0 – 1,698	300
Upper Mantle	0 – 1,698	200	0 – 1,698	300
Upper Ilmenite	0 – 1,698	non-uniform	0 – 1,698	non-uniform
Crust	--- constant 40 *km* (GRAIL, Wieczorek et al., 2013) ---			
Lunar Radius (R_L)	R_L = 1,738 km (Williams et al., 2014)			

We performed this grid search for all subclasses, ~10,000 models each. Since the grid search coarsely increments each layer's thickness, an additional ~10,000 candidate models per subclass were generated randomly to fill in gaps.

3.4.2 Differential Evolution

To locate the global minimum in *G-RMSND* within the prescribed model space, we employed a differential evolution (DE) optimization algorithm (Price et al., 2005). This method is a population-based stochastic function minimizer, which acts to randomly sample the parameter space through the generation of population members. DE creates and follows a path that reduces the misfit between population members and an objective function (in our case G-

RMSND). The function adds the weighted difference between two population members to a third random child vector. This method ensures that a global minimum (rather than a local minimum) is reached. In each generation, the lowest objective function is maintained. Subsequent generations are iterated until a minimum is reached. We employed a population of 15 members, with a weighting factor of 0.85 and a crossover constant of 0.9.

Similar to the grid search, we varied the thickness of all the layers with the exception of the fixed crust and the open upper ilmenite-bearing layer. The DE algorithm randomly generated and imposed layer thicknesses for all but the uppermost two stratigraphic layers (six variables for CH, and eight for CS), from the inner core through the upper mantle. DE was performed for all nine subclasses, and converged to a global minimum within 2,000 iterations for each iteration. Additional DE runs were performed as a means of verifying global minimum.

3.5 Quantifying the fit to Geochemical Constraints

As an additional constraint, we calculated the bulk composition of each model and compared this to the range of estimates of the bulk lunar composition from the literature. There is a substantial range of proposed lunar compositions and uncertainties in estimates are not typically quantified. We constructed a reference composition for the bulk silicate Moon (R_L - R_{core}) for six oxides (SiO_2, TiO_2, Al_2O_3, FeO, MgO, and CaO) by averaging the concentrations of twenty-five sets of published compositions (Table S2), assuming equal reliability (Buck & Toksoz, 1980; Delano & Lindsley, 1983; Hauri et al., 2015; Jones & Delano, 1989; Kuskov, 1997; Kuskov & Kronrod, 1998; Morgan et al., 1978; O'Neill, 1991; Ringwood et al., 1987; Ringwood, 1979; Ringwood & Kesson, 1977; Taylor, 1980, 1982, 1999; Taylor & Bence, 1975; Wänke et al., 1977; Wänke & Dreibus, 1982, 1986; Warren, 2005; Warren & Dauphas, 2014). We quantified the range in published estimates by calculating the standard deviation of each oxide concentration from the compilation of published values. Averaging estimates and calculating uncertainty in this way is not intended to produce a definitive lunar composition, but is designed to allow us to construct a quantitative metric by which we can access the consistency of our lunar structure models with the geochemical constraints.

To allow comparison with ourour models, we converted each oxide to its equivalent mass in a series of spherical shells, which we then integrated to calculate each oxide's total mass. Each sampled candidate model may possess a different total core size (sum of inner and outer core thicknesses). Therefore, we calculated both the reference and model oxide masses for a given configuration of stratigraphic thicknesses. As was done for mass and MOI, we characterized the

misfit of each oxide in mass fraction by calculating a *zscore* as defined in equation 8. From these normalized deviations, we calculated the bulk chemistry *RMSND* (*BC-RMSND* or BC_{RMS}) as:

$$BC\text{-}RMSND = \left[\frac{1}{6}\sum_i^6 \left[zscore_{oxide_i}\right]^2\right]^{\frac{1}{2}} \quad (10)$$

where the sum is over all 6 oxides. Finally, in order to quantify the qualtiy of fit considering both geochemical and geophysical constraints together, we calculated a combined geophysical and bulk composition *RMSND* (*Comb-RMSND* or $Comb_{RMS}$ or $G+BC_{RMS}$):

$$Comb\text{-}RMSND = \left[\frac{1}{2}\left([G\text{-}RMSND]^2 + [BC\text{-}RMSND]^2\right)\right]^{\frac{1}{2}} \quad (11)$$

Comb-RMSND was used to rank the candidate models by the best-fitting (or smallest deviation from) the reference constraints.

4 Results

We report the results of our structure model parameters searches compared to the geophysical, bulk compositional, and combined constraints. Section 4.1 presents the results of this analysis with geophysical constraints only, and Section 4.2 shows the effects of overlaying bulk chemistry and combined constraints. Our model database can be found at the University of Florida's Institutional Repository (IR@UF, http://ufdc.ufl.edu/ufir).

4.1 Geophysical

While the majority of sampled models did not yield satisfactory *zscores*, a portion of the sampled models achieved a geophysics *zscore* $\leq 2\sigma$. Figure 3a shows the results of model fitness to the observed mass and MOI for all models. For reference we note the mass and MOI *zscore* values for Weber et al. (2011), 632, and Garcia et al. (2011, 2012), 137, found by integrating their published density profiles. The distribution of models in mass and MOI space displays a long tail of models that over-predict mass (e.g., due to an overly large core) and under-predict MOI (i.e., due to excess mass within the outer layers). The appearance of clusters of models display the grid search sampling increment, with a dense cluster close to the origin largely composed of models from the DE search.

The influence of temperature is visible when the models are separated according to thermal profile (Figure 3b, CH-H shown). We note a positive ~50σ shift in mass deviation between the MaxT and MinT CH-H cases. Similar shifts were found for the CH-T and CS subclasses (see Figure S3).

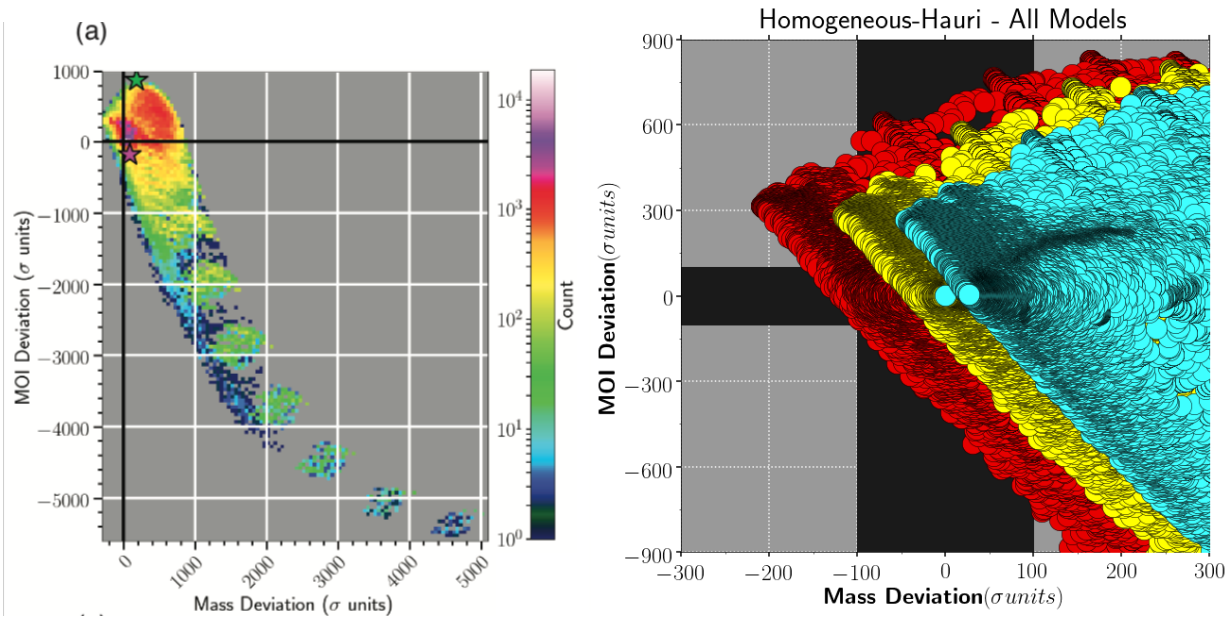

Figure 3. (**a, b**) The total model count distribution from all model subclasses (CH-H, CH-T, and CS), as a function of the number of standard deviation misfits from observational Mass and MOI. The map is color-coded according to the number of models that fall within each gridded cell with bin sizes of 50σ (**a**) (for 1σ zoom, see Figure S3). Overlaid are the calculated Mass and MOI deviations for the seismic/density models from Garcia et al. (2011, 2012) (pink star, *G-RMSND* of 137) and Weber et al. (2011) (green star, *G-RMSND* of 632). (**b**) The influence of temperature is shown for the three CH-H subclasses (red: MaxT, yellow: MeanT, cyan: MinT) within a zoomed window (for the full distribution of CH-H models, see Figure S3). This shows a systematic shift where decreased temperature corresponds to increased mass, and is due to material densification with decreasing temperature.

Figure 4 shows the variety of stratigraphic configurations within the lowest (≤2σ) Mass and MOI zscores. Low sigma models were found for all three CS selenotherms, however, within the CH classes, only the CH-H MaxT and MeanT and the CH-T MaxT achieved the same. The lowest *G-RMSND* values achieved for the CH-H MinT, CH-T MeanT, and CH-T MinT classes (those classes that did not have members that met the ≤2σ requirement) are 18, 32, and 81, respectively.

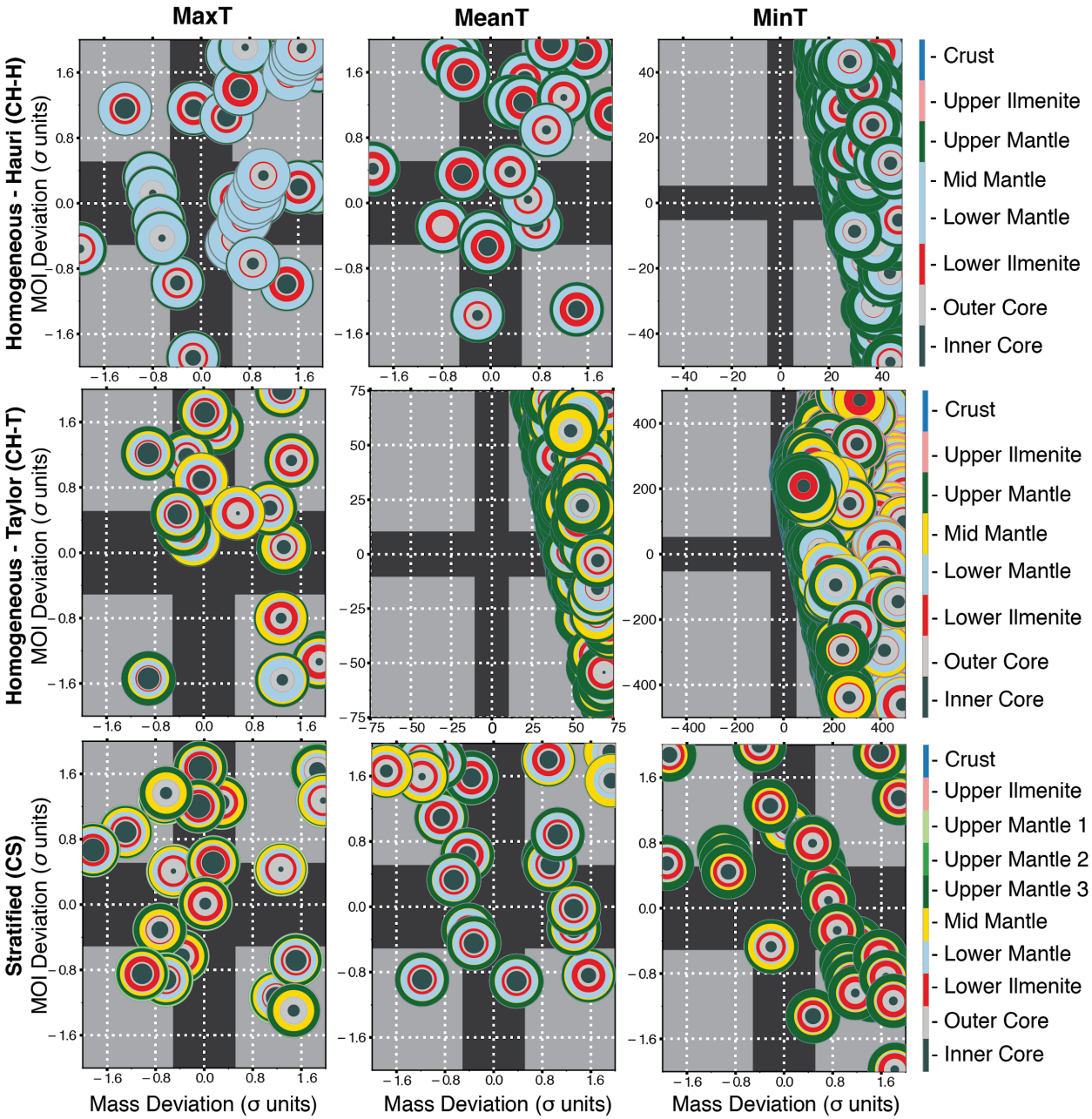

Figure 4. Low *zscore* geophysical results with respect to mass and MOI for all classes of model. The black bars highlight the region of lowest *zscore* values, ±2σ for all model subclasses except CH-H MinT, CH-T MeanT, and CH-T MinT, where the best-fit models are limited to ±50σ, 75σ, and 500σ windows, respectively. Color bar, right, indicates layer names. See Figure 1 for the mineralogy of each layer. Not that the axis scales vary for each panel.

The top 30 models for each of the three model classes, CH-H (S5a), CH-T (S5b), and CS (S5c), are shown in Figure S5 and are ordered from smallest to greatest *G-RMSND*. The bottom panels depict the structure of each lunar candidate model as a stratigraphic column. The top panels show the corresponding mass and MOI deviations, as well as *G-RMSND* values, for each stratigraphic column. The colored diamonds along the x-axis indicate each model's

corresponding thermal profile. Although the size of the inner and outer cores are variable, the sum, i.e., the total size of the core, is limited to a narrow range of thicknesses for all three model classes. Each of the top 30 models possess little-to-no upper ilmenite-bearing layer. However, we observe that most of the models contain a substantial lower ilmenite-bearing layer. All other layers have variable thicknesses. We note that all of the lunar candidate models featured in the top 30 list were generated by the differential evolution (DE) search and have *G-RMSND* values less than 2.5 (Figure S5), speaking to the strength of this technique.

For models with low *G-RMSND*, we observed distinct stratigraphic layer correlations (Figure 5). For models with low *G-RMSND* values, we observed a near 1:1 correspondent degeneracy between the inner and outer core sizes (Figure 5a) with a well-constrained total core thickness (Figure 5c). There is a small but non-zero upper ilmenite-bearing layer thickness visible across the full range of Total Core sizes with low *G-RMSND* (Figure 5b). The Lower Ilmenite thickness varies over a wide range from 0 - 500 km , however, the total volume of Ilmenite is narrowly defined, with a slight dependence on the total core size (Figure 5e). A decrease in Total Ilmenite volume corresponds to an increase in Total Core thickness. The thickness of the Total Mantle increases with increasing Total Core size (Figure 5d). Lastly, the upper ilmenite-bearing layer volume appears largely unaffected by changes in the lower ilmenite-bearing layer volume (Figure 5f). Similar trends as shown in Figure 5 are observed across all nine subclasses.

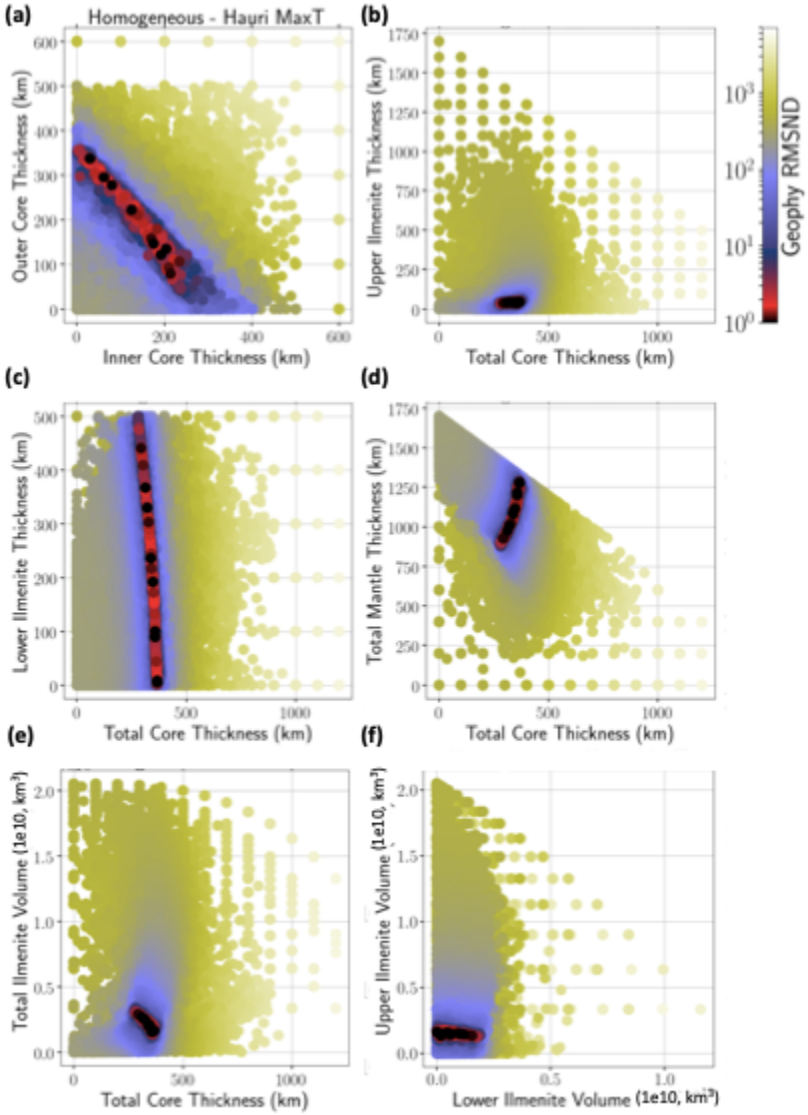

Figure 5. Structural trade-offs between stratigraphic layers (indicated in axes). Each circle represents a lunar candidate model color coded by *G-RMSND* (scale bar located to the right of panels). *Total Core* refers to the sum of the inner and outer core layers. *Total Mantle* refers to the sum of the upper, mid, and lower mantle layers. Note the exclusion of the upper and lower ilmenite-bearing layers within the *Total Mantle*. See the main text for details.

To more fully explore layer trends across all nine model subclasses, we compiled key model parameters onto box-and-whisker plots (Figure 6). The enhanced box-and-whisker plots each sampled lunar candidate model as a left-justified horizontal line where the length and color are scaled according to the model's RMSND value. Shorter lines and hotter colors correspond to smaller values. Smaller values are plotted on top of larger ones. To the left of each column of scaled lines are black and white boxes indicating that all components within the model RMSND value are less than or equal to 1σ and 3σ (1 or 3 zscores) misfit, respectively. A red arrow tail

points to the location of the lowest RMSND value of the subclass. The minimum and maximum range of sampled models is indicated by the whisker shown by upper and lower red triangles connected by a black dotted line. The standard box-and-whisker show a green box models within zscore<3 and a black box for values less than zscore < 1 with the red horizontal line indicating location of best-fit model within the subclass.

We observe, across all model classes, the best-fit models (shortest lines, hottest colors) appear in a narrow-ranged cluster on top of models with larger RMSND values (longer lines, cooler colors). In Figure 6b, the largest RMSND values are all located at large Total Core sizes, and are separated from smaller values. The red arrow tails show a trend toward smaller Total Core size with decreasing thermal profile in the CS model classes. We also see in Figure 6b no low sigma candidate models were found with zscore < 3 for the CH-H Max, CH-H MinT, CH-T MeanT, and CH-T MinT model subclasses.

The *Total Core* size as a function of *BC-RMSND* value ranges from 0 - ~900 km thick for models where all oxide deviations have *zscore* ≤ 3 (Figure S4a, middle panel). The largest *BC-RMSND* values are distributed throughout the full range of sampled *Total Core* thicknesses. For the *Comb-RMSND* (Figure S4a, bottom panel), the distribution pattern of *RMSND* values largely resembles what was found for the *G-RMSND* values, where the largest values are only associated with large *Total Core* size. The red arrow tail that points to the location of the best-fit models spans a narrow range of *Total Core* sizes across all nine subclasses (see Table S5 for summary).

For layers plotted as a function of *BC-RMSND*, all nine model subclasses produced lunar candidate models that fall within 3σ, but only the CH-T model class has models that fall within 1σ (for all three thermal profiles) (Figure S4). For layers plotted as a function of *Comb-RMSND*, the CS model class produced candidate models that have *zscore* values for all constraints ($zscore_{all}$) that fall within 3σ for all three thermal profiles. For the CH-T model class, only the MaxT thermal profile produced models that fall within $zscore_{all} \leq 3$, similar to what was found with *G-RMSND*, but unlike *BC-RMSND*, all three thermal profiles fall within *zscore* ≤ 3. For the CH-H model class, only the MeanT thermal profile produced candidate models with $zscore_{all} \leq 3$, which is a departure from both the *G-RMSND* and *BC-RMSND* cases. The CH-H-MaxT, CH-H-MinT, CH-T-MeanT, and CH-T-MinT model subclasses did not contain any candidate models with $\text{zscore}_{\text{all}} \leq 3$.

The Upper Ilmenite volume as a function of *BC-RMSND* value (Figure S4b, middle) has a distribution that tapers towards 0 km^3: there is a steady decrease of *RMSND* value with

decrease in Upper Ilmenite volume. Low *BC-RMSND* valued models are not co-located with larger valued models. This pattern was observed for all nine model subclasses, and was not observed for any other stratigraphic layer (or combination of layers) or *RMSND* type. Models where all oxide deviations have *zscore* ≤ 3, range from 0 to 0.2e10 km^3, and the best-fit models are at or near 0 km^3. For the *Comb-RMSND* (Figure S4b, bottom), the largest *RMSND* values are distributed across the full range of sampled volumes. In all nine subclasses there is little to no Upper Ilmenite volume, with the exception of CH-H-MeanT, CH-T-MaxT, and all three CS, do contain a small volume of Upper Ilmenite in the best fit models.

Slightly larger ranges were observed for the lower ilmenite-bearing layer volume (Figure S4c). For all nine subclasses, there is little-to-no Lower Ilmenite volume for low *BC-RMSND* values (Figure S4c, middle). The large G-*RMSND* values are distributed across the full range of sampled volumes, which differs from the Upper Ilmenite volume which taper towards the best-fitting point. The *Comb-RMSND* (Figure S4c, bottom) follows a similar pattern to that found for the *G-RMSND* values. The Total Ilmenite volume is also considered in Figure S4d with similar conclusions to the Upper Ilmenite.

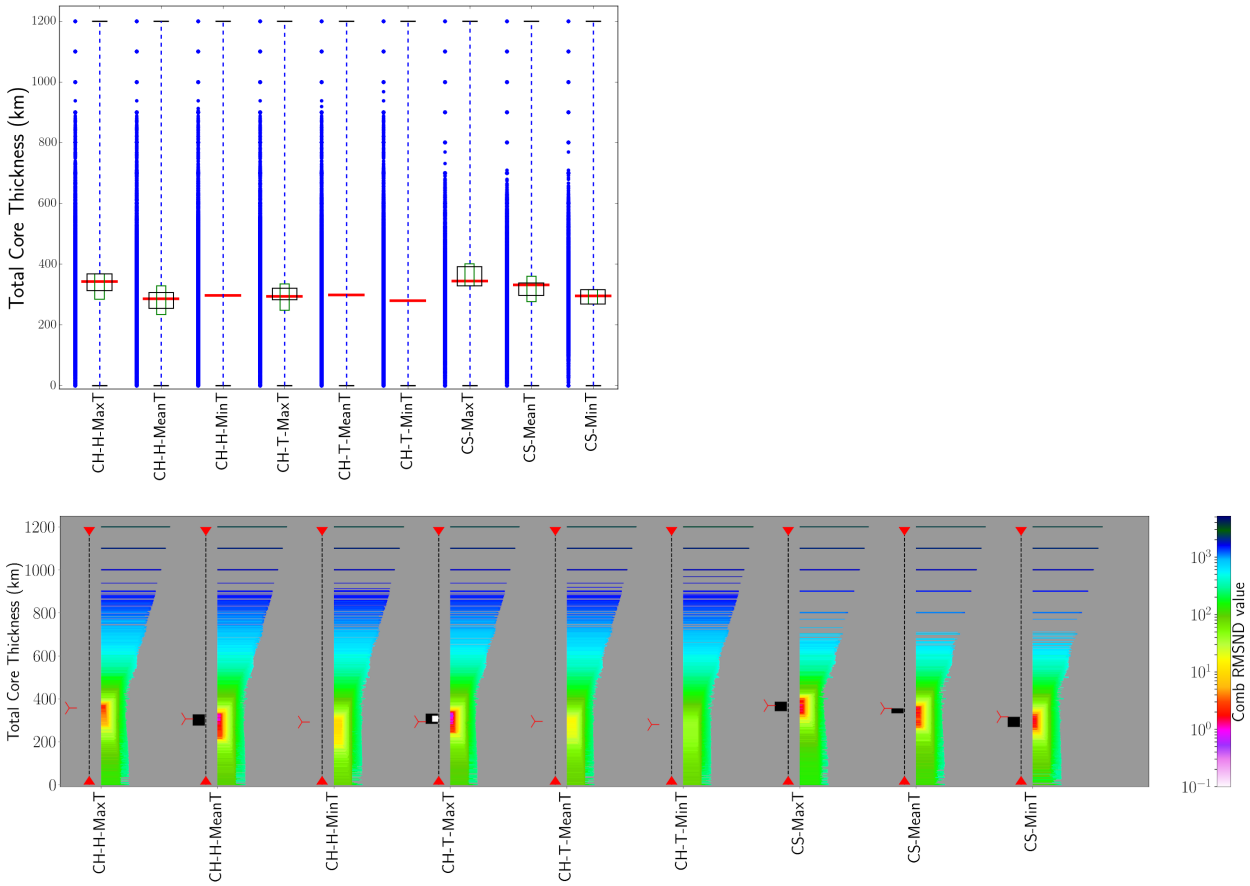

Figure 6. Box-and-whisker plots of the Total Core thickness for all model subclasses as labeled on x-axis. Each sampled lunar candidate model plots as a left-justified line where the length and color vary according to the model's Comb-RMSND. High RMSND values correspond to the longer horizontal lines, and low RMSND values to short lines. Low RMSND values are plotted on top of larger values. To the left of each column of scaled lines are the "simplified" ranges where the min/max sampled layer thickness (or volume) is shown by red triangles and connected by a black dotted line. The black and white boxes indicate that all components within the RMSND value are less than or equal to 1σ and 3σ (1 or 3 zscores) misfit, respectively. The best fit thickness (or volume) is marked with a red arrow tail for each model subclass. For additional Box and Whisker plots, see Figure S4.

Seismic observations have the potential to also place a strong constraint on the internal structure of the Moon. In order for seismic velocity profiles to be used as robust constraints on the internal structure of the Moon, they should be sensitive to the mineralogy and thermal condition across depths in the lunar interior. We tested the sensitivity of seismic velocity profiles to the thermal state and mineralogy as follows. In Figure 7 we compare the seismic and density profiles of the lowest G-RMSND (best-fit) lunar candidate model for each of the CH-H, CH-T, and CS model classes from Figure S5 to those derived directly from the Apollo seismic analyses of Garcia et al. (2011, 2012) and Weber et al. (2011). The top panels show the profiles from the

best-fit model, as well as two counterpart models with the same layer configuration but different thermal profiles, and the structures from Weber et al. (2011) and Garcia et al. (2011). The bottom row plots the difference between the best-fit and thermal counterpart models Vp, Vs, and density. We note that the *G-RMSND* < 1 for each of the best-fit models, but the zscore misfit of the temperature companion models range between 60 - 130 (large misfit). Nevertheless, only very minor differences were observed between the seismic and density profiles of the well-fit models, their thermal counterparts, and the Weber et al. (2011) and Garcia et al. (2011, 2012) profiles. Both the best-fit models and their thermal counterparts generally reproduced the observed velocity and density structures with the exception of the crust and lower mantle/core, which indicates that seismic profiles alone cannot be used as robust constraints of mineralogy and thermal structure in the lunar interior, thus emphasizing the need to use physical quantities such as mass and MOI as additional constraints

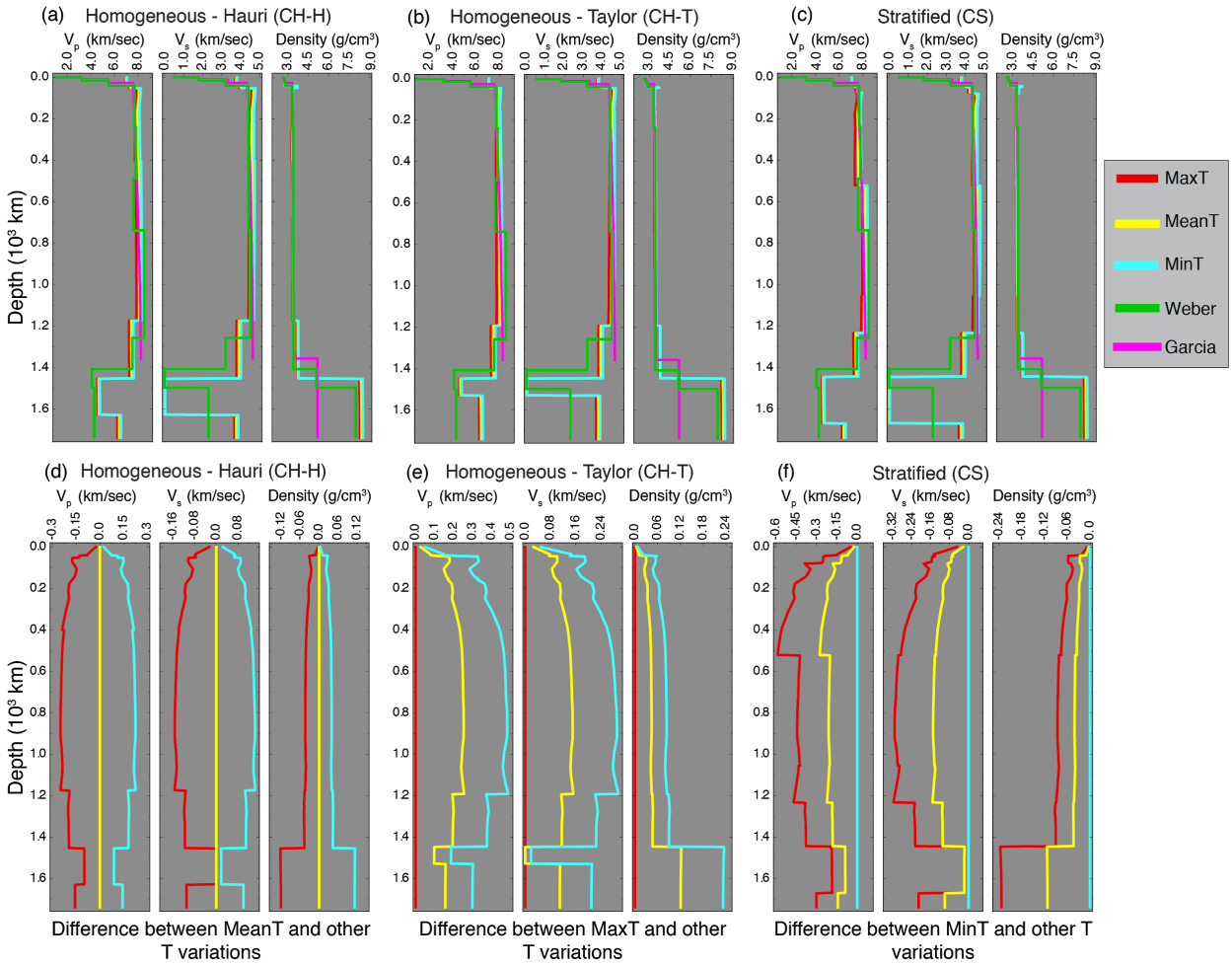

Figure 7. Comparison of a well-fit model (low *G-RMSND*) and the corresponding thermal counterpart models (same layer configuration, different thermal profile) from the CH-H (a,d), CH-T (b,e), and CS (c,f) model classes. Panels (a,b,c) show seismic velocities V_p, V_s, and density profiles for each of the well-fit models along with their counterparts, and are compared to the Garcia et al., (2011, 2012) and Weber et al., (2011) models. Panels (d,e,f) show the difference between the well-fit models (the model with a constant value of zero in each panel) and their counterparts. The *G-RMSND* values for the well-fit models are; CH-H: 0.5 (MeanT), CH-T: 0.2 (MaxT), and CS: 0.5 (MinT), while all corresponding counterparts are > 80. *G-RMSND* values for Garcia et al. (2011, 2012) and Weber et al. (2011) are 137 and 632, respectively. Apparently, the large range in thermal profiles do not translate into large variations in seismic velocity, and model fit to Mass and MOI are not indicators of fit to estimates of seismic velocity.

4.2 Bulk Composition and Combined RMSND

For each of the sampled lunar candidate models generated by the search methods, we calculated the misfit to bulk chemistry, both as *zscore* of each oxide's deviation (equation 8) and as *BC-RMSND* values (equation 10). We observed that the minimum *G-RMSND* value per *BC-RMSND* value follows a curve such that the minimum *G-RMSND* decreases with decreasing *BC-RMSND* value (Figure S6). The lowest *G-RMSND* values only correspond to low *BC-RMSND*

values. Equivalent distributions were observed for the CH-H and CH-T model classes (ref supplemental figures). Figure 8 shows the top 30 models that have $zscore_{Mass}$, $zscore_{MOI} \leq 2$, then organized from least to greatest *Comb-RMSND* values for CH-H (a), CH-T (b), and CS (c) model classes. Similar to the construction of Figure S5, the bottom panels depict the structure of each lunar candidate model as a stratigraphic column. The middle panels show the corresponding Mass and MOI deviations, and the *G-RMSND* values. Added here, are the *BC-RMSND* and *Comb-RMSND* values. The top panels show oxide deviations from the mean reference bulk composition in terms of their *zscore*. As was found in *G-RMSND*-only case (Figure S5), for all three model classes the inner and outer core thicknesses are variable, but the *Total Core* size is limited to a narrow range of thickness. Likewise, all the models shown possess little to no upper ilmenite-bearing layer, but a variety of thicknesses were observed for all other layers. In general, *RMSND*≤3 for all the model classes within the top 30.

In terms of bulk chemistry, the CH-H models show a rapid increase in *BC-RMSND* corresponding to a rapid increase in TiO_2 *zscore* from ~1.5 - 6, which is a component of the ilmenite-bearing layer. A vivid example of its effect can be seen in the top CH-Hmodels, where TiO_2 *zscore* clearly increases with Lower Ilmenite thickness and/or Upper Ilmenite thickness, implying a limitation of Total Ilmenite volume from the bulk chemistry constraints. Since the comparison between the volumes of upper and lower ilmenite-bearing layer is difficult from the layer thicknesses in Figure 8, we refer to Figures S4 for details of the Total Ilmenite volume.The *zscores* were lower than those of TiO_2 for the other five oxides. For most of the top 30 models shown, *BC-RMSND* was the primary contributor to increases in CH-H *Comb-RMSND* values, and only models from the MaxT and MeanT thermal profiles are featured.

Of the three model classes, the CH-T models display the best fits to bulk chemistry, as well as showing a steady increase in *G-RMSND*. Only models from the MaxT thermal profile are featured in the top 30 models. A near constant depletion of Al_2O_3 of ~-0.8 was observed across all the top 30 models. Misfit of TiO_2 was variable, but ranged between ~-1.0 - 2.4. Very little misfit was observed for the remaining four oxides. For most of the top 30 models shown, the *G-RMSND* was the primary contributor to the increases in CH-T *Comb-RMSND*.

Of the three model classes, the CS models display the greatest variety of individual oxides with large misfit, but most models are depleted in Al_2O_3 (~-2.0) and enriched in SiO_2 and TiO_2 (~1.0 - 4.5). All three thermal profiles appear in the top 30 list for CS models. With some exceptions, the *BC-RMSND* was the primary contributor to increases in *Comb-RMSND* values for most of the models.

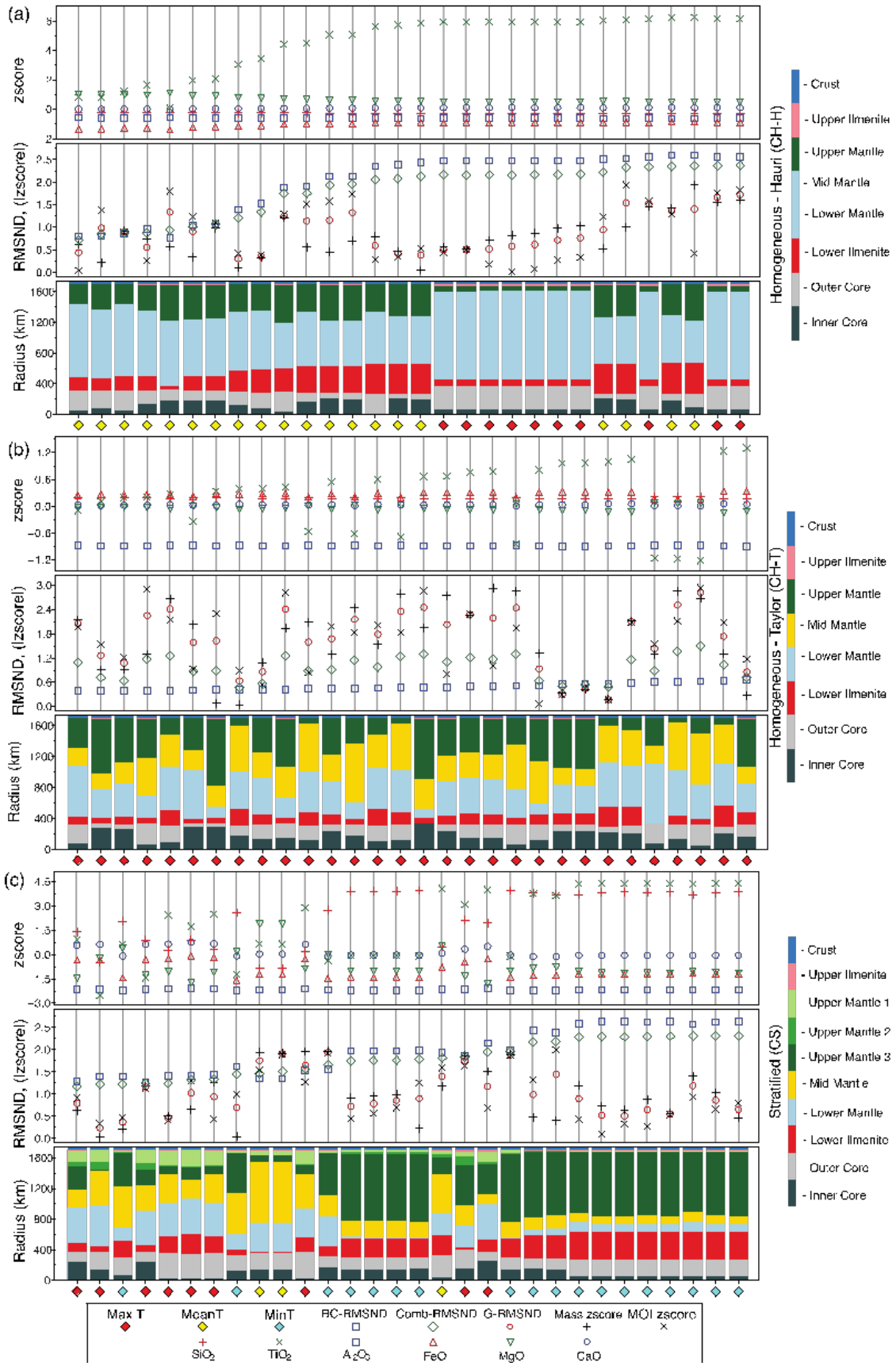

Figure 8. (caption continued on next page)

Figure 8. The top thirty best-fit model candidates for (a) CH-H, (b) CH-T, and (c) CS model classes are compared in terms of oxide deviation (top panel); deviations for Mass, MOI, and *RMSND* (middle panel); and model stratigraphic structure with color coded layers (bottom panel). The stratigraphic legend is to the right of each set of panels. Diamonds along the x-axis indicate model temperature profile. Models are ordered by lowest *Comb-RMSND*. For compositional description of each layer, see Figure 1.

Table S5 summarizes the range of layer thicknesses and volumes that have *zscore* ≤ 2 for all components within *G-RMSND* and *BC-RMSND*, and *zscore* ≤ 3 for all components within *Comb-RMSND* for all model subclasses. Comparing our final ranges of thickness to our originally sampled ranges (as listed in Table 1) indicates how well our routine has constrained thickness estimates, and quantifies the relative effectiveness between *RMSND* constraints. Model counts by subclass are provided in the supplement text S2. Note that the Upper Ilmenite range has artificially low reduced ranges, as it was tested to the full lunar radius (minus the crust).

For *G-RMSND* best-fit models, we constrain the total core to within 234 - 401 km thick regardless of thermal profile or model class. This represents a total core that is 14% of the initial sampled range. However, large variability exists in outer and inner core thicknesses, where both layers range from 0 - ~330 km. The volumes of lower, upper, and total ilmenite-bearing layers all show substantial reduction from their initial ranges (due to radial geometry, the lower ilmenite-bearing layer thickness did not reduce much based-on *G-RMSND*, although the upper ilmenite-bearing layer thickness did.). Of these three, Lower Ilmenite and Total Ilmenite volumes reduced to ~13% of their initial sampled extents. While the lower bound of the upper and lower ilmenite-bearing layer volumes is zero, the Total Ilmenite volume lower bound is non-zero for *G-RMSND*. A total of 141 lunar candidate models were included for the *G-RMSND* final ranges.

For the *BC-RMSND*, reduced normalized range for the Total Core size was much greater than that based on the *G-RMSND*. The final range of the upper ilmenite-bearing layer thickness is thin (0-25 km), and there was nearly no reduction in range of the Lower Ilmenite thickness. However, the volumes of Lower, Upper, and Total ilmenite all have reduced normalized ranges that are less than half of the geophysical based ranges. We observed that the Total Ilmenite volume lower bound is non-zero, and higher than in *G-RMSND*. More than 38,000 lunar candidate models were included for the *BC-RMSND* final ranges.

When the results from the previous two are combined, we observed improved constraints on layer thicknesses and volumes. The range of Upper Ilmenite thickness was similar to that

found with *BC-RMSND* alone. However, when considering the combined constraints, the *Total Core* thickness was constrained to be within 269-387 km, narrower than *G-RMSND* or *BC-RMSND* alone. With the *Comb-RMSND*, the reduced normalized ranges of total mantle thickness was 15%, as compared to *G-RMSND* (25%) and *BC-RMSND* (53%). The range of Total Ilmenite volume falls between *G-RMSND* and *BC-RMSND*, also with a non-zero lower limit. A total of 100 lunar candidate models were included for the *Comb-RMSND* final ranges.

5 Discussion

5.1 Constraints on mantle stratification and present-day selenotherm

The present-day Moon is likely in-between a perfectly stratified and completely homogenized state. If the present-day Moon is more homogenized, our models favor warmer selenotherms, with a temperature profile closer to our MeanT or MaxT profiles. Such selenotherms are consistent with the hotter CMB temperature proposed by two recent experimental studies (Mallik et al., 2019; Zhang et al., 2019). A colder Moon (following the Min T profile and similar to that predicted by the recent study by Kawamura et al., 2017) is only allowed in our models if the present-day Moon retained most of the stratigraphy from LMO crystallization and has not undergone homogenization since due to mantle mixing and dynamics.

5.2 Comparison to seismic profiles

Our models do not attempt to capture the details of the crustal structure of the Moon, including regolith, mega-regolith, and additional layering; rather we imposed a uniform 40 km thick anorthitic crust. We also assumed that our initial compositional models (Figure 1) represented the laterally averaged compositional structure. Yet despite the minimalist design of our compositional models, our results are seen to generally match to the Weber et al. (2011) and Garcia et al. (2011, 2012) profiles for all three model classes. Figure 7 demonstrates the shifts in seismic and density profiles that occur with changes in thermal profile, which is not a surprising result. However, the relative changes are on the order of ~3% difference in seismic velocity, and <2% difference in density, which are both potentially within the measurement error of the Apollo seismic data. Recall that, in each of the model classes, two of the three lunar candidate model profiles shown in Figure 7 have *G-RMSND* values >60, and indeed the Weber et al. (2011) and Garcia et al. (2011, 2012) profiles have even higher *G-RMSND* values (632 and 137, respectively). Therefore, the current constraints on seismic velocity are insufficient to constrain the density and compositional structure of the lunar interior without applying additional constraints.

5.3 Combining Geophysics with Bulk Composition

While we cannot rule out either a stratified or homogeneous mantle, bulk chemistry clarifies the trends in layer thickness for a given temperature profile and puts firm limits on some layers. Some curious features appear when layer thicknesses of the *BC-RMSND* are displayed versus one another (Figure 5). Lower ilmenite-bearing layer volume, rather than appearing independent from upper ilmenite-bearing layer volume, now trades off as per the limitation on the total Ti content of the Moon. As is shown by the linear trade-off in Upper and Lower Ilmenite volumes in Figure S7a, the total volume of the ilmenite-bearing layer (upper and lower combined) is a near constant and is controlled by the Ti concentration of the bulk Moon. To this effect, the total mantle thickness increases with core growth within the geophysical constraints. However, within the chemistry the best fit region is much wider for total mantle thickness versus total core (Figure S7b). The Upper and Lower Ilmenite volumes are also well constrained. Bulk chemistry limits ilmenite-bearing material and therefore sometimes temperature profile (Figure S4). As the deviation of Ti goes up, it drives an increase in *BC-RMSND*. For instance, in CH-H-MaxT, the best-fitting lower ilmenite-bearing layer thickness seems to vanish with the bulk chemistry implementation. This also occurs in the Taylor model class, but for Al content in the crust. A noteworthy feature from the bulk chemistry in the CS model class is that not only Ti but also Si is limited. This is because our CS mantle is based on the model from Snyder et al. (1992), which features a pure orthopyroxene layer rich in Si relative to olivine. This layer can be seen in the stratigraphic column plots of Figure 8.

An interesting observation in the top 30 models in Figure 8 is that, irrespective of model class, every best-fit model has a prominently thick lower ilmenite-bearing layer which supports the idea that a mantle overturn process involving sinking of the upper ilmenite-bearing layer through the mantle took place at some point in lunar history. Also, it is noteworthy that each of the top 30 models contain a finite volume of upper ilmenite-bearing layer, which is likely a residue from the mantle overturn process. These upper and lower ilmenite-bearing layers not only redistribute heat producing elements within the Moon (which has implications for the dynamics of the lunar interior), but the presence of a residual upper ilmenite layer may have implications for potential assimilation of these Fe-Ti rich cumulates with a Mg-rich primary partial melt to produce the chemistry of certain lunar basalts (e.g. Mallik et al., 2019).

5.4 The lunar core

Our models determine tight range of possible *Total Core* sizes of **269 - 387 km** (Figure 6, 8 and Table S5), consistent with previous results (Hood et al., 1999; Shimizu et al., 2013,Garcia

et al., 2011, 2012; Weber et al., 2011;Yan et al., 2015). *BC-RMSND* applied no direct constraints to the *Total Core* size, which is sensible since the bulk chemistry constraints only described the silicate mantle. We cannot independently constrain inner and outer core thicknesses, as the densities of liquid and solid iron are similar.

In our model, for simplicity, we assumed that the lunar core was pure iron and not allowed for the existence of any light elements in the core. The light element composition of any possible fluid outer core is debated, with different studies favoring sulfur (Jing et al., 2014), carbon (Steenstra et al., 2016). The addition of light elements would lower the core's density, reducing the mass and MOI of the Moon for a fixed core size. The effect of light elements on global mass and MOI likely trades off with the mass of other layers, in particular the lower and upper ilmenite-bearing layers. Using both geochemical and geophysical constraints on the light element composition of the lunar core should be considered by future work.

5.5 Upper and Lower Ilmenite-bearing Layers

Across all nine model subclasses, we observed little-to-no upper ilmenite-bearing layer. This was consistent for both the geophysical and bulk compositional *RMSNDs*, but was especially robust from *BC-RMSND*, where small values coincide with a small volume of ilmenite-bearing material (Figure S4b, middle). Similarly, we observed little-to-no Lower Ilmenite volume (Figure S4c), but Total Ilmenite is non-zero (Figure S4d). Figure S7 demonstrated that a trade-off exists between the upper and lower ilmenite-bearing layers. For the case of a zero Upper Ilmenite layer, a non-zero volume of lower ilmenite-bearing material at the CMB exists. Bulk compositional constraints limit the total amount of TiO_2 (and therefore ilmenite) in the silicate mantle. For many candidate models, deviations in TiO_2 are due to enrichment, especially for models with a non-zero volume of upper ilmenite-bearing material (Figure 8). Furthermore, the constraints on MOI limit the volume of the upper-ilmenite material, where large volumes are penalized for adding excessive mass to the outer radii of the lunar interior. Therefore, our models do not discount the possibility that any substantial ilmenite-bearing layer that formed during LMO crystallization may have subsequently been transported to the CMB or mixed with the rest of the mantle.

5.6 Limitations of this Study and Future Directions

In our stratified mantle models, we assumed that the stratification was introduced by the crystallization of a whole-mantle MO. However. the depth of the lunar MO is uncertain. Current estimates state a MO of around 700 km thick, based on the thickness of the crust as obtained from GRAIL results (Elkins-Tanton et al., 2011). If the Moon only had a partial-mantle MO

there would be a substantial primitive lower mantle in the Moon, which has not been considered in this study. However, the methods outlined here are applicable to other models that do consider a partial MO, such as Charlier et al. (2018) and Lin et al. (2018a,b).

Our reference bulk composition is derived from a compilation of available compositional models, but these models largely consist of Taylor-like compositions, which bias our geochemical constraints towards a Taylor-like lunar structure. For example, in Figure 4S the best-fit models found for the CH-T model class feature the lowest *BC-RMSND* values across all models. To help correct this, a weighting could be applied when averaging the available compositions. However, we elected not to do this because the validity of one composition relative to another is uncertain. The available bulk compositional models assume that estimates based on Apollo samples and remote spectroscopy of the lunar surface represent the bulk silicate mantle and crust. This may not be the case, and future sample return missions are likely needed for improvements in this area. The imposed bulk chemistry reference can be tweaked for future work to re-evaluate the ensemble of best-fitting models.

This study does not take the hemispheric dichotomy of the Moon into consideration. Given that heat producing elements are more concentrated on the surface of the near side rather than the far side, it is not surprising if the near side follows a hotter selenotherm than the far side, and the hemispheres have had distinct evolutionary histories. Future seismic analyses from a global lunar geophysical network may shed light into the hemispheric dichotomy and resolve the potentially distinct interior structures of each hemisphere.

Though not treated in this study, an additional constraint on lunar structure could be provided by the observed tidal dissipation quantified by the Love numbers k2 and h2. However, tidal dissipation depends on both mantle temperature and mineral grain size (Faul & Jackson, 2005; Nimmo et al., 2012). Grain size is not well constrained within the lunar mantle, and so this.

Lastly, we performed two preliminary studies to investigate and motivate the sinking mechanisms for ilmenite-bearing layer through the mantle. These are summarized briefly here and the reader is directed to Text S1 for full description. We examined whether the ilmenite-bearing layer proposed to have formed below the anorthite crust after 95% MO crystallization can sink, either as a liquid or a solid, and constitute the proposed melt layer within the lunar lower mantle. As a liquid, we found that Fe+Ti-rich partial melt must reach a density crossover point of ~180 *km*, with limited mantle assimilation, to become negatively buoyant with respect to the surrounding mantle. This crossover depth increases with increasing amounts of mantle

assimilation. We considered impacts as a possible mechanism to transport ilmenite to depth, and found that it is unlikely that impacts are capable of transporting significant amounts of Fe-Ti-rich partial melt beyond the crossover depth. As a solid, we performed mantle convection modeling and demonstrated that an ilmenite-bearing layer can sink and persist at the CMB as a solid for a homogeneous mantle. Further convection modeling is required to more fully capture the ilmenite-bearing layer overturn scenario in a stratified model composition.

6 Conclusions

We have explored the range of possible lunar interior structure models by combining geophysical and geochemical constraints. To do this, we developed a computational tool called *Selenoman* to calculate the physical properties of the lunar interior and compare against observations of mass, MOI, and bulk chemistry. We tested 383,234 different 1D lunar candidate models across nine combinations of compositional classes and temperature profiles. We found that mass and MOI alone narrowed the scope of likely composition and selenotherm combinations, but the addition of bulk compositional constraints further constrained the range of plausible structures. Our inherently multidisciplinary approach is applicable to any planetary body where estimates of bulk chemistry and total mass and moment of inertia are available, such as Mars.

We found both compositionally homogenous and compositionally stratified lunar candidate models that match the observational constraints applied in this study but find that imposed temperature gradient qualifies the likelihood of our proposed profiles. Within our best-fit models we observed a *Total Core* size (sum of inner and outer core size) to be consistent with previous observations.

Our lunar candidate models are consistent with an ilmenite-bearing layer at the CMB in the present-day Moon. The volume of a lower ilmenite-bearing layer was not well constrained, with acceptable models varying from 0-7.7e8 km^3. The resulting range of the upper ilmenite-bearing layer thickness was less than 24 km. Our best-fit models exhibited a non-zero volume of Total Ilmenite (sum of upper and lower ilmenite-bearing layers), and we found that the Upper and Lower Ilmenite volumes trade off to meet the total titanium constraint of the Moon. The use of bulk chemistry constraints reduced the range of ilmenite-bearing layer thicknesses found for observationally consistent models by introducing additional limitations on our results.

Despite the simplistic assumptions of our laterally averaged compositional structure, our results generally match the seismic and density profiles of *Weber et al.* [2011] and *Garcia et al.*

[2011, 2012] for all three model classes. We demonstrate that the shifts in seismic and density that occur with the change in temperature profile are potentially less than the measurement error of the Apollo seismic data. We conclude that current estimates of seismic velocities alone are insufficient to constrain the density and compositional structure of the lunar interior without applying additional constraints.

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The lunar equations of state analysis algorithm developed for this project can be accessed at https://github.com/geodynamics/burnman. In addition, the compositional model database supporting this analysis can be found at the University of Florida's Institutional Repository (IR@UF), http://ufdc.ufl.edu/ufir.

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Pressure (GPa)	Temperature (K)	mass of liquid	SiO2	TiO2	Al2O3	Fe2O3	Cr2O3
0.5	1723.15	100.312306	36.5857	14.1558	3.98755	0.72941	0
0.5	1723.15	100.312306	36.5857	14.1558	3.98755	0.72941	0
0.505	1723.15	100.312167	36.5858	14.1558	3.98755	0.728023	0
0.51	1723.15	100.312028	36.5858	14.1558	3.98756	0.726639	0
0.515	1723.15	100.311889	36.5859	14.1558	3.98756	0.725259	0
0.52	1723.15	100.31175	36.5859	14.1559	3.98757	0.723883	0
0.525	1723.15	100.311612	36.586	14.1559	3.98757	0.722509	0
0.53	1723.15	100.311474	36.586	14.1559	3.98758	0.721139	0
0.535	1723.15	100.311337	36.5861	14.1559	3.98759	0.719773	0
0.54	1723.15	100.3112	36.5861	14.1559	3.98759	0.718409	0
0.545	1723.15	100.311063	36.5862	14.156	3.9876	0.717049	0
0.55	1723.15	100.310927	36.5862	14.156	3.9876	0.715693	0
0.555	1723.15	100.31079	36.5863	14.156	3.98761	0.714339	0
0.56	1723.15	100.310655	36.5863	14.156	3.98761	0.712989	0
0.565	1723.15	100.310519	36.5864	14.156	3.98762	0.711642	0
0.57	1723.15	100.310384	36.5864	14.1561	3.98762	0.710299	0
0.575	1723.15	100.310249	36.5865	14.1561	3.98763	0.708958	0
0.58	1723.15	100.310115	36.5865	14.1561	3.98763	0.707621	0
0.585	1723.15	100.309981	36.5866	14.1561	3.98764	0.706287	0
0.59	1723.15	100.309847	36.5866	14.1561	3.98764	0.704957	0
0.595	1723.15	100.309713	36.5867	14.1562	3.98765	0.703629	0
0.6	1723.15	100.30958	36.5867	14.1562	3.98766	0.702305	0
0.605	1723.15	100.309447	36.5868	14.1562	3.98766	0.700984	0
0.61	1723.15	100.309315	36.5868	14.1562	3.98767	0.699666	0
0.615	1723.15	100.309183	36.5869	14.1562	3.98767	0.698352	0
0.62	1723.15	100.309051	36.5869	14.1562	3.98768	0.69704	0
0.625	1723.15	100.308919	36.587	14.1563	3.98768	0.695732	0
0.63	1723.15	100.308788	36.587	14.1563	3.98769	0.694427	0
0.635	1723.15	100.308657	36.5871	14.1563	3.98769	0.693125	0
0.64	1723.15	100.308526	36.5871	14.1563	3.9877	0.691826	0
0.645	1723.15	100.308396	36.5872	14.1563	3.9877	0.690531	0
0.65	1723.15	100.308266	36.5872	14.1564	3.98771	0.689238	0
0.655	1723.15	100.308136	36.5873	14.1564	3.98771	0.687949	0
0.66	1723.15	100.308007	36.5873	14.1564	3.98772	0.686663	0
0.665	1723.15	100.307878	36.5874	14.1564	3.98772	0.685379	0
0.67	1723.15	100.307749	36.5874	14.1564	3.98773	0.684099	0
0.675	1723.15	100.307621	36.5875	14.1565	3.98773	0.682822	0
0.68	1723.15	100.307493	36.5875	14.1565	3.98774	0.681549	0
0.685	1723.15	100.307365	36.5875	14.1565	3.98774	0.680278	0
0.69	1723.15	100.307237	36.5876	14.1565	3.98775	0.67901	0
0.695	1723.15	100.30711	36.5876	14.1565	3.98775	0.677745	0
0.7	1723.15	100.306983	36.5877	14.1565	3.98776	0.676484	0
0.705	1723.15	100.306857	36.5877	14.1566	3.98776	0.675225	0
0.71	1723.15	100.306731	36.5878	14.1566	3.98777	0.67397	0
0.715	1723.15	100.306605	36.5878	14.1566	3.98777	0.672717	0
0.72	1723.15	100.306479	36.5879	14.1566	3.98778	0.671468	0

0.725	1723.15	100.306354	36.5879	14.1566	3.98778	0.670221	0
0.73	1723.15	100.306229	36.588	14.1566	3.98779	0.668978	0
0.735	1723.15	100.306104	36.588	14.1567	3.98779	0.667737	0
0.74	1723.15	100.305979	36.588	14.1567	3.9878	0.6665	0
0.745	1723.15	100.305855	36.5881	14.1567	3.9878	0.665265	0
0.75	1723.15	100.305731	36.5881	14.1567	3.98781	0.664033	0
0.755	1723.15	100.305608	36.5882	14.1567	3.98781	0.662805	0
0.76	1723.15	100.305485	36.5882	14.1568	3.98782	0.661579	0
0.765	1723.15	100.305362	36.5883	14.1568	3.98782	0.660356	0
0.77	1723.15	100.305239	36.5883	14.1568	3.98783	0.659137	0
0.775	1723.15	100.305117	36.5884	14.1568	3.98783	0.65792	0
0.78	1723.15	100.304994	36.5884	14.1568	3.98784	0.656706	0
0.785	1723.15	100.304873	36.5885	14.1568	3.98784	0.655495	0
0.79	1723.15	100.304751	36.5885	14.1569	3.98785	0.654287	0
0.795	1723.15	100.30463	36.5885	14.1569	3.98785	0.653082	0
0.8	1723.15	100.304509	36.5886	14.1569	3.98786	0.651879	0
0.805	1723.15	100.304388	36.5886	14.1569	3.98786	0.65068	0
0.81	1723.15	100.304268	36.5887	14.1569	3.98787	0.649483	0
0.815	1723.15	100.304148	36.5887	14.1569	3.98787	0.64829	0
0.82	1723.15	100.304028	36.5888	14.157	3.98788	0.647099	0
0.825	1723.15	100.303909	36.5888	14.157	3.98788	0.645911	0
0.83	1723.15	100.30379	36.5888	14.157	3.98789	0.644726	0
0.835	1723.15	100.303671	36.5889	14.157	3.98789	0.643543	0
0.84	1723.15	100.303552	36.5889	14.157	3.98789	0.642364	0
0.845	1723.15	100.303434	36.589	14.157	3.9879	0.641187	0
0.85	1723.15	100.303316	36.589	14.1571	3.9879	0.640014	0
0.855	1723.15	100.303198	36.5891	14.1571	3.98791	0.638843	0
0.86	1723.15	100.303081	36.5891	14.1571	3.98791	0.637674	0
0.865	1723.15	100.302963	36.5891	14.1571	3.98792	0.636509	0
0.87	1723.15	100.302847	36.5892	14.1571	3.98792	0.635346	0
0.875	1723.15	100.30273	36.5892	14.1571	3.98793	0.634186	0
0.88	1723.15	100.302614	36.5893	14.1572	3.98793	0.633029	0
0.885	1723.15	100.302498	36.5893	14.1572	3.98794	0.631875	0
0.89	1723.15	100.302382	36.5894	14.1572	3.98794	0.630724	0
0.895	1723.15	100.302266	36.5894	14.1572	3.98795	0.629575	0
0.9	1723.15	100.302151	36.5894	14.1572	3.98795	0.628429	0
0.905	1723.15	100.302036	36.5895	14.1572	3.98795	0.627285	0
0.91	1723.15	100.301921	36.5895	14.1573	3.98796	0.626145	0
0.915	1723.15	100.301807	36.5896	14.1573	3.98796	0.625007	0
0.92	1723.15	100.301693	36.5896	14.1573	3.98797	0.623872	0
0.925	1723.15	100.301579	36.5897	14.1573	3.98797	0.622739	0
0.93	1723.15	100.301465	36.5897	14.1573	3.98798	0.62161	0
0.935	1723.15	100.301352	36.5897	14.1573	3.98798	0.620483	0
0.94	1723.15	100.301239	36.5898	14.1574	3.98799	0.619358	0
0.945	1723.15	100.301126	36.5898	14.1574	3.98799	0.618236	0
0.95	1723.15	100.301014	36.5899	14.1574	3.988	0.617117	0
0.955	1723.15	100.300901	36.5899	14.1574	3.988	0.616001	0
0.96	1723.15	100.300789	36.5899	14.1574	3.988	0.614887	0

0.965	1723.15	100.300678	36.59	14.1574	3.98801	0.613776	0
0.97	1723.15	100.300566	36.59	14.1574	3.98801	0.612668	0
0.975	1723.15	100.300455	36.5901	14.1575	3.98802	0.611562	0
0.98	1723.15	100.300344	36.5901	14.1575	3.98802	0.610459	0
0.985	1723.15	100.300233	36.5901	14.1575	3.98803	0.609359	0
0.99	1723.15	100.300123	36.5902	14.1575	3.98803	0.608261	0
0.995	1723.15	100.300013	36.5902	14.1575	3.98804	0.607165	0
1	1723.15	100.299903	36.5903	14.1575	3.98804	0.606073	0
1.005	1723.15	100.299793	36.5903	14.1576	3.98804	0.604983	0
1.01	1723.15	100.299684	36.5903	14.1576	3.98805	0.603895	0
1.015	1723.15	100.299575	36.5904	14.1576	3.98805	0.60281	0
1.02	1723.15	100.299466	36.5904	14.1576	3.98806	0.601728	0
1.025	1723.15	100.299358	36.5905	14.1576	3.98806	0.600648	0
1.03	1723.15	100.299249	36.5905	14.1576	3.98807	0.599571	0
1.035	1723.15	100.299141	36.5905	14.1576	3.98807	0.598496	0
1.04	1723.15	100.299033	36.5906	14.1577	3.98807	0.597424	0
1.045	1723.15	100.298926	36.5906	14.1577	3.98808	0.596354	0
1.05	1723.15	100.298819	36.5907	14.1577	3.98808	0.595287	0
1.055	1723.15	100.298712	36.5907	14.1577	3.98809	0.594223	0
1.06	1723.15	100.298605	36.5907	14.1577	3.98809	0.593161	0
1.065	1723.15	100.298498	36.5908	14.1577	3.9881	0.592101	0
1.07	1723.15	100.298392	36.5908	14.1578	3.9881	0.591044	0
1.075	1723.15	100.298286	36.5909	14.1578	3.9881	0.58999	0
1.08	1723.15	100.29818	36.5909	14.1578	3.98811	0.588938	0
1.085	1723.15	100.298075	36.5909	14.1578	3.98811	0.587889	0
1.09	1723.15	100.297969	36.591	14.1578	3.98812	0.586842	0
1.095	1723.15	100.297864	36.591	14.1578	3.98812	0.585797	0
1.1	1723.15	100.29776	36.591	14.1578	3.98812	0.584755	0
1.105	1723.15	100.297655	36.5911	14.1579	3.98813	0.583715	0
1.11	1723.15	100.297551	36.5911	14.1579	3.98813	0.582678	0
1.115	1723.15	100.297447	36.5912	14.1579	3.98814	0.581644	0
1.12	1723.15	100.297343	36.5912	14.1579	3.98814	0.580611	0
1.125	1723.15	100.297239	36.5912	14.1579	3.98815	0.579581	0
1.13	1723.15	100.297136	36.5913	14.1579	3.98815	0.578554	0
1.135	1723.15	100.297033	36.5913	14.1579	3.98815	0.577529	0
1.14	1723.15	100.29693	36.5913	14.158	3.98816	0.576507	0
1.145	1723.15	100.296828	36.5914	14.158	3.98816	0.575487	0
1.15	1723.15	100.296725	36.5914	14.158	3.98817	0.574469	0
1.155	1723.15	100.296623	36.5915	14.158	3.98817	0.573453	0
1.16	1723.15	100.296521	36.5915	14.158	3.98817	0.572441	0
1.165	1723.15	100.29642	36.5915	14.158	3.98818	0.57143	0
1.17	1723.15	100.296318	36.5916	14.158	3.98818	0.570422	0
1.175	1723.15	100.296217	36.5916	14.1581	3.98819	0.569416	0
1.18	1723.15	100.296116	36.5916	14.1581	3.98819	0.568413	0
1.185	1723.15	100.296016	36.5917	14.1581	3.98819	0.567412	0
1.19	1723.15	100.295915	36.5917	14.1581	3.9882	0.566413	0
1.195	1723.15	100.295815	36.5918	14.1581	3.9882	0.565417	0
1.2	1723.15	100.295715	36.5918	14.1581	3.98821	0.564423	0

1.205	1723.15	100.295616	36.5918	14.1581	3.98821	0.563431	0
1.21	1723.15	100.295516	36.5919	14.1582	3.98821	0.562442	0
1.215	1723.15	100.295417	36.5919	14.1582	3.98822	0.561455	0
1.22	1723.15	100.295318	36.5919	14.1582	3.98822	0.56047	0
1.225	1723.15	100.295219	36.592	14.1582	3.98823	0.559488	0
1.23	1723.15	100.295121	36.592	14.1582	3.98823	0.558507	0
1.235	1723.15	100.295022	36.592	14.1582	3.98823	0.55753	0
1.24	1723.15	100.294924	36.5921	14.1582	3.98824	0.556554	0
1.245	1723.15	100.294826	36.5921	14.1583	3.98824	0.555581	0
1.25	1723.15	100.294729	36.5922	14.1583	3.98825	0.55461	0
1.255	1723.15	100.294631	36.5922	14.1583	3.98825	0.553642	0
1.26	1723.15	100.294534	36.5922	14.1583	3.98825	0.552675	0
1.265	1723.15	100.294437	36.5923	14.1583	3.98826	0.551711	0
1.27	1723.15	100.294341	36.5923	14.1583	3.98826	0.550749	0
1.275	1723.15	100.294244	36.5923	14.1583	3.98826	0.54979	0
1.28	1723.15	100.294148	36.5924	14.1584	3.98827	0.548832	0
1.285	1723.15	100.294052	36.5924	14.1584	3.98827	0.547877	0
1.29	1723.15	100.293956	36.5924	14.1584	3.98828	0.546925	0
1.295	1723.15	100.29386	36.5925	14.1584	3.98828	0.545974	0
1.3	1723.15	100.293765	36.5925	14.1584	3.98828	0.545026	0
1.305	1723.15	100.29367	36.5925	14.1584	3.98829	0.544079	0
1.31	1723.15	100.293575	36.5926	14.1584	3.98829	0.543135	0
1.315	1723.15	100.29348	36.5926	14.1584	3.9883	0.542194	0
1.32	1723.15	100.293386	36.5926	14.1585	3.9883	0.541254	0
1.325	1723.15	100.293292	36.5927	14.1585	3.9883	0.540317	0
1.33	1723.15	100.293198	36.5927	14.1585	3.98831	0.539382	0
1.335	1723.15	100.293104	36.5927	14.1585	3.98831	0.538449	0
1.34	1723.15	100.29301	36.5928	14.1585	3.98831	0.537518	0
1.345	1723.15	100.292917	36.5928	14.1585	3.98832	0.536589	0
1.35	1723.15	100.292824	36.5928	14.1585	3.98832	0.535663	0
1.355	1723.15	100.292731	36.5929	14.1586	3.98832	0.534739	0
1.36	1723.15	100.292638	36.5929	14.1586	3.98833	0.533816	0
1.365	1723.15	100.292546	36.5929	14.1586	3.98833	0.532896	0
1.37	1723.15	100.292453	36.593	14.1586	3.98834	0.531979	0
1.375	1723.15	100.292361	36.593	14.1586	3.98834	0.531063	0
1.38	1723.15	100.292269	36.5931	14.1586	3.98834	0.530149	0
1.385	1723.15	100.292178	36.5931	14.1586	3.98835	0.529238	0
1.39	1723.15	100.292086	36.5931	14.1586	3.98835	0.528329	0
1.395	1723.15	100.291995	36.5932	14.1587	3.98835	0.527421	0
1.4	1723.15	100.291904	36.5932	14.1587	3.98836	0.526516	0
1.405	1723.15	100.291813	36.5932	14.1587	3.98836	0.525613	0
1.41	1723.15	100.291723	36.5932	14.1587	3.98837	0.524712	0
1.415	1723.15	100.291632	36.5933	14.1587	3.98837	0.523814	0
1.42	1723.15	100.291542	36.5933	14.1587	3.98837	0.522917	0
1.425	1723.15	100.291452	36.5933	14.1587	3.98838	0.522022	0
1.43	1723.15	100.291363	36.5934	14.1587	3.98838	0.52113	0
1.435	1723.15	100.291273	36.5934	14.1588	3.98838	0.52024	0
1.44	1723.15	100.291184	36.5934	14.1588	3.98839	0.519351	0

1.445	1723.15	100.291095	36.5935	14.1588	3.98839	0.518465	0
1.45	1723.15	100.291006	36.5935	14.1588	3.98839	0.517581	0
1.455	1723.15	100.290917	36.5935	14.1588	3.9884	0.516698	0
1.46	1723.15	100.290829	36.5936	14.1588	3.9884	0.515818	0
1.465	1723.15	100.29074	36.5936	14.1588	3.9884	0.51494	0
1.47	1723.15	100.290652	36.5936	14.1588	3.98841	0.514064	0
1.475	1723.15	100.290564	36.5937	14.1589	3.98841	0.51319	0
1.48	1723.15	100.290477	36.5937	14.1589	3.98841	0.512318	0
1.485	1723.15	100.290389	36.5937	14.1589	3.98842	0.511448	0
1.49	1723.15	100.290302	36.5938	14.1589	3.98842	0.51058	0
1.495	1723.15	100.290215	36.5938	14.1589	3.98842	0.509714	0
1.5	1723.15	100.290128	36.5938	14.1589	3.98843	0.50885	0
1.505	1723.15	100.290042	36.5939	14.1589	3.98843	0.507988	0
1.51	1723.15	100.289955	36.5939	14.1589	3.98844	0.507128	0
1.515	1723.15	100.289869	36.5939	14.159	3.98844	0.50627	0
1.52	1723.15	100.289783	36.594	14.159	3.98844	0.505414	0
1.525	1723.15	100.289697	36.594	14.159	3.98845	0.50456	0
1.53	1723.15	100.289611	36.594	14.159	3.98845	0.503708	0
1.535	1723.15	100.289526	36.5941	14.159	3.98845	0.502858	0
1.54	1723.15	100.289441	36.5941	14.159	3.98846	0.50201	0
1.545	1723.15	100.289356	36.5941	14.159	3.98846	0.501164	0
1.55	1723.15	100.289271	36.5941	14.159	3.98846	0.50032	0
1.555	1723.15	100.289186	36.5942	14.1591	3.98847	0.499478	0
1.56	1723.15	100.289102	36.5942	14.1591	3.98847	0.498638	0
1.565	1723.15	100.289017	36.5942	14.1591	3.98847	0.497799	0
1.57	1723.15	100.288933	36.5943	14.1591	3.98848	0.496963	0
1.575	1723.15	100.288849	36.5943	14.1591	3.98848	0.496128	0
1.58	1723.15	100.288766	36.5943	14.1591	3.98848	0.495296	0
1.585	1723.15	100.288682	36.5944	14.1591	3.98849	0.494465	0
1.59	1723.15	100.288599	36.5944	14.1591	3.98849	0.493637	0
1.595	1723.15	100.288516	36.5944	14.1591	3.98849	0.49281	0
1.6	1723.15	100.288433	36.5945	14.1592	3.9885	0.491985	0
1.605	1723.15	100.28835	36.5945	14.1592	3.9885	0.491162	0
1.61	1723.15	100.288267	36.5945	14.1592	3.9885	0.490341	0
1.615	1723.15	100.288185	36.5945	14.1592	3.98851	0.489522	0
1.62	1723.15	100.288103	36.5946	14.1592	3.98851	0.488705	0
1.625	1723.15	100.288021	36.5946	14.1592	3.98851	0.487889	0
1.63	1723.15	100.287939	36.5946	14.1592	3.98852	0.487076	0
1.635	1723.15	100.287858	36.5947	14.1592	3.98852	0.486264	0
1.64	1723.15	100.287776	36.5947	14.1593	3.98852	0.485454	0
1.645	1723.15	100.287695	36.5947	14.1593	3.98853	0.484646	0
1.65	1723.15	100.287614	36.5947	14.1593	3.98853	0.48384	0
1.655	1723.15	100.287533	36.5948	14.1593	3.98853	0.483036	0
1.66	1723.15	100.287452	36.5948	14.1593	3.98853	0.482234	0
1.665	1723.15	100.287372	36.5948	14.1593	3.98854	0.481433	0
1.67	1723.15	100.287292	36.5949	14.1593	3.98854	0.480634	0
1.675	1723.15	100.287212	36.5949	14.1593	3.98854	0.479837	0
1.68	1723.15	100.287132	36.5949	14.1593	3.98855	0.479042	0

1.685	1723.15	100.287052	36.595	14.1594	3.98855	0.478249	0
1.69	1723.15	100.286972	36.595	14.1594	3.98855	0.477458	0
1.695	1723.15	100.286893	36.595	14.1594	3.98856	0.476668	0
1.7	1723.15	100.286814	36.595	14.1594	3.98856	0.475881	0
1.705	1723.15	100.286735	36.5951	14.1594	3.98856	0.475095	0
1.71	1723.15	100.286656	36.5951	14.1594	3.98857	0.474311	0
1.715	1723.15	100.286577	36.5951	14.1594	3.98857	0.473528	0
1.72	1723.15	100.286499	36.5952	14.1594	3.98857	0.472748	0
1.725	1723.15	100.286421	36.5952	14.1594	3.98858	0.471969	0
1.73	1723.15	100.286343	36.5952	14.1595	3.98858	0.471192	0
1.735	1723.15	100.286265	36.5952	14.1595	3.98858	0.470417	0
1.74	1723.15	100.286187	36.5953	14.1595	3.98859	0.469643	0
1.745	1723.15	100.286109	36.5953	14.1595	3.98859	0.468872	0
1.75	1723.15	100.286032	36.5953	14.1595	3.98859	0.468102	0
1.755	1723.15	100.285955	36.5954	14.1595	3.98859	0.467334	0
1.76	1723.15	100.285878	36.5954	14.1595	3.9886	0.466567	0
1.765	1723.15	100.285801	36.5954	14.1595	3.9886	0.465803	0
1.77	1723.15	100.285724	36.5954	14.1595	3.9886	0.46504	0
1.775	1723.15	100.285648	36.5955	14.1596	3.98861	0.464279	0
1.78	1723.15	100.285571	36.5955	14.1596	3.98861	0.463519	0
1.785	1723.15	100.285495	36.5955	14.1596	3.98861	0.462762	0
1.79	1723.15	100.285419	36.5956	14.1596	3.98862	0.462006	0
1.795	1723.15	100.285343	36.5956	14.1596	3.98862	0.461252	0
1.8	1723.15	100.285268	36.5956	14.1596	3.98862	0.460499	0
1.805	1723.15	100.285192	36.5956	14.1596	3.98862	0.459748	0
1.81	1723.15	100.285117	36.5957	14.1596	3.98863	0.458999	0
1.815	1723.15	100.285042	36.5957	14.1596	3.98863	0.458252	0
1.82	1723.15	100.284967	36.5957	14.1596	3.98863	0.457506	0
1.825	1723.15	100.284892	36.5957	14.1597	3.98864	0.456763	0
1.83	1723.15	100.284817	36.5958	14.1597	3.98864	0.45602	0
1.835	1723.15	100.284743	36.5958	14.1597	3.98864	0.45528	0
1.84	1723.15	100.284669	36.5958	14.1597	3.98865	0.454541	0
1.845	1723.15	100.284595	36.5959	14.1597	3.98865	0.453804	0
1.85	1723.15	100.284521	36.5959	14.1597	3.98865	0.453068	0
1.855	1723.15	100.284447	36.5959	14.1597	3.98865	0.452335	0
1.86	1723.15	100.284373	36.5959	14.1597	3.98866	0.451602	0
1.865	1723.15	100.2843	36.596	14.1597	3.98866	0.450872	0
1.87	1723.15	100.284227	36.596	14.1598	3.98866	0.450143	0
1.875	1723.15	100.284154	36.596	14.1598	3.98867	0.449416	0
1.88	1723.15	100.284081	36.596	14.1598	3.98867	0.448691	0
1.885	1723.15	100.284008	36.5961	14.1598	3.98867	0.447967	0
1.89	1723.15	100.283935	36.5961	14.1598	3.98867	0.447244	0
1.895	1723.15	100.283863	36.5961	14.1598	3.98868	0.446524	0
1.9	1723.15	100.283791	36.5961	14.1598	3.98868	0.445805	0
1.905	1723.15	100.283718	36.5962	14.1598	3.98868	0.445088	0
1.91	1723.15	100.283647	36.5962	14.1598	3.98869	0.444372	0
1.915	1723.15	100.283575	36.5962	14.1598	3.98869	0.443658	0
1.92	1723.15	100.283503	36.5962	14.1599	3.98869	0.442946	0

1.925	1723.15	100.283432	36.5963	14.1599	3.98869	0.442235	0
1.93	1723.15	100.28336	36.5963	14.1599	3.9887	0.441526	0
1.935	1723.15	100.283289	36.5963	14.1599	3.9887	0.440818	0
1.94	1723.15	100.283218	36.5964	14.1599	3.9887	0.440112	0
1.945	1723.15	100.283148	36.5964	14.1599	3.98871	0.439408	0
1.95	1723.15	100.283077	36.5964	14.1599	3.98871	0.438705	0
1.955	1723.15	100.283006	36.5964	14.1599	3.98871	0.438004	0
1.96	1723.15	100.282936	36.5965	14.1599	3.98871	0.437304	0
1.965	1723.15	100.282866	36.5965	14.1599	3.98872	0.436606	0
1.97	1723.15	100.282796	36.5965	14.16	3.98872	0.43591	0
1.975	1723.15	100.282726	36.5965	14.16	3.98872	0.435215	0
1.98	1723.15	100.282656	36.5966	14.16	3.98873	0.434522	0
1.985	1723.15	100.282587	36.5966	14.16	3.98873	0.43383	0
1.99	1723.15	100.282518	36.5966	14.16	3.98873	0.43314	0
1.995	1723.15	100.282448	36.5966	14.16	3.98873	0.432451	0
2	1723.15	100.282379	36.5967	14.16	3.98874	0.431764	0
2.005	1723.15	100.28231	36.5967	14.16	3.98874	0.431079	0
2.01	1723.15	100.282242	36.5967	14.16	3.98874	0.430395	0
2.015	1723.15	100.282173	36.5967	14.16	3.98874	0.429712	0
2.02	1723.15	100.282105	36.5968	14.1601	3.98875	0.429032	0
2.025	1723.15	100.282036	36.5968	14.1601	3.98875	0.428352	0
2.03	1723.15	100.281968	36.5968	14.1601	3.98875	0.427675	0
2.035	1723.15	100.2819	36.5968	14.1601	3.98876	0.426998	0
2.04	1723.15	100.281832	36.5969	14.1601	3.98876	0.426324	0
2.045	1723.15	100.281765	36.5969	14.1601	3.98876	0.42565	0
2.05	1723.15	100.281697	36.5969	14.1601	3.98876	0.424979	0
2.055	1723.15	100.28163	36.5969	14.1601	3.98877	0.424309	0
2.06	1723.15	100.281563	36.597	14.1601	3.98877	0.42364	0
2.065	1723.15	100.281496	36.597	14.1601	3.98877	0.422973	0
2.07	1723.15	100.281429	36.597	14.1601	3.98877	0.422307	0
2.075	1723.15	100.281362	36.597	14.1602	3.98878	0.421643	0
2.08	1723.15	100.281295	36.5971	14.1602	3.98878	0.420981	0
2.085	1723.15	100.281229	36.5971	14.1602	3.98878	0.420319	0
2.09	1723.15	100.281163	36.5971	14.1602	3.98879	0.41966	0
2.095	1723.15	100.281096	36.5971	14.1602	3.98879	0.419002	0
2.1	1723.15	100.28103	36.5972	14.1602	3.98879	0.418345	0
2.105	1723.15	100.280965	36.5972	14.1602	3.98879	0.41769	0
2.11	1723.15	100.280899	36.5972	14.1602	3.9888	0.417036	0
2.115	1723.15	100.280833	36.5972	14.1602	3.9888	0.416384	0
2.12	1723.15	100.280768	36.5972	14.1602	3.9888	0.415733	0
2.125	1723.15	100.280703	36.5973	14.1603	3.9888	0.415084	0
2.13	1723.15	100.280637	36.5973	14.1603	3.98881	0.414436	0
2.135	1723.15	100.280573	36.5973	14.1603	3.98881	0.413789	0
2.14	1723.15	100.280508	36.5973	14.1603	3.98881	0.413144	0
2.145	1723.15	100.280443	36.5974	14.1603	3.98881	0.412501	0
2.15	1723.15	100.280378	36.5974	14.1603	3.98882	0.411859	0
2.155	1723.15	100.280314	36.5974	14.1603	3.98882	0.411218	0
2.16	1723.15	100.28025	36.5974	14.1603	3.98882	0.410579	0

2.165	1723.15	100.280186	36.5975	14.1603	3.98882	0.409941	0
2.17	1723.15	100.280122	36.5975	14.1603	3.98883	0.409305	0
2.175	1723.15	100.280058	36.5975	14.1603	3.98883	0.40867	0
2.18	1723.15	100.279994	36.5975	14.1604	3.98883	0.408036	0
2.185	1723.15	100.279931	36.5976	14.1604	3.98883	0.407404	0
2.19	1723.15	100.279867	36.5976	14.1604	3.98884	0.406774	0
2.195	1723.15	100.279804	36.5976	14.1604	3.98884	0.406144	0
2.2	1723.15	100.279741	36.5976	14.1604	3.98884	0.405517	0
2.205	1723.15	100.279678	36.5976	14.1604	3.98884	0.40489	0
2.21	1723.15	100.279615	36.5977	14.1604	3.98885	0.404265	0
2.215	1723.15	100.279553	36.5977	14.1604	3.98885	0.403642	0
2.22	1723.15	100.27949	36.5977	14.1604	3.98885	0.403019	0
2.225	1723.15	100.279428	36.5977	14.1604	3.98885	0.402399	0
2.23	1723.15	100.279365	36.5978	14.1604	3.98886	0.401779	0
2.235	1723.15	100.279303	36.5978	14.1604	3.98886	0.401161	0
2.24	1723.15	100.279241	36.5978	14.1605	3.98886	0.400544	0
2.245	1723.15	100.279179	36.5978	14.1605	3.98886	0.399929	0
2.25	1723.15	100.279118	36.5978	14.1605	3.98887	0.399315	0
2.255	1723.15	100.279056	36.5979	14.1605	3.98887	0.398703	0
2.26	1723.15	100.278995	36.5979	14.1605	3.98887	0.398092	0
2.265	1723.15	100.278933	36.5979	14.1605	3.98887	0.397482	0
2.27	1723.15	100.278872	36.5979	14.1605	3.98888	0.396873	0
2.275	1723.15	100.278811	36.598	14.1605	3.98888	0.396266	0
2.28	1723.15	100.27875	36.598	14.1605	3.98888	0.39566	0
2.285	1723.15	100.27869	36.598	14.1605	3.98888	0.395056	0
2.29	1723.15	100.278629	36.598	14.1605	3.98889	0.394453	0
2.295	1723.15	100.278569	36.5981	14.1606	3.98889	0.393851	0
2.3	1723.15	100.278508	36.5981	14.1606	3.98889	0.393251	0
2.305	1723.15	100.278448	36.5981	14.1606	3.98889	0.392652	0
2.31	1723.15	100.278388	36.5981	14.1606	3.9889	0.392054	0
2.315	1723.15	100.278328	36.5981	14.1606	3.9889	0.391458	0
2.32	1723.15	100.278268	36.5982	14.1606	3.9889	0.390863	0
2.325	1723.15	100.278209	36.5982	14.1606	3.9889	0.390269	0
2.33	1723.15	100.278149	36.5982	14.1606	3.9889	0.389677	0
2.335	1723.15	100.27809	36.5982	14.1606	3.98891	0.389086	0
2.34	1723.15	100.27803	36.5982	14.1606	3.98891	0.388496	0
2.345	1723.15	100.277971	36.5983	14.1606	3.98891	0.387908	0
2.35	1723.15	100.277912	36.5983	14.1606	3.98891	0.387321	0
2.355	1723.15	100.277853	36.5983	14.1607	3.98892	0.386735	0
2.36	1723.15	100.277795	36.5983	14.1607	3.98892	0.38615	0
2.365	1723.15	100.277736	36.5984	14.1607	3.98892	0.385567	0
2.37	1723.15	100.277677	36.5984	14.1607	3.98892	0.384985	0
2.375	1723.15	100.277619	36.5984	14.1607	3.98893	0.384404	0
2.38	1723.15	100.277561	36.5984	14.1607	3.98893	0.383825	0
2.385	1723.15	100.277503	36.5984	14.1607	3.98893	0.383247	0
2.39	1723.15	100.277445	36.5985	14.1607	3.98893	0.38267	0
2.395	1723.15	100.277387	36.5985	14.1607	3.98894	0.382095	0
2.4	1723.15	100.277329	36.5985	14.1607	3.98894	0.381521	0

2.405	1723.15	100.277272	36.5985	14.1607	3.98894	0.380948	0
2.41	1723.15	100.277214	36.5985	14.1607	3.98894	0.380376	0
2.415	1723.15	100.277157	36.5986	14.1608	3.98894	0.379806	0
2.42	1723.15	100.2771	36.5986	14.1608	3.98895	0.379237	0
2.425	1723.15	100.277043	36.5986	14.1608	3.98895	0.378669	0
2.43	1723.15	100.276986	36.5986	14.1608	3.98895	0.378102	0
2.435	1723.15	100.276929	36.5986	14.1608	3.98895	0.377537	0
2.44	1723.15	100.276872	36.5987	14.1608	3.98896	0.376973	0
2.445	1723.15	100.276816	36.5987	14.1608	3.98896	0.37641	0
2.45	1723.15	100.276759	36.5987	14.1608	3.98896	0.375848	0
2.455	1723.15	100.276703	36.5987	14.1608	3.98896	0.375288	0
2.46	1723.15	100.276647	36.5988	14.1608	3.98896	0.374729	0
2.465	1723.15	100.276591	36.5988	14.1608	3.98897	0.374171	0
2.47	1723.15	100.276535	36.5988	14.1608	3.98897	0.373614	0
2.475	1723.15	100.276479	36.5988	14.1608	3.98897	0.373059	0
2.48	1723.15	100.276423	36.5988	14.1609	3.98897	0.372505	0
2.485	1723.15	100.276368	36.5989	14.1609	3.98898	0.371952	0
2.49	1723.15	100.276312	36.5989	14.1609	3.98898	0.3714	0
2.495	1723.15	100.276257	36.5989	14.1609	3.98898	0.370849	0
2.5	1723.15	100.276202	36.5989	14.1609	3.98898	0.3703	0
2.505	1723.15	100.276146	36.5989	14.1609	3.98898	0.369752	0
2.51	1723.15	100.276092	36.599	14.1609	3.98899	0.369205	0
2.515	1723.15	100.276037	36.599	14.1609	3.98899	0.36866	0
2.52	1723.15	100.275982	36.599	14.1609	3.98899	0.368115	0
2.525	1723.15	100.275927	36.599	14.1609	3.98899	0.367572	0
2.53	1723.15	100.275873	36.599	14.1609	3.989	0.36703	0
2.535	1723.15	100.275819	36.5991	14.1609	3.989	0.366489	0
2.54	1723.15	100.275764	36.5991	14.1609	3.989	0.365949	0
2.545	1723.15	100.27571	36.5991	14.161	3.989	0.365411	0
2.55	1723.15	100.275656	36.5991	14.161	3.989	0.364873	0
2.555	1723.15	100.275602	36.5991	14.161	3.98901	0.364337	0
2.56	1723.15	100.275549	36.5992	14.161	3.98901	0.363802	0
2.565	1723.15	100.275495	36.5992	14.161	3.98901	0.363269	0
2.57	1723.15	100.275441	36.5992	14.161	3.98901	0.362736	0
2.575	1723.15	100.275388	36.5992	14.161	3.98901	0.362205	0
2.58	1723.15	100.275335	36.5992	14.161	3.98902	0.361674	0
2.585	1723.15	100.275281	36.5992	14.161	3.98902	0.361145	0
2.59	1723.15	100.275228	36.5993	14.161	3.98902	0.360617	0
2.595	1723.15	100.275175	36.5993	14.161	3.98902	0.360091	0
2.6	1723.15	100.275123	36.5993	14.161	3.98903	0.359565	0
2.605	1723.15	100.27507	36.5993	14.161	3.98903	0.359041	0
2.61	1723.15	100.275017	36.5993	14.1611	3.98903	0.358517	0
2.615	1723.15	100.274965	36.5994	14.1611	3.98903	0.357995	0
2.62	1723.15	100.274913	36.5994	14.1611	3.98903	0.357474	0
2.625	1723.15	100.27486	36.5994	14.1611	3.98904	0.356954	0
2.63	1723.15	100.274808	36.5994	14.1611	3.98904	0.356436	0
2.635	1723.15	100.274756	36.5994	14.1611	3.98904	0.355918	0
2.64	1723.15	100.274704	36.5995	14.1611	3.98904	0.355402	0

2.645	1723.15	100.274652	36.5995	14.1611	3.98904	0.354887	0
2.65	1723.15	100.274601	36.5995	14.1611	3.98905	0.354372	0
2.655	1723.15	100.274549	36.5995	14.1611	3.98905	0.353859	0
2.66	1723.15	100.274498	36.5995	14.1611	3.98905	0.353348	0
2.665	1723.15	100.274446	36.5996	14.1611	3.98905	0.352837	0
2.67	1723.15	100.274395	36.5996	14.1611	3.98905	0.352327	0
2.675	1723.15	100.274344	36.5996	14.1611	3.98906	0.351819	0
2.68	1723.15	100.274293	36.5996	14.1612	3.98906	0.351311	0
2.685	1723.15	100.274242	36.5996	14.1612	3.98906	0.350805	0
2.69	1723.15	100.274191	36.5996	14.1612	3.98906	0.3503	0
2.695	1723.15	100.274141	36.5997	14.1612	3.98906	0.349796	0
2.7	1723.15	100.27409	36.5997	14.1612	3.98907	0.349293	0
2.705	1723.15	100.27404	36.5997	14.1612	3.98907	0.348791	0
2.71	1723.15	100.27399	36.5997	14.1612	3.98907	0.34829	0
2.715	1723.15	100.273939	36.5997	14.1612	3.98907	0.34779	0
2.72	1723.15	100.273889	36.5998	14.1612	3.98907	0.347292	0
2.725	1723.15	100.273839	36.5998	14.1612	3.98908	0.346794	0
2.73	1723.15	100.273789	36.5998	14.1612	3.98908	0.346298	0
2.735	1723.15	100.27374	36.5998	14.1612	3.98908	0.345802	0
2.74	1723.15	100.27369	36.5998	14.1612	3.98908	0.345308	0
2.745	1723.15	100.27364	36.5998	14.1612	3.98908	0.344815	0
2.75	1723.15	100.273591	36.5999	14.1613	3.98909	0.344323	0
2.755	1723.15	100.273541	36.5999	14.1613	3.98909	0.343832	0
2.76	1723.15	100.273492	36.5999	14.1613	3.98909	0.343342	0
2.765	1723.15	100.273443	36.5999	14.1613	3.98909	0.342853	0
2.77	1723.15	100.273394	36.5999	14.1613	3.98909	0.342365	0
2.775	1723.15	100.273345	36.6	14.1613	3.9891	0.341879	0
2.78	1723.15	100.273296	36.6	14.1613	3.9891	0.341393	0
2.785	1723.15	100.189083	36.5974	14.1732	3.97361	0.341051	0
2.79	1723.15	99.985613	36.5913	14.202	3.93608	0.340912	0
2.795	1723.15	99.784235	36.5851	14.2307	3.89879	0.340771	0
2.8	1723.15	99.584929	36.5791	14.2592	3.86173	0.340627	0
2.805	1723.15	99.387675	36.573	14.2875	3.82492	0.340482	0
2.81	1723.15	99.192453	36.567	14.3156	3.78834	0.340334	0
2.815	1723.15	98.999244	36.5611	14.3435	3.752	0.340185	0
2.82	1723.15	98.808028	36.5552	14.3713	3.7159	0.340033	0
2.825	1723.15	98.618786	36.5493	14.3989	3.68004	0.339879	0
2.83	1723.15	98.431499	36.5435	14.4263	3.64442	0.339723	0
2.835	1723.15	98.246149	36.5378	14.4535	3.60904	0.339564	0
2.84	1723.15	98.062717	36.532	14.4805	3.5739	0.339404	0
2.845	1723.15	97.881185	36.5264	14.5074	3.53899	0.339242	0
2.85	1723.15	97.701534	36.5207	14.5341	3.50432	0.339078	0
2.855	1723.15	97.523748	36.5151	14.5606	3.46989	0.338911	0
2.86	1723.15	97.347808	36.5096	14.5869	3.43569	0.338743	0
2.865	1723.15	97.173697	36.5041	14.613	3.40174	0.338572	0
2.87	1723.15	97.001398	36.4986	14.639	3.36801	0.3384	0
2.875	1723.15	96.830894	36.4932	14.6647	3.33453	0.338226	0
2.88	1723.15	96.662168	36.4879	14.6903	3.30128	0.338049	0

2.885	1723.15	96.495203	36.4825	14.7158	3.26827	0.337871	0
2.89	1723.15	96.329984	36.4773	14.741	3.23549	0.337691	0
2.895	1723.15	96.166493	36.472	14.7661	3.20295	0.337509	0
2.9	1723.15	95.914686	36.4933	14.8048	3.16921	0.337197	0
2.905	1723.15	95.629156	36.5253	14.849	3.13518	0.336831	0
2.91	1723.15	95.346978	36.5574	14.893	3.10146	0.336462	0
2.915	1723.15	95.068101	36.5895	14.9367	3.06804	0.336091	0
2.92	1723.15	94.792471	36.6216	14.9801	3.03492	0.335716	0
2.925	1723.15	94.520039	36.6536	15.0233	3.00211	0.335339	0
2.93	1723.15	94.250753	36.6857	15.0662	2.96959	0.33496	0
2.935	1723.15	93.984566	36.7178	15.1089	2.93737	0.334578	0
2.94	1723.15	93.721428	36.7499	15.1513	2.90545	0.334194	0
2.945	1723.15	93.461293	36.7819	15.1935	2.87382	0.333807	0
2.95	1723.15	93.204116	36.814	15.2354	2.84248	0.333417	0
2.955	1723.15	92.949849	36.8461	15.2771	2.81143	0.333025	0
2.96	1723.15	92.69845	36.8782	15.3185	2.78068	0.332631	0
2.965	1723.15	92.449875	36.9102	15.3597	2.7502	0.332234	0
2.97	1723.15	92.204081	36.9423	15.4006	2.72002	0.331835	0
2.975	1723.15	91.961025	36.9744	15.4413	2.69011	0.331433	0
2.98	1723.15	91.720668	37.0064	15.4818	2.66049	0.331029	0
2.985	1723.15	91.482969	37.0385	15.522	2.63115	0.330623	0
2.99	1723.15	91.247887	37.0705	15.562	2.60208	0.330214	0
2.995	1723.15	91.015385	37.1026	15.6018	2.5733	0.329803	0
3	1723.15	90.785424	37.1346	15.6413	2.54478	0.32939	0
3.005	1723.15	90.557967	37.1667	15.6806	2.51654	0.328974	0
3.01	1723.15	90.332976	37.1987	15.7196	2.48857	0.328557	0
3.015	1723.15	90.110417	37.2308	15.7584	2.46087	0.328137	0
3.02	1723.15	89.890253	37.2628	15.797	2.43344	0.327715	0
3.025	1723.15	89.67245	37.2948	15.8354	2.40627	0.327291	0
3.03	1723.15	89.456974	37.3268	15.8736	2.37936	0.326864	0
3.035	1723.15	89.24379	37.3589	15.9115	2.35272	0.326436	0
3.04	1723.15	89.032867	37.3909	15.9492	2.32634	0.326005	0
3.045	1723.15	88.824171	37.4229	15.9866	2.30021	0.325573	0
3.05	1723.15	88.617671	37.4549	16.0239	2.27435	0.325138	0
3.055	1723.15	88.413335	37.4869	16.0609	2.24874	0.324701	0
3.06	1723.15	88.211133	37.5189	16.0977	2.22338	0.324263	0
3.065	1723.15	88.011035	37.5508	16.1343	2.19827	0.323822	0
3.07	1723.15	87.813011	37.5828	16.1707	2.17341	0.323379	0
3.075	1723.15	87.617031	37.6148	16.2069	2.1488	0.322935	0
3.08	1723.15	87.423068	37.6467	16.2429	2.12444	0.322488	0
3.085	1723.15	87.231092	37.6787	16.2786	2.10032	0.32204	0
3.09	1723.15	87.041076	37.7106	16.3141	2.07645	0.32159	0
3.095	1723.15	86.852993	37.7425	16.3495	2.05281	0.321138	0
3.1	1723.15	86.666817	37.7745	16.3846	2.02941	0.320684	0
3.105	1723.15	86.48252	37.8064	16.4195	2.00626	0.320228	0
3.11	1723.15	86.300076	37.8383	16.4542	1.98333	0.319771	0
3.115	1723.15	86.119461	37.8702	16.4887	1.96064	0.319312	0
3.12	1723.15	85.940649	37.9021	16.523	1.93819	0.318851	0

3.125	1723.15	85.763616	37.9339	16.5571	1.91596	0.318388	0
3.13	1723.15	85.588336	37.9658	16.591	1.89396	0.317924	0
3.135	1723.15	85.414787	37.9976	16.6248	1.87219	0.317458	0
3.14	1723.15	85.242945	38.0295	16.6583	1.85065	0.31699	0
3.145	1723.15	85.072787	38.0613	16.6916	1.82933	0.316521	0
3.15	1723.15	84.904289	38.0931	16.7247	1.80823	0.31605	0
3.155	1723.15	84.73743	38.1249	16.7576	1.78735	0.315577	0
3.16	1723.15	84.572187	38.1567	16.7904	1.76668	0.315103	0
3.165	1723.15	84.40854	38.1885	16.8229	1.74624	0.314628	0
3.17	1723.15	84.246465	38.2203	16.8553	1.72601	0.31415	0
3.175	1723.15	84.085943	38.252	16.8875	1.70599	0.313672	0
3.18	1723.15	83.926953	38.2838	16.9195	1.68619	0.313192	0
3.185	1723.15	83.769474	38.3155	16.9513	1.66659	0.31271	0
3.19	1723.15	83.613486	38.3472	16.9829	1.6472	0.312227	0
3.195	1723.15	83.45897	38.3789	17.0143	1.62802	0.311742	0
3.2	1723.15	83.305906	38.4106	17.0456	1.60905	0.311256	0
3.205	1723.15	83.154275	38.4422	17.0767	1.59027	0.310769	0
3.21	1723.15	82.828717	38.4613	17.1431	1.57683	0.310196	0
3.215	1723.15	82.520497	38.4815	17.2065	1.5631	0.309627	0
3.22	1723.15	82.215776	38.5017	17.2697	1.54949	0.309057	0
3.225	1723.15	81.914503	38.522	17.3326	1.536	0.308484	0
3.23	1723.15	81.616626	38.5423	17.3952	1.52263	0.30791	0
3.235	1723.15	81.322092	38.5627	17.4576	1.50938	0.307335	0
3.24	1723.15	81.030853	38.5832	17.5198	1.49624	0.306757	0
3.245	1723.15	80.74286	38.6037	17.5816	1.48322	0.306178	0
3.25	1723.15	80.458065	38.6243	17.6433	1.47032	0.305598	0
3.255	1723.15	80.176421	38.6449	17.7047	1.45753	0.305016	0
3.26	1723.15	79.897882	38.6656	17.7658	1.44485	0.304432	0
3.265	1723.15	79.622403	38.6863	17.8267	1.43229	0.303847	0
3.27	1723.15	79.349939	38.7071	17.8873	1.41984	0.303261	0
3.275	1723.15	79.080446	38.728	17.9477	1.4075	0.302673	0
3.28	1723.15	78.813882	38.7489	18.0078	1.39527	0.302085	0
3.285	1723.15	78.550204	38.7699	18.0677	1.38315	0.301495	0
3.29	1723.15	78.28937	38.7909	18.1273	1.37113	0.300904	0
3.295	1723.15	78.03134	38.812	18.1866	1.35923	0.300311	0
3.3	1723.15	77.776072	38.8331	18.2458	1.34743	0.299718	0
3.305	1723.15	77.523528	38.8543	18.3046	1.33574	0.299124	0
3.31	1723.15	77.273669	38.8756	18.3633	1.32416	0.298528	0
3.315	1723.15	77.026455	38.8968	18.4217	1.31268	0.297932	0
3.32	1723.15	76.781848	38.9182	18.4798	1.3013	0.297335	0
3.325	1723.15	76.539812	38.9396	18.5377	1.29003	0.296737	0
3.33	1723.15	76.30031	38.961	18.5953	1.27886	0.296138	0
3.335	1723.15	76.063305	38.9825	18.6527	1.26779	0.295539	0
3.34	1723.15	75.828761	39.004	18.7099	1.25682	0.294939	0
3.345	1723.15	75.596644	39.0256	18.7668	1.24595	0.294338	0
3.35	1723.15	75.366919	39.0472	18.8235	1.23518	0.293736	0
3.355	1723.15	75.139552	39.0688	18.8799	1.22451	0.293134	0
3.36	1723.15	74.914509	39.0905	18.9361	1.21393	0.292531	0

3.365	1723.15	74.691758	39.1123	18.992	1.20346	0.291928	0
3.37	1723.15	74.471265	39.1341	19.0478	1.19308	0.291324	0
3.375	1723.15	74.253	39.1559	19.1032	1.18279	0.290719	0
3.38	1723.15	74.03693	39.1777	19.1585	1.1726	0.290115	0
3.385	1723.15	73.823024	39.1996	19.2135	1.1625	0.289509	0
3.39	1723.15	73.611253	39.2216	19.2683	1.15249	0.288904	0
3.395	1723.15	73.401585	39.2436	19.3228	1.14258	0.288297	0
3.4	1723.15	73.193992	39.2656	19.3771	1.13276	0.287691	0
3.405	1723.15	72.988445	39.2876	19.4312	1.12303	0.287084	0
3.41	1723.15	72.784915	39.3097	19.485	1.11338	0.286477	0
3.415	1723.15	72.583374	39.3318	19.5387	1.10383	0.28587	0
3.42	1723.15	72.383794	39.354	19.5921	1.09437	0.285262	0
3.425	1723.15	72.186148	39.3762	19.6452	1.08499	0.284655	0
3.43	1723.15	71.99041	39.3984	19.6982	1.0757	0.284047	0
3.435	1723.15	71.796552	39.4207	19.7509	1.06649	0.283438	0
3.44	1723.15	71.60455	39.4429	19.8034	1.05737	0.28283	0
3.445	1723.15	71.414378	39.4653	19.8557	1.04834	0.282222	0
3.45	1723.15	71.226011	39.4876	19.9077	1.03939	0.281613	0
3.455	1723.15	71.039424	39.51	19.9595	1.03052	0.281005	0
3.46	1723.15	70.854592	39.5324	20.0112	1.02173	0.280396	0
3.465	1723.15	70.671493	39.5548	20.0626	1.01302	0.279787	0
3.47	1723.15	70.490103	39.5772	20.1137	1.0044	0.279178	0
3.475	1723.15	70.310399	39.5997	20.1647	0.995856	0.27857	0
3.48	1723.15	70.132358	39.6222	20.2155	0.987391	0.277961	0
3.485	1723.15	69.955957	39.6448	20.266	0.979004	0.277352	0
3.49	1723.15	69.781176	39.6673	20.3163	0.970696	0.276744	0
3.495	1723.15	69.607992	39.6899	20.3664	0.962464	0.276135	0
3.5	1723.15	69.436384	39.7125	20.4164	0.954309	0.275526	0
3.505	1723.15	69.266332	39.7351	20.4661	0.94623	0.274918	0
3.51	1723.15	69.097814	39.7577	20.5156	0.938226	0.27431	0
3.515	1723.15	68.930812	39.7804	20.5648	0.930296	0.273702	0
3.52	1723.15	68.765304	39.8031	20.6139	0.92244	0.273094	0
3.525	1723.15	68.601272	39.8258	20.6628	0.914657	0.272486	0
3.53	1723.15	68.438696	39.8485	20.7115	0.906946	0.271878	0
3.535	1723.15	68.277557	39.8713	20.76	0.899307	0.271271	0
3.54	1723.15	68.117838	39.894	20.8082	0.891739	0.270663	0
3.545	1723.15	67.959519	39.9168	20.8563	0.884241	0.270056	0
3.55	1723.15	67.802583	39.9396	20.9042	0.876813	0.26945	0
3.555	1723.15	67.647012	39.9624	20.9519	0.869454	0.268843	0
3.56	1723.15	67.492788	39.9852	20.9994	0.862163	0.268237	0
3.565	1723.15	67.339895	40.008	21.0467	0.85494	0.267631	0
3.57	1723.15	67.188316	40.0309	21.0938	0.847785	0.267025	0
3.575	1723.15	67.038035	40.0538	21.1407	0.840695	0.26642	0
3.58	1723.15	66.889034	40.0766	21.1874	0.833672	0.265815	0
3.585	1723.15	66.741298	40.0995	21.2339	0.826714	0.26521	0
3.59	1723.15	66.594811	40.1224	21.2803	0.81982	0.264606	0
3.595	1723.15	66.449559	40.1454	21.3264	0.81299	0.264001	0
3.6	1723.15	66.305524	40.1683	21.3724	0.806224	0.263398	0

3.605	1723.15	66.162693	40.1912	21.4182	0.799521	0.262795	0
3.61	1723.15	66.021051	40.2142	21.4637	0.792879	0.262192	0
3.615	1723.15	65.880583	40.2371	21.5092	0.7863	0.261589	0
3.62	1723.15	65.741275	40.2601	21.5544	0.779781	0.260987	0
3.625	1723.15	65.603113	40.283	21.5994	0.773322	0.260385	0
3.63	1723.15	65.466082	40.306	21.6443	0.766924	0.259784	0
3.635	1723.15	65.33017	40.329	21.689	0.760585	0.259183	0
3.64	1723.15	65.195363	40.352	21.7335	0.754304	0.258583	0
3.645	1723.15	65.061648	40.375	21.7778	0.748081	0.257983	0
3.65	1723.15	64.929011	40.398	21.822	0.741917	0.257383	0
3.655	1723.15	64.79744	40.421	21.8659	0.735809	0.256784	0
3.66	1723.15	64.666922	40.444	21.9097	0.729757	0.256186	0
3.665	1723.15	64.537445	40.4671	21.9534	0.723761	0.255588	0
3.67	1723.15	64.408997	40.4901	21.9968	0.717821	0.254991	0
3.675	1723.15	64.281566	40.5131	22.0401	0.711936	0.254394	0
3.68	1723.15	64.155139	40.5361	22.0832	0.706105	0.253797	0
3.685	1723.15	64.029706	40.5592	22.1262	0.700327	0.253201	0
3.69	1723.15	63.905254	40.5822	22.1689	0.694603	0.252606	0
3.695	1723.15	63.781772	40.6052	22.2115	0.688931	0.252011	0
3.7	1723.15	63.65925	40.6283	22.254	0.683312	0.251417	0
3.705	1723.15	63.537676	40.6513	22.2962	0.677745	0.250823	0
3.71	1723.15	63.417039	40.6744	22.3383	0.672228	0.25023	0
3.715	1723.15	63.297329	40.6974	22.3803	0.666762	0.249637	0
3.72	1723.15	63.178536	40.7204	22.4221	0.661347	0.249045	0
3.725	1723.15	63.060648	40.7435	22.4637	0.655981	0.248454	0
3.73	1723.15	62.943656	40.7665	22.5051	0.650664	0.247863	0
3.735	1723.15	62.82755	40.7895	22.5464	0.645396	0.247273	0
3.74	1723.15	62.71232	40.8126	22.5876	0.640177	0.246683	0
3.745	1723.15	62.597956	40.8356	22.6285	0.635005	0.246094	0
3.75	1723.15	62.484449	40.8586	22.6694	0.62988	0.245506	0
3.755	1723.15	62.371789	40.8817	22.71	0.624802	0.244918	0
3.76	1723.15	62.259967	40.9047	22.7505	0.619771	0.244331	0
3.765	1723.15	62.148974	40.9277	22.7909	0.614785	0.243745	0
3.77	1723.15	62.0388	40.9507	22.8311	0.609845	0.243159	0
3.775	1723.15	61.929437	40.9737	22.8711	0.604951	0.242574	0
3.78	1723.15	61.820876	40.9967	22.911	0.6001	0.24199	0
3.785	1723.15	61.713109	41.0197	22.9507	0.595294	0.241406	0
3.79	1723.15	61.606126	41.0427	22.9903	0.590531	0.240823	0
3.795	1723.15	61.49992	41.0657	23.0298	0.585812	0.240241	0
3.8	1723.15	61.394482	41.0887	23.069	0.581136	0.239659	0
3.805	1723.15	61.289804	41.1116	23.1082	0.576502	0.239078	0
3.81	1723.15	61.185878	41.1346	23.1472	0.57191	0.238498	0
3.815	1723.15	61.082696	41.1575	23.186	0.567359	0.237918	0
3.82	1723.15	60.98025	41.1805	23.2247	0.56285	0.237339	0
3.825	1723.15	60.878533	41.2034	23.2632	0.558382	0.236761	0
3.83	1723.15	60.777537	41.2264	23.3016	0.553954	0.236184	0
3.835	1723.15	60.677254	41.2493	23.3399	0.549566	0.235607	0
3.84	1723.15	60.577677	41.2722	23.378	0.545217	0.235031	0

3.845	1723.15	60.478799	41.2951	23.416	0.540908	0.234456	0
3.85	1723.15	60.380613	41.318	23.4538	0.536637	0.233881	0
3.855	1723.15	60.283111	41.3409	23.4915	0.532405	0.233307	0
3.86	1723.15	60.186287	41.3637	23.5291	0.528211	0.232734	0
3.865	1723.15	60.090133	41.3866	23.5665	0.524055	0.232162	0
3.87	1723.15	59.994643	41.4094	23.6037	0.519936	0.231591	0
3.875	1723.15	59.89981	41.4323	23.6409	0.515854	0.23102	0
3.88	1723.15	59.805627	41.4551	23.6779	0.511808	0.23045	0
3.885	1723.15	59.712089	41.4779	23.7147	0.507799	0.229881	0
3.89	1723.15	59.619188	41.5007	23.7514	0.503826	0.229312	0
3.895	1723.15	59.526918	41.5235	23.788	0.499888	0.228745	0
3.9	1723.15	59.435273	41.5463	23.8245	0.495985	0.228178	0
3.905	1723.15	59.344246	41.569	23.8608	0.492117	0.227612	0
3.91	1723.15	59.253833	41.5918	23.897	0.488283	0.227046	0
3.915	1723.15	59.164026	41.6145	23.933	0.484484	0.226482	0
3.92	1723.15	59.074819	41.6372	23.9689	0.480718	0.225918	0
3.925	1723.15	58.986208	41.6599	24.0047	0.476986	0.225355	0
3.93	1723.15	58.898185	41.6826	24.0404	0.473287	0.224793	0
3.935	1723.15	58.810746	41.7053	24.0759	0.46962	0.224232	0
3.94	1723.15	58.723885	41.728	24.1113	0.465987	0.223671	0
3.945	1723.15	58.637595	41.7506	24.1466	0.462385	0.223112	0
3.95	1723.15	58.551872	41.7732	24.1817	0.458815	0.222553	0
3.955	1723.15	58.466711	41.7958	24.2167	0.455277	0.221995	0
3.96	1723.15	58.382105	41.8184	24.2516	0.45177	0.221438	0
3.965	1723.15	58.29805	41.841	24.2863	0.448294	0.220881	0
3.97	1723.15	58.214541	41.8636	24.321	0.444848	0.220326	0
3.975	1723.15	58.131571	41.8861	24.3555	0.441433	0.219771	0
3.98	1723.15	58.049137	41.9087	24.3899	0.438048	0.219217	0
3.985	1723.15	57.967233	41.9312	24.4241	0.434692	0.218664	0
3.99	1723.15	57.885854	41.9537	24.4583	0.431366	0.218112	0
3.995	1723.15	57.804996	41.9761	24.4923	0.428069	0.217561	0
4	1723.15	57.724653	41.9986	24.5262	0.424801	0.217011	0

weight percent concentration of oxides

FeO	MnO	MgO	NiO	CaO	Na2O	K2O	P2O5	FeOT
31.4524	0	3.96761	0	9.12151	0	0	0	32.10887
31.4524	0	3.96761	0	9.12151	0	0	0	32.10887
31.4537	0	3.96761	0	9.12153	0	0	0	32.10892
31.455	0	3.96762	0	9.12154	0	0	0	32.10898
31.4563	0	3.96763	0	9.12155	0	0	0	32.10903
31.4575	0	3.96763	0	9.12156	0	0	0	32.10899
31.4588	0	3.96764	0	9.12158	0	0	0	32.10906
31.4601	0	3.96764	0	9.12159	0	0	0	32.10913
31.4614	0	3.96765	0	9.1216	0	0	0	32.1092
31.4626	0	3.96765	0	9.12161	0	0	0	32.10917
31.4639	0	3.96766	0	9.12163	0	0	0	32.10924
31.4652	0	3.96766	0	9.12164	0	0	0	32.10932
31.4664	0	3.96767	0	9.12165	0	0	0	32.10931
31.4677	0	3.96767	0	9.12166	0	0	0	32.10939
31.4689	0	3.96768	0	9.12168	0	0	0	32.10938
31.4702	0	3.96768	0	9.12169	0	0	0	32.10947
31.4715	0	3.96769	0	9.1217	0	0	0	32.10956
31.4727	0	3.9677	0	9.12171	0	0	0	32.10956
31.4739	0	3.9677	0	9.12172	0	0	0	32.10956
31.4752	0	3.96771	0	9.12174	0	0	0	32.10966
31.4764	0	3.96771	0	9.12175	0	0	0	32.10967
31.4777	0	3.96772	0	9.12176	0	0	0	32.10977
31.4789	0	3.96772	0	9.12177	0	0	0	32.10979
31.4801	0	3.96773	0	9.12178	0	0	0	32.1098
31.4813	0	3.96773	0	9.1218	0	0	0	32.10982
31.4826	0	3.96774	0	9.12181	0	0	0	32.10994
31.4838	0	3.96774	0	9.12182	0	0	0	32.10996
31.485	0	3.96775	0	9.12183	0	0	0	32.10998
31.4862	0	3.96775	0	9.12184	0	0	0	32.11001
31.4874	0	3.96776	0	9.12186	0	0	0	32.11004
31.4886	0	3.96776	0	9.12187	0	0	0	32.11008
31.4898	0	3.96777	0	9.12188	0	0	0	32.11011
31.491	0	3.96777	0	9.12189	0	0	0	32.11015
31.4922	0	3.96778	0	9.1219	0	0	0	32.1102
31.4934	0	3.96778	0	9.12192	0	0	0	32.11024
31.4946	0	3.96779	0	9.12193	0	0	0	32.11029
31.4958	0	3.96779	0	9.12194	0	0	0	32.11034
31.497	0	3.9678	0	9.12195	0	0	0	32.11039
31.4982	0	3.9678	0	9.12196	0	0	0	32.11045
31.4994	0	3.96781	0	9.12197	0	0	0	32.11051
31.5005	0	3.96781	0	9.12199	0	0	0	32.11047
31.5017	0	3.96782	0	9.122	0	0	0	32.11054
31.5029	0	3.96782	0	9.12201	0	0	0	32.1106
31.5041	0	3.96783	0	9.12202	0	0	0	32.11067
31.5052	0	3.96783	0	9.12203	0	0	0	32.11065
31.5064	0	3.96784	0	9.12204	0	0	0	32.11072

31.5076	0	3.96784	0	9.12205	0	0	0	32.1108
31.5087	0	3.96785	0	9.12207	0	0	0	32.11078
31.5099	0	3.96785	0	9.12208	0	0	0	32.11086
31.511	0	3.96786	0	9.12209	0	0	0	32.11085
31.5122	0	3.96786	0	9.1221	0	0	0	32.11094
31.5133	0	3.96787	0	9.12211	0	0	0	32.11093
31.5145	0	3.96787	0	9.12212	0	0	0	32.11102
31.5156	0	3.96788	0	9.12213	0	0	0	32.11102
31.5167	0	3.96788	0	9.12214	0	0	0	32.11102
31.5179	0	3.96789	0	9.12216	0	0	0	32.11112
31.519	0	3.96789	0	9.12217	0	0	0	32.11113
31.5202	0	3.9679	0	9.12218	0	0	0	32.11124
31.5213	0	3.9679	0	9.12219	0	0	0	32.11125
31.5224	0	3.96791	0	9.1222	0	0	0	32.11126
31.5235	0	3.96791	0	9.12221	0	0	0	32.11127
31.5246	0	3.96792	0	9.12222	0	0	0	32.11129
31.5258	0	3.96792	0	9.12223	0	0	0	32.11141
31.5269	0	3.96793	0	9.12224	0	0	0	32.11143
31.528	0	3.96793	0	9.12225	0	0	0	32.11146
31.5291	0	3.96794	0	9.12227	0	0	0	32.11149
31.5302	0	3.96794	0	9.12228	0	0	0	32.11152
31.5313	0	3.96795	0	9.12229	0	0	0	32.11155
31.5324	0	3.96795	0	9.1223	0	0	0	32.11159
31.5335	0	3.96796	0	9.12231	0	0	0	32.11163
31.5346	0	3.96796	0	9.12232	0	0	0	32.11167
31.5357	0	3.96796	0	9.12233	0	0	0	32.11171
31.5368	0	3.96797	0	9.12234	0	0	0	32.11176
31.5379	0	3.96797	0	9.12235	0	0	0	32.11181
31.539	0	3.96798	0	9.12236	0	0	0	32.11186
31.5401	0	3.96798	0	9.12237	0	0	0	32.11191
31.5411	0	3.96799	0	9.12238	0	0	0	32.11187
31.5422	0	3.96799	0	9.12239	0	0	0	32.11193
31.5433	0	3.968	0	9.1224	0	0	0	32.11199
31.5444	0	3.968	0	9.12242	0	0	0	32.11205
31.5454	0	3.96801	0	9.12243	0	0	0	32.11202
31.5465	0	3.96801	0	9.12244	0	0	0	32.11209
31.5476	0	3.96802	0	9.12245	0	0	0	32.11216
31.5486	0	3.96802	0	9.12246	0	0	0	32.11213
31.5497	0	3.96802	0	9.12247	0	0	0	32.11221
31.5508	0	3.96803	0	9.12248	0	0	0	32.11228
31.5518	0	3.96803	0	9.12249	0	0	0	32.11227
31.5529	0	3.96804	0	9.1225	0	0	0	32.11235
31.5539	0	3.96804	0	9.12251	0	0	0	32.11233
31.555	0	3.96805	0	9.12252	0	0	0	32.11242
31.556	0	3.96805	0	9.12253	0	0	0	32.11241
31.557	0	3.96806	0	9.12254	0	0	0	32.11241
31.5581	0	3.96806	0	9.12255	0	0	0	32.1125
31.5591	0	3.96806	0	9.12256	0	0	0	32.1125

31.5602	0	3.96807	0	9.12257	0	0	0	32.1126
31.5612	0	3.96807	0	9.12258	0	0	0	32.1126
31.5622	0	3.96808	0	9.12259	0	0	0	32.11261
31.5633	0	3.96808	0	9.1226	0	0	0	32.11271
31.5643	0	3.96809	0	9.12261	0	0	0	32.11272
31.5653	0	3.96809	0	9.12262	0	0	0	32.11273
31.5663	0	3.9681	0	9.12263	0	0	0	32.11275
31.5673	0	3.9681	0	9.12264	0	0	0	32.11277
31.5684	0	3.9681	0	9.12265	0	0	0	32.11288
31.5694	0	3.96811	0	9.12266	0	0	0	32.11291
31.5704	0	3.96811	0	9.12267	0	0	0	32.11293
31.5714	0	3.96812	0	9.12268	0	0	0	32.11296
31.5724	0	3.96812	0	9.12269	0	0	0	32.11298
31.5734	0	3.96813	0	9.1227	0	0	0	32.11301
31.5744	0	3.96813	0	9.12271	0	0	0	32.11305
31.5754	0	3.96813	0	9.12272	0	0	0	32.11308
31.5764	0	3.96814	0	9.12273	0	0	0	32.11312
31.5774	0	3.96814	0	9.12274	0	0	0	32.11316
31.5784	0	3.96815	0	9.12275	0	0	0	32.1132
31.5794	0	3.96815	0	9.12276	0	0	0	32.11324
31.5804	0	3.96816	0	9.12277	0	0	0	32.11329
31.5813	0	3.96816	0	9.12278	0	0	0	32.11324
31.5823	0	3.96816	0	9.12279	0	0	0	32.11329
31.5833	0	3.96817	0	9.1228	0	0	0	32.11334
31.5843	0	3.96817	0	9.12281	0	0	0	32.1134
31.5853	0	3.96818	0	9.12282	0	0	0	32.11346
31.5862	0	3.96818	0	9.12283	0	0	0	32.11342
31.5872	0	3.96818	0	9.12284	0	0	0	32.11348
31.5882	0	3.96819	0	9.12285	0	0	0	32.11354
31.5891	0	3.96819	0	9.12285	0	0	0	32.11351
31.5901	0	3.9682	0	9.12286	0	0	0	32.11358
31.5911	0	3.9682	0	9.12287	0	0	0	32.11365
31.592	0	3.9682	0	9.12288	0	0	0	32.11362
31.593	0	3.96821	0	9.12289	0	0	0	32.1137
31.5939	0	3.96821	0	9.1229	0	0	0	32.11368
31.5949	0	3.96822	0	9.12291	0	0	0	32.11376
31.5958	0	3.96822	0	9.12292	0	0	0	32.11374
31.5968	0	3.96823	0	9.12293	0	0	0	32.11382
31.5977	0	3.96823	0	9.12294	0	0	0	32.11381
31.5987	0	3.96823	0	9.12295	0	0	0	32.1139
31.5996	0	3.96824	0	9.12296	0	0	0	32.11389
31.6006	0	3.96824	0	9.12297	0	0	0	32.11398
31.6015	0	3.96825	0	9.12298	0	0	0	32.11397
31.6024	0	3.96825	0	9.12298	0	0	0	32.11397
31.6034	0	3.96825	0	9.12299	0	0	0	32.11407
31.6043	0	3.96826	0	9.123	0	0	0	32.11407
31.6052	0	3.96826	0	9.12301	0	0	0	32.11408
31.6062	0	3.96827	0	9.12302	0	0	0	32.11418

31.6071	0	3.96827	0	9.12303	0	0	0	32.11419
31.608	0	3.96827	0	9.12304	0	0	0	32.1142
31.6089	0	3.96828	0	9.12305	0	0	0	32.11421
31.6098	0	3.96828	0	9.12306	0	0	0	32.11422
31.6108	0	3.96828	0	9.12307	0	0	0	32.11434
31.6117	0	3.96829	0	9.12308	0	0	0	32.11436
31.6126	0	3.96829	0	9.12308	0	0	0	32.11438
31.6135	0	3.9683	0	9.12309	0	0	0	32.1144
31.6144	0	3.9683	0	9.1231	0	0	0	32.11442
31.6153	0	3.9683	0	9.12311	0	0	0	32.11445
31.6162	0	3.96831	0	9.12312	0	0	0	32.11448
31.6171	0	3.96831	0	9.12313	0	0	0	32.11451
31.618	0	3.96832	0	9.12314	0	0	0	32.11454
31.6189	0	3.96832	0	9.12315	0	0	0	32.11457
31.6198	0	3.96832	0	9.12316	0	0	0	32.11461
31.6207	0	3.96833	0	9.12316	0	0	0	32.11465
31.6216	0	3.96833	0	9.12317	0	0	0	32.11469
31.6225	0	3.96833	0	9.12318	0	0	0	32.11473
31.6234	0	3.96834	0	9.12319	0	0	0	32.11478
31.6242	0	3.96834	0	9.1232	0	0	0	32.11472
31.6251	0	3.96835	0	9.12321	0	0	0	32.11477
31.626	0	3.96835	0	9.12322	0	0	0	32.11482
31.6269	0	3.96835	0	9.12322	0	0	0	32.11487
31.6278	0	3.96836	0	9.12323	0	0	0	32.11493
31.6286	0	3.96836	0	9.12324	0	0	0	32.11489
31.6295	0	3.96836	0	9.12325	0	0	0	32.11494
31.6304	0	3.96837	0	9.12326	0	0	0	32.115
31.6312	0	3.96837	0	9.12327	0	0	0	32.11497
31.6321	0	3.96838	0	9.12328	0	0	0	32.11503
31.633	0	3.96838	0	9.12328	0	0	0	32.1151
31.6338	0	3.96838	0	9.12329	0	0	0	32.11507
31.6347	0	3.96839	0	9.1233	0	0	0	32.11513
31.6355	0	3.96839	0	9.12331	0	0	0	32.11511
31.6364	0	3.96839	0	9.12332	0	0	0	32.11518
31.6373	0	3.9684	0	9.12333	0	0	0	32.11526
31.6381	0	3.9684	0	9.12333	0	0	0	32.11523
31.639	0	3.96841	0	9.12334	0	0	0	32.11531
31.6398	0	3.96841	0	9.12335	0	0	0	32.1153
31.6406	0	3.96841	0	9.12336	0	0	0	32.11528
31.6415	0	3.96842	0	9.12337	0	0	0	32.11536
31.6423	0	3.96842	0	9.12338	0	0	0	32.11535
31.6432	0	3.96842	0	9.12338	0	0	0	32.11544
31.644	0	3.96843	0	9.12339	0	0	0	32.11543
31.6448	0	3.96843	0	9.1234	0	0	0	32.11543
31.6457	0	3.96843	0	9.12341	0	0	0	32.11552
31.6465	0	3.96844	0	9.12342	0	0	0	32.11552
31.6473	0	3.96844	0	9.12343	0	0	0	32.11552
31.6482	0	3.96844	0	9.12343	0	0	0	32.11562

31.649	0	3.96845	0	9.12344	0	0	0	32.11562
31.6498	0	3.96845	0	9.12345	0	0	0	32.11562
31.6506	0	3.96846	0	9.12346	0	0	0	32.11563
31.6515	0	3.96846	0	9.12347	0	0	0	32.11574
31.6523	0	3.96846	0	9.12347	0	0	0	32.11575
31.6531	0	3.96847	0	9.12348	0	0	0	32.11576
31.6539	0	3.96847	0	9.12349	0	0	0	32.11577
31.6547	0	3.96847	0	9.1235	0	0	0	32.11579
31.6555	0	3.96848	0	9.12351	0	0	0	32.1158
31.6563	0	3.96848	0	9.12351	0	0	0	32.11582
31.6571	0	3.96848	0	9.12352	0	0	0	32.11584
31.658	0	3.96849	0	9.12353	0	0	0	32.11597
31.6588	0	3.96849	0	9.12354	0	0	0	32.11599
31.6596	0	3.96849	0	9.12355	0	0	0	32.11602
31.6604	0	3.9685	0	9.12355	0	0	0	32.11604
31.6612	0	3.9685	0	9.12356	0	0	0	32.11607
31.662	0	3.9685	0	9.12357	0	0	0	32.1161
31.6627	0	3.96851	0	9.12358	0	0	0	32.11604
31.6635	0	3.96851	0	9.12358	0	0	0	32.11607
31.6643	0	3.96851	0	9.12359	0	0	0	32.11611
31.6651	0	3.96852	0	9.1236	0	0	0	32.11615
31.6659	0	3.96852	0	9.12361	0	0	0	32.11619
31.6667	0	3.96852	0	9.12362	0	0	0	32.11623
31.6675	0	3.96853	0	9.12362	0	0	0	32.11627
31.6683	0	3.96853	0	9.12363	0	0	0	32.11632
31.669	0	3.96853	0	9.12364	0	0	0	32.11627
31.6698	0	3.96854	0	9.12365	0	0	0	32.11632
31.6706	0	3.96854	0	9.12365	0	0	0	32.11637
31.6714	0	3.96854	0	9.12366	0	0	0	32.11642
31.6721	0	3.96855	0	9.12367	0	0	0	32.11637
31.6729	0	3.96855	0	9.12368	0	0	0	32.11643
31.6737	0	3.96855	0	9.12368	0	0	0	32.11649
31.6744	0	3.96856	0	9.12369	0	0	0	32.11645
31.6752	0	3.96856	0	9.1237	0	0	0	32.11651
31.676	0	3.96856	0	9.12371	0	0	0	32.11657
31.6767	0	3.96857	0	9.12371	0	0	0	32.11653
31.6775	0	3.96857	0	9.12372	0	0	0	32.1166
31.6782	0	3.96857	0	9.12373	0	0	0	32.11657
31.679	0	3.96858	0	9.12374	0	0	0	32.11664
31.6798	0	3.96858	0	9.12374	0	0	0	32.11671
31.6805	0	3.96858	0	9.12375	0	0	0	32.11668
31.6813	0	3.96859	0	9.12376	0	0	0	32.11676
31.682	0	3.96859	0	9.12377	0	0	0	32.11673
31.6828	0	3.96859	0	9.12377	0	0	0	32.11681
31.6835	0	3.9686	0	9.12378	0	0	0	32.11679
31.6843	0	3.9686	0	9.12379	0	0	0	32.11687
31.685	0	3.9686	0	9.1238	0	0	0	32.11685
31.6857	0	3.9686	0	9.1238	0	0	0	32.11684

31.6865	0	3.96861	0	9.12381	0	0	0	32.11692
31.6872	0	3.96861	0	9.12382	0	0	0	32.11691
31.6879	0	3.96861	0	9.12382	0	0	0	32.1169
31.6887	0	3.96862	0	9.12383	0	0	0	32.11699
31.6894	0	3.96862	0	9.12384	0	0	0	32.11699
31.6901	0	3.96862	0	9.12385	0	0	0	32.11698
31.6909	0	3.96863	0	9.12385	0	0	0	32.11708
31.6916	0	3.96863	0	9.12386	0	0	0	32.11707
31.6923	0	3.96863	0	9.12387	0	0	0	32.11707
31.6931	0	3.96864	0	9.12387	0	0	0	32.11717
31.6938	0	3.96864	0	9.12388	0	0	0	32.11718
31.6945	0	3.96864	0	9.12389	0	0	0	32.11718
31.6952	0	3.96865	0	9.1239	0	0	0	32.11718
31.6959	0	3.96865	0	9.1239	0	0	0	32.11719
31.6966	0	3.96865	0	9.12391	0	0	0	32.1172
31.6974	0	3.96865	0	9.12392	0	0	0	32.11731
31.6981	0	3.96866	0	9.12392	0	0	0	32.11732
31.6988	0	3.96866	0	9.12393	0	0	0	32.11734
31.6995	0	3.96866	0	9.12394	0	0	0	32.11735
31.7002	0	3.96867	0	9.12394	0	0	0	32.11737
31.7009	0	3.96867	0	9.12395	0	0	0	32.11739
31.7016	0	3.96867	0	9.12396	0	0	0	32.11741
31.7023	0	3.96868	0	9.12396	0	0	0	32.11743
31.703	0	3.96868	0	9.12397	0	0	0	32.11745
31.7037	0	3.96868	0	9.12398	0	0	0	32.11747
31.7044	0	3.96868	0	9.12399	0	0	0	32.1175
31.7051	0	3.96869	0	9.12399	0	0	0	32.11753
31.7058	0	3.96869	0	9.124	0	0	0	32.11756
31.7065	0	3.96869	0	9.12401	0	0	0	32.11759
31.7072	0	3.9687	0	9.12401	0	0	0	32.11762
31.7079	0	3.9687	0	9.12402	0	0	0	32.11765
31.7086	0	3.9687	0	9.12403	0	0	0	32.11769
31.7093	0	3.96871	0	9.12403	0	0	0	32.11772
31.7099	0	3.96871	0	9.12404	0	0	0	32.11766
31.7106	0	3.96871	0	9.12405	0	0	0	32.1177
31.7113	0	3.96871	0	9.12405	0	0	0	32.11774
31.712	0	3.96872	0	9.12406	0	0	0	32.11778
31.7127	0	3.96872	0	9.12407	0	0	0	32.11783
31.7133	0	3.96872	0	9.12407	0	0	0	32.11777
31.714	0	3.96873	0	9.12408	0	0	0	32.11782
31.7147	0	3.96873	0	9.12409	0	0	0	32.11787
31.7154	0	3.96873	0	9.12409	0	0	0	32.11792
31.716	0	3.96873	0	9.1241	0	0	0	32.11787
31.7167	0	3.96874	0	9.12411	0	0	0	32.11792
31.7174	0	3.96874	0	9.12411	0	0	0	32.11798
31.718	0	3.96874	0	9.12412	0	0	0	32.11793
31.7187	0	3.96875	0	9.12413	0	0	0	32.11799
31.7194	0	3.96875	0	9.12413	0	0	0	32.11805

31.72	0	3.96875	0	9.12414	0	0	0	32.11801
31.7207	0	3.96875	0	9.12415	0	0	0	32.11807
31.7214	0	3.96876	0	9.12415	0	0	0	32.11814
31.722	0	3.96876	0	9.12416	0	0	0	32.1181
31.7227	0	3.96876	0	9.12416	0	0	0	32.11817
31.7233	0	3.96877	0	9.12417	0	0	0	32.11813
31.724	0	3.96877	0	9.12418	0	0	0	32.1182
31.7246	0	3.96877	0	9.12418	0	0	0	32.11817
31.7253	0	3.96877	0	9.12419	0	0	0	32.11825
31.7259	0	3.96878	0	9.1242	0	0	0	32.11822
31.7266	0	3.96878	0	9.1242	0	0	0	32.11829
31.7272	0	3.96878	0	9.12421	0	0	0	32.11827
31.7279	0	3.96878	0	9.12422	0	0	0	32.11835
31.7285	0	3.96879	0	9.12422	0	0	0	32.11833
31.7292	0	3.96879	0	9.12423	0	0	0	32.11841
31.7298	0	3.96879	0	9.12423	0	0	0	32.11839
31.7304	0	3.9688	0	9.12424	0	0	0	32.11837
31.7311	0	3.9688	0	9.12425	0	0	0	32.11846
31.7317	0	3.9688	0	9.12425	0	0	0	32.11844
31.7323	0	3.9688	0	9.12426	0	0	0	32.11843
31.733	0	3.96881	0	9.12427	0	0	0	32.11852
31.7336	0	3.96881	0	9.12427	0	0	0	32.11851
31.7342	0	3.96881	0	9.12428	0	0	0	32.1185
31.7349	0	3.96881	0	9.12428	0	0	0	32.11859
31.7355	0	3.96882	0	9.12429	0	0	0	32.11859
31.7361	0	3.96882	0	9.1243	0	0	0	32.11858
31.7367	0	3.96882	0	9.1243	0	0	0	32.11858
31.7374	0	3.96883	0	9.12431	0	0	0	32.11868
31.738	0	3.96883	0	9.12432	0	0	0	32.11868
31.7386	0	3.96883	0	9.12432	0	0	0	32.11868
31.7392	0	3.96883	0	9.12433	0	0	0	32.11868
31.7398	0	3.96884	0	9.12433	0	0	0	32.11868
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31.7411	0	3.96884	0	9.12435	0	0	0	32.11879
31.7417	0	3.96884	0	9.12435	0	0	0	32.1188
31.7423	0	3.96885	0	9.12436	0	0	0	32.11881
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31.7447	0	3.96886	0	9.12438	0	0	0	32.11886
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31.7459	0	3.96886	0	9.12439	0	0	0	32.11889
31.7465	0	3.96886	0	9.1244	0	0	0	32.11891
31.7472	0	3.96887	0	9.1244	0	0	0	32.11903
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31.7483	0	3.96887	0	9.12442	0	0	0	32.11897
31.7489	0	3.96887	0	9.12442	0	0	0	32.119
31.7495	0	3.96888	0	9.12443	0	0	0	32.11902

31.7501	0	3.96888	0	9.12443	0	0	0	32.11905
31.7507	0	3.96888	0	9.12444	0	0	0	32.11907
31.7513	0	3.96888	0	9.12445	0	0	0	32.1191
31.7519	0	3.96889	0	9.12445	0	0	0	32.11913
31.7525	0	3.96889	0	9.12446	0	0	0	32.11916
31.7531	0	3.96889	0	9.12446	0	0	0	32.1192
31.7537	0	3.96889	0	9.12447	0	0	0	32.11923
31.7543	0	3.9689	0	9.12447	0	0	0	32.11927
31.7548	0	3.9689	0	9.12448	0	0	0	32.1192
31.7554	0	3.9689	0	9.12449	0	0	0	32.11924
31.756	0	3.9689	0	9.12449	0	0	0	32.11928
31.7566	0	3.96891	0	9.1245	0	0	0	32.11932
31.7572	0	3.96891	0	9.1245	0	0	0	32.11936
31.7577	0	3.96891	0	9.12451	0	0	0	32.1193
31.7583	0	3.96891	0	9.12451	0	0	0	32.11934
31.7589	0	3.96892	0	9.12452	0	0	0	32.11939
31.7595	0	3.96892	0	9.12453	0	0	0	32.11944
31.76	0	3.96892	0	9.12453	0	0	0	32.11938
31.7606	0	3.96892	0	9.12454	0	0	0	32.11943
31.7612	0	3.96893	0	9.12454	0	0	0	32.11948
31.7617	0	3.96893	0	9.12455	0	0	0	32.11943
31.7623	0	3.96893	0	9.12455	0	0	0	32.11949
31.7629	0	3.96893	0	9.12456	0	0	0	32.11954
31.7634	0	3.96894	0	9.12456	0	0	0	32.11949
31.764	0	3.96894	0	9.12457	0	0	0	32.11955
31.7646	0	3.96894	0	9.12458	0	0	0	32.11961
31.7651	0	3.96894	0	9.12458	0	0	0	32.11957
31.7657	0	3.96895	0	9.12459	0	0	0	32.11963
31.7663	0	3.96895	0	9.12459	0	0	0	32.11969
31.7668	0	3.96895	0	9.1246	0	0	0	32.11965
31.7674	0	3.96895	0	9.1246	0	0	0	32.11971
31.7679	0	3.96896	0	9.12461	0	0	0	32.11968
31.7685	0	3.96896	0	9.12461	0	0	0	32.11974
31.769	0	3.96896	0	9.12462	0	0	0	32.11971
31.7696	0	3.96896	0	9.12462	0	0	0	32.11978
31.7701	0	3.96897	0	9.12463	0	0	0	32.11975
31.7707	0	3.96897	0	9.12464	0	0	0	32.11982
31.7712	0	3.96897	0	9.12464	0	0	0	32.11979
31.7718	0	3.96897	0	9.12465	0	0	0	32.11986
31.7723	0	3.96897	0	9.12465	0	0	0	32.11984
31.7729	0	3.96898	0	9.12466	0	0	0	32.11991
31.7734	0	3.96898	0	9.12466	0	0	0	32.11989
31.7739	0	3.96898	0	9.12467	0	0	0	32.11986
31.7745	0	3.96898	0	9.12467	0	0	0	32.11994
31.775	0	3.96899	0	9.12468	0	0	0	32.11992
31.7756	0	3.96899	0	9.12468	0	0	0	32.12
31.7761	0	3.96899	0	9.12469	0	0	0	32.11999
31.7766	0	3.96899	0	9.12469	0	0	0	32.11997

31.7772	0	3.969	0	9.1247	0	0	0	32.12005
31.7777	0	3.969	0	9.1247	0	0	0	32.12004
31.7782	0	3.969	0	9.12471	0	0	0	32.12003
31.7788	0	3.969	0	9.12472	0	0	0	32.12011
31.7793	0	3.969	0	9.12472	0	0	0	32.1201
31.7798	0	3.96901	0	9.12473	0	0	0	32.12009
31.7803	0	3.96901	0	9.12473	0	0	0	32.12008
31.7809	0	3.96901	0	9.12474	0	0	0	32.12018
31.7814	0	3.96901	0	9.12474	0	0	0	32.12017
31.7819	0	3.96902	0	9.12475	0	0	0	32.12016
31.7824	0	3.96902	0	9.12475	0	0	0	32.12016
31.783	0	3.96902	0	9.12476	0	0	0	32.12026
31.7835	0	3.96902	0	9.12476	0	0	0	32.12025
31.784	0	3.96902	0	9.12477	0	0	0	32.12025
31.7845	0	3.96903	0	9.12477	0	0	0	32.12025
31.785	0	3.96903	0	9.12478	0	0	0	32.12025
31.7855	0	3.96903	0	9.12478	0	0	0	32.12026
31.7861	0	3.96903	0	9.12479	0	0	0	32.12036
31.7866	0	3.96904	0	9.12479	0	0	0	32.12036
31.7871	0	3.96904	0	9.1248	0	0	0	32.12037
31.7876	0	3.96904	0	9.1248	0	0	0	32.12038
31.7881	0	3.96904	0	9.12481	0	0	0	32.12038
31.7886	0	3.96904	0	9.12481	0	0	0	32.12039
31.7891	0	3.96905	0	9.12482	0	0	0	32.1204
31.7896	0	3.96905	0	9.12482	0	0	0	32.12041
31.7901	0	3.96905	0	9.12483	0	0	0	32.12043
31.7906	0	3.96905	0	9.12483	0	0	0	32.12044
31.7911	0	3.96905	0	9.12484	0	0	0	32.12045
31.7916	0	3.96906	0	9.12484	0	0	0	32.12047
31.7921	0	3.96906	0	9.12485	0	0	0	32.12049
31.7926	0	3.96906	0	9.12485	0	0	0	32.1205
31.7931	0	3.96906	0	9.12486	0	0	0	32.12052
31.7936	0	3.96907	0	9.12486	0	0	0	32.12054
31.7941	0	3.96907	0	9.12487	0	0	0	32.12056
31.7946	0	3.96907	0	9.12487	0	0	0	32.12058
31.7951	0	3.96907	0	9.12488	0	0	0	32.12061
31.7956	0	3.96907	0	9.12488	0	0	0	32.12063
31.7961	0	3.96908	0	9.12489	0	0	0	32.12066
31.7966	0	3.96908	0	9.12489	0	0	0	32.12068
31.7971	0	3.96908	0	9.12489	0	0	0	32.12071
31.7976	0	3.96908	0	9.1249	0	0	0	32.12074
31.7981	0	3.96908	0	9.1249	0	0	0	32.12077
31.7986	0	3.96909	0	9.12491	0	0	0	32.1208
31.799	0	3.96909	0	9.12491	0	0	0	32.12073
31.7995	0	3.96909	0	9.12492	0	0	0	32.12076
31.8	0	3.96909	0	9.12492	0	0	0	32.12079
31.8005	0	3.96909	0	9.12493	0	0	0	32.12083
31.801	0	3.9691	0	9.12493	0	0	0	32.12086

31.8014	0	3.9691	0	9.12494	0	0	0	32.1208
31.8019	0	3.9691	0	9.12494	0	0	0	32.12083
31.8024	0	3.9691	0	9.12495	0	0	0	32.12087
31.8029	0	3.9691	0	9.12495	0	0	0	32.12091
31.8034	0	3.96911	0	9.12496	0	0	0	32.12095
31.8038	0	3.96911	0	9.12496	0	0	0	32.12089
31.8043	0	3.96911	0	9.12497	0	0	0	32.12094
31.8048	0	3.96911	0	9.12497	0	0	0	32.12098
31.8053	0	3.96912	0	9.12498	0	0	0	32.12102
31.8057	0	3.96912	0	9.12498	0	0	0	32.12097
31.8062	0	3.96912	0	9.12498	0	0	0	32.12102
31.8067	0	3.96912	0	9.12499	0	0	0	32.12106
31.8071	0	3.96912	0	9.12499	0	0	0	32.12101
31.8076	0	3.96913	0	9.125	0	0	0	32.12106
31.8081	0	3.96913	0	9.125	0	0	0	32.12111
31.8085	0	3.96913	0	9.12501	0	0	0	32.12106
31.809	0	3.96913	0	9.12501	0	0	0	32.12111
31.8095	0	3.96913	0	9.12502	0	0	0	32.12117
31.8099	0	3.96913	0	9.12502	0	0	0	32.12112
31.8104	0	3.96914	0	9.12503	0	0	0	32.12118
31.8108	0	3.96914	0	9.12503	0	0	0	32.12113
31.8113	0	3.96914	0	9.12503	0	0	0	32.12119
31.8118	0	3.96914	0	9.12504	0	0	0	32.12125
31.8122	0	3.96914	0	9.12504	0	0	0	32.12121
31.8127	0	3.96915	0	9.12505	0	0	0	32.12127
31.8131	0	3.96915	0	9.12505	0	0	0	32.12123
31.8136	0	3.96915	0	9.12506	0	0	0	32.12129
31.814	0	3.96915	0	9.12506	0	0	0	32.12125
31.8235	0	3.96442	0	9.12683	0	0	0	32.13045
31.8456	0	3.95298	0	9.13109	0	0	0	32.15242
31.8676	0	3.94164	0	9.13532	0	0	0	32.17429
31.8895	0	3.93041	0	9.13951	0	0	0	32.19606
31.9112	0	3.91927	0	9.14366	0	0	0	32.21763
31.9327	0	3.90823	0	9.14777	0	0	0	32.239
31.954	0	3.8973	0	9.15185	0	0	0	32.26017
31.9752	0	3.88646	0	9.15589	0	0	0	32.28123
31.9963	0	3.87572	0	9.15989	0	0	0	32.30219
32.0171	0	3.86507	0	9.16385	0	0	0	32.32285
32.0378	0	3.85452	0	9.16778	0	0	0	32.34341
32.0584	0	3.84407	0	9.17167	0	0	0	32.36386
32.0788	0	3.83371	0	9.17553	0	0	0	32.38412
32.099	0	3.82345	0	9.17934	0	0	0	32.40417
32.1191	0	3.81328	0	9.18313	0	0	0	32.42412
32.139	0	3.80321	0	9.18688	0	0	0	32.44387
32.1588	0	3.79322	0	9.19059	0	0	0	32.46351
32.1784	0	3.78333	0	9.19427	0	0	0	32.48296
32.1978	0	3.77353	0	9.19791	0	0	0	32.5022
32.2171	0	3.76383	0	9.20152	0	0	0	32.52134

32.2363	0	3.75421	0	9.20509	0	0	0	32.54038
32.2553	0	3.74468	0	9.20863	0	0	0	32.55922
32.2741	0	3.73524	0	9.21214	0	0	0	32.57786
32.2451	0	3.72754	0	9.22285	0	0	0	32.54858
32.1965	0	3.72061	0	9.23647	0	0	0	32.49965
32.1479	0	3.71377	0	9.25003	0	0	0	32.45072
32.0992	0	3.70701	0	9.26353	0	0	0	32.40168
32.0504	0	3.70033	0	9.27697	0	0	0	32.35254
32.0016	0	3.69374	0	9.29035	0	0	0	32.30341
31.9526	0	3.68723	0	9.30367	0	0	0	32.25406
31.9037	0	3.68081	0	9.31694	0	0	0	32.20482
31.8546	0	3.67446	0	9.33015	0	0	0	32.15537
31.8055	0	3.6682	0	9.3433	0	0	0	32.10593
31.7563	0	3.66202	0	9.3564	0	0	0	32.05638
31.707	0	3.65591	0	9.36944	0	0	0	32.00672
31.6577	0	3.64989	0	9.38243	0	0	0	31.95707
31.6084	0	3.64395	0	9.39536	0	0	0	31.90741
31.5589	0	3.63808	0	9.40824	0	0	0	31.85755
31.5094	0	3.63229	0	9.42107	0	0	0	31.80769
31.4599	0	3.62658	0	9.43384	0	0	0	31.75783
31.4102	0	3.62094	0	9.44656	0	0	0	31.70776
31.3606	0	3.61538	0	9.45922	0	0	0	31.65779
31.3108	0	3.6099	0	9.47184	0	0	0	31.60762
31.261	0	3.60449	0	9.4844	0	0	0	31.55745
31.2112	0	3.59915	0	9.49692	0	0	0	31.50728
31.1613	0	3.59389	0	9.50938	0	0	0	31.457
31.1113	0	3.5887	0	9.5218	0	0	0	31.40662
31.0613	0	3.58358	0	9.53416	0	0	0	31.35624
31.0112	0	3.57853	0	9.54648	0	0	0	31.30576
30.9611	0	3.57356	0	9.55874	0	0	0	31.25528
30.9109	0	3.56865	0	9.57096	0	0	0	31.20469
30.8607	0	3.56382	0	9.58313	0	0	0	31.1541
30.8104	0	3.55905	0	9.59525	0	0	0	31.10342
30.7601	0	3.55435	0	9.60733	0	0	0	31.05272
30.7097	0	3.54972	0	9.61936	0	0	0	31.00193
30.6593	0	3.54516	0	9.63135	0	0	0	30.95114
30.6088	0	3.54067	0	9.64328	0	0	0	30.90024
30.5583	0	3.53624	0	9.65518	0	0	0	30.84934
30.5077	0	3.53187	0	9.66702	0	0	0	30.79834
30.4571	0	3.52758	0	9.67883	0	0	0	30.74734
30.4064	0	3.52334	0	9.69059	0	0	0	30.69624
30.3557	0	3.51918	0	9.7023	0	0	0	30.64513
30.305	0	3.51507	0	9.71397	0	0	0	30.59402
30.2542	0	3.51103	0	9.7256	0	0	0	30.54282
30.2034	0	3.50705	0	9.73719	0	0	0	30.49161
30.1525	0	3.50313	0	9.74873	0	0	0	30.44029
30.1016	0	3.49928	0	9.76024	0	0	0	30.38898
30.0507	0	3.49549	0	9.7717	0	0	0	30.33767

29.9997	0	3.49175	0	9.78311	0	0	0	30.28625
29.9487	0	3.48808	0	9.79449	0	0	0	30.23483
29.8977	0	3.48447	0	9.80583	0	0	0	30.18341
29.8466	0	3.48091	0	9.81713	0	0	0	30.13189
29.7955	0	3.47742	0	9.82838	0	0	0	30.08037
29.7443	0	3.47398	0	9.8396	0	0	0	30.02875
29.6931	0	3.4706	0	9.85078	0	0	0	29.97712
29.6419	0	3.46728	0	9.86192	0	0	0	29.92549
29.5907	0	3.46401	0	9.87302	0	0	0	29.87387
29.5394	0	3.4608	0	9.88408	0	0	0	29.82214
29.4881	0	3.45764	0	9.89511	0	0	0	29.7704
29.4368	0	3.45454	0	9.90609	0	0	0	29.71867
29.3854	0	3.4515	0	9.91704	0	0	0	29.66684
29.334	0	3.44851	0	9.92795	0	0	0	29.615
29.2826	0	3.44557	0	9.93883	0	0	0	29.56317
29.2312	0	3.44269	0	9.94967	0	0	0	29.51133
29.1797	0	3.43985	0	9.96047	0	0	0	29.45939
29.1235	0	3.4161	0	9.96892	0	0	0	29.40268
29.0677	0	3.39418	0	9.97737	0	0	0	29.34636
29.012	0	3.37247	0	9.98565	0	0	0	29.29015
28.9563	0	3.35096	0	9.99375	0	0	0	29.23394
28.9006	0	3.32964	0	10.0017	0	0	0	29.17772
28.845	0	3.30851	0	10.0095	0	0	0	29.1216
28.7894	0	3.28758	0	10.0171	0	0	0	29.06548
28.7339	0	3.26683	0	10.0245	0	0	0	29.00946
28.6785	0	3.24627	0	10.0318	0	0	0	28.95354
28.623	0	3.2259	0	10.039	0	0	0	28.89751
28.5677	0	3.20572	0	10.046	0	0	0	28.84169
28.5123	0	3.18571	0	10.0528	0	0	0	28.78576
28.457	0	3.16589	0	10.0596	0	0	0	28.72993
28.4018	0	3.14624	0	10.0662	0	0	0	28.67421
28.3466	0	3.12677	0	10.0726	0	0	0	28.61848
28.2914	0	3.10747	0	10.079	0	0	0	28.56275
28.2362	0	3.08835	0	10.0852	0	0	0	28.50701
28.1811	0	3.0694	0	10.0913	0	0	0	28.45138
28.1261	0	3.05061	0	10.0973	0	0	0	28.39585
28.071	0	3.03199	0	10.1031	0	0	0	28.34021
28.0161	0	3.01354	0	10.1089	0	0	0	28.28478
27.9611	0	2.99525	0	10.1145	0	0	0	28.22924
27.9062	0	2.97712	0	10.1201	0	0	0	28.1738
27.8513	0	2.95916	0	10.1255	0	0	0	28.11836
27.7965	0	2.94135	0	10.1309	0	0	0	28.06302
27.7416	0	2.92369	0	10.1362	0	0	0	28.00759
27.6869	0	2.90619	0	10.1413	0	0	0	27.95235
27.6321	0	2.88884	0	10.1464	0	0	0	27.897
27.5774	0	2.87165	0	10.1514	0	0	0	27.84176
27.5227	0	2.8546	0	10.1563	0	0	0	27.78652
27.4681	0	2.8377	0	10.1612	0	0	0	27.73138

27.4134	0	2.82094	0	10.1659	0	0	0	27.67614
27.3589	0	2.80433	0	10.1706	0	0	0	27.62109
27.3043	0	2.78786	0	10.1752	0	0	0	27.56595
27.2498	0	2.77154	0	10.1797	0	0	0	27.5109
27.1953	0	2.75535	0	10.1842	0	0	0	27.45586
27.1409	0	2.7393	0	10.1886	0	0	0	27.40091
27.0864	0	2.72339	0	10.1929	0	0	0	27.34587
27.0321	0	2.70761	0	10.1972	0	0	0	27.29102
26.9777	0	2.69196	0	10.2014	0	0	0	27.23608
26.9234	0	2.67645	0	10.2055	0	0	0	27.18123
26.8691	0	2.66107	0	10.2096	0	0	0	27.12638
26.8149	0	2.64582	0	10.2137	0	0	0	27.07164
26.7606	0	2.63069	0	10.2176	0	0	0	27.01679
26.7064	0	2.61569	0	10.2216	0	0	0	26.96204
26.6523	0	2.60081	0	10.2254	0	0	0	26.90739
26.5982	0	2.58606	0	10.2292	0	0	0	26.85275
26.5441	0	2.57143	0	10.233	0	0	0	26.7981
26.49	0	2.55692	0	10.2367	0	0	0	26.74345
26.436	0	2.54253	0	10.2404	0	0	0	26.6889
26.382	0	2.52826	0	10.2441	0	0	0	26.63436
26.3281	0	2.51411	0	10.2477	0	0	0	26.57991
26.2742	0	2.50007	0	10.2512	0	0	0	26.52546
26.2203	0	2.48614	0	10.2547	0	0	0	26.47101
26.1665	0	2.47233	0	10.2582	0	0	0	26.41666
26.1127	0	2.45863	0	10.2616	0	0	0	26.36232
26.0589	0	2.44504	0	10.265	0	0	0	26.30797
26.0052	0	2.43156	0	10.2684	0	0	0	26.25372
25.9515	0	2.41819	0	10.2717	0	0	0	26.19947
25.8978	0	2.40492	0	10.275	0	0	0	26.14523
25.8442	0	2.39176	0	10.2782	0	0	0	26.09108
25.7906	0	2.37871	0	10.2814	0	0	0	26.03693
25.7371	0	2.36576	0	10.2846	0	0	0	25.98288
25.6836	0	2.35291	0	10.2878	0	0	0	25.92884
25.6301	0	2.34016	0	10.2909	0	0	0	25.87479
25.5767	0	2.32752	0	10.294	0	0	0	25.82084
25.5233	0	2.31497	0	10.2971	0	0	0	25.7669
25.4699	0	2.30252	0	10.3001	0	0	0	25.71295
25.4166	0	2.29017	0	10.3031	0	0	0	25.65911
25.3634	0	2.27792	0	10.3061	0	0	0	25.60536
25.3102	0	2.26576	0	10.3091	0	0	0	25.55161
25.257	0	2.2537	0	10.312	0	0	0	25.49787
25.2038	0	2.24173	0	10.315	0	0	0	25.44412
25.1507	0	2.22985	0	10.3179	0	0	0	25.39048
25.0977	0	2.21806	0	10.3207	0	0	0	25.33693
25.0447	0	2.20637	0	10.3236	0	0	0	25.28339
24.9917	0	2.19476	0	10.3264	0	0	0	25.22985
24.9388	0	2.18325	0	10.3292	0	0	0	25.1764
24.8859	0	2.17182	0	10.332	0	0	0	25.12296

24.8331	0	2.16047	0	10.3348	0	0	0	25.06962
24.7803	0	2.14922	0	10.3375	0	0	0	25.01627
24.7275	0	2.13805	0	10.3403	0	0	0	24.96293
24.6748	0	2.12696	0	10.343	0	0	0	24.90969
24.6222	0	2.11596	0	10.3457	0	0	0	24.85655
24.5696	0	2.10504	0	10.3483	0	0	0	24.80341
24.517	0	2.0942	0	10.351	0	0	0	24.75026
24.4645	0	2.08345	0	10.3537	0	0	0	24.69722
24.4121	0	2.07277	0	10.3563	0	0	0	24.64428
24.3597	0	2.06217	0	10.3589	0	0	0	24.59134
24.3073	0	2.05166	0	10.3615	0	0	0	24.53841
24.255	0	2.04122	0	10.3641	0	0	0	24.48557
24.2027	0	2.03085	0	10.3667	0	0	0	24.43273
24.1505	0	2.02057	0	10.3692	0	0	0	24.37999
24.0983	0	2.01036	0	10.3718	0	0	0	24.32725
24.0462	0	2.00022	0	10.3743	0	0	0	24.27462
23.9942	0	1.99016	0	10.3768	0	0	0	24.22208
23.9421	0	1.98017	0	10.3793	0	0	0	24.16945
23.8902	0	1.97026	0	10.3818	0	0	0	24.11701
23.8383	0	1.96042	0	10.3843	0	0	0	24.06458
23.7864	0	1.95065	0	10.3868	0	0	0	24.01214
23.7346	0	1.94095	0	10.3893	0	0	0	23.95981
23.6829	0	1.93132	0	10.3917	0	0	0	23.90757
23.6312	0	1.92176	0	10.3942	0	0	0	23.85534
23.5795	0	1.91227	0	10.3966	0	0	0	23.80311
23.5279	0	1.90284	0	10.3991	0	0	0	23.75098
23.4764	0	1.89349	0	10.4015	0	0	0	23.69895
23.4249	0	1.8842	0	10.4039	0	0	0	23.64691
23.3735	0	1.87498	0	10.4063	0	0	0	23.59498
23.3221	0	1.86582	0	10.4087	0	0	0	23.54306
23.2708	0	1.85673	0	10.4111	0	0	0	23.49123
23.2195	0	1.8477	0	10.4134	0	0	0	23.4394
23.1683	0	1.83874	0	10.4158	0	0	0	23.38767
23.1172	0	1.82984	0	10.4182	0	0	0	23.33604
23.0661	0	1.821	0	10.4205	0	0	0	23.28442
23.0151	0	1.81223	0	10.4229	0	0	0	23.23289
22.9641	0	1.80351	0	10.4252	0	0	0	23.18137
22.9132	0	1.79486	0	10.4276	0	0	0	23.12994
22.8623	0	1.78627	0	10.4299	0	0	0	23.07852
22.8116	0	1.77774	0	10.4322	0	0	0	23.02729
22.7608	0	1.76927	0	10.4345	0	0	0	22.97597
22.7101	0	1.76085	0	10.4369	0	0	0	22.92475
22.6595	0	1.7525	0	10.4392	0	0	0	22.87363
22.609	0	1.7442	0	10.4415	0	0	0	22.82261
22.5585	0	1.73596	0	10.4438	0	0	0	22.77158
22.508	0	1.72777	0	10.4461	0	0	0	22.72057
22.4577	0	1.71965	0	10.4484	0	0	0	22.66975
22.4073	0	1.71158	0	10.4506	0	0	0	22.61883

22.3571	0	1.70356	0	10.4529	0	0	0	22.56811
22.3069	0	1.6956	0	10.4552	0	0	0	22.51739
22.2568	0	1.68769	0	10.4575	0	0	0	22.46678
22.2067	0	1.67984	0	10.4597	0	0	0	22.41616
22.1567	0	1.67204	0	10.462	0	0	0	22.36565
22.1068	0	1.66429	0	10.4643	0	0	0	22.31523
22.0569	0	1.6566	0	10.4665	0	0	0	22.26482
22.0071	0	1.64895	0	10.4688	0	0	0	22.21451
21.9573	0	1.64136	0	10.471	0	0	0	22.16419
21.9076	0	1.63382	0	10.4733	0	0	0	22.11398
21.858	0	1.62633	0	10.4755	0	0	0	22.06387
21.8085	0	1.61889	0	10.4778	0	0	0	22.01386
21.759	0	1.6115	0	10.48	0	0	0	21.96385
21.7095	0	1.60416	0	10.4822	0	0	0	21.91384
21.6602	0	1.59687	0	10.4845	0	0	0	21.86403
21.6109	0	1.58963	0	10.4867	0	0	0	21.81423
21.5616	0	1.58243	0	10.4889	0	0	0	21.76442
21.5125	0	1.57529	0	10.4912	0	0	0	21.71481
21.4634	0	1.56819	0	10.4934	0	0	0	21.66521
21.4144	0	1.56113	0	10.4956	0	0	0	21.6157
21.3654	0	1.55413	0	10.4978	0	0	0	21.5662
21.3165	0	1.54717	0	10.5	0	0	0	21.5168
21.2677	0	1.54025	0	10.5023	0	0	0	21.4675
21.2189	0	1.53338	0	10.5045	0	0	0	21.41819
21.1702	0	1.52656	0	10.5067	0	0	0	21.36899
21.1216	0	1.51978	0	10.5089	0	0	0	21.31989
21.073	0	1.51304	0	10.5111	0	0	0	21.27079
21.0245	0	1.50635	0	10.5133	0	0	0	21.2218
20.9761	0	1.4997	0	10.5155	0	0	0	21.1729
20.9278	0	1.49309	0	10.5177	0	0	0	21.1241
20.8795	0	1.48653	0	10.52	0	0	0	21.0753
20.8313	0	1.48001	0	10.5222	0	0	0	21.02661

Mg#	Density of liquid (g/cc)
18.05047	3.197715
18.05047	3.197715
18.05044	3.198499
18.05046	3.199282
18.05047	3.200064
18.05049	3.200845
18.05049	3.201625
18.05046	3.202405
18.05047	3.203183
18.05048	3.203961
18.05048	3.204738
18.05045	3.205514
18.05049	3.206289
18.05045	3.207064
18.0505	3.207838
18.05045	3.208611
18.05045	3.209383
18.05049	3.210154
18.05049	3.210924
18.05048	3.211694
18.05047	3.212463
18.05046	3.213231
18.05046	3.213998
18.05049	3.214765
18.05048	3.215531
18.05046	3.216296
18.05045	3.21706
18.05048	3.217823
18.05046	3.218586
18.05049	3.219347
18.05047	3.220108
18.05049	3.220869
18.05047	3.221628
18.05049	3.222387
18.05047	3.223145
18.05049	3.223902
18.05046	3.224659
18.05047	3.225414
18.05045	3.226169
18.05046	3.226923
18.05048	3.227677
18.05048	3.228429
18.05045	3.229181
18.05046	3.229932
18.05047	3.230683
18.05047	3.231432

18.05044	3.232181
18.05048	3.232929
18.05044	3.233677
18.05049	3.234424
18.05045	3.23517
18.05049	3.235915
18.05045	3.236659
18.05048	3.237403
18.05048	3.238146
18.05047	3.238888
18.05047	3.23963
18.05046	3.240371
18.05046	3.241111
18.05049	3.241851
18.05048	3.242589
18.05051	3.243327
18.05045	3.244065
18.05048	3.244801
18.05047	3.245537
18.05049	3.246272
18.05048	3.247007
18.0505	3.247741
18.05048	3.248474
18.0505	3.249206
18.05048	3.249938
18.05046	3.250669
18.05048	3.251399
18.05046	3.252129
18.05047	3.252858
18.05045	3.253586
18.0505	3.254314
18.05048	3.255041
18.05049	3.255767
18.05046	3.256492
18.05051	3.257217
18.05048	3.257941
18.05048	3.258665
18.05049	3.259388
18.05046	3.26011
18.05046	3.260831
18.05047	3.261552
18.05047	3.262272
18.05048	3.262992
18.05047	3.263711
18.05048	3.264429
18.05052	3.265146
18.05047	3.265863
18.05047	3.26658

18.05047	3.267295
18.05046	3.26801
18.0505	3.268724
18.05045	3.269438
18.05048	3.270151
18.05048	3.270863
18.05051	3.271575
18.0505	3.272286
18.05045	3.272996
18.05047	3.273706
18.05046	3.274415
18.05049	3.275124
18.05047	3.275831
18.0505	3.276539
18.05048	3.277245
18.05047	3.277951
18.05049	3.278656
18.05047	3.279361
18.05049	3.280065
18.05047	3.280769
18.05048	3.281471
18.05051	3.282174
18.05048	3.282875
18.05049	3.283576
18.05047	3.284277
18.05048	3.284976
18.0505	3.285675
18.05047	3.286374
18.05048	3.287072
18.05049	3.287769
18.0505	3.288466
18.05047	3.289162
18.05048	3.289857
18.05048	3.290552
18.05049	3.291247
18.05049	3.29194
18.0505	3.292633
18.0505	3.293326
18.05051	3.294018
18.05046	3.294709
18.05051	3.2954
18.05046	3.29609
18.0505	3.296779
18.0505	3.297468
18.05046	3.298157
18.0505	3.298844
18.05049	3.299531
18.05048	3.300218

18.05048	3.300904
18.05047	3.301589
18.05051	3.302274
18.0505	3.302959
18.05045	3.303642
18.05048	3.304325
18.05047	3.305008
18.05049	3.30569
18.05048	3.306371
18.05047	3.307052
18.05049	3.307732
18.05048	3.308412
18.0505	3.309091
18.05049	3.30977
18.05047	3.310448
18.05049	3.311125
18.05047	3.311802
18.05045	3.312478
18.05047	3.313154
18.05049	3.313829
18.05051	3.314504
18.05049	3.315178
18.05046	3.315851
18.05047	3.316524
18.05049	3.317197
18.05047	3.317869
18.05048	3.31854
18.05049	3.319211
18.0505	3.319881
18.05047	3.320551
18.05049	3.32122
18.05049	3.321888
18.0505	3.322557
18.05047	3.323224
18.05047	3.323891
18.05048	3.324557
18.05048	3.325223
18.05049	3.325889
18.0505	3.326554
18.0505	3.327218
18.0505	3.327882
18.05046	3.328545
18.0505	3.329208
18.05051	3.32987
18.05046	3.330531
18.0505	3.331193
18.0505	3.331853
18.05046	3.332513

18.05049	3.333173
18.05049	3.333832
18.05052	3.33449
18.05047	3.335148
18.05047	3.335806
18.0505	3.336463
18.0505	3.337119
18.05049	3.337775
18.05052	3.338431
18.05051	3.339086
18.0505	3.33974
18.05048	3.340394
18.05047	3.341047
18.05046	3.3417
18.05048	3.342352
18.05047	3.343004
18.05045	3.343656
18.05052	3.344306
18.05051	3.344957
18.05049	3.345607
18.05051	3.346256
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18.05047	3.347553
18.05049	3.348201
18.05047	3.348848
18.05049	3.349495
18.05051	3.350142
18.05048	3.350787
18.05046	3.351433
18.05052	3.352078
18.05049	3.352722
18.05046	3.353366
18.05052	3.354009
18.05049	3.354652
18.05046	3.355295
18.05052	3.355937
18.05049	3.356578
18.0505	3.357219
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18.05049	3.359139
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18.05048	3.362966
18.05049	3.363602

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18.0505	3.36741
18.05049	3.368043
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18.05048	3.369938
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18.05049	3.377481
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18.05048	3.37998
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18.05048	3.38185
18.0505	3.382472
18.05049	3.383094
18.05047	3.383716
18.05049	3.384337
18.05052	3.384958
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18.05048	3.391755
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18.05052	3.392986
18.05049	3.3936

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18.0505	3.396054
18.05047	3.396666
18.05053	3.397278
18.05049	3.39789
18.05051	3.398501
18.05047	3.399111
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18.05049	3.404588
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18.0505	3.407012
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18.05048	3.439682
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18.05047	3.440848
18.05052	3.44143
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18.05053	3.443756
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18.0505	3.447234
18.05051	3.447812
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18.05049	3.450122
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18.05047	3.461015
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18.05052	3.464428
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18.05048	3.477396
18.0505	3.477956

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18.05052	3.485757
18.0505	3.486312
18.05052	3.486867
18.05049	3.487421
18.05047	3.487974
18.05049	3.488528
18.0505	3.489081
18.05052	3.489634
18.0505	3.490186
18.05047	3.490739
18.05049	3.49129
18.0505	3.491842
18.05052	3.492393
18.05049	3.492944
18.0505	3.493495
18.02864	3.494329
17.97589	3.495568
17.92357	3.496803
17.8717	3.498033
17.82027	3.499259
17.76931	3.50048
17.71885	3.501697
17.66879	3.502909
17.61914	3.504116
17.56998	3.505319
17.52124	3.506518
17.47292	3.507712
17.42503	3.508901
17.37762	3.510086
17.33059	3.511267
17.28403	3.512443
17.23782	3.513615
17.19208	3.514782
17.14678	3.515944
17.10189	3.517103

17.05736	3.518256
17.01326	3.519406
16.96959	3.52055
16.95319	3.520761
16.94817	3.520586
16.94348	3.520407
16.93912	3.520225
16.93509	3.52004
16.9314	3.51985
16.92809	3.519657
16.92507	3.519461
16.9224	3.519261
16.92006	3.519057
16.91807	3.51885
16.91639	3.51864
16.91505	3.518426
16.91401	3.518209
16.91333	3.517988
16.91296	3.517764
16.9129	3.517537
16.9132	3.517307
16.91377	3.517073
16.91474	3.516836
16.91599	3.516596
16.91752	3.516353
16.91941	3.516107
16.92162	3.515857
16.92412	3.515605
16.92695	3.51535
16.9301	3.515091
16.93354	3.51483
16.93731	3.514566
16.94138	3.514299
16.94574	3.514028
16.95043	3.513756
16.95542	3.51348
16.96075	3.513202
16.96634	3.51292
16.97223	3.512636
16.97846	3.51235
16.98495	3.512061
16.99179	3.511769
16.99885	3.511474
17.00626	3.511177
17.01394	3.510878
17.02193	3.510576
17.03023	3.510272
17.0388	3.509965

17.04765	3.509655
17.05681	3.509344
17.06624	3.50903
17.07595	3.508713
17.08598	3.508395
17.0963	3.508074
17.10689	3.507751
17.11777	3.507426
17.12888	3.507098
17.14032	3.506769
17.15201	3.506437
17.16398	3.506104
17.17629	3.505768
17.18884	3.50543
17.20164	3.505091
17.21473	3.504749
17.22808	3.504406
17.15688	3.504325
17.09272	3.504222
17.02906	3.504117
16.96589	3.504011
16.90318	3.503903
16.84089	3.503793
16.77912	3.503682
16.71774	3.503569
16.65679	3.503454
16.59638	3.503338
16.53637	3.50322
16.47683	3.5031
16.41774	3.502978
16.35903	3.502855
16.3008	3.50273
16.243	3.502603
16.18568	3.502475
16.12877	3.502345
16.07221	3.502213
16.01616	3.502079
15.96048	3.501944
15.90526	3.501807
15.85042	3.501669
15.79606	3.501529
15.74205	3.501387
15.68847	3.501243
15.63525	3.501098
15.58248	3.500951
15.53012	3.500803
15.47812	3.500653
15.4265	3.500502

15.3753	3.500348
15.32443	3.500194
15.274	3.500037
15.22396	3.49988
15.17426	3.49972
15.12491	3.499559
15.07601	3.499397
15.02738	3.499233
14.97916	3.499068
14.93131	3.498901
14.88382	3.498733
14.83667	3.498564
14.78989	3.498393
14.74345	3.49822
14.69731	3.498047
14.65155	3.497872
14.60614	3.497695
14.56108	3.497518
14.51632	3.497339
14.47192	3.497159
14.42784	3.496977
14.38407	3.496795
14.34062	3.496611
14.2975	3.496426
14.2547	3.49624
14.21223	3.496053
14.17004	3.495864
14.12819	3.495675
14.08663	3.495484
14.04536	3.495292
14.00444	3.4951
13.96377	3.494906
13.9234	3.494711
13.88334	3.494515
13.84359	3.494319
13.80409	3.494121
13.76492	3.493922
13.72601	3.493723
13.68737	3.493522
13.649	3.493321
13.61096	3.493119
13.5732	3.492916
13.53567	3.492712
13.49838	3.492508
13.46142	3.492302
13.4247	3.492096
13.38827	3.491889
13.35209	3.491682

13.3161	3.491473
13.28046	3.491265
13.24508	3.491055
13.20989	3.490845
13.17497	3.490634
13.1403	3.490422
13.10589	3.49021
13.07175	3.489997
13.03778	3.489784
13.00407	3.48957
12.97068	3.489356
12.93746	3.489141
12.90446	3.488926
12.87174	3.48871
12.83925	3.488494
12.80694	3.488277
12.77486	3.48806
12.74306	3.487843
12.71146	3.487625
12.68009	3.487406
12.64895	3.487188
12.61801	3.486969
12.58727	3.486749
12.55677	3.48653
12.52651	3.48631
12.4964	3.48609
12.46654	3.485869
12.43689	3.485649
12.40744	3.485428
12.37819	3.485206
12.34915	3.484985
12.32032	3.484763
12.2917	3.484542
12.26325	3.48432
12.235	3.484098
12.20698	3.483875
12.17911	3.483653
12.15146	3.483431
12.12404	3.483208
12.09674	3.482985
12.06971	3.482763
12.04279	3.48254
12.01612	3.482317
11.98956	3.482094
11.96323	3.481871
11.93708	3.481649
11.91112	3.481426
11.88538	3.481203

11.85973	3.48098
11.83431	3.480757
11.80903	3.480535
11.78398	3.480312
11.75908	3.48009
11.73431	3.479867
11.70979	3.479645
11.68535	3.479422
11.66116	3.4792
11.63711	3.478978
11.61321	3.478757
11.58946	3.478535
11.5659	3.478313
11.54255	3.478092
11.51929	3.477871
11.49624	3.47765
11.47333	3.477429
11.4506	3.477209
11.428	3.476988
11.4055	3.476768
11.38328	3.476549
11.36116	3.476329
11.33913	3.47611
11.31732	3.475891
11.29569	3.475672
11.27415	3.475454
11.25277	3.475236
11.23157	3.475018
11.21047	3.474801
11.18949	3.474583
11.16873	3.474367
11.14808	3.47415

Pressure (GPa)	Temperature (K)	mass of liquid	SiO2	TiO2	Al2O3	Fe2O3	Cr2O3
0.5	1723.15	100.312306	36.5857	14.1558	3.98755	0.72941	0
0.5	1723.15	102.313101	36.739	13.885	4.0297	0.722903	0.011935
0.505	1723.15	104.313745	36.8864	13.6247	4.07024	0.7152	0.023412
0.51	1723.15	106.314379	37.0282	13.3741	4.10925	0.707687	0.034457
0.515	1723.15	108.315002	37.1649	13.1328	4.14682	0.700356	0.045094
0.52	1723.15	110.315615	37.2965	12.9003	4.18303	0.693204	0.055345
0.525	1723.15	112.316219	37.4235	12.676	4.21796	0.686224	0.065231
0.53	1723.15	114.316814	37.5461	12.4596	4.25166	0.679412	0.074771
0.535	1723.15	116.317401	37.6644	12.2507	4.2842	0.672762	0.083982
0.54	1723.15	118.31798	37.7787	12.0488	4.31564	0.666269	0.092883
0.545	1723.15	120.318551	37.8893	11.8536	4.34603	0.659929	0.101487
0.55	1723.15	122.319115	37.9962	11.6648	4.37543	0.653735	0.10981
0.555	1723.15	124.319671	38.0997	11.4821	4.40389	0.647684	0.117865
0.56	1723.15	126.320221	38.1999	11.3051	4.43144	0.641771	0.125665
0.565	1723.15	128.320764	38.297	11.1337	4.45814	0.635992	0.133221
0.57	1723.15	130.321301	38.3911	10.9676	4.48401	0.630342	0.140546
0.575	1723.15	132.321832	38.4823	10.8064	4.50911	0.624817	0.147649
0.58	1723.15	134.322357	38.5709	10.6501	4.53345	0.619414	0.154541
0.585	1723.15	136.322877	38.6568	10.4984	4.55708	0.614127	0.16123
0.59	1723.15	138.323391	38.7403	10.351	4.58003	0.608954	0.167726
0.595	1723.15	140.3239	38.8214	10.2079	4.60233	0.603892	0.174037
0.6	1723.15	142.324403	38.9002	10.0688	4.62399	0.598935	0.18017
0.605	1723.15	144.324902	38.9768	9.9335	4.64506	0.594082	0.186133
0.61	1723.15	146.325396	39.0513	9.80194	4.66555	0.589329	0.191933
0.615	1723.15	148.325885	39.1238	9.67392	4.68549	0.584673	0.197577
0.62	1723.15	150.32637	39.1944	9.54931	4.7049	0.58011	0.203071
0.625	1723.15	152.32685	39.2632	9.42798	4.7238	0.575639	0.20842
0.63	1723.15	154.327326	39.3301	9.30979	4.74221	0.571256	0.21363
0.635	1723.15	156.327798	39.3954	9.19462	4.76014	0.566958	0.218708
0.64	1723.15	158.328266	39.459	9.08237	4.77763	0.562743	0.223657
0.645	1723.15	160.328729	39.521	8.97292	4.79468	0.558609	0.228482
0.65	1723.15	162.329189	39.5815	8.86616	4.81131	0.554554	0.233189
0.655	1723.15	164.329646	39.6405	8.76201	4.82753	0.550573	0.237781
0.66	1723.15	166.330098	39.6981	8.66036	4.84336	0.546667	0.242262
0.665	1723.15	168.330547	39.7543	8.56112	4.85882	0.542832	0.246637
0.67	1723.15	170.330992	39.8092	8.46422	4.87391	0.539067	0.250909
0.675	1723.15	172.331434	39.8628	8.36957	4.88866	0.535369	0.255082
0.68	1723.15	174.331873	39.9152	8.27709	4.90306	0.531737	0.259159
0.685	1723.15	176.332308	39.9664	8.18671	4.91714	0.528168	0.263144
0.69	1723.15	178.33274	40.0165	8.09835	4.93091	0.524661	0.26704
0.695	1723.15	180.333169	40.0654	8.01196	4.94436	0.521215	0.270849
0.7	1723.15	182.333595	40.1133	7.92746	4.95753	0.517827	0.274574
0.705	1723.15	184.334018	40.1602	7.8448	4.9704	0.514497	0.278218
0.71	1723.15	186.334437	40.206	7.76391	4.983	0.511221	0.281785
0.715	1723.15	188.334854	40.2509	7.68474	4.99534	0.508	0.285275
0.72	1723.15	190.335268	40.2948	7.60723	5.00741	0.504832	0.288692

0.725	1723.15	192.335679	40.3378	7.53134	5.01923	0.501714	0.292039
0.73	1723.15	194.336087	40.3799	7.45701	5.03081	0.498646	0.295316
0.735	1723.15	196.336493	40.4212	7.38419	5.04216	0.495627	0.298526
0.74	1723.15	198.336896	40.4616	7.31284	5.05327	0.492656	0.301672
0.745	1723.15	200.337296	40.5012	7.24292	5.06416	0.48973	0.304755
0.75	1723.15	202.337693	40.5401	7.17438	5.07484	0.486849	0.307777
0.755	1723.15	204.338088	40.5782	7.10718	5.08531	0.484012	0.310739
0.76	1723.15	206.338481	40.6155	7.04129	5.09558	0.481218	0.313645
0.765	1723.15	208.33887	40.6522	6.97666	5.10564	0.478466	0.316494
0.77	1723.15	210.339258	40.6881	6.91326	5.11552	0.475754	0.319289
0.775	1723.15	212.339643	40.7233	6.85105	5.12521	0.473081	0.322032
0.78	1723.15	214.340025	40.7579	6.79001	5.13472	0.470448	0.324724
0.785	1723.15	216.340406	40.7919	6.7301	5.14406	0.467852	0.327365
0.79	1723.15	218.340784	40.8252	6.67128	5.15322	0.465293	0.329959
0.795	1723.15	220.341159	40.858	6.61353	5.16222	0.462771	0.332505
0.8	1723.15	222.341532	40.8901	6.55682	5.17105	0.460283	0.335005
0.805	1723.15	224.341904	40.9217	6.50112	5.17973	0.45783	0.337461
0.81	1723.15	226.342272	40.9527	6.44641	5.18825	0.45541	0.339873
0.815	1723.15	228.342639	40.9832	6.39265	5.19663	0.453023	0.342243
0.82	1723.15	230.343004	41.0131	6.33983	5.20486	0.450668	0.344572
0.825	1723.15	232.343366	41.0425	6.28792	5.21295	0.448345	0.346861
0.83	1723.15	234.343726	41.0715	6.23689	5.2209	0.446052	0.349111
0.835	1723.15	236.344084	41.0999	6.18673	5.22871	0.443789	0.351323
0.84	1723.15	238.34444	41.1279	6.13741	5.2364	0.441555	0.353497
0.845	1723.15	240.344794	41.1554	6.08891	5.24395	0.43935	0.355636
0.85	1723.15	242.345146	41.1824	6.04121	5.25139	0.437173	0.357739
0.855	1723.15	244.345496	41.209	5.9943	5.2587	0.435024	0.359808
0.86	1723.15	246.345844	41.2352	5.94814	5.26589	0.432901	0.361843
0.865	1723.15	248.34619	41.2609	5.90273	5.27296	0.430805	0.363845
0.87	1723.15	250.346534	41.2862	5.85804	5.27993	0.428734	0.365815
0.875	1723.15	252.346876	41.3112	5.81407	5.28678	0.426689	0.367754
0.88	1723.15	254.347216	41.3357	5.77078	5.29352	0.424668	0.369663
0.885	1723.15	256.347555	41.3599	5.72817	5.30016	0.422672	0.371542
0.89	1723.15	258.347891	41.3837	5.68622	5.3067	0.420699	0.373391
0.895	1723.15	260.348226	41.4071	5.64492	5.31313	0.418749	0.375213
0.9	1723.15	261.802124	41.4328	5.61594	5.33058	0.417116	0.377793
0.905	1723.15	262.596315	41.4615	5.60132	5.36126	0.415847	0.381301
0.91	1723.15	263.389871	41.4901	5.5868	5.39177	0.414585	0.384788
0.915	1723.15	264.182797	41.5185	5.57238	5.42211	0.413329	0.388255
0.92	1723.15	264.975097	41.5467	5.55806	5.45228	0.41208	0.391702
0.925	1723.15	265.766777	41.5748	5.54383	5.48229	0.410838	0.39513
0.93	1723.15	266.55784	41.6027	5.52971	5.51213	0.409601	0.398538
0.935	1723.15	267.348291	41.6304	5.51568	5.5418	0.408371	0.401927
0.94	1723.15	268.138134	41.658	5.50175	5.57132	0.407147	0.405297
0.945	1723.15	268.927374	41.6854	5.48791	5.60067	0.40593	0.408648
0.95	1723.15	269.716015	41.7127	5.47416	5.62986	0.404718	0.411981
0.955	1723.15	270.50406	41.7398	5.46051	5.6589	0.403513	0.415295
0.96	1723.15	271.291515	41.7667	5.44695	5.68778	0.402314	0.41859

0.965	1723.15	272.078384	41.7935	5.43348	5.7165	0.40112	0.421867
0.97	1723.15	272.86467	41.8201	5.42009	5.74507	0.399933	0.425127
0.975	1723.15	273.650378	41.8466	5.4068	5.77349	0.398751	0.428368
0.98	1723.15	274.435513	41.873	5.39359	5.80176	0.397576	0.431592
0.985	1723.15	275.220077	41.8992	5.38047	5.82988	0.396406	0.434799
0.99	1723.15	276.004076	41.9252	5.36744	5.85785	0.395242	0.437988
0.995	1723.15	276.787514	41.9511	5.35448	5.88568	0.394083	0.44116
1	1723.15	277.570394	41.9768	5.34162	5.91336	0.392931	0.444314
1.005	1723.15	278.35272	42.0025	5.32883	5.94089	0.391783	0.447452
1.01	1723.15	279.134497	42.0279	5.31613	5.96828	0.390642	0.450574
1.015	1723.15	279.915728	42.0533	5.30351	5.99554	0.389506	0.453679
1.02	1723.15	280.696418	42.0785	5.29097	6.02265	0.388375	0.456767
1.025	1723.15	281.47657	42.1035	5.27851	6.04962	0.38725	0.459839
1.03	1723.15	282.256189	42.1284	5.26613	6.07646	0.386131	0.462895
1.035	1723.15	283.035278	42.1532	5.25383	6.10315	0.385016	0.465935
1.04	1723.15	283.813841	42.1779	5.2416	6.12972	0.383907	0.468959
1.045	1723.15	284.591881	42.2024	5.22945	6.15615	0.382803	0.471968
1.05	1723.15	285.369404	42.2268	5.21738	6.18244	0.381705	0.474961
1.055	1723.15	286.146412	42.251	5.20538	6.20861	0.380612	0.477938
1.06	1723.15	286.922909	42.2752	5.19346	6.23464	0.379523	0.480901
1.065	1723.15	287.6989	42.2992	5.18161	6.26055	0.37844	0.483848
1.07	1723.15	288.474387	42.3231	5.16983	6.28633	0.377362	0.48678
1.075	1723.15	289.249375	42.3468	5.15812	6.31197	0.376289	0.489697
1.08	1723.15	290.023867	42.3704	5.14649	6.3375	0.375221	0.4926
1.085	1723.15	290.797868	42.3939	5.13492	6.36289	0.374158	0.495488
1.09	1723.15	291.571379	42.4173	5.12343	6.38817	0.3731	0.498361
1.095	1723.15	292.344406	42.4406	5.112	6.41332	0.372047	0.50122
1.1	1723.15	293.116952	42.4637	5.10065	6.43835	0.370999	0.504065
1.105	1723.15	293.88902	42.4868	5.08936	6.46325	0.369955	0.506896
1.11	1723.15	294.660615	42.5097	5.07814	6.48804	0.368916	0.509712
1.115	1723.15	295.431739	42.5325	5.06698	6.51271	0.367882	0.512515
1.12	1723.15	296.202396	42.5551	5.0559	6.53726	0.366853	0.515304
1.125	1723.15	296.97259	42.5777	5.04487	6.56169	0.365829	0.518079
1.13	1723.15	297.742323	42.6002	5.03391	6.58601	0.364809	0.520841
1.135	1723.15	298.511601	42.6225	5.02302	6.61021	0.363793	0.52359
1.14	1723.15	299.280426	42.6447	5.01219	6.6343	0.362782	0.526324
1.145	1723.15	300.048801	42.6668	5.00142	6.65827	0.361776	0.529046
1.15	1723.15	300.81673	42.6888	4.99072	6.68213	0.360775	0.531755
1.155	1723.15	301.584217	42.7107	4.98008	6.70588	0.359777	0.534451
1.16	1723.15	302.351264	42.7325	4.96949	6.72952	0.358784	0.537133
1.165	1723.15	303.117875	42.7542	4.95897	6.75305	0.357796	0.539803
1.17	1723.15	303.884054	42.7758	4.94851	6.77647	0.356812	0.54246
1.175	1723.15	304.649804	42.7972	4.93811	6.79978	0.355832	0.545105
1.18	1723.15	305.415128	42.8186	4.92777	6.82298	0.354857	0.547737
1.185	1723.15	306.18003	42.8399	4.91748	6.84608	0.353886	0.550357
1.19	1723.15	306.944512	42.861	4.90726	6.86907	0.352919	0.552964
1.195	1723.15	307.681859	42.8844	4.89724	6.89174	0.351968	0.553315
1.2	1723.15	308.370416	42.9116	4.88754	6.9139	0.351039	0.549614

1.205	1723.15	309.05858	42.9388	4.8779	6.93596	0.350115	0.54594
1.21	1723.15	309.746355	42.9659	4.86832	6.95793	0.349194	0.542294
1.215	1723.15	310.433744	42.9928	4.85878	6.9798	0.348277	0.538673
1.22	1723.15	311.12075	43.0196	4.8493	7.00157	0.347363	0.53508
1.225	1723.15	311.807377	43.0463	4.83987	7.02325	0.346453	0.531512
1.23	1723.15	312.493629	43.0729	4.8305	7.04484	0.345547	0.52797
1.235	1723.15	313.179508	43.0994	4.82117	7.06633	0.344644	0.524454
1.24	1723.15	313.865018	43.1257	4.81189	7.08772	0.343744	0.520964
1.245	1723.15	314.550162	43.1519	4.80267	7.10903	0.342848	0.517499
1.25	1723.15	315.234943	43.1781	4.79349	7.13024	0.341956	0.514059
1.255	1723.15	315.919365	43.2041	4.78436	7.15136	0.341067	0.510644
1.26	1723.15	316.603431	43.23	4.77528	7.17239	0.340182	0.507253
1.265	1723.15	317.287144	43.2557	4.76625	7.19333	0.3393	0.503887
1.27	1723.15	316.812847	43.1915	4.773	7.2282	0.339284	0.501152
1.275	1723.15	316.339017	43.1272	4.77975	7.26301	0.339269	0.498403
1.28	1723.15	315.871497	43.0632	4.78641	7.29769	0.339249	0.495638
1.285	1723.15	315.41016	42.9997	4.79298	7.33223	0.339225	0.492856
1.29	1723.15	314.954875	42.9365	4.79946	7.36663	0.339198	0.490059
1.295	1723.15	314.50552	42.8738	4.80586	7.4009	0.339166	0.487246
1.3	1723.15	314.061971	42.8114	4.81217	7.43503	0.33913	0.484418
1.305	1723.15	313.62411	42.7493	4.81841	7.46902	0.33909	0.481574
1.31	1723.15	313.19182	42.6877	4.82456	7.50287	0.339046	0.478715
1.315	1723.15	312.764988	42.6264	4.83063	7.53658	0.338999	0.475842
1.32	1723.15	312.343502	42.5655	4.83662	7.57015	0.338948	0.472953
1.325	1723.15	311.927254	42.5049	4.84253	7.60358	0.338894	0.47005
1.33	1723.15	311.516136	42.4447	4.84836	7.63687	0.338836	0.467133
1.335	1723.15	311.110044	42.3849	4.85412	7.67002	0.338774	0.464201
1.34	1723.15	310.708877	42.3254	4.8598	7.70302	0.33871	0.461256
1.345	1723.15	310.312535	42.2663	4.86541	7.73588	0.338642	0.458297
1.35	1723.15	309.920921	42.2075	4.87094	7.76859	0.338571	0.455324
1.355	1723.15	309.533937	42.1491	4.8764	7.80115	0.338497	0.452338
1.36	1723.15	309.151492	42.0911	4.88178	7.83357	0.338419	0.449339
1.365	1723.15	308.773493	42.0333	4.8871	7.86584	0.338339	0.446326
1.37	1723.15	308.399851	41.976	4.89235	7.89796	0.338256	0.443301
1.375	1723.15	308.030477	41.919	4.89752	7.92993	0.33817	0.440264
1.38	1723.15	307.665285	41.8623	4.90263	7.96175	0.338081	0.437214
1.385	1723.15	307.304192	41.8059	4.90767	7.99342	0.33799	0.434152
1.39	1723.15	306.947114	41.7499	4.91264	8.02493	0.337896	0.431079
1.395	1723.15	306.59397	41.6943	4.91754	8.0563	0.337799	0.427993
1.4	1723.15	306.24468	41.639	4.92238	8.0875	0.3377	0.424896
1.405	1723.15	305.899168	41.584	4.92716	8.11856	0.337598	0.421788
1.41	1723.15	305.557355	41.5293	4.93187	8.14945	0.337494	0.418669
1.415	1723.15	305.219169	41.475	4.93652	8.1802	0.337387	0.41554
1.42	1723.15	304.884534	41.421	4.94111	8.21078	0.337279	0.412399
1.425	1723.15	304.553378	41.3673	4.94563	8.2412	0.337168	0.409249
1.43	1723.15	304.225632	41.314	4.95009	8.27147	0.337055	0.406089
1.435	1723.15	303.901225	41.261	4.9545	8.30157	0.33694	0.402919
1.44	1723.15	303.58009	41.2083	4.95884	8.33151	0.336822	0.399739

1.445	1723.15	303.26216	41.1559	4.96313	8.36129	0.336703	0.39655
1.45	1723.15	302.947368	41.1039	4.96736	8.3909	0.336582	0.393353
1.455	1723.15	302.635651	41.0521	4.97153	8.42035	0.336459	0.390147
1.46	1723.15	302.326946	41.0007	4.97564	8.44964	0.336334	0.386932
1.465	1723.15	302.021189	40.9496	4.9797	8.47876	0.336207	0.383709
1.47	1723.15	301.718321	40.8989	4.9837	8.50771	0.336079	0.380479
1.475	1723.15	301.418281	40.8484	4.98765	8.53649	0.335949	0.377241
1.48	1723.15	301.121011	40.7983	4.99155	8.5651	0.335817	0.373996
1.485	1723.15	300.826453	40.7484	4.99539	8.59355	0.335683	0.370744
1.49	1723.15	300.53455	40.6989	4.99918	8.62182	0.335549	0.367485
1.495	1723.15	300.245246	40.6497	5.00292	8.64992	0.335412	0.364221
1.5	1723.15	299.958487	40.6008	5.0066	8.67784	0.335274	0.36095
1.505	1723.15	299.67422	40.5522	5.01024	8.70559	0.335135	0.357674
1.51	1723.15	299.39239	40.5039	5.01383	8.73317	0.334995	0.354393
1.515	1723.15	299.112946	40.456	5.01736	8.76057	0.334853	0.351107
1.52	1723.15	298.835838	40.4083	5.02085	8.78779	0.33471	0.347816
1.525	1723.15	298.561015	40.361	5.02429	8.81483	0.334565	0.344522
1.53	1723.15	298.288428	40.3139	5.02769	8.84169	0.33442	0.341224
1.535	1723.15	298.018028	40.2671	5.03103	8.86837	0.334273	0.337922
1.54	1723.15	297.749769	40.2207	5.03433	8.89487	0.334126	0.334618
1.545	1723.15	297.483604	40.1746	5.03758	8.92119	0.333977	0.33131
1.55	1723.15	297.219486	40.1287	5.04079	8.94733	0.333827	0.328001
1.555	1723.15	296.957371	40.0832	5.04396	8.97328	0.333676	0.32469
1.56	1723.15	296.697215	40.0379	5.04708	8.99904	0.333525	0.321378
1.565	1723.15	296.438974	39.993	5.05015	9.02462	0.333372	0.318065
1.57	1723.15	296.182606	39.9484	5.05319	9.05001	0.333219	0.314752
1.575	1723.15	295.928068	39.904	5.05618	9.07521	0.333065	0.311438
1.58	1723.15	295.67532	39.86	5.05913	9.10022	0.33291	0.308125
1.585	1723.15	295.424321	39.8162	5.06204	9.12504	0.332754	0.304813
1.59	1723.15	295.175031	39.7728	5.06491	9.14967	0.332598	0.301503
1.595	1723.15	294.927413	39.7296	5.06773	9.17411	0.332441	0.298194
1.6	1723.15	294.681426	39.6867	5.07052	9.19835	0.332283	0.294887
1.605	1723.15	294.437035	39.6442	5.07327	9.2224	0.332125	0.291584
1.61	1723.15	294.194202	39.6019	5.07598	9.24625	0.331966	0.288283
1.615	1723.15	293.952891	39.5599	5.07865	9.26991	0.331806	0.284987
1.62	1723.15	293.713067	39.5182	5.08128	9.29337	0.331646	0.281695
1.625	1723.15	293.474694	39.4768	5.08388	9.31663	0.331486	0.278407
1.63	1723.15	293.23774	39.4357	5.08644	9.33969	0.331325	0.275125
1.635	1723.15	293.002169	39.3949	5.08896	9.36256	0.331164	0.271849
1.64	1723.15	292.767951	39.3544	5.09145	9.38522	0.331003	0.268579
1.645	1723.15	292.535051	39.3141	5.0939	9.40768	0.330841	0.265316
1.65	1723.15	292.303439	39.2742	5.09632	9.42994	0.330679	0.26206
1.655	1723.15	292.073084	39.2345	5.0987	9.452	0.330516	0.258812
1.66	1723.15	291.843955	39.1952	5.10105	9.47385	0.330353	0.255573
1.665	1723.15	291.616022	39.1561	5.10336	9.4955	0.33019	0.252343
1.67	1723.15	291.389257	39.1173	5.10564	9.51694	0.330027	0.249122
1.675	1723.15	291.163631	39.0788	5.10789	9.53817	0.329864	0.245911
1.68	1723.15	290.939115	39.0406	5.11011	9.5592	0.3297	0.242711

1.685	1723.15	290.715683	39.0026	5.11229	9.58002	0.329536	0.239521
1.69	1723.15	290.493306	38.965	5.11444	9.60064	0.329372	0.236344
1.695	1723.15	290.271959	38.9276	5.11656	9.62104	0.329208	0.233179
1.7	1723.15	290.051616	38.8905	5.11865	9.64123	0.329044	0.230026
1.705	1723.15	289.832251	38.8537	5.12071	9.66122	0.32888	0.226887
1.71	1723.15	289.613839	38.8172	5.12274	9.68099	0.328716	0.223761
1.715	1723.15	289.396355	38.781	5.12474	9.70055	0.328552	0.22065
1.72	1723.15	289.179777	38.745	5.12671	9.7199	0.328388	0.217554
1.725	1723.15	288.964079	38.7094	5.12865	9.73904	0.328224	0.214473
1.73	1723.15	288.749239	38.674	5.13057	9.75796	0.32806	0.211407
1.735	1723.15	288.535234	38.6389	5.13245	9.77667	0.327896	0.208359
1.74	1723.15	288.322042	38.6041	5.13431	9.79517	0.327732	0.205327
1.745	1723.15	288.109641	38.5695	5.13614	9.81345	0.327568	0.202312
1.75	1723.15	287.89801	38.5353	5.13794	9.83151	0.327405	0.199316
1.755	1723.15	287.687126	38.5013	5.13972	9.84936	0.327241	0.196338
1.76	1723.15	287.47697	38.4676	5.14147	9.867	0.327078	0.193378
1.765	1723.15	287.267521	38.4341	5.14319	9.88441	0.326915	0.190438
1.77	1723.15	287.058758	38.401	5.14489	9.90162	0.326752	0.187518
1.775	1723.15	286.850662	38.3681	5.14657	9.9186	0.326589	0.184619
1.78	1723.15	286.643213	38.3355	5.14821	9.93537	0.326426	0.18174
1.785	1723.15	286.436393	38.3032	5.14984	9.95192	0.326264	0.178882
1.79	1723.15	286.230181	38.2712	5.15144	9.96825	0.326102	0.176046
1.795	1723.15	286.024559	38.2394	5.15301	9.98436	0.32594	0.173231
1.8	1723.15	285.81951	38.2079	5.15456	10.0003	0.325779	0.17044
1.805	1723.15	285.615013	38.1767	5.15609	10.0159	0.325617	0.167671
1.81	1723.15	285.411052	38.1458	5.1576	10.0314	0.325456	0.164925
1.815	1723.15	285.207609	38.1151	5.15908	10.0466	0.325296	0.162204
1.82	1723.15	285.004665	38.0847	5.16054	10.0616	0.325135	0.159506
1.825	1723.15	284.802203	38.0546	5.16198	10.0764	0.324975	0.156832
1.83	1723.15	284.600207	38.0247	5.1634	10.091	0.324816	0.154184
1.835	1723.15	284.398657	37.9952	5.1648	10.1054	0.324656	0.15156
1.84	1723.15	283.618598	37.9485	5.17403	10.125	0.324443	0.148394
1.845	1723.15	282.82025	37.9011	5.18351	10.1445	0.324237	0.145221
1.85	1723.15	282.016581	37.8539	5.19305	10.1636	0.324033	0.142064
1.855	1723.15	281.207395	37.8068	5.20265	10.1824	0.323829	0.138923
1.86	1723.15	280.392494	37.7598	5.21232	10.2009	0.323627	0.135801
1.865	1723.15	279.571675	37.713	5.22207	10.219	0.323426	0.132697
1.87	1723.15	278.744729	37.6663	5.23188	10.2368	0.323227	0.129615
1.875	1723.15	277.911445	37.6198	5.24178	10.2543	0.323028	0.126553
1.88	1723.15	277.071607	37.5733	5.25175	10.2714	0.322831	0.123514
1.885	1723.15	276.224994	37.5271	5.26181	10.2881	0.322635	0.120499
1.89	1723.15	275.371382	37.4809	5.27195	10.3045	0.322441	0.117509
1.895	1723.15	274.510541	37.4349	5.28218	10.3206	0.322247	0.114545
1.9	1723.15	273.642239	37.389	5.2925	10.3362	0.322055	0.111608
1.905	1723.15	272.76624	37.3432	5.30292	10.3515	0.321865	0.108699
1.91	1723.15	271.882307	37.2975	5.31343	10.3664	0.321675	0.105819
1.915	1723.15	270.990199	37.252	5.32405	10.3809	0.321487	0.10297
1.92	1723.15	270.089674	37.2065	5.33477	10.3951	0.321301	0.100153

1.925	1723.15	269.180492	37.1612	5.3456	10.4088	0.321116	0.097368
1.93	1723.15	268.262411	37.116	5.35654	10.4221	0.320932	0.094618
1.935	1723.15	267.335194	37.071	5.36759	10.4349	0.320749	0.091902
1.94	1723.15	266.398608	37.026	5.37876	10.4474	0.320568	0.089223
1.945	1723.15	265.452428	36.9812	5.39005	10.4594	0.320388	0.086581
1.95	1723.15	264.496436	36.9364	5.40147	10.471	0.320209	0.083978
1.955	1723.15	263.530427	36.8918	5.41301	10.4821	0.320032	0.081415
1.96	1723.15	262.554214	36.8474	5.42467	10.4927	0.319856	0.078893
1.965	1723.15	261.567623	36.803	5.43647	10.5029	0.319682	0.076413
1.97	1723.15	260.570506	36.7588	5.4484	10.5126	0.319508	0.073976
1.975	1723.15	259.562739	36.7147	5.46046	10.5218	0.319336	0.071584
1.98	1723.15	258.174193	36.6705	5.48227	10.5065	0.319501	0.070712
1.985	1723.15	256.294356	36.626	5.5171	10.4592	0.320109	0.071814
1.99	1723.15	254.417836	36.5813	5.55217	10.4121	0.320704	0.072899
1.995	1723.15	252.543747	36.5365	5.5875	10.3651	0.321286	0.073969
2	1723.15	250.67228	36.4916	5.6231	10.3181	0.321854	0.075028
2.005	1723.15	248.804706	36.4467	5.65893	10.2712	0.32241	0.076081
2.01	1723.15	246.943037	36.4019	5.69499	10.2244	0.322951	0.077131
2.015	1723.15	245.089537	36.3574	5.73122	10.1775	0.32348	0.078183
2.02	1723.15	243.246341	36.3131	5.76762	10.1307	0.323995	0.079238
2.025	1723.15	241.41526	36.2692	5.80415	10.0838	0.324497	0.080297
2.03	1723.15	239.59773	36.2257	5.84079	10.037	0.324985	0.081363
2.035	1723.15	237.794838	36.1825	5.87753	9.99021	0.325461	0.082435
2.04	1723.15	236.007373	36.1399	5.91436	9.94344	0.325923	0.083514
2.045	1723.15	234.235884	36.0977	5.95126	9.89669	0.326373	0.0846
2.05	1723.15	232.480729	36.0559	5.98823	9.84997	0.32681	0.085692
2.055	1723.15	230.742115	36.0146	6.02526	9.8033	0.327235	0.086792
2.06	1723.15	229.020131	35.9739	6.06236	9.75667	0.327647	0.087898
2.065	1723.15	227.314771	35.9335	6.09952	9.71008	0.328047	0.08901
2.07	1723.15	225.625961	35.8937	6.13674	9.66355	0.328435	0.090128
2.075	1723.15	223.953569	35.8543	6.17402	9.61706	0.328811	0.091253
2.08	1723.15	222.297417	35.8154	6.21137	9.57063	0.329176	0.092383
2.085	1723.15	220.657297	35.777	6.24878	9.52425	0.329529	0.093518
2.09	1723.15	219.032973	35.739	6.28626	9.47793	0.329871	0.094658
2.095	1723.15	217.424188	35.7015	6.3238	9.43166	0.330201	0.095804
2.1	1723.15	215.830674	35.6644	6.36142	9.38545	0.330521	0.096954
2.105	1723.15	214.252148	35.6277	6.39912	9.3393	0.33083	0.098108
2.11	1723.15	212.688324	35.5915	6.4369	9.2932	0.331128	0.099266
2.115	1723.15	211.138908	35.5556	6.47476	9.24716	0.331415	0.100428
2.12	1723.15	209.603605	35.5202	6.5127	9.20118	0.331692	0.101593
2.125	1723.15	208.082119	35.4852	6.55075	9.15526	0.331958	0.102761
2.13	1723.15	206.574152	35.4506	6.58888	9.10939	0.332215	0.103933
2.135	1723.15	205.079413	35.4164	6.62712	9.06358	0.332461	0.105107
2.14	1723.15	203.597608	35.3825	6.66547	9.01782	0.332698	0.106283
2.145	1723.15	202.128449	35.349	6.70392	8.97212	0.332925	0.107461
2.15	1723.15	200.671652	35.3159	6.74249	8.92647	0.333142	0.108641
2.155	1723.15	199.226937	35.2831	6.78118	8.88087	0.33335	0.109821
2.16	1723.15	197.794027	35.2507	6.82	8.83533	0.333548	0.111003

2.165	1723.15	196.372652	35.2186	6.85895	8.78983	0.333737	0.112185
2.17	1723.15	194.962546	35.1868	6.89803	8.74439	0.333918	0.113367
2.175	1723.15	193.563448	35.1554	6.93725	8.69899	0.334089	0.114549
2.18	1723.15	192.175102	35.1243	6.97662	8.65365	0.334251	0.11573
2.185	1723.15	190.797258	35.0935	7.01615	8.60835	0.334404	0.11691
2.19	1723.15	189.42967	35.063	7.05583	8.5631	0.334549	0.118088
2.195	1723.15	188.072098	35.0328	7.09567	8.51789	0.334685	0.119263
2.2	1723.15	186.724306	35.0028	7.13568	8.47273	0.334813	0.120436
2.205	1723.15	185.386062	34.9732	7.17586	8.42761	0.334933	0.121606
2.21	1723.15	184.057141	34.9438	7.21622	8.38254	0.335044	0.122771
2.215	1723.15	182.737321	34.9147	7.25677	8.33751	0.335147	0.123932
2.22	1723.15	181.426382	34.8859	7.29751	8.29252	0.335242	0.125087
2.225	1723.15	180.124111	34.8573	7.33844	8.24757	0.335329	0.126236
2.23	1723.15	178.830297	34.8289	7.37957	8.20266	0.335409	0.127378
2.235	1723.15	177.544732	34.8008	7.42091	8.15779	0.33548	0.128513
2.24	1723.15	176.26721	34.773	7.46246	8.11296	0.335544	0.129638
2.245	1723.15	174.997529	34.7453	7.50423	8.06817	0.335601	0.130754
2.25	1723.15	173.735486	34.7179	7.54623	8.02342	0.335649	0.131859
2.255	1723.15	172.480883	34.6907	7.58845	7.97871	0.335691	0.132952
2.26	1723.15	171.233519	34.6637	7.6309	7.93404	0.335725	0.134032
2.265	1723.15	169.993196	34.637	7.6736	7.8894	0.335752	0.135098
2.27	1723.15	168.759711	34.6104	7.71654	7.84481	0.335772	0.136147
2.275	1723.15	167.532865	34.584	7.75973	7.80025	0.335784	0.13718
2.28	1723.15	166.312451	34.5578	7.80317	7.75573	0.33579	0.138193
2.285	1723.15	165.098264	34.5318	7.84688	7.71125	0.335789	0.139185
2.29	1723.15	163.890091	34.506	7.89084	7.66681	0.335781	0.140154
2.295	1723.15	162.687715	34.4804	7.93508	7.62241	0.335766	0.141099
2.3	1723.15	161.490915	34.4549	7.97959	7.57805	0.335744	0.142017
2.305	1723.15	160.299464	34.4296	8.02438	7.53373	0.335716	0.142906
2.31	1723.15	159.113127	34.4044	8.06945	7.48945	0.335682	0.143763
2.315	1723.15	157.931668	34.3795	8.1148	7.44522	0.335641	0.144587
2.32	1723.15	156.754846	34.3547	8.16044	7.40102	0.335594	0.145374
2.325	1723.15	155.582422	34.33	8.20637	7.35687	0.33554	0.146123
2.33	1723.15	154.41416	34.3055	8.2526	7.31276	0.335481	0.146831
2.335	1723.15	153.249838	34.2811	8.29912	7.2687	0.335415	0.147498
2.34	1723.15	152.089248	34.2569	8.34595	7.22468	0.335343	0.14812
2.345	1723.15	150.932205	34.2328	8.39309	7.1807	0.335266	0.148699
2.35	1723.15	149.778551	34.2089	8.44053	7.13677	0.335182	0.149233
2.355	1723.15	148.628152	34.1851	8.4883	7.09287	0.335093	0.149722
2.36	1723.15	147.480908	34.1614	8.53638	7.04902	0.334997	0.150168
2.365	1723.15	146.336739	34.1379	8.5848	7.00521	0.334896	0.150571
2.37	1723.15	145.195591	34.1144	8.63356	6.96144	0.33479	0.150933
2.375	1723.15	144.057428	34.0911	8.68266	6.91772	0.334677	0.151255
2.38	1723.15	142.922228	34.0678	8.73211	6.87403	0.334558	0.151539
2.385	1723.15	141.789982	34.0447	8.78193	6.83039	0.334434	0.151788
2.39	1723.15	140.660687	34.0216	8.83212	6.78678	0.334304	0.152002
2.395	1723.15	139.53435	33.9986	8.88268	6.74323	0.334169	0.152185
2.4	1723.15	138.410982	33.9757	8.93364	6.69971	0.334027	0.152336

2.405	1723.15	137.290596	33.9529	8.98499	6.65624	0.33388	0.152459
2.41	1723.15	136.173209	33.9301	9.03676	6.61282	0.333727	0.152555
2.415	1723.15	135.058843	33.9073	9.08894	6.56945	0.333568	0.152626
2.42	1723.15	133.947516	33.8846	9.14154	6.52614	0.333404	0.152672
2.425	1723.15	132.839253	33.8619	9.19458	6.48287	0.333233	0.152695
2.43	1723.15	131.734077	33.8393	9.24807	6.43967	0.333057	0.152697
2.435	1723.15	130.632015	33.8167	9.30202	6.39652	0.332875	0.152679
2.44	1723.15	129.533091	33.794	9.35643	6.35344	0.332687	0.152641
2.445	1723.15	128.437334	33.7714	9.41132	6.31043	0.332494	0.152586
2.45	1723.15	127.344773	33.7488	9.46669	6.26749	0.332294	0.152513
2.455	1723.15	126.255436	33.7262	9.52256	6.22462	0.332089	0.152425
2.46	1723.15	125.169354	33.7035	9.57893	6.18184	0.331877	0.152321
2.465	1723.15	124.08656	33.6808	9.63582	6.13913	0.33166	0.152203
2.47	1723.15	123.007085	33.6581	9.69324	6.09652	0.331437	0.152071
2.475	1723.15	121.930964	33.6354	9.75119	6.054	0.331208	0.151927
2.48	1723.15	120.858229	33.6126	9.80969	6.01158	0.330973	0.15177
2.485	1723.15	119.788917	33.5897	9.86874	5.96926	0.330733	0.151602
2.49	1723.15	118.723064	33.5668	9.92837	5.92705	0.330486	0.151423
2.495	1723.15	117.660708	33.5438	9.98857	5.88495	0.330233	0.151233
2.5	1723.15	116.601884	33.5207	10.0494	5.84297	0.329975	0.151034
2.505	1723.15	115.546633	33.4976	10.1107	5.80112	0.32971	0.150825
2.51	1723.15	114.494994	33.4743	10.1727	5.75941	0.32944	0.150608
2.515	1723.15	113.447006	33.451	10.2353	5.71783	0.329163	0.150382
2.52	1723.15	112.402711	33.4275	10.2986	5.67639	0.328881	0.150148
2.525	1723.15	111.362149	33.404	10.3625	5.63511	0.328592	0.149906
2.53	1723.15	110.325361	33.3803	10.427	5.59398	0.328298	0.149656
2.535	1723.15	109.292391	33.3565	10.4922	5.55302	0.327997	0.1494
2.54	1723.15	108.26328	33.3325	10.558	5.51222	0.327691	0.149136
2.545	1723.15	107.238071	33.3084	10.6246	5.47161	0.327379	0.148865
2.55	1723.15	106.216807	33.2842	10.6918	5.43118	0.32706	0.148589
2.555	1723.15	105.19953	33.2598	10.7598	5.39094	0.326736	0.148305
2.56	1723.15	104.186283	33.2353	10.8284	5.3509	0.326406	0.148016
2.565	1723.15	103.17711	33.2106	10.8978	5.31106	0.32607	0.147721
2.57	1723.15	102.172053	33.1857	10.9679	5.27144	0.325727	0.147419
2.575	1723.15	101.171153	33.1607	11.0387	5.23203	0.325379	0.147112
2.58	1723.15	100.174453	33.1354	11.1103	5.19285	0.325025	0.1468
2.585	1723.15	99.181995	33.11	11.1826	5.1539	0.324666	0.146482
2.59	1723.15	98.193818	33.0844	11.2558	5.11518	0.3243	0.146159
2.595	1723.15	97.209962	33.0586	11.3297	5.07671	0.323928	0.14583
2.6	1723.15	96.230467	33.0327	11.4044	5.03849	0.323551	0.145497
2.605	1723.15	95.25537	33.0065	11.4799	5.00053	0.323168	0.145158
2.61	1723.15	94.284707	32.9801	11.5562	4.96282	0.322779	0.144815
2.615	1723.15	93.318514	32.9534	11.6333	4.92538	0.322384	0.144468
2.62	1723.15	92.356826	32.9266	11.7113	4.88822	0.321983	0.144116
2.625	1723.15	91.399673	32.8996	11.7902	4.85132	0.321577	0.14376
2.63	1723.15	90.447088	32.8723	11.8698	4.81471	0.321165	0.1434
2.635	1723.15	89.499098	32.8448	11.9504	4.77837	0.320747	0.143037
2.64	1723.15	88.555732	32.8171	12.0318	4.74232	0.320324	0.142671

2.645	1723.15	87.617014	32.7891	12.1142	4.70656	0.319895	0.142302
2.65	1723.15	86.682968	32.7609	12.1974	4.67109	0.31946	0.141931
2.655	1723.15	85.753617	32.7325	12.2816	4.63591	0.319019	0.141559
2.66	1723.15	84.828979	32.7038	12.3667	4.60103	0.318573	0.141185
2.665	1723.15	83.909073	32.6749	12.4527	4.56643	0.318121	0.14081
2.67	1723.15	82.993916	32.6457	12.5397	4.53213	0.317664	0.140436
2.675	1723.15	82.083523	32.6163	12.6277	4.49813	0.3172	0.140062
2.68	1723.15	81.177908	32.5866	12.7167	4.46441	0.316731	0.13969
2.685	1723.15	80.277083	32.5566	12.8067	4.43098	0.316256	0.13932
2.69	1723.15	79.381061	32.5264	12.8977	4.39785	0.315776	0.138953
2.695	1723.15	78.489852	32.496	12.9898	4.365	0.315289	0.138591
2.7	1723.15	77.603469	32.4652	13.0829	4.33243	0.314797	0.138233
2.705	1723.15	76.721921	32.4342	13.1771	4.30015	0.314299	0.13788
2.71	1723.15	75.84522	32.4029	13.2725	4.26814	0.313794	0.137535
2.715	1723.15	74.973378	32.3713	13.3689	4.23641	0.313284	0.137197
2.72	1723.15	74.106409	32.3394	13.4665	4.20496	0.312768	0.136868
2.725	1723.15	73.244325	32.3072	13.5652	4.17377	0.312245	0.136549
2.73	1723.15	72.387142	32.2747	13.6652	4.14285	0.311716	0.136241
2.735	1723.15	71.534877	32.2419	13.7663	4.11219	0.311181	0.135944
2.74	1723.15	70.687549	32.2088	13.8687	4.08179	0.310639	0.135661
2.745	1723.15	69.845179	32.1753	13.9724	4.05164	0.310091	0.135391
2.75	1723.15	69.00779	32.1415	14.0773	4.02175	0.309536	0.135136
2.755	1723.15	68.175408	32.1074	14.1835	3.9921	0.308975	0.134898
2.76	1723.15	67.34806	32.0729	14.2911	3.9627	0.308407	0.134676
2.765	1723.15	66.525777	32.0381	14.4	3.93354	0.307831	0.134473
2.77	1723.15	65.708592	32.0029	14.5103	3.90463	0.307249	0.134289
2.775	1723.15	64.89654	31.9674	14.622	3.87595	0.30666	0.134125
2.78	1723.15	64.089661	31.9314	14.7352	3.8475	0.306063	0.133982
2.785	1723.15	63.287993	31.8951	14.8498	3.81929	0.305459	0.133862
2.79	1723.15	62.491581	31.8584	14.9659	3.7913	0.304847	0.133765
2.795	1723.15	61.70047	31.8213	15.0835	3.76355	0.304228	0.133692
2.8	1723.15	60.914708	31.7837	15.2027	3.73602	0.303601	0.133645
2.805	1723.15	60.134344	31.7458	15.3234	3.70871	0.302966	0.133623
2.81	1723.15	59.359431	31.7074	15.4457	3.68163	0.302323	0.133629
2.815	1723.15	58.590022	31.6685	15.5697	3.65476	0.301672	0.133663
2.82	1723.15	57.826173	31.6293	15.6953	3.62812	0.301013	0.133726
2.825	1723.15	57.067942	31.5895	15.8225	3.6017	0.300345	0.133819
2.83	1723.15	56.315387	31.5493	15.9515	3.57549	0.299668	0.133943
2.835	1723.15	55.568569	31.5086	16.0822	3.5495	0.298983	0.134099
2.84	1723.15	54.827549	31.4675	16.2147	3.52372	0.298289	0.134288
2.845	1723.15	54.092389	31.4258	16.3489	3.49816	0.297585	0.134511
2.85	1723.15	53.363153	31.3836	16.485	3.47282	0.296873	0.134768
2.855	1723.15	52.639906	31.3409	16.6229	3.44769	0.296151	0.135061
2.86	1723.15	51.922711	31.2977	16.7626	3.42277	0.29542	0.135391
2.865	1723.15	51.211634	31.254	16.9042	3.39806	0.294679	0.135757
2.87	1723.15	50.506741	31.2097	17.0478	3.37357	0.293928	0.136163
2.875	1723.15	49.808097	31.1649	17.1933	3.34928	0.293168	0.136607
2.88	1723.15	49.115766	31.1195	17.3407	3.32521	0.292397	0.137091

2.885	1723.15	48.429816	31.0736	17.4901	3.30135	0.291616	0.137616
2.89	1723.15	47.75031	31.0271	17.6415	3.2777	0.290825	0.138183
2.895	1723.15	47.077312	30.98	17.7949	3.25427	0.290023	0.138793
2.9	1723.15	46.410887	30.9323	17.9503	3.23104	0.28921	0.139446
2.905	1723.15	45.751097	30.884	18.1078	3.20802	0.288386	0.140143
2.91	1723.15	45.098003	30.8351	18.2673	3.18522	0.287552	0.140885
2.915	1723.15	44.451666	30.7857	18.429	3.16262	0.286706	0.141673
2.92	1723.15	43.812146	30.7356	18.5927	3.14024	0.285849	0.142507
2.925	1723.15	43.179498	30.6849	18.7585	3.11806	0.28498	0.143389
2.93	1723.15	42.553781	30.6335	18.9265	3.0961	0.2841	0.144318
2.935	1723.15	41.935046	30.5816	19.0965	3.07435	0.283208	0.145296
2.94	1723.15	41.323347	30.529	19.2687	3.05281	0.282305	0.146324
2.945	1723.15	40.718734	30.4757	19.4431	3.03147	0.281389	0.147401
2.95	1723.15	40.121253	30.4218	19.6195	3.01035	0.280461	0.148528
2.955	1723.15	39.53095	30.3673	19.7981	2.98944	0.279522	0.149706
2.96	1723.15	38.947867	30.3122	19.9788	2.96874	0.27857	0.150935
2.965	1723.15	38.372044	30.2564	20.1617	2.94825	0.277605	0.152217
2.97	1723.15	37.803518	30.1999	20.3466	2.92798	0.276628	0.15355
2.975	1723.15	37.450301	30.1952	20.4183	2.94631	0.27617	0.148793
2.98	1723.15	36.850665	30.128	20.6254	2.91419	0.27509	0.152145
2.985	1723.15	36.392111	30.0936	20.7571	2.91177	0.274335	0.150613
2.99	1723.15	35.875846	30.0432	20.9251	2.89482	0.273419	0.151567
2.995	1723.15	35.29009	29.9722	21.1427	2.86045	0.272291	0.155645
3	1723.15	34.858897	29.9396	21.2703	2.86151	0.271534	0.153595
3.005	1723.15	34.282772	29.8659	21.4951	2.82556	0.270375	0.1582
3.01	1723.15	33.869411	29.8347	21.6195	2.82903	0.269616	0.155759
3.015	1723.15	33.303146	29.7584	21.8515	2.79143	0.268426	0.160923
3.02	1723.15	32.907211	29.7286	21.9724	2.79737	0.267667	0.158056
3.025	1723.15	32.351001	29.6496	22.2115	2.75808	0.266447	0.16381
3.03	1723.15	31.821457	29.5735	22.4428	2.72724	0.26524	0.168097
3.035	1723.15	31.507691	29.5638	22.5195	2.75138	0.264628	0.161786
3.04	1723.15	30.967093	29.4808	22.7694	2.7094	0.263366	0.168501
3.045	1723.15	30.613424	29.4551	22.8799	2.72175	0.262606	0.164394
3.05	1723.15	30.178746	29.4023	23.055	2.70727	0.261614	0.165718
3.055	1723.15	29.750429	29.3493	23.2305	2.69301	0.260617	0.167069
3.06	1723.15	29.328426	29.2962	23.4061	2.67896	0.259616	0.168444
3.065	1723.15	28.912687	29.243	23.582	2.66511	0.25861	0.169843
3.07	1723.15	28.50316	29.1897	23.758	2.65148	0.2576	0.171266
3.075	1723.15	28.099792	29.1364	23.9341	2.63806	0.256585	0.17271
3.08	1723.15	27.702527	29.083	24.1102	2.62485	0.255568	0.174175
3.085	1723.15	27.311308	29.0297	24.2863	2.61184	0.254547	0.17566
3.09	1723.15	26.926076	28.9763	24.4622	2.59905	0.253523	0.177162
3.095	1723.15	26.546767	28.9229	24.6379	2.58646	0.252496	0.178682
3.1	1723.15	26.17332	28.8696	24.8135	2.57409	0.251468	0.180217
3.105	1723.15	25.805669	28.8163	24.9887	2.56192	0.250437	0.181767
3.11	1723.15	25.443747	28.7631	25.1635	2.54996	0.249405	0.183329
3.115	1723.15	25.087484	28.71	25.3378	2.53821	0.248373	0.184903
3.12	1723.15	24.736811	28.657	25.5117	2.52666	0.247339	0.186486

3.125	1723.15	24.391655	28.6041	25.685	2.51532	0.246306	0.188077
3.13	1723.15	24.051943	28.5514	25.8577	2.50419	0.245272	0.189675
3.135	1723.15	23.717599	28.4988	26.0296	2.49327	0.24424	0.191278
3.14	1723.15	23.388547	28.4465	26.2008	2.48255	0.243208	0.192884
3.145	1723.15	23.064708	28.3943	26.3712	2.47203	0.242178	0.194492
3.15	1723.15	22.746004	28.3423	26.5406	2.46173	0.24115	0.196101
3.155	1723.15	22.432354	28.2906	26.7092	2.45162	0.240124	0.197707
3.16	1723.15	22.120141	28.2548	26.8261	2.4419	0.239376	0.198982
3.165	1723.15	21.810507	28.2236	26.928	2.43248	0.238707	0.20016
3.17	1723.15	21.504082	28.1923	27.0299	2.42336	0.238037	0.201341
3.175	1723.15	21.205517	28.1405	27.1988	2.41431	0.236998	0.202971
3.18	1723.15	20.911748	28.0891	27.3657	2.40546	0.235968	0.204588
3.185	1723.15	20.622717	28.0381	27.5313	2.39681	0.234942	0.206194
3.19	1723.15	20.338335	27.9875	27.6956	2.38837	0.233922	0.207788
3.195	1723.15	20.058512	27.9372	27.8585	2.38013	0.232907	0.209368
3.2	1723.15	19.78316	27.8873	28.0199	2.3721	0.231898	0.210932
3.205	1723.15	19.512187	27.8378	28.1799	2.36427	0.230895	0.212479
3.21	1723.15	19.245504	27.7887	28.3383	2.35664	0.229898	0.214007
3.215	1723.15	18.983022	27.74	28.4952	2.34923	0.228909	0.215515
3.22	1723.15	18.724649	27.6918	28.6505	2.34202	0.227927	0.217002
3.225	1723.15	18.470298	27.6439	28.8042	2.33502	0.226952	0.218465
3.23	1723.15	18.219879	27.5966	28.9563	2.32822	0.225985	0.219903
3.235	1723.15	17.973304	27.5496	29.1067	2.32164	0.225026	0.221315
3.24	1723.15	17.730485	27.5031	29.2554	2.31528	0.224075	0.2227
3.245	1723.15	17.491335	27.4571	29.4025	2.30913	0.223133	0.224057
3.25	1723.15	17.255768	27.4115	29.5478	2.30319	0.222199	0.225384
3.255	1723.15	17.023699	27.3664	29.6915	2.29748	0.221274	0.226681
3.26	1723.15	16.795044	27.3218	29.8335	2.29198	0.220358	0.227945
3.265	1723.15	16.569719	27.2776	29.9737	2.28671	0.21945	0.229177
3.27	1723.15	16.323825	27.3549	29.7871	2.24043	0.220762	0.232157
3.275	1723.15	16.078448	27.3928	29.637	2.25499	0.221369	0.229127
3.28	1723.15	15.82934	27.4306	29.4884	2.27012	0.221955	0.226199
3.285	1723.15	15.587295	27.422	29.5073	2.27402	0.221671	0.225885
3.29	1723.15	15.351578	27.3886	29.6155	2.27207	0.220925	0.226929
3.295	1723.15	15.122762	27.3363	29.7841	2.27028	0.219833	0.228446
3.3	1723.15	14.898041	27.2851	29.9489	2.2687	0.218762	0.229906
3.305	1723.15	14.67733	27.2347	30.1111	2.26733	0.217704	0.231316
3.31	1723.15	14.460503	27.185	30.2706	2.26618	0.216662	0.232675
3.315	1723.15	14.24744	27.136	30.4273	2.26525	0.215634	0.233981
3.32	1723.15	14.038018	27.0877	30.5814	2.26455	0.214621	0.235233
3.325	1723.15	13.832123	27.0402	30.7329	2.26409	0.213623	0.236431
3.33	1723.15	13.62964	26.9933	30.8817	2.26387	0.212639	0.237573
3.335	1723.15	13.430457	26.9472	31.0281	2.2639	0.21167	0.238659
3.34	1723.15	13.234468	26.9017	31.1719	2.26418	0.210715	0.239689
3.345	1723.15	13.041566	26.8569	31.3133	2.26473	0.209775	0.240661
3.35	1723.15	12.851651	26.8127	31.4523	2.26555	0.208848	0.241576
3.355	1723.15	12.664625	26.7692	31.589	2.26665	0.207935	0.242434
3.36	1723.15	12.480391	26.7263	31.7234	2.26804	0.207036	0.243234

3.365	1723.15	12.298858	26.6839	31.8557	2.26973	0.206149	0.243976
3.37	1723.15	12.119938	26.6421	31.9859	2.27173	0.205275	0.244661
3.375	1723.15	11.91656	26.5813	32.1807	2.27662	0.203964	0.246223
3.38	1723.15	11.730374	26.5313	32.3383	2.28052	0.2029	0.247224
3.385	1723.15	11.564508	26.495	32.4488	2.28298	0.202155	0.247527
3.39	1723.15	11.363935	26.4309	32.6541	2.28966	0.200762	0.24913
3.395	1723.15	11.183332	26.3804	32.8125	2.29494	0.199686	0.250028
3.4	1723.15	10.869739	26.39	32.8553	2.28089	0.199274	0.25568
3.405	1723.15	10.556084	26.3704	32.9316	2.30534	0.198403	0.256808
3.41	1723.15	10.245378	26.3516	33.006	2.33178	0.197529	0.257819
3.415	1723.15	9.937574	26.3336	33.0784	2.36036	0.19665	0.258704
3.42	1723.15	9.632629	26.3166	33.1487	2.39124	0.195767	0.259453
3.425	1723.15	9.330504	26.3006	33.2167	2.4246	0.194878	0.260056
3.43	1723.15	9.031162	26.2857	33.2822	2.46063	0.193984	0.260502
3.435	1723.15	8.734567	26.2718	33.3453	2.49955	0.193083	0.260777
3.44	1723.15	8.440688	26.2592	33.4056	2.54161	0.192174	0.26087
3.445	1723.15	8.149497	26.2479	33.4629	2.58707	0.191257	0.260764
3.45	1723.15	7.860971	26.2381	33.5171	2.63625	0.19033	0.260443
3.455	1723.15	7.621839	26.2142	33.609	2.67779	0.189307	0.26002
3.46	1723.15	7.441966	26.1714	33.7509	2.70736	0.188167	0.259604
3.465	1723.15	7.267723	26.1273	33.8961	2.7376	0.187007	0.259089
3.47	1723.15	7.098976	26.0818	34.0448	2.7685	0.185829	0.258475
3.475	1723.15	6.935591	26.0348	34.1969	2.80005	0.184632	0.257763
3.48	1723.15	6.777435	25.9864	34.3525	2.83223	0.183415	0.256956
3.485	1723.15	6.624375	25.9365	34.5116	2.86504	0.182179	0.256055
3.49	1723.15	6.476281	25.8852	34.6741	2.89846	0.180923	0.255062
3.495	1723.15	6.333022	25.8323	34.8402	2.93248	0.179649	0.253979
3.5	1723.15	6.194472	25.778	35.0097	2.96708	0.178356	0.252809
3.505	1723.15	6.060505	25.7222	35.1826	3.00225	0.177043	0.251555
3.51	1723.15	5.930999	25.6648	35.3589	3.03797	0.175713	0.250219
3.515	1723.15	5.803391	25.6073	35.5356	3.07512	0.17437	0.248794
3.52	1723.15	5.677195	25.5496	35.712	3.11395	0.173016	0.247276
3.525	1723.15	5.55272	25.4919	35.8884	3.15442	0.17165	0.245663
3.53	1723.15	5.474364	25.5107	35.8015	3.17653	0.172394	0.241041
3.535	1723.15	5.310555	25.3768	36.2389	3.2401	0.168894	0.242194
3.54	1723.15	5.1913	25.3187	36.4152	3.28592	0.16749	0.240283
3.545	1723.15	5.120379	25.3478	36.2921	3.30955	0.168527	0.235088
3.55	1723.15	4.959887	25.2033	36.7643	3.38278	0.164659	0.236214
3.555	1723.15	4.845986	25.145	36.9398	3.4346	0.163216	0.233991
3.56	1723.15	4.733916	25.0868	37.1147	3.48859	0.161759	0.231663
3.565	1723.15	4.623692	25.0286	37.289	3.5448	0.16029	0.229228
3.57	1723.15	4.515335	24.9706	37.4624	3.60333	0.158808	0.226687
3.575	1723.15	4.408861	24.9128	37.6348	3.66424	0.157313	0.22404
3.58	1723.15	4.30429	24.8553	37.8059	3.72761	0.155805	0.22129
3.585	1723.15	4.201638	24.7982	37.9756	3.79351	0.154286	0.218437
3.59	1723.15	4.100925	24.7415	38.1436	3.862	0.152755	0.215484
3.595	1723.15	4.002168	24.6853	38.3096	3.93315	0.151213	0.212432
3.6	1723.15	3.905383	24.6299	38.4733	4.00703	0.149661	0.209286

3.605	1723.15	3.810585	24.5752	38.6344	4.08369	0.148099	0.206047
3.61	1723.15	3.71779	24.5213	38.7926	4.1632	0.146528	0.20272
3.615	1723.15	3.62701	24.4685	38.9475	4.2456	0.14495	0.19931
3.62	1723.15	3.538257	24.4169	39.0987	4.33095	0.143364	0.195821
3.625	1723.15	3.451542	24.3665	39.246	4.41927	0.141773	0.192259
3.63	1723.15	3.366871	24.3176	39.3888	4.51061	0.140177	0.188628
3.635	1723.15	3.28425	24.2703	39.5268	4.605	0.138577	0.184936
3.64	1723.15	3.203683	24.2248	39.6595	4.70245	0.136976	0.181188
3.645	1723.15	3.12517	24.1812	39.7865	4.80298	0.135374	0.177391
3.65	1723.15	3.048709	24.1397	39.9074	4.9066	0.133774	0.173553
3.655	1723.15	2.974294	24.1005	40.0217	5.0133	0.132175	0.16968
3.66	1723.15	2.901918	24.0637	40.129	5.12307	0.130581	0.16578
3.665	1723.15	2.831568	24.0295	40.2288	5.23589	0.128993	0.161859
3.67	1723.15	2.763229	23.9981	40.3207	5.35174	0.127412	0.157927
3.675	1723.15	2.696884	23.9697	40.4044	5.47059	0.12584	0.153989
3.68	1723.15	2.632511	23.9444	40.4794	5.59238	0.124279	0.150053
3.685	1723.15	2.570086	23.9223	40.5453	5.71706	0.12273	0.146126
3.69	1723.15	2.509581	23.9036	40.6018	5.84459	0.121195	0.142216
3.695	1723.15	2.453069	23.8852	40.6435	5.97032	0.119703	0.147505
3.7	1723.15	2.397305	23.8719	40.6854	6.10075	0.118202	0.14336
3.705	1723.15	2.34139	23.8657	40.7211	6.23832	0.116691	0.13077
3.71	1723.15	2.290004	23.8587	40.7333	6.37179	0.115253	0.135139
3.715	1723.15	2.290303	24.0902	39.9313	6.37103	0.122755	0.127536
3.72	1723.15	2.193174	23.8613	40.7399	6.64274	0.112465	0.127473
3.725	1723.15	2.145765	23.8675	40.7292	6.785	0.111064	0.123586
3.73	1723.15	2.147216	24.1197	39.8743	6.78182	0.119196	0.108996
3.735	1723.15	2.055658	23.8993	40.6686	7.076	0.108379	0.109551
3.74	1723.15	2.011944	23.9197	40.6204	7.22732	0.10704	0.106075
3.745	1723.15	1.970976	23.9413	40.5602	7.3762	0.105749	0.10876
3.75	1723.15	1.980146	24.2242	39.5903	7.34643	0.115343	0.102026
3.755	1723.15	1.894623	24	40.4199	7.67349	0.103282	0.102024
3.76	1723.15	1.896529	23.976	40.3791	7.66609	0	0.101922
3.765	1723.15	1.853232	24.0172	40.3892	7.84263	0.101409	0.093401
3.77	1723.15	1.816299	24.0583	40.2875	8.00329	0.100187	0.090232
3.775	1723.15	1.818346	24.0313	40.242	7.99461	0	0.090131
3.78	1723.15	1.827508	24.3581	39.248	7.9584	0.110848	0.08379
3.785	1723.15	1.746129	24.1339	40.105	8.32802	0.097318	0.084492
3.79	1723.15	1.71273	24.1871	39.9723	8.49358	0.096162	0.081512
3.795	1723.15	1.681286	24.2415	39.8309	8.65644	0.095047	0.082821
3.8	1723.15	1.649799	24.3033	39.6828	8.82599	0.093921	0.075823
3.805	1723.15	1.652115	24.2693	39.6269	8.814	0	0.075717
3.81	1723.15	1.617627	24.3506	39.5669	9.00466	0.092279	0.073155
3.815	1723.15	1.62	24.315	39.5086	8.99186	0	0.073047
3.82	1723.15	1.586581	24.4022	39.4398	9.18475	0.09067	0.070541
3.825	1723.15	1.559112	24.4724	39.2606	9.35307	0.089642	0.071348
3.83	1723.15	1.532332	24.547	39.0759	9.5235	0.088622	0.068668
3.835	1723.15	1.505818	24.6279	38.8803	9.69855	0.087606	0.062944
3.84	1723.15	1.480358	24.7117	38.6734	9.87331	0.08662	0.060532

3.845	1723.15	1.456276	24.7965	38.4609	10.0452	0.085667	0.061017
3.85	1723.15	1.432285	24.8879	38.2406	10.2223	0.084706	0.055957
3.855	1723.15	1.409218	24.982	38.0103	10.3991	0.083771	0.053757
3.86	1723.15	1.387366	25.0768	37.7757	10.5729	0.082865	0.054053
3.865	1723.15	1.366076	25.1753	37.5364	10.7482	0.081965	0.0519
3.87	1723.15	1.345028	25.2794	37.2872	10.9271	0.081066	0.047622
3.875	1723.15	1.324763	25.3859	37.0298	11.1056	0.080189	0.045687
3.88	1723.15	1.34968	25.7687	35.709	10.9145	0.097446	0.044301
3.885	1723.15	1.289283	25.5958	36.527	11.4361	0.078612	0.044205
3.89	1723.15	1.314616	25.9803	35.2	11.2301	0.096446	0.041014
3.895	1723.15	1.315006	26.1829	34.5742	11.241	0.10225	0.039216
3.9	1723.15	1.307219	26.3272	34.1728	11.3218	0.104465	0.037803
3.905	1723.15	1.296101	26.4473	33.8655	11.4327	0.10519	0.036548
3.91	1723.15	1.283742	26.5576	33.5977	11.5567	0.105277	0.035372
3.915	1723.15	1.271038	26.6639	33.3465	11.6863	0.105084	0.034242
3.92	1723.15	1.258366	26.7688	33.1022	11.8183	0.104768	0.033146
3.925	1723.15	1.245887	26.8733	32.8607	11.9512	0.104396	0.032081
3.93	1723.15	1.233665	26.9778	32.6203	12.0843	0.103996	0.031043
3.935	1723.15	1.221729	27.0825	32.3805	12.2174	0.103582	0.030033
3.94	1723.15	1.210087	27.1874	32.1411	12.3501	0.103159	0.029051
3.945	1723.15	1.198741	27.2927	31.9019	12.4825	0.102731	0.028097
3.95	1723.15	1.187692	27.3981	31.663	12.6143	0.102298	0.02717
3.955	1723.15	1.176938	27.5038	31.4244	12.7455	0.101863	0.026272
3.96	1723.15	1.166476	27.6097	31.1863	12.8759	0.101425	0.025401
3.965	1723.15	1.156302	27.7157	30.9486	13.0056	0.100986	0.024557
3.97	1723.15	1.146412	27.8218	30.7116	13.1344	0.100546	0.023741
3.975	1723.15	1.136804	27.9281	30.4752	13.2623	0.100105	0.022952
3.98	1723.15	1.127471	28.0343	30.2397	13.3891	0.099664	0.02219
3.985	1723.15	1.118411	28.1405	30.005	13.5149	0.099224	0.021454
3.99	1723.15	1.109618	28.2467	29.7713	13.6395	0.098784	0.020743
3.995	1723.15	1.101088	28.3528	29.5386	13.7628	0.098346	0.020059
4	1723.15	1.092815	28.4587	29.3072	13.885	0.097909	0.019398

weight percent concentration of oxides

FeO	MnO	MgO	NiO	CaO	Na2O	K2O	P2O5	FeOT
31.4524	0	3.96761	0	9.12151	0	0	0	32.10887
31.0436	0.002935	4.5298	0	9.03314	0.0018	0.000196	0	31.69421
30.6518	0.005757	5.07043	0	8.94816	0.003531	0.000384	0	31.29548
30.2749	0.008473	5.59071	0	8.86639	0.005197	0.000565	0	30.91182
29.912	0.011089	6.09177	0	8.78763	0.006801	0.000739	0	30.54232
29.5623	0.013609	6.57466	0	8.71174	0.008347	0.000907	0	30.18618
29.2252	0.01604	7.04035	0	8.63854	0.009838	0.001069	0	29.8428
28.8999	0.018386	7.48974	0	8.56791	0.011277	0.001226	0	29.51137
28.5859	0.020651	7.92367	0	8.49972	0.012666	0.001377	0	29.19139
28.2826	0.02284	8.34293	0	8.43382	0.014009	0.001523	0	28.88224
27.9894	0.024956	8.74824	0	8.37012	0.015306	0.001664	0	28.58334
27.7059	0.027002	9.1403	0	8.30851	0.016562	0.0018	0	28.29426
27.4315	0.028983	9.51974	0	8.24887	0.017776	0.001932	0	28.01442
27.1659	0.030901	9.88716	0	8.19113	0.018953	0.00206	0	27.74349
26.9086	0.032759	10.2431	0	8.13519	0.020092	0.002184	0	27.48099
26.6593	0.034561	10.5882	0	8.08096	0.021197	0.002304	0	27.22661
26.4175	0.036307	10.9228	0	8.02838	0.022268	0.00242	0	26.97984
26.183	0.038002	11.2474	0	7.97736	0.023308	0.002533	0	26.74047
25.9554	0.039647	11.5625	0	7.92784	0.024317	0.002643	0	26.50811
25.7344	0.041244	11.8685	0	7.87975	0.025296	0.00275	0	26.28246
25.5198	0.042796	12.1658	0	7.83304	0.026248	0.002853	0	26.0633
25.3112	0.044304	12.4547	0	7.78763	0.027173	0.002954	0	25.85024
25.1084	0.04577	12.7356	0	7.74349	0.028073	0.003051	0	25.64307
24.9112	0.047197	13.0088	0	7.70055	0.028947	0.003146	0	25.4416
24.7194	0.048585	13.2747	0	7.65877	0.029799	0.003239	0	25.24561
24.5327	0.049935	13.5335	0	7.61811	0.030627	0.003329	0	25.0548
24.3509	0.051251	13.7855	0	7.57851	0.031434	0.003417	0	24.86898
24.1739	0.052532	14.0309	0	7.53994	0.03222	0.003502	0	24.68803
24.0014	0.053781	14.2701	0	7.50236	0.032985	0.003585	0	24.51166
23.8333	0.054998	14.5032	0	7.46572	0.033732	0.003667	0	24.33977
23.6694	0.056184	14.7305	0	7.43	0.03446	0.003746	0	24.17215
23.5096	0.057342	14.9522	0	7.39517	0.035169	0.003823	0	24.0087
23.3537	0.058471	15.1686	0	7.36117	0.035862	0.003898	0	23.84922
23.2016	0.059573	15.3797	0	7.328	0.036538	0.003972	0	23.6936
23.053	0.060648	15.5858	0	7.29562	0.037198	0.004043	0	23.54155
22.9081	0.061699	15.787	0	7.264	0.037842	0.004113	0	23.39326
22.7664	0.062725	15.9836	0	7.23311	0.038471	0.004182	0	23.24823
22.6281	0.063728	16.1756	0	7.20293	0.039086	0.004249	0	23.10666
22.4929	0.064708	16.3634	0	7.17343	0.039687	0.004314	0	22.96825
22.3608	0.065666	16.5469	0	7.1446	0.040275	0.004378	0	22.83299
22.2316	0.066602	16.7263	0	7.11641	0.040849	0.00444	0	22.70069
22.1052	0.067518	16.9018	0	7.08883	0.041411	0.004501	0	22.57124
21.9817	0.068414	17.0735	0	7.06186	0.041961	0.004561	0	22.44475
21.8608	0.069291	17.2415	0	7.03546	0.042499	0.004619	0	22.3209
21.7424	0.07015	17.4059	0	7.00962	0.043025	0.004677	0	22.1996
21.6266	0.07099	17.5669	0	6.98433	0.043541	0.004733	0	22.08095

21.5132	0.071813	17.7245	0	6.95957	0.044045	0.004788	0	21.96474
21.4021	0.072619	17.8789	0	6.93531	0.044539	0.004841	0	21.85088
21.2933	0.073408	18.0301	0	6.91155	0.045024	0.004894	0	21.73936
21.1868	0.074182	18.1783	0	6.88826	0.045498	0.004945	0	21.63019
21.0823	0.07494	18.3235	0	6.86545	0.045963	0.004996	0	21.52306
20.98	0.075683	18.4659	0	6.84308	0.046419	0.005046	0	21.41816
20.8796	0.076411	18.6054	0	6.82115	0.046866	0.005094	0	21.31521
20.7813	0.077126	18.7423	0	6.79965	0.047304	0.005142	0	21.2144
20.6848	0.077826	18.8765	0	6.77856	0.047734	0.005188	0	21.11542
20.5901	0.078514	19.0082	0	6.75787	0.048155	0.005234	0	21.01828
20.4973	0.079188	19.1374	0	6.73757	0.048569	0.005279	0	20.92307
20.4062	0.07985	19.2642	0	6.71765	0.048975	0.005323	0	20.8296
20.3168	0.0805	19.3886	0	6.6981	0.049373	0.005367	0	20.73787
20.229	0.081137	19.5108	0	6.67891	0.049764	0.005409	0	20.64776
20.1429	0.081764	19.6307	0	6.66006	0.050148	0.005451	0	20.55939
20.0583	0.082378	19.7485	0	6.64156	0.050525	0.005492	0	20.47255
19.9752	0.082982	19.8642	0	6.62338	0.050896	0.005532	0	20.38725
19.8936	0.083575	19.9778	0	6.60553	0.05126	0.005572	0	20.30347
19.8134	0.084158	20.0895	0	6.58799	0.051617	0.005611	0	20.22112
19.7347	0.084731	20.1992	0	6.57075	0.051968	0.005649	0	20.1403
19.6573	0.085294	20.307	0	6.55381	0.052314	0.005686	0	20.06081
19.5812	0.085847	20.413	0	6.53716	0.052653	0.005723	0	19.98265
19.5064	0.086391	20.5172	0	6.52079	0.052986	0.005759	0	19.90581
19.4329	0.086926	20.6196	0	6.5047	0.053314	0.005795	0	19.8303
19.3606	0.087451	20.7204	0	6.48887	0.053637	0.00583	0	19.75602
19.2896	0.087969	20.8194	0	6.47331	0.053954	0.005865	0	19.68306
19.2197	0.088477	20.9169	0	6.458	0.054266	0.005898	0	19.61122
19.1509	0.088978	21.0128	0	6.44294	0.054573	0.005932	0	19.54051
19.0832	0.08947	21.1071	0	6.42812	0.054875	0.005965	0	19.47092
19.0167	0.089955	21.1999	0	6.41354	0.055172	0.005997	0	19.40256
18.9512	0.090431	21.2912	0	6.39919	0.055465	0.006029	0	19.33522
18.8867	0.090901	21.3811	0	6.38507	0.055752	0.00606	0	19.2689
18.8233	0.091363	21.4697	0	6.37116	0.056036	0.006091	0	19.2037
18.7608	0.091818	21.5568	0	6.35747	0.056315	0.006121	0	19.13943
18.6993	0.092265	21.6426	0	6.344	0.05659	0.006151	0	19.07617
18.651	0.092252	21.6762	0	6.3431	0.056979	0.006193	0	19.0264
18.618	0.091691	21.6482	0	6.35715	0.057508	0.006251	0	18.99226
18.5851	0.091134	21.6202	0	6.37113	0.058034	0.006308	0	18.95823
18.5525	0.090582	21.5924	0	6.38505	0.058557	0.006365	0	18.9245
18.5201	0.090034	21.5646	0	6.39889	0.059076	0.006421	0	18.89097
18.4879	0.08949	21.537	0	6.41267	0.059593	0.006478	0	18.85765
18.4559	0.088951	21.5095	0	6.42639	0.060107	0.006533	0	18.82454
18.4241	0.088416	21.482	0	6.44004	0.060619	0.006589	0	18.79163
18.3925	0.087885	21.4547	0	6.45362	0.061127	0.006644	0	18.75893
18.3611	0.087359	21.4275	0	6.46715	0.061632	0.006699	0	18.72644
18.33	0.086836	21.4003	0	6.4806	0.062135	0.006754	0	18.69425
18.299	0.086318	21.3733	0	6.494	0.062635	0.006808	0	18.66216
18.2682	0.085804	21.3463	0	6.50733	0.063132	0.006862	0	18.63028

18.2376	0.085293	21.3195	0	6.5206	0.063626	0.006916	0	18.59861
18.2072	0.084787	21.2927	0	6.53381	0.064118	0.006969	0	18.56714
18.177	0.084285	21.2661	0	6.54696	0.064606	0.007022	0	18.53588
18.147	0.083788	21.2395	0	6.56005	0.065093	0.007075	0	18.50482
18.1172	0.083294	21.213	0	6.57308	0.065576	0.007128	0	18.47397
18.0876	0.082804	21.1866	0	6.58605	0.066057	0.00718	0	18.44332
18.0581	0.082318	21.1604	0	6.59896	0.066536	0.007232	0	18.41277
18.0288	0.081836	21.1342	0	6.61181	0.067011	0.007284	0	18.38244
17.9997	0.081357	21.1081	0	6.62461	0.067485	0.007335	0	18.3523
17.9708	0.080883	21.0821	0	6.63735	0.067955	0.007386	0	18.32238
17.9421	0.080413	21.0561	0	6.65003	0.068424	0.007437	0	18.29266
17.9135	0.079946	21.0303	0	6.66265	0.068889	0.007488	0	18.26304
17.8851	0.079483	21.0046	0	6.67522	0.069353	0.007538	0	18.23363
17.8569	0.079024	20.9789	0	6.68774	0.069814	0.007588	0	18.20442
17.8288	0.078569	20.9534	0	6.70019	0.070272	0.007638	0	18.17531
17.8009	0.078117	20.9279	0	6.7126	0.070728	0.007688	0	18.14642
17.7732	0.077669	20.9025	0	6.72495	0.071182	0.007737	0	18.11772
17.7456	0.077225	20.8772	0	6.73724	0.071633	0.007786	0	18.08913
17.7182	0.076784	20.852	0	6.74949	0.072083	0.007835	0	18.06075
17.691	0.076348	20.8269	0	6.76168	0.072529	0.007884	0	18.03257
17.6639	0.075914	20.8019	0	6.77382	0.072974	0.007932	0	18.0045
17.6369	0.075484	20.7769	0	6.7859	0.073416	0.00798	0	17.97653
17.6102	0.075058	20.7521	0	6.79794	0.073856	0.008028	0	17.94886
17.5835	0.074635	20.7273	0	6.80992	0.074294	0.008075	0	17.9212
17.5571	0.074216	20.7026	0	6.82185	0.074729	0.008123	0	17.89384
17.5307	0.0738	20.678	0	6.83373	0.075163	0.00817	0	17.86649
17.5046	0.073388	20.6535	0	6.84557	0.075594	0.008217	0	17.83944
17.4785	0.072979	20.629	0	6.85735	0.076023	0.008263	0	17.8124
17.4527	0.072574	20.6047	0	6.86908	0.07645	0.00831	0	17.78566
17.4269	0.072171	20.5804	0	6.88077	0.076875	0.008356	0	17.75892
17.4013	0.071773	20.5562	0	6.8924	0.077297	0.008402	0	17.73239
17.3759	0.071377	20.5321	0	6.90399	0.077718	0.008448	0	17.70607
17.3506	0.070985	20.5081	0	6.91553	0.078137	0.008493	0	17.67985
17.3254	0.070596	20.4842	0	6.92702	0.078553	0.008538	0	17.65373
17.3004	0.07021	20.4603	0	6.93846	0.078968	0.008583	0	17.62781
17.2755	0.069828	20.4365	0	6.94986	0.07938	0.008628	0	17.602
17.2507	0.069449	20.4128	0	6.96121	0.079791	0.008673	0	17.5763
17.2261	0.069072	20.3892	0	6.97252	0.080199	0.008717	0	17.5508
17.2016	0.068699	20.3656	0	6.98378	0.080606	0.008761	0	17.5254
17.1772	0.06833	20.3422	0	6.99499	0.08101	0.008805	0	17.50011
17.153	0.067963	20.3188	0	7.00616	0.081413	0.008849	0	17.47502
17.1289	0.067599	20.2955	0	7.01729	0.081814	0.008893	0	17.45003
17.1049	0.067238	20.2723	0	7.02837	0.082213	0.008936	0	17.42515
17.0811	0.066881	20.2491	0	7.0394	0.08261	0.008979	0	17.40047
17.0573	0.066526	20.226	0	7.05039	0.083005	0.009022	0	17.3758
17.0337	0.066174	20.203	0	7.06134	0.083398	0.009065	0	17.35133
17.0104	0.065821	20.1794	0	7.07285	0.083797	0.009108	0	17.32717
16.9875	0.065462	20.1546	0	7.08539	0.084207	0.009153	0	17.30344

16.9646	0.065106	20.1298	0	7.0979	0.084615	0.009197	0	17.2797
16.9419	0.064753	20.1051	0	7.11036	0.085022	0.009241	0	17.25617
16.9192	0.064403	20.0805	0	7.12277	0.085427	0.009286	0	17.23265
16.8967	0.064056	20.056	0	7.13514	0.08583	0.009329	0	17.20933
16.8742	0.063712	20.0316	0	7.14746	0.086232	0.009373	0	17.18601
16.8519	0.063371	20.0072	0	7.15974	0.086632	0.009416	0	17.16289
16.8296	0.063033	19.9829	0	7.17198	0.08703	0.00946	0	17.13978
16.8075	0.062698	19.9587	0	7.18417	0.087427	0.009503	0	17.11687
16.7854	0.062365	19.9346	0	7.19632	0.087822	0.009546	0	17.09396
16.7634	0.062036	19.9105	0	7.20843	0.088215	0.009589	0	17.07116
16.7416	0.061709	19.8865	0	7.2205	0.088607	0.009631	0	17.04856
16.7198	0.061385	19.8626	0	7.23252	0.088997	0.009674	0	17.02596
16.6981	0.061064	19.8387	0	7.2445	0.089386	0.009716	0	17.00347
16.7253	0.061737	19.8072	0	7.27274	0.090088	0.009794	0	17.03066
16.7525	0.062409	19.7758	0	7.30102	0.090792	0.009872	0	17.05784
16.7794	0.063072	19.7446	0	7.32926	0.091496	0.00995	0	17.08472
16.8061	0.063727	19.7135	0	7.35746	0.092201	0.010028	0	17.1114
16.8325	0.064375	19.6826	0	7.38561	0.092905	0.010106	0	17.13778
16.8586	0.065015	19.6519	0	7.41372	0.09361	0.010184	0	17.16385
16.8845	0.065646	19.6214	0	7.44179	0.094314	0.010262	0	17.18972
16.9102	0.06627	19.591	0	7.46982	0.095019	0.01034	0	17.21538
16.9356	0.066885	19.5607	0	7.49781	0.095724	0.010418	0	17.24074
16.9608	0.067492	19.5306	0	7.52576	0.096429	0.010496	0	17.2659
16.9857	0.068091	19.5007	0	7.55367	0.097134	0.010575	0	17.29075
17.0104	0.068681	19.4709	0	7.58154	0.097839	0.010653	0	17.3154
17.0349	0.069264	19.4413	0	7.60937	0.098545	0.010731	0	17.33985
17.0591	0.069838	19.4118	0	7.63717	0.09925	0.01081	0	17.364
17.0831	0.070403	19.3825	0	7.66493	0.099956	0.010888	0	17.38794
17.1069	0.07096	19.3533	0	7.69265	0.100661	0.010966	0	17.41168
17.1305	0.071509	19.3243	0	7.72034	0.101367	0.011045	0	17.43521
17.1538	0.072049	19.2955	0	7.74799	0.102073	0.011123	0	17.45845
17.1769	0.07258	19.2667	0	7.77561	0.102779	0.011202	0	17.48148
17.1999	0.073103	19.2381	0	7.8032	0.103485	0.01128	0	17.50441
17.2226	0.073617	19.2097	0	7.83075	0.104191	0.011359	0	17.52703
17.245	0.074123	19.1814	0	7.85828	0.104897	0.011438	0	17.54935
17.2673	0.07462	19.1532	0	7.88576	0.105603	0.011516	0	17.57157
17.2894	0.075109	19.1252	0	7.91322	0.10631	0.011595	0	17.59359
17.3113	0.075589	19.0973	0	7.94065	0.107016	0.011674	0	17.61541
17.333	0.07606	19.0695	0	7.96805	0.107722	0.011752	0	17.63702
17.3544	0.076522	19.0419	0	7.99541	0.108429	0.011831	0	17.65833
17.3757	0.076976	19.0144	0	8.02275	0.109136	0.01191	0	17.67954
17.3968	0.077422	18.9871	0	8.05006	0.109842	0.011989	0	17.70054
17.4177	0.077858	18.9598	0	8.07735	0.110549	0.012068	0	17.72135
17.4384	0.078286	18.9327	0	8.1046	0.111256	0.012146	0	17.74195
17.4589	0.078705	18.9058	0	8.13183	0.111963	0.012225	0	17.76235
17.4793	0.079116	18.8789	0	8.15903	0.11267	0.012304	0	17.78265
17.4994	0.079518	18.8522	0	8.18621	0.113378	0.012383	0	17.80265
17.5194	0.079911	18.8256	0	8.21336	0.114085	0.012462	0	17.82254

17.5392	0.080296	18.7991	0	8.24049	0.114792	0.012541	0	17.84223
17.5588	0.080672	18.7727	0	8.2676	0.1155	0.012621	0	17.86172
17.5783	0.08104	18.7465	0	8.29468	0.116207	0.0127	0	17.88111
17.5976	0.081399	18.7203	0	8.32174	0.116915	0.012779	0	17.9003
17.6167	0.081749	18.6943	0	8.34877	0.117623	0.012858	0	17.91929
17.6356	0.082091	18.6684	0	8.37579	0.11833	0.012937	0	17.93807
17.6544	0.082424	18.6426	0	8.40278	0.119038	0.013017	0	17.95675
17.673	0.082749	18.6169	0	8.42976	0.119746	0.013096	0	17.97524
17.6915	0.083066	18.5913	0	8.45671	0.120455	0.013175	0	17.99361
17.7097	0.083374	18.5659	0	8.48364	0.121163	0.013255	0	18.01169
17.7279	0.083673	18.5405	0	8.51056	0.121871	0.013334	0	18.02977
17.7458	0.083965	18.5153	0	8.53746	0.12258	0.013414	0	18.04755
17.7637	0.084248	18.4901	0	8.56434	0.123288	0.013493	0	18.06532
17.7813	0.084523	18.4651	0	8.5912	0.123997	0.013573	0	18.0828
17.7988	0.084789	18.4401	0	8.61805	0.124706	0.013652	0	18.10017
17.8162	0.085047	18.4153	0	8.64488	0.125415	0.013732	0	18.11744
17.8334	0.085298	18.3905	0	8.67169	0.126124	0.013812	0	18.13451
17.8505	0.08554	18.3659	0	8.69849	0.126834	0.013891	0	18.15148
17.8674	0.085773	18.3413	0	8.72528	0.127543	0.013971	0	18.16825
17.8842	0.085999	18.3168	0	8.75205	0.128253	0.014051	0	18.18491
17.9008	0.086217	18.2925	0	8.77881	0.128962	0.014131	0	18.20138
17.9173	0.086427	18.2682	0	8.80556	0.129672	0.014211	0	18.21774
17.9337	0.086629	18.244	0	8.83229	0.130382	0.014291	0	18.23401
17.9499	0.086824	18.2199	0	8.85901	0.131092	0.014371	0	18.25007
17.966	0.08701	18.1959	0	8.88572	0.131803	0.014451	0	18.26603
17.9819	0.087189	18.1719	0	8.91242	0.132513	0.014531	0	18.2818
17.9977	0.08736	18.1481	0	8.93911	0.133224	0.014611	0	18.29746
18.0134	0.087524	18.1243	0	8.9658	0.133935	0.014691	0	18.31302
18.0289	0.087679	18.1006	0	8.99247	0.134646	0.014771	0	18.32838
18.0444	0.087828	18.077	0	9.01913	0.135357	0.014852	0	18.34374
18.0597	0.087969	18.0535	0	9.04578	0.136069	0.014932	0	18.3589
18.0748	0.088102	18.0301	0	9.07243	0.136781	0.015013	0	18.37385
18.0899	0.088228	18.0067	0	9.09907	0.137493	0.015093	0	18.38881
18.1048	0.088347	17.9834	0	9.1257	0.138205	0.015173	0	18.40357
18.1196	0.088459	17.9602	0	9.15233	0.138917	0.015254	0	18.41823
18.1343	0.088564	17.937	0	9.17895	0.13963	0.015335	0	18.43278
18.1488	0.088661	17.914	0	9.20557	0.140342	0.015415	0	18.44714
18.1633	0.088751	17.891	0	9.23218	0.141055	0.015496	0	18.46149
18.1776	0.088835	17.868	0	9.25879	0.141769	0.015577	0	18.47565
18.1918	0.088912	17.8452	0	9.28539	0.142482	0.015658	0	18.4897
18.2059	0.088981	17.8224	0	9.31199	0.143196	0.015739	0	18.50366
18.2198	0.089044	17.7996	0	9.33858	0.14391	0.015819	0	18.51741
18.2337	0.089101	17.777	0	9.36518	0.144624	0.0159	0	18.53116
18.2474	0.08915	17.7544	0	9.39177	0.145339	0.015982	0	18.54472
18.2611	0.089193	17.7318	0	9.41836	0.146054	0.016063	0	18.55827
18.2746	0.08923	17.7093	0	9.44494	0.146769	0.016144	0	18.57162
18.288	0.08926	17.6869	0	9.47153	0.147484	0.016225	0	18.58488
18.3013	0.089284	17.6645	0	9.49812	0.1482	0.016306	0	18.59803

18.3145	0.089302	17.6422	0	9.5247	0.148916	0.016388	0	18.61108
18.3276	0.089314	17.62	0	9.55129	0.149632	0.016469	0	18.62403
18.3406	0.089319	17.5978	0	9.57787	0.150348	0.016551	0	18.63689
18.3534	0.089318	17.5756	0	9.60446	0.151065	0.016632	0	18.64954
18.3662	0.089312	17.5535	0	9.63105	0.151783	0.016714	0	18.66219
18.3789	0.089299	17.5315	0	9.65764	0.1525	0.016796	0	18.67474
18.3914	0.089281	17.5095	0	9.68423	0.153218	0.016878	0	18.6871
18.4039	0.089257	17.4875	0	9.71082	0.153936	0.016959	0	18.69945
18.4163	0.089227	17.4656	0	9.73742	0.154655	0.017041	0	18.7117
18.4285	0.089192	17.4438	0	9.76401	0.155373	0.017123	0	18.72375
18.4407	0.089151	17.422	0	9.79062	0.156093	0.017205	0	18.73581
18.4528	0.089105	17.4002	0	9.81722	0.156812	0.017288	0	18.74776
18.4647	0.089053	17.3785	0	9.84383	0.157532	0.01737	0	18.75951
18.4766	0.088996	17.3568	0	9.87044	0.158252	0.017452	0	18.77126
18.4884	0.088934	17.3352	0	9.89706	0.158973	0.017535	0	18.78292
18.5	0.088867	17.3136	0	9.92368	0.159694	0.017617	0	18.79437
18.5116	0.088795	17.2921	0	9.9503	0.160416	0.017699	0	18.80582
18.5231	0.088717	17.2706	0	9.97694	0.161137	0.017782	0	18.81718
18.5345	0.088635	17.2491	0	10.0036	0.16186	0.017865	0	18.82843
18.5458	0.088549	17.2277	0	10.0302	0.162582	0.017948	0	18.83958
18.557	0.088457	17.2063	0	10.0569	0.163305	0.01803	0	18.85064
18.5681	0.088361	17.1849	0	10.0835	0.164029	0.018113	0	18.86159
18.5791	0.08826	17.1636	0	10.1102	0.164753	0.018196	0	18.87245
18.59	0.088155	17.1423	0	10.1368	0.165477	0.018279	0	18.8832
18.6008	0.088045	17.121	0	10.1635	0.166202	0.018363	0	18.89386
18.6116	0.087931	17.0998	0	10.1902	0.166927	0.018446	0	18.90451
18.6222	0.087813	17.0786	0	10.2169	0.167652	0.018529	0	18.91497
18.6328	0.087691	17.0575	0	10.2436	0.168379	0.018613	0	18.92542
18.6432	0.087565	17.0363	0	10.2703	0.169105	0.018696	0	18.93568
18.6536	0.087435	17.0152	0	10.297	0.169832	0.01878	0	18.94593
18.6639	0.0873	16.9941	0	10.3237	0.17056	0.018863	0	18.95609
18.6929	0.087278	16.9827	0	10.3262	0.171495	0.018986	0	18.9849
18.7229	0.087266	16.9715	0	10.3283	0.172442	0.01911	0	19.01471
18.7531	0.087247	16.9603	0	10.33	0.173394	0.019236	0	19.04473
18.7837	0.087222	16.9493	0	10.3315	0.174352	0.019362	0	19.07515
18.8146	0.087192	16.9384	0	10.3325	0.175315	0.01949	0	19.10586
18.8459	0.087155	16.9276	0	10.3332	0.176284	0.019619	0	19.13698
18.8776	0.087113	16.917	0	10.3335	0.177259	0.019749	0	19.1685
18.9096	0.087065	16.9065	0	10.3333	0.17824	0.01988	0	19.20033
18.942	0.087012	16.8961	0	10.3328	0.179227	0.020012	0	19.23255
18.9748	0.086952	16.8859	0	10.3318	0.180221	0.020146	0	19.26517
19.0081	0.086888	16.8758	0	10.3304	0.181221	0.020281	0	19.2983
19.0418	0.086817	16.8659	0	10.3285	0.182227	0.020418	0	19.33182
19.0759	0.086741	16.8561	0	10.3261	0.183241	0.020556	0	19.36575
19.1106	0.08666	16.8464	0	10.3232	0.184262	0.020695	0	19.40028
19.1457	0.086573	16.8369	0	10.3198	0.18529	0.020836	0	19.43521
19.1814	0.086481	16.8275	0	10.3158	0.186325	0.020979	0	19.47074
19.2176	0.086384	16.8183	0	10.3113	0.187368	0.021123	0	19.50677

19.2544	0.086281	16.8093	0	10.3063	0.188419	0.021268	0	19.5434
19.2918	0.086173	16.8004	0	10.3006	0.189477	0.021416	0	19.58064
19.3297	0.08606	16.7917	0	10.2942	0.190544	0.021565	0	19.61837
19.3683	0.085941	16.7832	0	10.2873	0.19162	0.021716	0	19.65681
19.4076	0.085817	16.7748	0	10.2797	0.192704	0.021869	0	19.69595
19.4475	0.085688	16.7666	0	10.2714	0.193797	0.022024	0	19.73569
19.4881	0.085554	16.7586	0	10.2623	0.194899	0.02218	0	19.77613
19.5294	0.085414	16.7508	0	10.2526	0.196011	0.022339	0	19.81727
19.5714	0.08527	16.7431	0	10.2421	0.197132	0.0225	0	19.85911
19.6142	0.08512	16.7356	0	10.2309	0.198263	0.022663	0	19.90176
19.6577	0.084964	16.7284	0	10.2189	0.199404	0.022828	0	19.9451
19.7121	0.084644	16.7132	0	10.2166	0.200891	0.023028	0	19.99965
19.7804	0.084116	16.6877	0	10.2274	0.202841	0.023275	0	20.0685
19.8498	0.083595	16.6629	0	10.2362	0.204808	0.023525	0	20.13843
19.9203	0.083079	16.6388	0	10.243	0.206792	0.023779	0	20.20946
19.9918	0.082568	16.6154	0	10.2478	0.208793	0.024037	0	20.28147
20.0643	0.082061	16.5926	0	10.2506	0.210811	0.024297	0	20.35447
20.1376	0.081558	16.5705	0	10.2515	0.212845	0.024562	0	20.42826
20.2116	0.081057	16.5489	0	10.2509	0.214896	0.024829	0	20.50273
20.2861	0.080559	16.5278	0	10.2488	0.216962	0.0251	0	20.5777
20.3609	0.080064	16.5072	0	10.2454	0.219041	0.025373	0	20.65295
20.436	0.079572	16.4869	0	10.241	0.221135	0.025649	0	20.72849
20.5112	0.079084	16.4669	0	10.2355	0.223242	0.025928	0	20.80411
20.5864	0.078599	16.4473	0	10.2291	0.225362	0.026209	0	20.87973
20.6615	0.078119	16.4279	0	10.2219	0.227494	0.026492	0	20.95524
20.7366	0.077644	16.4088	0	10.214	0.229639	0.026779	0	21.03073
20.8114	0.077173	16.3899	0	10.2054	0.231797	0.027067	0	21.10591
20.8861	0.076709	16.3712	0	10.1962	0.233966	0.027358	0	21.18098
20.9605	0.076251	16.3528	0	10.1865	0.236148	0.027651	0	21.25574
21.0346	0.075799	16.3345	0	10.1762	0.238343	0.027947	0	21.33019
21.1084	0.075354	16.3165	0	10.1655	0.24055	0.028245	0	21.40433
21.182	0.074916	16.2986	0	10.1543	0.242769	0.028546	0	21.47826
21.2551	0.074486	16.2808	0	10.1426	0.245001	0.028848	0	21.55168
21.3279	0.074064	16.2633	0	10.1306	0.247246	0.029154	0	21.62478
21.4004	0.07365	16.2459	0	10.1182	0.249503	0.029462	0	21.69758
21.4725	0.073245	16.2286	0	10.1054	0.251774	0.029772	0	21.76997
21.5442	0.072848	16.2115	0	10.0923	0.254058	0.030085	0	21.84195
21.6155	0.072461	16.1945	0	10.0789	0.256355	0.0304	0	21.91352
21.6864	0.072082	16.1777	0	10.0651	0.258666	0.030718	0	21.98467
21.7569	0.071712	16.1609	0	10.0511	0.26099	0.031038	0	22.05542
21.8269	0.071352	16.1444	0	10.0367	0.263329	0.031361	0	22.12566
21.8966	0.071002	16.1279	0	10.0221	0.265681	0.031687	0	22.19559
21.9658	0.070661	16.1116	0	10.0072	0.268048	0.032016	0	22.26501
22.0347	0.07033	16.0954	0	9.99209	0.27043	0.032347	0	22.33413
22.1031	0.070009	16.0793	0	9.97669	0.272826	0.032681	0	22.40273
22.1711	0.069699	16.0633	0	9.96105	0.275238	0.033018	0	22.47093
22.2386	0.069398	16.0475	0	9.94517	0.277664	0.033358	0	22.53862
22.3057	0.069107	16.0317	0	9.92906	0.280107	0.033701	0	22.60589

22.3724	0.068827	16.0161	0	9.91273	0.282565	0.034047	0	22.67276
22.4387	0.068556	16.0006	0	9.89617	0.285039	0.034396	0	22.73923
22.5045	0.068296	15.9852	0	9.8794	0.28753	0.034748	0	22.80518
22.5699	0.068047	15.97	0	9.86242	0.290037	0.035103	0	22.87073
22.6348	0.067807	15.9548	0	9.84524	0.292562	0.035462	0	22.93576
22.6994	0.067578	15.9398	0	9.82785	0.295103	0.035823	0	23.00049
22.7635	0.06736	15.9248	0	9.81026	0.297662	0.036188	0	23.06472
22.8271	0.067151	15.91	0	9.79248	0.300239	0.036557	0	23.12843
22.8903	0.066953	15.8953	0	9.77451	0.302834	0.036929	0	23.19174
22.9531	0.066766	15.8806	0	9.75635	0.305447	0.037304	0	23.25464
23.0154	0.066588	15.8661	0	9.73801	0.308079	0.037683	0	23.31703
23.0773	0.066421	15.8517	0	9.71948	0.310731	0.038066	0	23.37902
23.1388	0.066264	15.8374	0	9.70078	0.313401	0.038452	0	23.4406
23.1998	0.066117	15.8233	0	9.6819	0.316092	0.038842	0	23.50167
23.2604	0.06598	15.8092	0	9.66285	0.318802	0.039236	0	23.56233
23.3206	0.065854	15.7952	0	9.64363	0.321533	0.039634	0	23.62259
23.3803	0.065738	15.7813	0	9.62424	0.324285	0.040036	0	23.68234
23.4395	0.065631	15.7676	0	9.60468	0.327058	0.040442	0	23.74158
23.4983	0.065535	15.7539	0	9.58496	0.329853	0.040852	0	23.80042
23.5567	0.065448	15.7404	0	9.56508	0.332671	0.041267	0	23.85885
23.6146	0.065372	15.7269	0	9.54504	0.33551	0.041685	0	23.91678
23.6721	0.065305	15.7136	0	9.52485	0.338373	0.042109	0	23.97429
23.7292	0.065249	15.7003	0	9.50451	0.341259	0.042537	0	24.03141
23.7857	0.065202	15.6872	0	9.48401	0.34417	0.042969	0	24.08791
23.8419	0.065165	15.6742	0	9.46337	0.347105	0.043406	0	24.14411
23.8975	0.065137	15.6612	0	9.44258	0.350065	0.043848	0	24.1997
23.9528	0.06512	15.6484	0	9.42165	0.353051	0.044296	0	24.25499
24.0076	0.065112	15.6357	0	9.40057	0.356064	0.044748	0	24.30977
24.0619	0.065113	15.623	0	9.37936	0.359103	0.045205	0	24.36404
24.1157	0.065125	15.6105	0	9.35802	0.362171	0.045668	0	24.41781
24.1691	0.065146	15.5981	0	9.33654	0.365267	0.046137	0	24.47118
24.2221	0.065176	15.5857	0	9.31492	0.368392	0.046611	0	24.52413
24.2746	0.065216	15.5735	0	9.29318	0.371548	0.047091	0	24.57659
24.3266	0.065266	15.5614	0	9.27131	0.374735	0.047576	0	24.62853
24.3782	0.065326	15.5493	0	9.24931	0.377953	0.048069	0	24.68007
24.4293	0.065395	15.5374	0	9.22717	0.381205	0.048567	0	24.73111
24.4799	0.065473	15.5255	0	9.20491	0.38449	0.049072	0	24.78164
24.5301	0.065561	15.5138	0	9.18251	0.387809	0.049583	0	24.83176
24.5799	0.065659	15.5021	0	9.15998	0.391163	0.050102	0	24.88148
24.6292	0.065767	15.4906	0	9.13731	0.394554	0.050627	0	24.9307
24.678	0.065884	15.4791	0	9.11451	0.39798	0.05116	0	24.97941
24.7264	0.066011	15.4678	0	9.09156	0.401444	0.0517	0	25.02771
24.7743	0.066148	15.4565	0	9.06846	0.404946	0.052247	0	25.07551
24.8217	0.066294	15.4454	0	9.04522	0.408485	0.052802	0	25.1228
24.8687	0.066449	15.4344	0	9.02183	0.412064	0.053365	0	25.16969
24.9152	0.066615	15.4235	0	8.99828	0.415682	0.053936	0	25.21607
24.9612	0.066789	15.4127	0	8.97459	0.41934	0.054515	0	25.26195
25.0068	0.066974	15.402	0	8.95074	0.423039	0.055102	0	25.30742

25.0518	0.067168	15.3914	0	8.92673	0.426779	0.055697	0	25.35229
25.0964	0.067371	15.3809	0	8.90257	0.430561	0.056301	0	25.39675
25.1404	0.067585	15.3705	0	8.87826	0.434385	0.056914	0	25.44061
25.184	0.067807	15.3603	0	8.85379	0.438252	0.057536	0	25.48406
25.227	0.068039	15.3501	0	8.82917	0.442162	0.058167	0	25.52691
25.2695	0.068281	15.3401	0	8.80439	0.446117	0.058807	0	25.56925
25.3115	0.068532	15.3302	0	8.77946	0.450117	0.059456	0	25.61109
25.3529	0.068793	15.3204	0	8.75437	0.454162	0.060115	0	25.65232
25.3938	0.069064	15.3107	0	8.72914	0.458253	0.060784	0	25.69304
25.4341	0.069344	15.3012	0	8.70377	0.462391	0.061462	0	25.73316
25.4738	0.069633	15.2917	0	8.67825	0.466576	0.062151	0	25.77268
25.513	0.069933	15.2824	0	8.65258	0.47081	0.06285	0	25.81169
25.5515	0.070242	15.2732	0	8.62678	0.475092	0.06356	0	25.84999
25.5894	0.07056	15.2641	0	8.60085	0.479424	0.064281	0	25.88769
25.6267	0.070888	15.2551	0	8.57478	0.483806	0.065012	0	25.92479
25.6634	0.071226	15.2462	0	8.54859	0.488239	0.065755	0	25.96128
25.6994	0.071574	15.2374	0	8.52228	0.492724	0.066509	0	25.99706
25.7348	0.071932	15.2288	0	8.49585	0.497262	0.067274	0	26.03224
25.7695	0.072299	15.2202	0	8.46931	0.501853	0.068052	0	26.06671
25.8035	0.072676	15.2118	0	8.44266	0.506498	0.068842	0	26.10048
25.8367	0.073064	15.2035	0	8.41592	0.511198	0.069644	0	26.13344
25.8693	0.073461	15.1952	0	8.38908	0.515953	0.070458	0	26.1658
25.9011	0.073868	15.1871	0	8.36216	0.520765	0.071285	0	26.19735
25.9322	0.074285	15.1791	0	8.33516	0.525635	0.072126	0	26.22819
25.9624	0.074713	15.1712	0	8.30808	0.530563	0.07298	0	26.25813
25.9919	0.07515	15.1634	0	8.28095	0.535549	0.073847	0	26.28737
26.0206	0.075598	15.1557	0	8.25376	0.540596	0.074728	0	26.3158
26.0484	0.076056	15.1481	0	8.22652	0.545704	0.075623	0	26.34332
26.0754	0.076525	15.1406	0	8.19924	0.550874	0.076533	0	26.37004
26.1015	0.077004	15.1332	0	8.17194	0.556106	0.077457	0	26.39585
26.1267	0.077493	15.1258	0	8.14462	0.561403	0.078396	0	26.42076
26.151	0.077993	15.1186	0	8.11729	0.566763	0.079351	0	26.44477
26.1744	0.078504	15.1114	0	8.08997	0.57219	0.080321	0	26.46786
26.1968	0.079025	15.1043	0	8.06266	0.577683	0.081307	0	26.48995
26.2183	0.079558	15.0973	0	8.03537	0.583244	0.082309	0	26.51114
26.2388	0.080101	15.0904	0	8.00811	0.588874	0.083328	0	26.53132
26.2582	0.080655	15.0836	0	7.9809	0.594574	0.084364	0	26.5504
26.2767	0.08122	15.0768	0	7.95375	0.600345	0.085417	0	26.56857
26.294	0.081797	15.0701	0	7.92666	0.606188	0.086487	0	26.58554
26.3103	0.082384	15.0634	0	7.89966	0.612104	0.087575	0	26.6015
26.3255	0.082983	15.0568	0	7.87274	0.618094	0.088682	0	26.61635
26.3396	0.083594	15.0503	0	7.84593	0.62416	0.089807	0	26.6301
26.3525	0.084216	15.0438	0	7.81923	0.630303	0.090952	0	26.64265
26.3642	0.084849	15.0374	0	7.79265	0.636524	0.092115	0	26.65398
26.3748	0.085495	15.031	0	7.7662	0.642824	0.093299	0	26.66422
26.3842	0.086152	15.0246	0	7.73989	0.649205	0.094503	0	26.67325
26.3924	0.086821	15.0183	0	7.71374	0.655667	0.095728	0	26.68107
26.3993	0.087502	15.0121	0	7.68775	0.662213	0.096974	0	26.68759

26.4049	0.088195	15.0058	0	7.66192	0.668843	0.098241	0	26.69281
26.4093	0.0889	14.9996	0	7.63627	0.67556	0.09953	0	26.69681
26.4124	0.089618	14.9935	0	7.61079	0.682363	0.100843	0	26.69952
26.4141	0.090349	14.9873	0	7.58551	0.689256	0.102178	0	26.70082
26.4145	0.091091	14.9812	0	7.56041	0.696239	0.103536	0	26.70081
26.4136	0.091847	14.9751	0	7.53551	0.703313	0.104919	0	26.6995
26.4113	0.092615	14.9691	0	7.5108	0.710481	0.106327	0	26.69678
26.4077	0.093397	14.963	0	7.48628	0.717743	0.10776	0	26.69276
26.4027	0.094191	14.957	0	7.46197	0.725102	0.109218	0	26.68733
26.3962	0.094999	14.9509	0	7.43785	0.732559	0.110703	0	26.6804
26.3884	0.09582	14.9449	0	7.41392	0.740115	0.112215	0	26.67216
26.3791	0.096655	14.9389	0	7.39019	0.747772	0.113755	0	26.66242
26.3684	0.097503	14.9329	0	7.36664	0.755532	0.115323	0	26.65127
26.3563	0.098365	14.927	0	7.34327	0.763396	0.11692	0	26.63871
26.3427	0.099241	14.921	0	7.32009	0.771367	0.118546	0	26.62466
26.3276	0.100132	14.9151	0	7.29707	0.779445	0.120203	0	26.60909
26.3111	0.101036	14.9091	0	7.27422	0.787632	0.121891	0	26.59212
26.2931	0.101955	14.9032	0	7.25153	0.79593	0.123611	0	26.57364
26.2736	0.102889	14.8973	0	7.229	0.80434	0.125364	0	26.55366
26.2526	0.103838	14.8913	0	7.2066	0.812865	0.12715	0	26.53218
26.2302	0.104802	14.8854	0	7.18435	0.821506	0.12897	0	26.50928
26.2062	0.105781	14.8795	0	7.16222	0.830264	0.130825	0	26.48478
26.1806	0.106776	14.8736	0	7.14022	0.839141	0.132716	0	26.45868
26.1536	0.107787	14.8677	0	7.11833	0.848139	0.134644	0	26.43117
26.125	0.108813	14.8618	0	7.09655	0.857259	0.136609	0	26.40205
26.0948	0.109856	14.8559	0	7.07487	0.866503	0.138612	0	26.37132
26.0631	0.110915	14.85	0	7.05328	0.875873	0.140655	0	26.33909
26.0299	0.111991	14.8441	0	7.03178	0.885369	0.142738	0	26.30536
25.995	0.113084	14.8382	0	7.01036	0.894994	0.144863	0	26.26991
25.9585	0.114194	14.8323	0	6.98901	0.904748	0.147029	0	26.23286
25.9205	0.115321	14.8264	0	6.96773	0.914634	0.149239	0	26.19431
25.8808	0.116466	14.8204	0	6.9465	0.924652	0.151492	0	26.15404
25.8395	0.117629	14.8145	0	6.92534	0.934803	0.153791	0	26.11217
25.7965	0.11881	14.8086	0	6.90423	0.94509	0.156136	0	26.06859
25.7519	0.12001	14.8026	0	6.88316	0.955513	0.158528	0	26.0234
25.7056	0.121228	14.7966	0	6.86213	0.966073	0.160968	0	25.97651
25.6576	0.122465	14.7906	0	6.84114	0.976771	0.163458	0	25.92791
25.6079	0.123722	14.7846	0	6.82019	0.987608	0.165998	0	25.8776
25.5566	0.124998	14.7786	0	6.79927	0.998585	0.168589	0	25.82568
25.5035	0.126293	14.7725	0	6.77837	1.0097	0.171233	0	25.77196
25.4486	0.127609	14.7664	0	6.75749	1.02096	0.17393	0	25.71643
25.3921	0.128945	14.7602	0	6.73664	1.03236	0.176682	0	25.65929
25.3337	0.130301	14.7541	0	6.71581	1.0439	0.17949	0	25.60024
25.2736	0.131678	14.7478	0	6.69499	1.05559	0.182354	0	25.53948
25.2118	0.133076	14.7416	0	6.67418	1.06742	0.185277	0	25.47701
25.1481	0.134495	14.7352	0	6.65339	1.07939	0.188259	0	25.41264
25.0826	0.135935	14.7288	0	6.6326	1.0915	0.191302	0	25.34645
25.0153	0.137398	14.7224	0	6.61182	1.10375	0.194406	0	25.27846

24.9462	0.138882	14.7159	0	6.59105	1.11614	0.197573	0	25.20865
24.8753	0.140388	14.7093	0	6.57028	1.12868	0.200804	0	25.13704
24.8025	0.141917	14.7027	0	6.54952	1.14135	0.204099	0	25.06352
24.7279	0.143468	14.6959	0	6.52876	1.15417	0.207462	0	24.98819
24.6515	0.145041	14.6891	0	6.508	1.16711	0.210891	0	24.91105
24.5732	0.146638	14.6822	0	6.48724	1.1802	0.214389	0	24.832
24.493	0.148257	14.6752	0	6.46648	1.19342	0.217956	0	24.75104
24.411	0.1499	14.6681	0	6.44573	1.20677	0.221595	0	24.66826
24.3272	0.151566	14.6609	0	6.42497	1.22024	0.225305	0	24.58368
24.2414	0.153255	14.6536	0	6.4042	1.23385	0.229088	0	24.49709
24.1539	0.154968	14.6462	0	6.38344	1.24758	0.232946	0	24.40879
24.0645	0.156704	14.6387	0	6.36267	1.26142	0.236879	0	24.31857
23.9733	0.158464	14.631	0	6.34191	1.27539	0.240887	0	24.22655
23.8802	0.160248	14.6232	0	6.32114	1.28947	0.244974	0	24.13261
23.7853	0.162056	14.6153	0	6.30037	1.30366	0.249138	0	24.03687
23.6887	0.163887	14.6073	0	6.2796	1.31795	0.253382	0	23.93941
23.5902	0.165742	14.5991	0	6.25883	1.33234	0.257706	0	23.84004
23.49	0.16762	14.5907	0	6.23806	1.34682	0.262111	0	23.73897
23.3122	0.169523	14.56	0	6.34897	1.35953	0.265118	0	23.56075
23.2408	0.171443	14.5581	0	6.29043	1.37443	0.269975	0	23.48838
23.1133	0.17342	14.5409	0	6.32273	1.38822	0.273927	0	23.3602
23.0147	0.175405	14.5314	0	6.30933	1.40262	0.278427	0	23.26078
22.9447	0.177377	14.5304	0	6.24281	1.41782	0.283615	0	23.18976
22.8102	0.179419	14.5119	0	6.28247	1.43172	0.287698	0	23.05458
22.7412	0.181426	14.5115	0	6.21053	1.44709	0.293116	0	22.98454
22.6022	0.18351	14.4921	0	6.25522	1.46103	0.297285	0	22.84485
22.5344	0.185551	14.4922	0	6.17781	1.47656	0.302941	0	22.77598
22.391	0.187676	14.4719	0	6.22762	1.49051	0.307194	0	22.6319
22.3244	0.189748	14.4725	0	6.14468	1.50616	0.313094	0	22.5642
22.2402	0.191859	14.4697	0	6.08071	1.52172	0.318934	0	22.47892
22.0606	0.194032	14.4405	0	6.18593	1.5351	0.322745	0	22.29877
21.9962	0.196153	14.4418	0	6.09449	1.55088	0.329026	0	22.23323
21.8428	0.198378	14.4193	0	6.15752	1.56475	0.333481	0	22.07915
21.7372	0.20059	14.4088	0	6.14303	1.57951	0.338947	0	21.97265
21.6313	0.202816	14.3982	0	6.12847	1.59427	0.3445	0	21.86586
21.5251	0.205054	14.3875	0	6.11385	1.60902	0.350139	0	21.75875
21.4186	0.207304	14.3767	0	6.09916	1.62375	0.355866	0	21.65135
21.3119	0.209567	14.3659	0	6.08442	1.63845	0.361682	0	21.54374
21.2051	0.21184	14.3549	0	6.06962	1.65312	0.367586	0	21.43603
21.0981	0.214124	14.3438	0	6.05478	1.66774	0.37358	0	21.32811
20.991	0.216417	14.3327	0	6.03989	1.68232	0.379664	0	21.22009
20.884	0.21872	14.3214	0	6.02495	1.69684	0.385839	0	21.11217
20.777	0.221031	14.3101	0	6.00998	1.7113	0.392106	0	21.00425
20.6701	0.22335	14.2986	0	5.99497	1.72569	0.398466	0	20.89642
20.5634	0.225675	14.287	0	5.97993	1.74	0.404919	0	20.78879
20.4568	0.228007	14.2754	0	5.96486	1.75422	0.411465	0	20.68126
20.3506	0.230345	14.2636	0	5.94977	1.76834	0.418106	0	20.57414
20.2446	0.232687	14.2517	0	5.93466	1.78236	0.424842	0	20.46721

20.139	0.235033	14.2397	0	5.91954	1.79627	0.431675	0	20.36068
20.0338	0.237382	14.2275	0	5.90441	1.81006	0.438604	0	20.25454
19.9291	0.239734	14.2153	0	5.88927	1.82373	0.445631	0	20.14892
19.825	0.242087	14.2029	0	5.87413	1.83726	0.452757	0	20.04389
19.7214	0.24444	14.1904	0	5.85899	1.85065	0.459981	0	19.93936
19.6184	0.246793	14.1778	0	5.84387	1.86389	0.467306	0	19.83544
19.5161	0.249145	14.165	0	5.82875	1.87698	0.474733	0	19.73221
19.449	0.251929	14.1536	0	5.81299	1.88907	0.482338	0	19.66444
19.3919	0.25481	14.1424	0	5.79706	1.90085	0.490104	0	19.60674
19.3345	0.257649	14.1311	0	5.78115	1.9126	0.498018	0	19.54873
19.2312	0.259861	14.1179	0	5.76609	1.92542	0.505974	0	19.4445
19.1293	0.26208	14.1046	0	5.75106	1.93803	0.514039	0	19.34167
19.0285	0.264299	14.0911	0	5.73605	1.95044	0.522214	0	19.23995
18.9286	0.266516	14.0775	0	5.72109	1.96264	0.5305	0	19.13913
18.8298	0.26873	14.0637	0	5.70617	1.97462	0.538899	0	19.03942
18.732	0.27094	14.0498	0	5.6913	1.98639	0.547412	0	18.94071
18.6354	0.273145	14.0357	0	5.67648	1.99793	0.55604	0	18.84321
18.54	0.275345	14.0214	0	5.66172	2.00924	0.564785	0	18.74691
18.4457	0.277537	14.0069	0	5.64702	2.02031	0.573649	0	18.65172
18.3526	0.279721	13.9923	0	5.63238	2.03113	0.582633	0	18.55773
18.2608	0.281896	13.9775	0	5.61781	2.04171	0.59174	0	18.46506
18.1702	0.284061	13.9625	0	5.60332	2.05203	0.600972	0	18.37359
18.0809	0.286214	13.9473	0	5.5889	2.0621	0.61033	0	18.28342
17.9928	0.288355	13.9319	0	5.57456	2.07191	0.619818	0	18.19447
17.9061	0.290483	13.9163	0	5.56031	2.08145	0.629437	0	18.10692
17.8206	0.292597	13.9005	0	5.54614	2.09073	0.639189	0	18.02058
17.7365	0.294696	13.8846	0	5.53205	2.09973	0.649079	0	17.93565
17.6537	0.296778	13.8684	0	5.51807	2.10845	0.659108	0	17.85202
17.5722	0.298844	13.8519	0	5.50417	2.1169	0.669279	0	17.76971
17.7152	0.303989	13.8361	0	5.50709	2.1217	0.680587	0	17.91389
17.8254	0.308684	13.8295	0	5.48378	2.12506	0.692218	0	18.02463
17.9331	0.313212	13.8228	0	5.46036	2.12887	0.704376	0	18.13286
17.9272	0.315893	13.8104	0	5.44264	2.13644	0.716598	0	18.1267
17.861	0.3176	13.7947	0	5.42802	2.14582	0.728905	0	18.05983
17.7539	0.318681	13.7774	0	5.41376	2.15603	0.741258	0	17.95175
17.6498	0.319808	13.7597	0	5.39962	2.16581	0.753782	0	17.84669
17.5479	0.320968	13.7418	0	5.38559	2.17518	0.766481	0	17.74383
17.4481	0.322157	13.7235	0	5.37169	2.18414	0.779359	0	17.6431
17.3506	0.323372	13.7049	0	5.35791	2.1927	0.792419	0	17.54467
17.2551	0.32461	13.6859	0	5.34426	2.20084	0.805666	0	17.44826
17.1619	0.325867	13.6667	0	5.33074	2.20857	0.819106	0	17.35416
17.0707	0.327142	13.647	0	5.31735	2.21588	0.832743	0	17.26208
16.9816	0.32843	13.6271	0	5.3041	2.22279	0.846584	0	17.1721
16.8945	0.32973	13.6067	0	5.29098	2.22928	0.860633	0	17.08414
16.8093	0.331039	13.586	0	5.278	2.23536	0.874898	0	16.9981
16.7261	0.332354	13.565	0	5.26516	2.24103	0.889384	0	16.91406
16.6448	0.333673	13.5435	0	5.25246	2.2463	0.904099	0	16.83194
16.5652	0.334994	13.5217	0	5.23989	2.25116	0.919049	0	16.75153

16.4874	0.336315	13.4995	0	5.22747	2.25561	0.934242	0	16.67293
16.4113	0.337634	13.4769	0	5.21518	2.25966	0.949685	0	16.59605
16.2827	0.339874	13.4526	0	5.2013	2.26723	0.967573	0	16.46627
16.1844	0.341646	13.4284	0	5.1885	2.27221	0.984637	0	16.36701
16.1245	0.34279	13.4046	0	5.17703	2.27408	1.00049	0	16.30644
15.9875	0.345266	13.3785	0	5.16312	2.2812	1.01991	0	16.16819
15.8887	0.347134	13.3527	0	5.15058	2.28515	1.03817	0	16.06842
15.8185	0.357689	13.3212	0	5.14976	2.3017	1.06996	0	15.99785
15.7261	0.368034	13.2942	0	5.12788	2.3176	1.10365	0	15.90466
15.6327	0.378229	13.2659	0	5.10575	2.33353	1.13908	0	15.81048
15.5383	0.388273	13.2364	0	5.08333	2.34949	1.17637	0	15.71529
15.4427	0.398163	13.2056	0	5.0606	2.3655	1.21569	0	15.61889
15.3458	0.407897	13.1732	0	5.03753	2.38154	1.2572	0	15.52119
15.2475	0.417472	13.1392	0	5.01409	2.39763	1.30109	0	15.42209
15.1477	0.426888	13.1033	0	4.99023	2.41378	1.34756	0	15.32147
15.0461	0.436141	13.0655	0	4.96591	2.42998	1.39685	0	15.21906
14.9427	0.445229	13.0256	0	4.94109	2.44625	1.44922	0	15.11483
14.8372	0.45415	12.9832	0	4.91572	2.46258	1.50496	0	15.0085
14.7287	0.457671	12.9407	0	4.89503	2.4728	1.5548	0	14.89908
14.6179	0.45472	12.8992	0	4.88065	2.47501	1.59507	0	14.78725
14.5061	0.451724	12.8563	0	4.8666	2.47614	1.63606	0	14.67441
14.3932	0.448702	12.8119	0	4.85287	2.47616	1.67777	0	14.56045
14.2793	0.445671	12.7661	0	4.83948	2.47505	1.72018	0	14.44547
14.1645	0.44265	12.7189	0	4.82642	2.47278	1.76328	0	14.32957
14.0487	0.439654	12.6702	0	4.8137	2.46933	1.80704	0	14.21266
13.9319	0.436698	12.6201	0	4.80133	2.46468	1.85146	0	14.09473
13.8143	0.433797	12.5687	0	4.78929	2.45881	1.8965	0	13.97598
13.6958	0.430962	12.5158	0	4.7776	2.45171	1.94215	0	13.85632
13.5766	0.428204	12.4616	0	4.76625	2.44337	1.98838	0	13.73594
13.4565	0.425532	12.406	0	4.75525	2.43379	2.03518	0	13.61464
13.3357	0.42327	12.3489	0	4.7443	2.42335	2.08337	0	13.49263
13.2141	0.421445	12.2899	0	4.73334	2.41212	2.13321	0	13.36981
13.0916	0.419974	12.2293	0	4.72239	2.40003	2.18464	0	13.24609
13.1933	0.414538	12.1763	0	4.72105	2.37311	2.21956	0	13.34845
12.8453	0.417655	12.104	0	4.70034	2.37395	2.2918	0	12.9973
12.7202	0.417079	12.0382	0	4.6894	2.35922	2.3483	0	12.87094
12.8507	0.411909	11.9817	0	4.68965	2.32839	2.38473	0	13.00237
12.4688	0.416202	11.9026	0	4.66726	2.32791	2.46594	0	12.61699
12.3411	0.416254	11.8313	0	4.65624	2.31045	2.52803	0	12.48799
12.2124	0.416443	11.7583	0	4.64517	2.29206	2.5921	0	12.35798
12.0829	0.416748	11.6834	0	4.63404	2.27274	2.65823	0	12.22716
11.9525	0.417149	11.6068	0	4.62282	2.25249	2.72645	0	12.09543
11.8212	0.417627	11.5283	0	4.61152	2.2313	2.79683	0	11.96278
11.6891	0.418165	11.4481	0	4.60009	2.20919	2.86943	0	11.82932
11.5561	0.418746	11.3661	0	4.58854	2.18616	2.9443	0	11.69496
11.4225	0.419354	11.2823	0	4.57684	2.16222	3.02149	0	11.55998
11.2881	0.419977	11.1968	0	4.56496	2.1374	3.10105	0	11.42419
11.153	0.420602	11.1097	0	4.55289	2.1117	3.18303	0	11.28769

11.0173	0.421215	11.0209	0	4.5406	2.08516	3.26747	0	11.15059
10.8811	0.421808	10.9305	0	4.52806	2.05781	3.35441	0	11.01298
10.7444	0.42237	10.8386	0	4.51526	2.02968	3.44388	0	10.87486
10.6073	0.422892	10.7452	0	4.50215	2.00081	3.53592	0	10.73633
10.4699	0.423368	10.6504	0	4.48872	1.97126	3.63056	0	10.5975
10.3323	0.42379	10.5543	0	4.47493	1.94106	3.72781	0	10.45846
10.1945	0.424152	10.4569	0	4.46075	1.91029	3.82768	0	10.31922
10.0568	0.424451	10.3585	0	4.44614	1.87901	3.93019	0	10.18008
9.9191	0.424682	10.259	0	4.43109	1.84728	4.03533	0	10.04094
9.78164	0.424842	10.1586	0	4.41555	1.81518	4.1431	0	9.902037
9.6445	0.42493	10.0575	0	4.39948	1.7828	4.25349	0	9.763458
9.5078	0.424945	9.95561	0	4.38286	1.75021	4.36647	0	9.625323
9.37166	0.424886	9.8532	0	4.36566	1.7175	4.48203	0	9.487754
9.2362	0.424754	9.75036	0	4.34783	1.68478	4.60012	0	9.350871
9.10153	0.42455	9.64723	0	4.32935	1.65213	4.72071	0	9.214786
8.96779	0.424276	9.54393	0	4.31019	1.61964	4.84375	0	9.079641
8.83507	0.423936	9.44059	0	4.29032	1.58742	4.96919	0	8.945527
8.70349	0.423532	9.33733	0	4.2697	1.55557	5.09697	0	8.812566
8.57744	0.422586	9.23945	0	4.24834	1.52337	5.22255	0	8.685173
8.44921	0.421872	9.13785	0	4.22682	1.49227	5.35238	0	8.555592
8.31841	0.421626	9.03175	0	4.2044	1.46257	5.48875	0	8.423432
8.19636	0.42066	8.93492	0	4.18077	1.43244	5.62066	0	8.300088
8.86091	0.405683	8.87606	0	4.19998	1.38591	5.62866	0	8.97139
7.95674	0.417117	8.74325	0	4.13187	1.3801	5.88707	0	8.057959
7.83641	0.416897	8.64466	0	4.10635	1.35288	6.02647	0	7.936368
8.5419	0.402097	8.58398	0	4.12564	1.31062	6.03172	0	8.649176
7.6026	0.414465	8.45213	0	4.05166	1.30718	6.3101	0	7.700141
7.48657	0.414655	8.35488	0	4.02307	1.28312	6.45715	0	7.582906
7.37549	0.414216	8.26279	0	3.99401	1.25976	6.60153	0	7.470664
8.19116	0.397086	8.2141	0	4.01694	1.22136	6.58106	0	8.294969
7.16069	0.41061	8.08462	0	3.9342	1.22251	6.8887	0	7.253644
7.35699	0.410197	8.0764	0	3.93031	1.22128	6.88177	0	7.35699
7.01099	0.411956	7.98267	0	3.89326	1.20385	7.05335	0	7.102258
6.90412	0.412099	7.89034	0	3.86101	1.18512	7.2078	0	6.994288
7.10883	0.411635	7.88135	0	3.85674	1.18379	7.19969	0	7.10883
7.80172	0.393907	7.84032	0	3.87834	1.15202	7.17454	0	7.901483
6.66584	0.409314	7.71251	0	3.78542	1.15783	7.52038	0	6.753426
6.56436	0.409876	7.62298	0	3.75135	1.1421	7.67872	0	6.650906
6.46697	0.409736	7.53792	0	3.71712	1.12738	7.83423	0	6.552513
6.36743	0.409725	7.4488	0	3.68191	1.1144	7.99589	0	6.451959
6.59236	0.409151	7.43823	0	3.67682	1.11283	7.98468	0	6.59236
6.23702	0.410141	7.35775	0	3.63722	1.10302	8.16729	0	6.320071
6.46637	0.40954	7.34684	0	3.63197	1.1014	8.15532	0	6.46637
6.10934	0.410459	7.2678	0	3.59228	1.09247	8.33972	0	6.190943
6.01887	0.409734	7.18661	0	3.55617	1.08207	8.49949	0	6.099548
5.92875	0.409015	7.10481	0	3.51968	1.07298	8.6611	0	6.00851
5.83833	0.408486	7.02146	0	3.48227	1.06527	8.82689	0	5.917175
5.75057	0.407799	6.9408	0	3.44443	1.05856	8.99223	0	5.828528

5.66602	0.40683	6.86367	0	3.40679	1.05269	9.15467	0	5.74312
5.5802	0.40615	6.78366	0	3.36838	1.04811	9.32199	0	5.656435
5.49675	0.405366	6.70604	0	3.3297	1.04439	9.48879	0	5.572144
5.4162	0.404352	6.63164	0	3.29135	1.04138	9.65267	0	5.490779
5.33609	0.403426	6.55688	0	3.25286	1.0393	9.81775	0	5.409858
5.25582	0.402714	6.48089	0	3.21373	1.03818	9.98628	0	5.328779
5.17759	0.401912	6.40696	0	3.17452	1.03776	10.1541	0	5.24976
6.4864	0.374201	6.38321	0	3.21892	1.02185	9.98152	0	6.574101
5.03566	0.394376	6.27768	0	3.09909	1.04691	10.4646	0	5.10641
6.37562	0.368449	6.25321	0	3.14555	1.03106	10.2782	0	6.462421
6.82146	0.354263	6.21982	0	3.14019	1.0344	10.2904	0	6.913485
6.9834	0.345466	6.17795	0	3.11825	1.04386	10.367	0	7.077419
7.02496	0.339889	6.13147	0	3.08941	1.0556	10.4714	0	7.119631
7.01474	0.336247	6.08279	0	3.0578	1.068	10.5878	0	7.109489
6.98217	0.333763	6.0331	0	3.02517	1.08042	10.7093	0	7.076746
6.93996	0.331968	5.98299	0	2.9923	1.09257	10.8331	0	7.034251
6.89357	0.330578	5.93275	0	2.95951	1.10437	10.9577	0	6.987526
6.84539	0.329423	5.88254	0	2.92695	1.11581	11.0824	0	6.938986
6.79648	0.328404	5.83245	0	2.89468	1.12689	11.2071	0	6.889704
6.7473	0.32746	5.78256	0	2.86272	1.13764	11.3315	0	6.840143
6.69809	0.326557	5.73292	0	2.8311	1.14809	11.4554	0	6.790548
6.64898	0.325675	5.68359	0	2.79982	1.15826	11.5788	0	6.741048
6.60006	0.324803	5.63462	0	2.76889	1.16818	11.7017	0	6.691737
6.55139	0.323934	5.58603	0	2.73832	1.17786	11.8238	0	6.642673
6.50302	0.323065	5.53788	0	2.70811	1.18733	11.9451	0	6.593907
6.455	0.322194	5.49018	0	2.67827	1.1966	12.0656	0	6.545491
6.40736	0.321322	5.44298	0	2.6488	1.2057	12.1852	0	6.497455
6.36015	0.320447	5.3963	0	2.61971	1.21464	12.3038	0	6.449848
6.31339	0.31957	5.35016	0	2.591	1.22342	12.4214	0	6.402691
6.26712	0.318692	5.3046	0	2.56268	1.23207	12.5379	0	6.356026
6.22136	0.317813	5.25961	0	2.53475	1.24059	12.6532	0	6.309871
6.17614	0.316934	5.21524	0	2.50722	1.24899	12.7673	0	6.264258

Mg#	Density of liquid (g/cc)
18.05047	3.197715
20.3037	3.190838
22.4086	3.185023
24.3793	3.179471
26.22826	3.174164
27.96648	3.169089
29.60353	3.164231
31.14809	3.159578
32.60769	3.155118
33.98919	3.150841
35.29871	3.146737
36.54169	3.142796
37.72316	3.13901
38.84748	3.135371
39.9187	3.131872
40.94068	3.128505
41.91653	3.125264
42.84924	3.122143
43.74181	3.119136
44.59675	3.116237
45.41633	3.113443
46.20269	3.110748
46.95787	3.108147
47.68359	3.105637
48.38167	3.103213
49.05359	3.100872
49.70082	3.09861
50.32449	3.096425
50.92624	3.094312
51.5069	3.092269
52.06771	3.090294
52.60959	3.088382
53.1337	3.086533
53.64054	3.084743
54.1313	3.083011
54.60628	3.081333
55.06681	3.079709
55.51298	3.078136
55.946	3.076612
56.36598	3.075135
56.77368	3.073705
57.16974	3.072318
57.5544	3.070974
57.92834	3.069672
58.29199	3.068409
58.6457	3.067185

58.98985	3.065998
59.32498	3.064847
59.65124	3.063731
59.96903	3.062648
60.27882	3.061598
60.58075	3.06058
60.87515	3.059592
61.1623	3.058634
61.44249	3.057705
61.71608	3.056803
61.98304	3.055929
62.24381	3.055081
62.49847	3.054258
62.74745	3.053461
62.99059	3.052687
63.22842	3.051936
63.46102	3.051208
63.68843	3.050502
63.91106	3.049818
64.12875	3.049154
64.34188	3.048511
64.55062	3.047888
64.75503	3.047283
64.95513	3.046697
65.15132	3.04613
65.34329	3.04558
65.53166	3.045047
65.71633	3.044531
65.89736	3.044032
66.07477	3.043548
66.24881	3.04308
66.41964	3.042627
66.58726	3.042189
66.75172	3.041765
66.91316	3.041355
67.00527	3.040988
67.0164	3.040664
67.02744	3.040345
67.03836	3.040032
67.04907	3.039724
67.05978	3.039422
67.07038	3.039125
67.08076	3.038833
67.09114	3.038546
67.10141	3.038264
67.11135	3.037987
67.1214	3.037716
67.13123	3.037449

67.14106	3.037187
67.15067	3.03693
67.16027	3.036678
67.16965	3.03643
67.17891	3.036187
67.18806	3.035948
67.19732	3.035715
67.20636	3.035485
67.21528	3.03526
67.22409	3.03504
67.23267	3.034823
67.24135	3.034611
67.24992	3.034404
67.25826	3.0342
67.26671	3.034001
67.27494	3.033806
67.28304	3.033615
67.29114	3.033427
67.29912	3.033244
67.30698	3.033065
67.31483	3.03289
67.32258	3.032718
67.33019	3.032551
67.33781	3.032387
67.34519	3.032227
67.35268	3.03207
67.35992	3.031917
67.36718	3.031768
67.3743	3.031623
67.38142	3.031481
67.38842	3.031342
67.39529	3.031207
67.40216	3.031075
67.40902	3.030947
67.41565	3.030822
67.42227	3.030701
67.42888	3.030582
67.43536	3.030467
67.44173	3.030356
67.4482	3.030247
67.45443	3.030142
67.46065	3.030039
67.46686	3.02994
67.47284	3.029844
67.47893	3.029751
67.48488	3.029661
67.48981	3.029544
67.4929	3.029377

67.496	3.029213
67.49896	3.029052
67.50203	3.028894
67.50495	3.028739
67.50799	3.028588
67.51078	3.028439
67.51368	3.028293
67.51644	3.02815
67.51931	3.02801
67.52206	3.027873
67.52466	3.027738
67.52737	3.027607
67.52996	3.027478
67.46005	3.028832
67.39017	3.030188
67.32083	3.031537
67.25178	3.032879
67.18328	3.034215
67.11531	3.035545
67.04776	3.036868
66.98051	3.038185
66.91368	3.039496
66.84727	3.040801
66.78141	3.0421
66.71584	3.043393
66.6507	3.04468
66.58598	3.045961
66.52169	3.047236
66.4577	3.048505
66.39413	3.049769
66.33111	3.051026
66.26828	3.052278
66.20575	3.053525
66.14377	3.054766
66.08222	3.056001
66.02086	3.057231
65.95992	3.058455
65.89929	3.059674
65.83897	3.060887
65.77921	3.062095
65.71964	3.063298
65.66049	3.064495
65.60154	3.065687
65.54302	3.066874
65.48493	3.068056
65.42691	3.069233
65.36945	3.070405
65.31219	3.071571

65.25523	3.072733
65.19859	3.073889
65.14226	3.075041
65.08613	3.076187
65.03044	3.077329
64.97507	3.078466
64.91988	3.079598
64.86502	3.080725
64.81035	3.081848
64.75625	3.082966
64.70209	3.084079
64.6485	3.085187
64.59486	3.086291
64.54179	3.08739
64.48879	3.088485
64.43611	3.089575
64.38363	3.090661
64.33147	3.091742
64.27951	3.092818
64.22775	3.09389
64.17644	3.094958
64.1252	3.096022
64.07416	3.097081
64.02344	3.098135
63.97293	3.099186
63.92262	3.100232
63.87263	3.101274
63.82272	3.102311
63.77313	3.103345
63.72362	3.104374
63.67444	3.105399
63.62559	3.10642
63.57669	3.107437
63.52812	3.10845
63.47975	3.109458
63.43145	3.110463
63.38362	3.111463
63.33574	3.11246
63.28805	3.113453
63.24071	3.114441
63.19343	3.115426
63.14636	3.116407
63.09951	3.117384
63.05285	3.118357
63.00615	3.119326
62.95977	3.120291
62.91361	3.121253
62.86752	3.12221

62.82165	3.123164
62.77598	3.124114
62.73038	3.125061
62.68499	3.126003
62.63969	3.126942
62.59459	3.127878
62.5497	3.128809
62.50476	3.129737
62.46003	3.130661
62.41564	3.131582
62.3712	3.132498
62.32683	3.133412
62.28281	3.134321
62.23873	3.135228
62.19487	3.13613
62.15121	3.137029
62.10764	3.137925
62.06415	3.138816
62.02074	3.139705
61.97754	3.14059
61.93441	3.141471
61.89137	3.142349
61.84854	3.143224
61.80578	3.144095
61.76311	3.144962
61.72053	3.145826
61.67814	3.146687
61.63585	3.147545
61.59363	3.148399
61.55149	3.149249
61.50943	3.150096
61.45758	3.15136
61.40477	3.152645
61.35173	3.153933
61.29849	3.155225
61.24505	3.156521
61.19127	3.157822
61.13729	3.159128
61.08312	3.160439
61.02862	3.161755
60.97393	3.163076
60.9188	3.164404
60.86349	3.165737
60.80787	3.167077
60.75168	3.168424
60.69532	3.169777
60.63841	3.171138
60.58122	3.172506

60.52361	3.173882
60.46547	3.175267
60.40705	3.17666
60.34811	3.178062
60.28852	3.179473
60.22854	3.180893
60.16806	3.182324
60.10708	3.183764
60.04546	3.185215
59.98324	3.186676
59.92067	3.188148
59.83321	3.189879
59.71387	3.191952
59.59435	3.19404
59.47467	3.196145
59.35496	3.198267
59.2351	3.200404
59.11548	3.202552
58.99595	3.204709
58.87675	3.206873
58.75812	3.209039
58.63978	3.211207
58.52196	3.213373
58.40494	3.215538
58.28853	3.217699
58.17276	3.219856
58.05785	3.222008
57.94355	3.224154
57.83024	3.226295
57.71763	3.228429
57.606	3.230556
57.49496	3.232676
57.38482	3.234789
57.27567	3.236895
57.1672	3.238994
57.05952	3.241085
56.95278	3.243169
56.84683	3.245245
56.74181	3.247314
56.63741	3.249375
56.53421	3.251428
56.43151	3.253475
56.32984	3.255513
56.22883	3.257545
56.12868	3.259569
56.0293	3.261586
55.93093	3.263595
55.83316	3.265598

55.7363	3.267593
55.64017	3.269582
55.5449	3.271564
55.45052	3.273538
55.35683	3.275506
55.26392	3.277468
55.17169	3.279422
55.08045	3.28137
54.98993	3.283312
54.89997	3.285247
54.811	3.287176
54.72274	3.289099
54.63519	3.291015
54.5486	3.292926
54.46257	3.29483
54.37724	3.296728
54.29272	3.29862
54.20915	3.300507
54.12612	3.302387
54.04394	3.304262
53.9624	3.306131
53.88169	3.307994
53.80152	3.309852
53.72239	3.311704
53.64383	3.31355
53.566	3.315391
53.48889	3.317226
53.41256	3.319056
53.33684	3.32088
53.26204	3.322699
53.18791	3.324512
53.11428	3.326319
53.04157	3.328121
52.96961	3.329918
52.89815	3.331709
52.82759	3.333495
52.75763	3.335275
52.68847	3.33705
52.6198	3.33882
52.55203	3.340584
52.48484	3.342344
52.41844	3.344098
52.35262	3.345848
52.2877	3.347592
52.2234	3.349332
52.15983	3.351067
52.09699	3.352797
52.03478	3.354523

51.97338	3.356244
51.91261	3.35796
51.85265	3.359672
51.79347	3.361379
51.73493	3.363082
51.67728	3.36478
51.62033	3.366474
51.56418	3.368163
51.50874	3.369847
51.45427	3.371527
51.40042	3.373202
51.34744	3.374872
51.29535	3.376538
51.24405	3.378199
51.19354	3.379855
51.14382	3.381505
51.09497	3.383151
51.04708	3.384792
50.99989	3.386427
50.95374	3.388057
50.90856	3.389682
50.86399	3.391301
50.82054	3.392914
50.77796	3.394521
50.73644	3.396122
50.69577	3.397717
50.65606	3.399305
50.61739	3.400887
50.57967	3.402463
50.54299	3.404031
50.50719	3.405592
50.47259	3.407146
50.43885	3.408692
50.40625	3.41023
50.37468	3.411761
50.34423	3.413283
50.31499	3.414797
50.28661	3.416302
50.25954	3.417798
50.23342	3.419284
50.20851	3.420762
50.1848	3.42223
50.16223	3.423687
50.14096	3.425135
50.12072	3.426572
50.1016	3.427998
50.08379	3.429414
50.06736	3.430818

50.05198	3.432212
50.03789	3.433593
50.02519	3.434963
50.01364	3.436321
50.00347	3.437668
49.99451	3.439002
49.98704	3.440323
49.98062	3.441633
49.97567	3.44293
49.97197	3.444215
49.96966	3.445487
49.96875	3.446746
49.96916	3.447993
49.97106	3.449227
49.97421	3.450449
49.97894	3.451658
49.98483	3.452855
49.99231	3.45404
50.00122	3.455211
50.01139	3.456371
50.02306	3.457519
50.03626	3.458654
50.051	3.459777
50.06709	3.460888
50.08473	3.461987
50.10391	3.463074
50.12455	3.46415
50.14666	3.465214
50.17043	3.466266
50.19577	3.467306
50.22259	3.468335
50.25093	3.469353
50.28103	3.470359
50.31283	3.471354
50.34607	3.472338
50.38102	3.47331
50.4177	3.474271
50.45611	3.475222
50.49616	3.476161
50.5379	3.477089
50.58149	3.478007
50.6266	3.478914
50.67386	3.479809
50.72257	3.480695
50.77327	3.481569
50.82565	3.482434
50.87997	3.483287
50.93624	3.484131

50.99431	3.484964
51.05419	3.485787
51.11617	3.4866
51.17982	3.487403
51.24551	3.488197
51.31318	3.488981
51.38285	3.489755
51.45444	3.49052
51.52797	3.491276
51.60365	3.492022
51.68122	3.49276
51.76089	3.49349
51.84241	3.494211
51.92608	3.494923
52.01183	3.495628
52.09956	3.496325
52.18934	3.497015
52.28099	3.497697
52.41642	3.495805
52.48989	3.497219
52.59686	3.496854
52.6869	3.497376
52.7614	3.498928
52.87535	3.498396
52.95047	3.500044
53.06899	3.4994
53.14436	3.501146
53.26746	3.500388
53.34306	3.502235
53.43248	3.503706
53.5824	3.501833
53.65783	3.503841
53.79197	3.502793
53.89402	3.503275
53.99679	3.503753
54.10027	3.50423
54.20449	3.504704
54.30949	3.505177
54.41484	3.505648
54.52083	3.506117
54.62751	3.506586
54.73432	3.507053
54.84172	3.50752
54.94924	3.507986
55.05696	3.508453
55.16516	3.508919
55.27313	3.509386
55.3813	3.509853

55.48941	3.510321
55.59729	3.51079
55.70517	3.511261
55.81256	3.511733
55.91977	3.512206
56.02665	3.512682
56.13292	3.513159
56.1978	3.51367
56.25065	3.514186
56.30388	3.514695
56.41239	3.515157
56.51956	3.515624
56.62558	3.516094
56.73088	3.516567
56.83499	3.517045
56.93822	3.517526
57.04012	3.518012
57.14066	3.518502
57.23996	3.518997
57.33805	3.519496
57.4346	3.52
57.52973	3.520508
57.62328	3.521021
57.71538	3.521539
57.80572	3.522062
57.89457	3.52259
57.98181	3.523122
58.0672	3.52366
58.15072	3.524202
57.92612	3.524861
57.7642	3.525488
57.60625	3.526073
57.59262	3.526533
57.6551	3.526933
57.77097	3.527304
57.88277	3.527686
57.9919	3.528079
58.0981	3.528482
58.20123	3.528895
58.3015	3.529318
58.3988	3.52975
58.49298	3.530192
58.5844	3.530643
58.67262	3.531103
58.75811	3.531571
58.8407	3.532048
58.92014	3.532533
58.99703	3.533025

59.07103	3.533525
59.14225	3.534031
59.28826	3.534326
59.3907	3.534746
59.43733	3.535323
59.59552	3.535587
59.69805	3.536009
59.74711	3.535364
59.83878	3.534774
59.93027	3.534125
60.02179	3.53341
60.1135	3.532627
60.20501	3.531769
60.29653	3.53083
60.38769	3.529805
60.47898	3.528685
60.57009	3.527463
60.6608	3.52613
60.75713	3.525232
60.86012	3.524968
60.9632	3.524729
61.06635	3.524516
61.16965	3.52433
61.27295	3.524175
61.37626	3.52405
61.47981	3.523957
61.58347	3.523897
61.68707	3.523872
61.79067	3.523882
61.89446	3.523927
61.99791	3.523965
62.10047	3.523985
62.2029	3.523989
61.91937	3.525082
62.40632	3.523933
62.50758	3.523884
62.15859	3.525085
62.7089	3.523701
62.80867	3.52358
62.9085	3.52343
63.00767	3.52325
63.10677	3.523036
63.20546	3.522787
63.30395	3.5225
63.40228	3.522171
63.49988	3.521798
63.59737	3.521378
63.6948	3.520908

63.79177	3.520385
63.8883	3.519805
63.98463	3.519164
64.08056	3.51846
64.17611	3.517689
64.27129	3.516847
64.36612	3.51593
64.46058	3.514935
64.55468	3.513858
64.64833	3.512696
64.74179	3.511445
64.83457	3.510102
64.92697	3.508664
65.01893	3.507126
65.11045	3.505488
65.20148	3.503745
65.29205	3.501896
65.38211	3.499937
65.47312	3.498045
65.56292	3.495955
65.65067	3.49358
65.74019	3.491345
63.81523	3.494159
65.91836	3.486428
66.00512	3.483788
63.88716	3.486568
66.17755	3.477958
66.26187	3.474897
66.34741	3.471878
63.83568	3.475435
66.5187	3.465488
66.18013	3.467639
66.70553	3.462405
66.78733	3.458822
66.4006	3.46112
63.88245	3.463532
67.05846	3.451909
67.13839	3.448044
67.2196	3.444216
67.29825	3.440118
66.79123	3.44276
67.48185	3.436411
66.94485	3.439131
67.66465	3.43262
67.74421	3.428438
67.82261	3.42414
67.89931	3.419646
67.97643	3.415114

68.05447	3.410633
68.13015	3.40594
68.20622	3.401219
68.28323	3.396555
68.35919	3.391811
68.43363	3.386911
68.50847	3.381992
63.38037	3.390237
68.66578	3.372612
63.30044	3.38133
61.59288	3.381812
60.87626	3.379694
60.55429	3.376477
60.39784	3.372794
60.31203	3.368918
60.25654	3.364965
60.21419	3.360988
60.17757	3.35701
60.14344	3.35304
60.11057	3.349085
60.07833	3.345148
60.04653	3.341231
60.01506	3.337337
59.98382	3.333466
59.95288	3.329622
59.92212	3.325806
59.89165	3.32202
59.8614	3.318265
59.83139	3.314543
59.80166	3.310857
59.7721	3.307206
59.74284	3.303594

Pressure (GPa)	Temperature (K)	mass of liquid	SiO2	TiO2	Al2O3
0.5	1723.15	100.312306	36.5857	14.1558	3.98755
0.5	1723.15	150.330424	39.1934	9.54906	4.70477
0.505	1723.15	200.346556	40.4994	7.24259	5.06393
0.51	1723.15	250.36196	41.2837	5.85768	5.2796
0.515	1723.15	300.376983	41.8069	4.93398	5.42346
0.52	1723.15	341.776936	42.2225	4.38171	5.66554
0.525	1723.15	372.313926	42.6054	4.06399	6.02616
0.53	1723.15	402.856541	42.9287	3.79439	6.33201
0.535	1723.15	433.392096	43.2053	3.56285	6.59487
0.54	1723.15	463.910694	43.4447	3.3619	6.82337
0.545	1723.15	494.404508	43.654	3.18593	7.02401
0.55	1723.15	524.867276	43.8385	3.03058	7.20177
0.555	1723.15	555.293942	44.0025	2.89246	7.36051
0.56	1723.15	585.680386	44.1494	2.76888	7.50326
0.565	1723.15	616.023233	44.2817	2.65768	7.63248
0.57	1723.15	646.319699	44.4015	2.5571	7.75012
0.575	1723.15	676.56748	44.5107	2.46571	7.85779
0.58	1723.15	706.764661	44.6106	2.38231	7.95682
0.585	1723.15	736.909649	44.7024	2.30591	8.0483
0.59	1723.15	766.57865	44.8009	2.23614	8.13267
0.595	1723.15	795.935918	44.9003	2.17203	8.21102
0.6	1723.15	825.224392	44.9931	2.11267	8.28432
0.605	1723.15	854.443762	45.0801	2.05757	8.35311
0.61	1723.15	883.593803	45.1617	2.00628	8.41786
0.615	1723.15	912.674367	45.2387	1.95844	8.47897
0.62	1723.15	941.685369	45.3113	1.91371	8.53679
0.625	1723.15	970.626779	45.3801	1.87179	8.59163
0.63	1723.15	999.49862	45.4454	1.83244	8.64376
0.635	1723.15	1028.300955	45.5075	1.79544	8.69343
0.64	1723.15	1057.033887	45.5667	1.76057	8.74084
0.645	1723.15	1085.697551	45.6232	1.72766	8.78618
0.65	1723.15	1114.292112	45.6773	1.69656	8.82961
0.655	1723.15	1142.81776	45.7291	1.66713	8.87129
0.66	1723.15	1171.274711	45.7788	1.63923	8.91136
0.665	1723.15	1199.663197	45.8266	1.61275	8.94993
0.67	1723.15	1227.983469	45.8726	1.58759	8.9871
0.675	1723.15	1256.235796	45.9169	1.56365	9.02299
0.68	1723.15	1284.420458	45.9597	1.54085	9.05768
0.685	1723.15	1312.53775	46.0011	1.51911	9.09124
0.69	1723.15	1340.587974	46.0411	1.49836	9.12376
0.695	1723.15	1368.571446	46.0799	1.47854	9.15531
0.7	1723.15	1396.488488	46.1175	1.45959	9.18593
0.705	1723.15	1424.339429	46.1541	1.44144	9.21569
0.71	1723.15	1452.124605	46.1896	1.42406	9.24465

0.715	1723.15	1479.84436	46.2241	1.4074	9.27284
0.72	1723.15	1507.499038	46.2577	1.39142	9.30032
0.725	1723.15	1535.088991	46.2904	1.37606	9.32711
0.73	1723.15	1562.614575	46.3224	1.36131	9.35327
0.735	1723.15	1590.076146	46.3535	1.34713	9.37882
0.74	1723.15	1617.474066	46.384	1.33348	9.4038
0.745	1723.15	1644.808696	46.4137	1.32034	9.42824
0.75	1723.15	1672.0804	46.4429	1.30768	9.45216
0.755	1723.15	1699.289546	46.4714	1.29548	9.47558
0.76	1723.15	1726.436499	46.4993	1.2837	9.49855
0.765	1723.15	1753.521627	46.5266	1.27234	9.52106
0.77	1723.15	1780.545299	46.5534	1.26137	9.54316
0.775	1723.15	1807.507881	46.5797	1.25077	9.56485
0.78	1723.15	1834.409744	46.6056	1.24052	9.58615
0.785	1723.15	1861.251255	46.631	1.23061	9.60709
0.79	1723.15	1888.032782	46.6559	1.22103	9.62767
0.795	1723.15	1914.754692	46.6804	1.21175	9.64792
0.8	1723.15	1941.417353	46.7045	1.20276	9.66784
0.805	1723.15	1968.021129	46.7282	1.19405	9.68745
0.81	1723.15	1994.566386	46.7516	1.18561	9.70676
0.815	1723.15	2021.053487	46.7746	1.17743	9.72579
0.82	1723.15	2047.482796	46.7973	1.16949	9.74454
0.825	1723.15	2073.854673	46.8196	1.16179	9.76303
0.83	1723.15	2100.169478	46.8417	1.15431	9.78127
0.835	1723.15	2126.427571	46.8634	1.14705	9.79926
0.84	1723.15	2152.629308	46.8848	1.14	9.81701
0.845	1723.15	2178.775045	46.906	1.13314	9.83454
0.85	1723.15	2204.865136	46.9269	1.12648	9.85184
0.855	1723.15	2230.899932	46.9475	1.12	9.86893
0.86	1723.15	2256.879784	46.9679	1.1137	9.88582
0.865	1723.15	2282.805042	46.9881	1.10757	9.90251
0.87	1723.15	2308.676051	47.008	1.1016	9.91901
0.875	1723.15	2334.493157	47.0277	1.09579	9.93532
0.88	1723.15	2360.256702	47.0472	1.09014	9.95145
0.885	1723.15	2385.967028	47.0664	1.08463	9.96741
0.89	1723.15	2411.624475	47.0855	1.07926	9.9832
0.895	1723.15	2437.229379	47.1044	1.07403	9.99882
0.9	1723.15	2462.782075	47.1231	1.06893	10.0143
0.905	1723.15	2488.282898	47.1416	1.06396	10.0296
0.91	1723.15	2513.732178	47.1599	1.05911	10.0448
0.915	1723.15	2539.130244	47.178	1.05438	10.0598
0.92	1723.15	2564.477424	47.196	1.04976	10.0746
0.925	1723.15	2589.774042	47.2138	1.04526	10.0894
0.93	1723.15	2615.020423	47.2315	1.04086	10.104
0.935	1723.15	2640.216886	47.249	1.03657	10.1184
0.94	1723.15	2665.363752	47.2664	1.03238	10.1328

0.945	1723.15	2690.461336	47.2836	1.02828	10.147
0.95	1723.15	2715.509954	47.3007	1.02428	10.1611
0.955	1723.15	2740.509918	47.3176	1.02037	10.1751
0.96	1723.15	2765.461539	47.3344	1.01655	10.1889
0.965	1723.15	2790.365127	47.3511	1.01282	10.2027
0.97	1723.15	2815.220986	47.3676	1.00917	10.2163
0.975	1723.15	2840.029423	47.3841	1.0056	10.2298
0.98	1723.15	2864.790739	47.4004	1.0021	10.2433
0.985	1723.15	2889.505235	47.4166	0.99869	10.2566
0.99	1723.15	2914.173209	47.4326	0.995349	10.2698
0.995	1723.15	2938.794958	47.4486	0.99208	10.2829
1	1723.15	2963.370775	47.4645	0.98888	10.296
1.005	1723.15	2987.900955	47.4802	0.985749	10.3089
1.01	1723.15	3012.385785	47.4959	0.982684	10.3217
1.015	1723.15	3036.825556	47.5114	0.979683	10.3345
1.02	1723.15	3061.220553	47.5269	0.976744	10.3471
1.025	1723.15	3085.571061	47.5422	0.973866	10.3597
1.03	1723.15	3109.877362	47.5575	0.971047	10.3722
1.035	1723.15	3134.139737	47.5726	0.968286	10.3846
1.04	1723.15	3158.358463	47.5877	0.96558	10.3969
1.045	1723.15	3182.533818	47.6027	0.962929	10.4091
1.05	1723.15	3206.666075	47.6176	0.960331	10.4213
1.055	1723.15	3230.755509	47.6324	0.957785	10.4334
1.06	1723.15	3254.802389	47.6471	0.955289	10.4454
1.065	1723.15	3278.806984	47.6618	0.952842	10.4573
1.07	1723.15	3302.769562	47.6764	0.950443	10.4692
1.075	1723.15	3326.690388	47.6908	0.948091	10.481
1.08	1723.15	3350.569724	47.7053	0.945784	10.4927
1.085	1723.15	3374.407832	47.7196	0.943522	10.5043
1.09	1723.15	3398.204972	47.7339	0.941302	10.5159
1.095	1723.15	3421.961401	47.7481	0.939125	10.5274
1.1	1723.15	3445.677376	47.7622	0.936989	10.5388
1.105	1723.15	3469.353151	47.7762	0.934893	10.5502
1.11	1723.15	3492.988977	47.7902	0.932837	10.5615
1.115	1723.15	3516.585106	47.8041	0.930819	10.5727
1.12	1723.15	3540.141786	47.818	0.928838	10.5839
1.125	1723.15	3563.659265	47.8318	0.926894	10.595
1.13	1723.15	3587.137787	47.8455	0.924985	10.606
1.135	1723.15	3610.577597	47.8592	0.923111	10.617
1.14	1723.15	3633.978936	47.8728	0.921272	10.6279
1.145	1723.15	3657.342045	47.8863	0.919465	10.6388
1.15	1723.15	3680.667162	47.8998	0.917691	10.6496
1.155	1723.15	3703.954523	47.9132	0.915949	10.6604
1.16	1723.15	3727.204364	47.9266	0.914238	10.6711
1.165	1723.15	3750.416919	47.9399	0.912558	10.6817
1.17	1723.15	3773.59242	47.9531	0.910907	10.6923

1.175	1723.15	3796.731096	47.9663	0.909286	10.7028
1.18	1723.15	3819.833177	47.9795	0.907692	10.7133
1.185	1723.15	3842.898889	47.9926	0.906127	10.7237
1.19	1723.15	3865.928458	48.0056	0.904589	10.7341
1.195	1723.15	3888.922108	48.0186	0.903078	10.7444
1.2	1723.15	3911.880061	48.0315	0.901592	10.7546
1.205	1723.15	3934.802538	48.0444	0.900133	10.7648
1.21	1723.15	3957.689759	48.0572	0.898698	10.775
1.215	1723.15	3976.708732	48.054	0.89799	10.7912
1.22	1723.15	3977.432736	47.9745	0.900626	10.8365
1.225	1723.15	3978.055109	47.8952	0.903267	10.8816
1.23	1723.15	3978.57521	47.816	0.905912	10.9264
1.235	1723.15	3978.992365	47.7369	0.908562	10.9709
1.24	1723.15	3979.305864	47.6579	0.911217	11.0152
1.245	1723.15	3979.514962	47.5791	0.913877	11.0593
1.25	1723.15	3979.618883	47.5004	0.916542	11.1031
1.255	1723.15	3979.616812	47.4218	0.919212	11.1467
1.26	1723.15	3979.507903	47.3433	0.921887	11.19
1.265	1723.15	3979.291279	47.265	0.924568	11.233
1.27	1723.15	3978.966025	47.1867	0.927254	11.2758
1.275	1723.15	3978.531197	47.1087	0.929947	11.3183
1.28	1723.15	3977.985817	47.0307	0.932645	11.3606
1.285	1723.15	3977.328875	46.9529	0.93535	11.4026
1.29	1723.15	3976.559332	46.8752	0.938062	11.4443
1.295	1723.15	3975.676114	46.7976	0.94078	11.4857
1.3	1723.15	3974.678117	46.7201	0.943505	11.5269
1.305	1723.15	3973.564209	46.6428	0.946237	11.5677
1.31	1723.15	3972.333224	46.5656	0.948977	11.6083
1.315	1723.15	3970.983968	46.4886	0.951724	11.6486
1.32	1723.15	3969.515219	46.4117	0.954479	11.6886
1.325	1723.15	3967.925723	46.3349	0.957243	11.7283
1.33	1723.15	3966.214199	46.2583	0.960015	11.7677
1.335	1723.15	3964.379337	46.1817	0.962796	11.8068
1.34	1723.15	3962.419799	46.1054	0.965586	11.8456
1.345	1723.15	3960.334221	46.0291	0.968385	11.884
1.35	1723.15	3958.121208	45.953	0.971194	11.9222
1.355	1723.15	3955.779341	45.877	0.974014	11.96
1.36	1723.15	3953.307173	45.8012	0.976843	11.9975
1.365	1723.15	3950.703231	45.7255	0.979684	12.0347
1.37	1723.15	3947.966015	45.6499	0.982536	12.0715
1.375	1723.15	3945.094	45.5745	0.985399	12.108
1.38	1723.15	3942.085634	45.4992	0.988274	12.1441
1.385	1723.15	3938.939339	45.4241	0.991162	12.1799
1.39	1723.15	3935.653512	45.3491	0.994062	12.2153
1.395	1723.15	3932.226524	45.2743	0.996976	12.2504
1.4	1723.15	3928.65672	45.1995	0.999903	12.2851

1.405	1723.15	3924.942419	45.125	1.00284	12.3194
1.41	1723.15	3921.081913	45.0506	1.0058	12.3533
1.415	1723.15	3917.073467	44.9763	1.00877	12.3869
1.42	1723.15	3912.915322	44.9021	1.01176	12.4201
1.425	1723.15	3908.605688	44.8282	1.01476	12.4529
1.43	1723.15	3904.142748	44.7543	1.01778	12.4852
1.435	1723.15	3899.524657	44.6806	1.02082	12.5172
1.44	1723.15	3894.749539	44.6071	1.02387	12.5488
1.445	1723.15	3889.815487	44.5337	1.02694	12.5799
1.45	1723.15	3884.720563	44.4604	1.03004	12.6106
1.455	1723.15	3879.462796	44.3873	1.03315	12.6409
1.46	1723.15	3874.04018	44.3144	1.03628	12.6707
1.465	1723.15	3868.450671	44.2416	1.03943	12.7001
1.47	1723.15	3862.692191	44.169	1.0426	12.7291
1.475	1723.15	3856.762618	44.0965	1.0458	12.7575
1.48	1723.15	3850.659791	44.0241	1.04902	12.7855
1.485	1723.15	3844.381504	43.952	1.05226	12.8131
1.49	1723.15	3837.925503	43.88	1.05553	12.8401
1.495	1723.15	3831.289488	43.8081	1.05882	12.8667
1.5	1723.15	3824.471103	43.7364	1.06214	12.8927
1.505	1723.15	3817.467941	43.6649	1.06549	12.9183
1.51	1723.15	3810.277536	43.5935	1.06886	12.9433
1.515	1723.15	3802.897361	43.5223	1.07226	12.9678
1.52	1723.15	3795.324823	43.4512	1.0757	12.9918
1.525	1723.15	3787.557264	43.3803	1.07916	13.0153
1.53	1723.15	3779.591953	43.3096	1.08265	13.0381
1.535	1723.15	3771.426086	43.2391	1.08618	13.0605
1.54	1723.15	3763.056779	43.1687	1.08975	13.0822
1.545	1723.15	3754.481068	43.0985	1.09334	13.1034
1.55	1723.15	3745.695903	43.0284	1.09698	13.124
1.555	1723.15	3736.698144	42.9586	1.10065	13.1439
1.56	1723.15	3727.484562	42.8889	1.10436	13.1633
1.565	1723.15	3718.051832	42.8194	1.10811	13.182
1.57	1723.15	3708.396532	42.75	1.11191	13.2001
1.575	1723.15	3698.515142	42.6809	1.11574	13.2176
1.58	1723.15	3688.404041	42.6119	1.11963	13.2344
1.585	1723.15	3678.059506	42.5431	1.12356	13.2505
1.59	1723.15	3667.477715	42.4745	1.12753	13.2659
1.595	1723.15	3656.654744	42.4061	1.13156	13.2807
1.6	1723.15	3645.586573	42.3379	1.13564	13.2947
1.605	1723.15	3634.269086	42.2699	1.13977	13.308
1.61	1723.15	3622.69808	42.2021	1.14396	13.3205
1.615	1723.15	3610.86927	42.1344	1.14821	13.3323
1.62	1723.15	3598.778297	42.067	1.15251	13.3433
1.625	1723.15	3586.420741	41.9997	1.15688	13.3536
1.63	1723.15	3573.792135	41.9327	1.16132	13.363

1.635	1723.15	3560.887979	41.8659	1.16582	13.3716
1.64	1723.15	3547.703764	41.7993	1.17039	13.3794
1.645	1723.15	3534.234988	41.7329	1.17503	13.3863
1.65	1723.15	3520.47719	41.6667	1.17974	13.3924
1.655	1723.15	3506.425972	41.6007	1.18453	13.3976
1.66	1723.15	3492.077038	41.5349	1.18941	13.4018
1.665	1723.15	3477.426228	41.4693	1.19436	13.4052
1.67	1723.15	3462.469559	41.404	1.1994	13.4076
1.675	1723.15	3447.203269	41.3389	1.20453	13.4091
1.68	1723.15	3431.623865	41.274	1.20974	13.4097
1.685	1723.15	3415.728172	41.2093	1.21506	13.4092
1.69	1723.15	3399.513384	41.1449	1.22047	13.4078
1.695	1723.15	3382.977121	41.0807	1.22597	13.4054
1.7	1723.15	3366.117477	41.0167	1.23158	13.402
1.705	1723.15	3348.93308	40.953	1.2373	13.3975
1.71	1723.15	3331.42314	40.8895	1.24312	13.392
1.715	1723.15	3313.587503	40.8262	1.24906	13.3855
1.72	1723.15	3295.426689	40.7632	1.25511	13.378
1.725	1723.15	3276.94194	40.7004	1.26127	13.3694
1.73	1723.15	3258.135252	40.6378	1.26755	13.3598
1.735	1723.15	3239.009401	40.5755	1.27396	13.3492
1.74	1723.15	3219.567966	40.5135	1.28048	13.3375
1.745	1723.15	3199.815338	40.4516	1.28713	13.3248
1.75	1723.15	3171.606562	40.3883	1.29762	13.2878
1.755	1723.15	3136.754937	40.3239	1.31136	13.2309
1.76	1723.15	3102.374887	40.2597	1.32525	13.1743
1.765	1723.15	3068.434193	40.1958	1.33928	13.118
1.77	1723.15	3034.901435	40.1322	1.35345	13.0621
1.775	1723.15	3001.746133	40.0688	1.36778	13.0065
1.78	1723.15	2968.938928	40.0058	1.38227	12.9511
1.785	1723.15	2936.451835	39.9431	1.39694	12.896
1.79	1723.15	2904.258576	39.8807	1.41178	12.8412
1.795	1723.15	2872.335009	39.8187	1.4268	12.7865
1.8	1723.15	2840.659668	39.7569	1.44202	12.732
1.805	1723.15	2809.214398	39.6956	1.45744	12.6777
1.81	1723.15	2777.98506	39.6347	1.47306	12.6234
1.815	1723.15	2746.962214	39.5742	1.4889	12.5692
1.82	1723.15	2716.141669	39.5143	1.50495	12.5151
1.825	1723.15	2685.524715	39.4549	1.52122	12.4609
1.83	1723.15	2655.11791	39.3961	1.53771	12.4068
1.835	1723.15	2624.93232	39.338	1.55442	12.3526
1.84	1723.15	2594.98227	39.2807	1.57134	12.2983
1.845	1723.15	2565.283817	39.2241	1.58847	12.2441
1.85	1723.15	2535.853202	39.1683	1.6058	12.1897
1.855	1723.15	2506.705541	39.1134	1.62333	12.1354
1.86	1723.15	2477.853892	39.0593	1.64105	12.081

1.865	1723.15	2449.308738	39.0061	1.65897	12.0266
1.87	1723.15	2421.077814	38.9538	1.67708	11.9723
1.875	1723.15	2393.166186	38.9024	1.69537	11.918
1.88	1723.15	2365.576489	38.8518	1.71385	11.8637
1.885	1723.15	2338.309235	38.8021	1.73251	11.8095
1.89	1723.15	2311.363147	38.7532	1.75137	11.7554
1.895	1723.15	2284.73548	38.7051	1.77041	11.7014
1.9	1723.15	2258.422308	38.6579	1.78965	11.6475
1.905	1723.15	2232.418786	38.6114	1.80908	11.5937
1.91	1723.15	2206.719364	38.5657	1.82871	11.5401
1.915	1723.15	2181.317969	38.5207	1.84854	11.4866
1.92	1723.15	2156.208159	38.4765	1.86857	11.4333
1.925	1723.15	2131.383244	38.433	1.88882	11.3801
1.93	1723.15	2106.836388	38.3902	1.90928	11.3272
1.935	1723.15	2082.560692	38.348	1.92996	11.2744
1.94	1723.15	2058.549254	38.3065	1.95087	11.2218
1.945	1723.15	2034.795225	38.2656	1.97201	11.1694
1.95	1723.15	2011.291849	38.2254	1.99339	11.1172
1.955	1723.15	1988.032494	38.1857	2.01501	11.0652
1.96	1723.15	1965.010677	38.1467	2.03688	11.0134
1.965	1723.15	1942.220082	38.1082	2.05901	10.9619
1.97	1723.15	1919.654576	38.0702	2.0814	10.9105
1.975	1723.15	1897.308217	38.0328	2.10405	10.8594
1.98	1723.15	1875.175262	37.9959	2.12699	10.8086
1.985	1723.15	1853.25017	37.9595	2.1502	10.7579
1.99	1723.15	1831.527608	37.9236	2.17371	10.7075
1.995	1723.15	1810.002446	37.8882	2.19751	10.6574
2	1723.15	1788.669761	37.8532	2.22162	10.6075
2.005	1723.15	1767.524833	37.8188	2.24604	10.5578
2.01	1723.15	1746.563146	37.7847	2.27078	10.5084
2.015	1723.15	1725.780378	37.7511	2.29585	10.4593
2.02	1723.15	1705.172405	37.7179	2.32126	10.4104
2.025	1723.15	1684.735293	37.6851	2.34701	10.3618
2.03	1723.15	1664.465296	37.6527	2.37312	10.3134
2.035	1723.15	1644.358848	37.6207	2.39959	10.2653
2.04	1723.15	1624.412564	37.5891	2.42643	10.2175
2.045	1723.15	1604.623229	37.5578	2.45365	10.17
2.05	1723.15	1584.987802	37.527	2.48126	10.1227
2.055	1723.15	1565.5034	37.4964	2.50927	10.0757
2.06	1723.15	1546.167306	37.4662	2.53769	10.029
2.065	1723.15	1526.976955	37.4363	2.56652	9.98261
2.07	1723.15	1507.929933	37.4068	2.59579	9.93649
2.075	1723.15	1489.023974	37.3776	2.62549	9.89066
2.08	1723.15	1470.256955	37.3486	2.65564	9.84512
2.085	1723.15	1451.626889	37.32	2.68626	9.79988
2.09	1723.15	1433.131924	37.2917	2.71734	9.75494

2.095	1723.15	1414.77034	37.2636	2.7489	9.71031
2.1	1723.15	1396.540541	37.2359	2.78096	9.66598
2.105	1723.15	1378.441055	37.2084	2.81351	9.62196
2.11	1723.15	1360.470528	37.1811	2.84659	9.57826
2.115	1723.15	1342.627721	37.1541	2.88019	9.53487
2.12	1723.15	1324.911506	37.1274	2.91433	9.4918
2.125	1723.15	1307.320866	37.1009	2.94902	9.44906
2.13	1723.15	1289.854885	37.0747	2.98427	9.40664
2.135	1723.15	1272.512751	37.0486	3.0201	9.36455
2.14	1723.15	1255.293748	37.0228	3.05651	9.3228
2.145	1723.15	1238.197256	36.9973	3.09353	9.28138
2.15	1723.15	1221.222746	36.9719	3.13116	9.2403
2.155	1723.15	1204.36978	36.9467	3.16941	9.19957
2.16	1723.15	1187.638001	36.9218	3.20831	9.15918
2.165	1723.15	1171.027139	36.897	3.24786	9.11914
2.17	1723.15	1154.537	36.8724	3.28808	9.07945
2.175	1723.15	1138.16747	36.8481	3.32898	9.04013
2.18	1723.15	1121.918506	36.8239	3.37057	9.00116
2.185	1723.15	1105.790136	36.7998	3.41287	8.96256
2.19	1723.15	1089.782458	36.776	3.4559	8.92433
2.195	1723.15	1073.895633	36.7523	3.49966	8.88647
2.2	1723.15	1058.129886	36.7288	3.54417	8.84898
2.205	1723.15	1042.485502	36.7054	3.58945	8.81188
2.21	1723.15	1026.96282	36.6822	3.63551	8.77515
2.215	1723.15	1011.562236	36.6591	3.68237	8.73882
2.22	1723.15	996.284196	36.6362	3.73004	8.70287
2.225	1723.15	981.129196	36.6134	3.77852	8.66732
2.23	1723.15	966.097777	36.5908	3.82785	8.63217
2.235	1723.15	951.190522	36.5683	3.87803	8.59742
2.24	1723.15	936.408057	36.546	3.92908	8.56307
2.245	1723.15	921.751044	36.5237	3.98101	8.52913
2.25	1723.15	907.220182	36.5016	4.03384	8.49561
2.255	1723.15	892.8162	36.4796	4.08758	8.4625
2.26	1723.15	878.539857	36.4578	4.14224	8.4298
2.265	1723.15	864.391942	36.436	4.19784	8.39753
2.27	1723.15	850.373265	36.4144	4.25438	8.36569
2.275	1723.15	836.484657	36.3929	4.3119	8.33428
2.28	1723.15	822.72697	36.3714	4.37039	8.30329
2.285	1723.15	809.101071	36.3501	4.42986	8.27275
2.29	1723.15	795.607839	36.3289	4.49034	8.24264
2.295	1723.15	782.248165	36.3079	4.55183	8.21297
2.3	1723.15	769.022944	36.2869	4.61435	8.18374
2.305	1723.15	755.93308	36.266	4.67789	8.15496
2.31	1723.15	742.979475	36.2452	4.74248	8.12663
2.315	1723.15	730.163031	36.2245	4.80812	8.09875
2.32	1723.15	717.484645	36.2039	4.87482	8.07133

2.325	1723.15	704.945209	36.1834	4.94258	8.04436
2.33	1723.15	692.5456	36.163	5.01142	8.01784
2.335	1723.15	680.286687	36.1428	5.08133	7.99179
2.34	1723.15	668.169319	36.1226	5.15232	7.96619
2.345	1723.15	656.194326	36.1025	5.2244	7.94105
2.35	1723.15	644.362518	36.0825	5.29756	7.91638
2.355	1723.15	632.674677	36.0626	5.37181	7.89217
2.36	1723.15	621.131556	36.0428	5.44714	7.86842
2.365	1723.15	609.733879	36.0231	5.52356	7.84513
2.37	1723.15	598.482331	36.0035	5.60105	7.82231
2.375	1723.15	587.377563	35.9841	5.67961	7.79995
2.38	1723.15	576.420181	35.9647	5.75924	7.77805
2.385	1723.15	565.610751	35.9454	5.83992	7.75661
2.39	1723.15	554.949788	35.9263	5.92165	7.73563
2.395	1723.15	544.437758	35.9073	6.0044	7.7151
2.4	1723.15	534.075073	35.8884	6.08817	7.69503
2.405	1723.15	523.86209	35.8696	6.17294	7.67541
2.41	1723.15	513.799105	35.8509	6.25868	7.65624
2.415	1723.15	503.886352	35.8324	6.34538	7.63752
2.42	1723.15	494.123998	35.814	6.43301	7.61924
2.425	1723.15	484.512146	35.7958	6.52154	7.60139
2.43	1723.15	475.050825	35.7777	6.61095	7.58397
2.435	1723.15	465.739991	35.7597	6.7012	7.56698
2.44	1723.15	456.579524	35.7419	6.79227	7.55041
2.445	1723.15	447.569227	35.7243	6.8841	7.53426
2.45	1723.15	438.70882	35.7068	6.97667	7.51851
2.455	1723.15	429.997943	35.6895	7.06993	7.50316
2.46	1723.15	421.436148	35.6724	7.16384	7.48821
2.465	1723.15	413.022904	35.6554	7.25835	7.47364
2.47	1723.15	404.757589	35.6387	7.35341	7.45944
2.475	1723.15	396.639493	35.6222	7.44898	7.44562
2.48	1723.15	388.667814	35.6058	7.545	7.43215
2.485	1723.15	380.841661	35.5897	7.64141	7.41902
2.49	1723.15	373.160049	35.5738	7.73815	7.40624
2.495	1723.15	365.6219	35.5582	7.83518	7.39378
2.5	1723.15	358.226046	35.5427	7.93242	7.38165
2.505	1723.15	350.971225	35.5276	8.02982	7.36981
2.51	1723.15	343.856084	35.5126	8.1273	7.35828
2.515	1723.15	336.87918	35.498	8.22482	7.34702
2.52	1723.15	330.03898	35.4836	8.32229	7.33605
2.525	1723.15	323.333865	35.4695	8.41965	7.32533
2.53	1723.15	316.762131	35.4557	8.51685	7.31486
2.535	1723.15	310.321988	35.4422	8.6138	7.30464
2.54	1723.15	304.01157	35.429	8.71045	7.29465
2.545	1723.15	297.828932	35.4161	8.80672	7.28487
2.55	1723.15	291.772056	35.4035	8.90255	7.27531

2.555	1723.15	285.838854	35.3913	8.99789	7.26595
2.56	1723.15	280.900463	35.3774	9.06766	7.26753
2.565	1723.15	275.528025	35.3661	9.15023	7.26014
2.57	1723.15	270.281603	35.3554	9.23091	7.25269
2.575	1723.15	265.156577	35.3453	9.30968	7.24518
2.58	1723.15	260.148413	35.3357	9.3865	7.23761
2.585	1723.15	255.252673	35.3267	9.46136	7.23
2.59	1723.15	250.465026	35.3184	9.53426	7.22236
2.595	1723.15	245.781256	35.3107	9.60519	7.21471
2.6	1723.15	241.197275	35.3036	9.67416	7.20704
2.605	1723.15	236.709122	35.2971	9.74117	7.1994
2.61	1723.15	232.312977	35.2913	9.80625	7.19178
2.615	1723.15	228.005158	35.2862	9.86941	7.1842
2.62	1723.15	223.782128	35.2817	9.93068	7.1767
2.625	1723.15	219.640497	35.2779	9.99008	7.16928
2.63	1723.15	215.577019	35.2748	10.0476	7.16197
2.635	1723.15	211.588595	35.2724	10.1034	7.1548
2.64	1723.15	207.672268	35.2706	10.1574	7.14778
2.645	1723.15	203.825225	35.2696	10.2097	7.14093
2.65	1723.15	200.044789	35.2692	10.2603	7.13429
2.655	1723.15	196.328423	35.2696	10.3093	7.12788
2.66	1723.15	192.67372	35.2706	10.3567	7.12172
2.665	1723.15	189.0784	35.2724	10.4026	7.11584
2.67	1723.15	185.540309	35.2749	10.447	7.11027
2.675	1723.15	182.057413	35.2781	10.4899	7.10504
2.68	1723.15	178.627793	35.282	10.5314	7.10017
2.685	1723.15	175.249641	35.2867	10.5716	7.09569
2.69	1723.15	171.921257	35.292	10.6105	7.09163
2.695	1723.15	168.641041	35.2982	10.6481	7.08803
2.7	1723.15	165.407494	35.305	10.6846	7.08491
2.705	1723.15	162.219208	35.3126	10.7198	7.0823
2.71	1723.15	159.074865	35.3209	10.754	7.08024
2.715	1723.15	155.973233	35.3301	10.7872	7.07876
2.72	1723.15	152.913161	35.3399	10.8193	7.0779
2.725	1723.15	149.893573	35.3506	10.8505	7.07769
2.73	1723.15	146.913469	35.362	10.8807	7.07816
2.735	1723.15	143.971917	35.3742	10.9101	7.07935
2.74	1723.15	141.06805	35.3872	10.9387	7.0813
2.745	1723.15	138.201064	35.401	10.9666	7.08405
2.75	1723.15	135.370214	35.4157	10.9937	7.08765
2.755	1723.15	132.574809	35.4312	11.0201	7.09212
2.76	1723.15	129.814211	35.4475	11.0459	7.09752
2.765	1723.15	127.087832	35.4647	11.0712	7.10389
2.77	1723.15	124.395129	35.4828	11.0959	7.11128
2.775	1723.15	121.735602	35.5018	11.1201	7.11974
2.78	1723.15	119.108792	35.5216	11.1439	7.12931

2.785	1723.15	116.514279	35.5425	11.1673	7.14006
2.79	1723.15	113.951677	35.5642	11.1904	7.15204
2.795	1723.15	111.420635	35.587	11.2132	7.1653
2.8	1723.15	108.920831	35.6107	11.2358	7.17991
2.805	1723.15	106.451974	35.6354	11.2581	7.19594
2.81	1723.15	104.013799	35.6612	11.2804	7.21345
2.815	1723.15	101.606066	35.6881	11.3025	7.23251
2.82	1723.15	99.22856	35.716	11.3247	7.25321
2.825	1723.15	96.881086	35.7451	11.3469	7.27561
2.83	1723.15	94.563472	35.7754	11.3692	7.29982
2.835	1723.15	92.275563	35.8068	11.3916	7.32591
2.84	1723.15	90.017223	35.8395	11.4143	7.35399
2.845	1723.15	87.788334	35.8735	11.4373	7.38416
2.85	1723.15	85.588794	35.9087	11.4607	7.41652
2.855	1723.15	83.418515	35.9453	11.4844	7.4512
2.86	1723.15	81.277428	35.9833	11.5087	7.48831
2.865	1723.15	79.165474	36.0228	11.5336	7.52798
2.87	1723.15	77.082612	36.0638	11.5591	7.57037
2.875	1723.15	75.028815	36.1064	11.5854	7.61562
2.88	1723.15	73.004073	36.1505	11.6125	7.66389
2.885	1723.15	71.008388	36.1964	11.6405	7.71535
2.89	1723.15	69.041783	36.2441	11.6695	7.77019
2.895	1723.15	67.104297	36.2936	11.6996	7.82861
2.9	1723.15	65.19599	36.345	11.7308	7.89082
2.905	1723.15	63.316943	36.3984	11.7633	7.95705
2.91	1723.15	61.467263	36.454	11.7972	8.02753
2.915	1723.15	59.647085	36.5118	11.8325	8.10254
2.92	1723.15	57.856575	36.5719	11.8692	8.18235
2.925	1723.15	56.095936	36.6345	11.9075	8.26726
2.93	1723.15	54.365413	36.6998	11.9475	8.35759
2.935	1723.15	52.665297	36.7677	11.989	8.45367
2.94	1723.15	50.995934	36.8386	12.0323	8.55587
2.945	1723.15	49.35773	36.9125	12.0772	8.66457
2.95	1723.15	47.751161	36.9897	12.1237	8.78017
2.955	1723.15	46.17678	37.0704	12.1718	8.90309
2.96	1723.15	44.635226	37.1547	12.2213	9.03375
2.965	1723.15	43.127231	37.2429	12.272	9.17261
2.97	1723.15	41.653628	37.3353	12.3237	9.32012
2.975	1723.15	40.215354	37.4321	12.376	9.47672
2.98	1723.15	38.813459	37.5335	12.4286	9.64285
2.985	1723.15	37.449094	37.6398	12.4808	9.81893
2.99	1723.15	36.123517	37.7513	12.5321	10.0053
2.995	1723.15	34.83807	37.8682	12.5817	10.2024
3	1723.15	33.594162	37.9908	12.6288	10.4103
3.005	1723.15	32.39324	38.1194	12.6723	10.6292
3.01	1723.15	31.236752	38.254	12.7111	10.8591

3.015	1723.15	30.126098	38.3949	12.7441	11.0999
3.02	1723.15	29.062577	38.5421	12.77	11.3513
3.025	1723.15	28.047337	38.6956	12.7876	11.6128
3.03	1723.15	27.081314	38.8554	12.7957	11.8837
3.035	1723.15	26.165185	39.0213	12.7932	12.1632
3.04	1723.15	25.299323	39.193	12.779	12.45
3.045	1723.15	24.483776	39.3701	12.7524	12.7431
3.05	1723.15	23.718246	39.5521	12.7129	13.0408
3.055	1723.15	23.00209	39.7383	12.6603	13.3418
3.06	1723.15	22.334341	39.9281	12.5946	13.6443
3.065	1723.15	21.71373	40.1207	12.5162	13.9466
3.07	1723.15	22.263336	40.2703	11.9554	13.5883
3.075	1723.15	20.883607	40.4872	12.2441	14.3927
3.08	1723.15	20.337675	40.6828	12.1666	14.7117
3.085	1723.15	19.861118	40.8748	12.0622	15.007
3.09	1723.15	19.43173	41.0641	11.9444	15.289
3.095	1723.15	19.041043	41.2503	11.8186	15.5607
3.1	1723.15	18.684994	41.4327	11.6876	15.8222
3.105	1723.15	18.360873	41.6103	11.5532	16.073
3.11	1723.15	18.066384	41.7823	11.4172	16.3126
3.115	1723.15	17.79938	41.948	11.2808	16.5404
3.12	1723.15	17.557812	42.1067	11.1455	16.7563
3.125	1723.15	17.339715	42.2579	11.0124	16.9599
3.13	1723.15	17.143217	42.4012	10.8824	17.1514
3.135	1723.15	16.966548	42.5363	10.7565	17.3309
3.14	1723.15	16.808043	42.6629	10.6354	17.4987
3.145	1723.15	16.666141	42.781	10.5196	17.6551
3.15	1723.15	16.53939	42.8906	10.4095	17.8006
3.155	1723.15	16.426446	42.9916	10.3055	17.9356
3.16	1723.15	16.326064	43.0844	10.2077	18.0607
3.165	1723.15	16.237098	43.169	10.1162	18.1764
3.17	1723.15	16.1585	43.2457	10.0311	18.2834
3.175	1723.15	16.158332	43.2461	10.0312	18.2836
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3.185	1723.15	16.158332	43.2461	10.0312	18.2836
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3.795	1723.15	16.158332	43.2461	10.0312	18.2836
3.8	1723.15	16.158332	43.2461	10.0312	18.2836
3.805	1723.15	16.158332	43.2461	10.0312	18.2836
3.81	1723.15	16.158332	43.2461	10.0312	18.2836
3.815	1723.15	16.158332	43.2461	10.0312	18.2836
3.82	1723.15	16.158332	43.2461	10.0312	18.2836
3.825	1723.15	16.158332	43.2461	10.0312	18.2836
3.83	1723.15	16.158332	43.2461	10.0312	18.2836
3.835	1723.15	16.158332	43.2461	10.0312	18.2836
3.84	1723.15	16.158332	43.2461	10.0312	18.2836
3.845	1723.15	16.158332	43.2461	10.0312	18.2836
3.85	1723.15	16.158332	43.2461	10.0312	18.2836
3.855	1723.15	16.158332	43.2461	10.0312	18.2836
3.86	1723.15	16.158332	43.2461	10.0312	18.2836
3.865	1723.15	16.158332	43.2461	10.0312	18.2836
3.87	1723.15	16.158332	43.2461	10.0312	18.2836
3.875	1723.15	16.158332	43.2461	10.0312	18.2836
3.88	1723.15	16.158332	43.2461	10.0312	18.2836
3.885	1723.15	16.158332	43.2461	10.0312	18.2836
3.89	1723.15	16.158332	43.2461	10.0312	18.2836
3.895	1723.15	16.158332	43.2461	10.0312	18.2836
3.9	1723.15	16.158332	43.2461	10.0312	18.2836
3.905	1723.15	16.158332	43.2461	10.0312	18.2836
3.91	1723.15	16.158332	43.2461	10.0312	18.2836
3.915	1723.15	16.158332	43.2461	10.0312	18.2836
3.92	1723.15	16.158332	43.2461	10.0312	18.2836
3.925	1723.15	16.158332	43.2461	10.0312	18.2836
3.93	1723.15	16.158332	43.2461	10.0312	18.2836

3.935	1723.15	16.158332	43.2461	10.0312	18.2836
3.94	1723.15	16.158332	43.2461	10.0312	18.2836
3.945	1723.15	16.158332	43.2461	10.0312	18.2836
3.95	1723.15	16.158332	43.2461	10.0312	18.2836
3.955	1723.15	16.158332	43.2461	10.0312	18.2836
3.96	1723.15	16.158332	43.2461	10.0312	18.2836
3.965	1723.15	16.158332	43.2461	10.0312	18.2836
3.97	1723.15	16.158332	43.2461	10.0312	18.2836
3.975	1723.15	16.158332	43.2461	10.0312	18.2836
3.98	1723.15	16.158332	43.2461	10.0312	18.2836
3.985	1723.15	16.158332	43.2461	10.0312	18.2836
3.99	1723.15	16.158332	43.2461	10.0312	18.2836
3.995	1723.15	16.158332	43.2461	10.0312	18.2836
4	1723.15	16.158332	43.2461	10.0312	18.2836

weight percent concentration of oxides

Fe2O3	Cr2O3	FeO	MnO	MgO	NiO	CaO
0.72941	0	31.4524	0	3.96761	0	9.12151
0.607015	0.203065	24.5078	0.049934	13.5331	0	7.6179
0.535843	0.304741	21.0398	0.0749362	18.3227	0	6.86513
0.490205	0.365793	18.9602	0.089949	21.1986	0	6.41315
0.458502	0.406514	17.5742	0.0999625	23.1168	0	6.11169
0.43914	0.44659	16.7327	0.101343	23.9021	0	6.03378
0.428104	0.491954	16.24	0.095661	23.8324	0	6.13406
0.418694	0.530432	15.8299	0.0909087	23.7672	0	6.21904
0.410574	0.563496	15.4839	0.0868863	23.7058	0	6.29214
0.403491	0.59223	15.1885	0.0834443	23.6475	0	6.35582
0.397254	0.617447	14.9337	0.0804692	23.5921	0	6.41193
0.391713	0.639772	14.7119	0.0778735	23.5391	0	6.46189
0.386752	0.659691	14.5173	0.0755895	23.4881	0	6.50676
0.38228	0.677587	14.3453	0.0735638	23.439	0	6.54739
0.378221	0.693766	14.1924	0.071754	23.3916	0	6.58446
0.374516	0.708477	14.0556	0.0701262	23.3456	0	6.61849
0.371116	0.721923	13.9326	0.0686528	23.3009	0	6.64993
0.36798	0.734271	13.8214	0.0673114	23.2574	0	6.67914
0.365074	0.745659	13.7206	0.0660837	23.2149	0	6.7064
0.362449	0.742337	13.6302	0.0649089	23.1683	0	6.73556
0.360039	0.731324	13.5483	0.0637985	23.1198	0	6.76511
0.357775	0.720924	13.473	0.0627696	23.0724	0	6.79309
0.355641	0.711072	13.4035	0.0618125	23.0261	0	6.81968
0.353623	0.701709	13.3392	0.0609187	22.9808	0	6.84503
0.351709	0.692788	13.2796	0.060081	22.9363	0	6.86926
0.349889	0.684264	13.2241	0.0592934	22.8926	0	6.89248
0.348154	0.676101	13.1724	0.0585506	22.8497	0	6.91479
0.346497	0.668267	13.1241	0.0578479	22.8075	0	6.93628
0.34491	0.660732	13.0788	0.0571816	22.7659	0	6.957
0.343386	0.653471	13.0364	0.056548	22.725	0	6.97704
0.341921	0.646463	12.9964	0.0559442	22.6847	0	6.99645
0.34051	0.639687	12.9588	0.0553676	22.6448	0	7.01528
0.339148	0.633126	12.9234	0.0548157	22.6055	0	7.03357
0.337832	0.626764	12.8898	0.0542866	22.5667	0	7.05137
0.336557	0.620587	12.8581	0.0537783	22.5283	0	7.06872
0.335322	0.614581	12.828	0.0532893	22.4904	0	7.08564
0.334122	0.608736	12.7995	0.0528181	22.4528	0	7.10217
0.332956	0.603041	12.7723	0.0523633	22.4157	0	7.11834
0.33182	0.597486	12.7464	0.0519238	22.3789	0	7.13416
0.330714	0.592064	12.7218	0.0514985	22.3425	0	7.14967
0.329635	0.586766	12.6983	0.0510865	22.3064	0	7.16488
0.328581	0.581585	12.6758	0.0506869	22.2706	0	7.17981
0.32755	0.576514	12.6543	0.0502988	22.2351	0	7.19448
0.326542	0.571549	12.6337	0.0499217	22.2	0	7.2089

0.325554	0.566682	12.614	0.0495547	22.1651	0	7.22309
0.324587	0.561909	12.595	0.0491974	22.1304	0	7.23706
0.323637	0.557226	12.5768	0.0488492	22.0961	0	7.25082
0.322705	0.552628	12.5593	0.0485095	22.062	0	7.26439
0.321789	0.548111	12.5425	0.048178	22.0281	0	7.27777
0.320889	0.543671	12.5262	0.0478541	21.9945	0	7.29098
0.320003	0.539306	12.5106	0.0475375	21.9611	0	7.30402
0.319132	0.535011	12.4955	0.0472278	21.9279	0	7.3169
0.318273	0.530784	12.4809	0.0469247	21.8949	0	7.32963
0.317427	0.526622	12.4668	0.0466279	21.8621	0	7.34221
0.316593	0.522523	12.4531	0.0463371	21.8296	0	7.35466
0.315771	0.518484	12.4399	0.046052	21.7972	0	7.36697
0.314958	0.514503	12.4271	0.0457723	21.765	0	7.37917
0.314157	0.510577	12.4146	0.0454979	21.733	0	7.39124
0.313365	0.506705	12.4026	0.0452285	21.7012	0	7.40319
0.312582	0.502885	12.3908	0.0449639	21.6696	0	7.41504
0.311808	0.499116	12.3795	0.044704	21.6381	0	7.42678
0.311043	0.495395	12.3684	0.0444484	21.6068	0	7.43842
0.310286	0.49172	12.3576	0.0441972	21.5757	0	7.44996
0.309537	0.488091	12.3471	0.04395	21.5447	0	7.4614
0.308795	0.484507	12.3369	0.0437068	21.5139	0	7.47276
0.308061	0.480965	12.3269	0.0434674	21.4832	0	7.48403
0.307333	0.477464	12.3171	0.0432317	21.4527	0	7.49521
0.306613	0.474004	12.3076	0.0429996	21.4224	0	7.50631
0.305898	0.470584	12.2983	0.0427709	21.3921	0	7.51734
0.30519	0.467201	12.2893	0.0425456	21.3621	0	7.52829
0.304487	0.463856	12.2804	0.0423235	21.3321	0	7.53916
0.303791	0.460546	12.2717	0.0421045	21.3023	0	7.54996
0.3031	0.457273	12.2632	0.0418885	21.2726	0	7.5607
0.302414	0.454033	12.2548	0.0416755	21.2431	0	7.57136
0.301733	0.450827	12.2467	0.0414653	21.2137	0	7.58197
0.301058	0.447654	12.2387	0.041258	21.1844	0	7.5925
0.300387	0.444514	12.2308	0.0410533	21.1553	0	7.60298
0.299721	0.441404	12.2231	0.0408512	21.1262	0	7.6134
0.299059	0.438325	12.2155	0.0406517	21.0973	0	7.62376
0.298402	0.435276	12.2081	0.0404547	21.0686	0	7.63406
0.297749	0.432257	12.2007	0.04026	21.0399	0	7.64431
0.2971	0.429266	12.1935	0.0400678	21.0113	0	7.65451
0.296455	0.426304	12.1865	0.0398779	20.9829	0	7.66465
0.295814	0.423369	12.1795	0.0396901	20.9546	0	7.67474
0.295176	0.420461	12.1726	0.0395046	20.9264	0	7.68478
0.294543	0.41758	12.1659	0.0393213	20.8983	0	7.69478
0.293913	0.414725	12.1592	0.03914	20.8703	0	7.70472
0.293286	0.411895	12.1526	0.0389607	20.8424	0	7.71462
0.292663	0.409091	12.1462	0.0387835	20.8147	0	7.72448
0.292043	0.406311	12.1398	0.0386082	20.787	0	7.73429

0.291426	0.403556	12.1334	0.0384348	20.7594	0	7.74405
0.290813	0.400824	12.1272	0.0382633	20.732	0	7.75378
0.290202	0.398116	12.1211	0.0380936	20.7046	0	7.76346
0.289595	0.395431	12.115	0.0379257	20.6774	0	7.7731
0.28899	0.392769	12.109	0.0377596	20.6503	0	7.7827
0.288388	0.390129	12.103	0.0375951	20.6232	0	7.79227
0.287789	0.387511	12.0972	0.0374324	20.5963	0	7.80179
0.287193	0.384914	12.0913	0.0372713	20.5694	0	7.81128
0.2866	0.382339	12.0856	0.0371119	20.5427	0	7.82073
0.286009	0.379786	12.0799	0.036954	20.516	0	7.83014
0.28542	0.377252	12.0742	0.0367977	20.4895	0	7.83951
0.284834	0.37474	12.0687	0.0366429	20.463	0	7.84886
0.284251	0.372247	12.0631	0.0364897	20.4366	0	7.85816
0.28367	0.369774	12.0576	0.0363379	20.4103	0	7.86743
0.283091	0.367321	12.0522	0.0361876	20.3842	0	7.87667
0.282515	0.364887	12.0468	0.0360387	20.3581	0	7.88588
0.281941	0.362472	12.0415	0.0358912	20.3321	0	7.89505
0.281369	0.360076	12.0361	0.0357451	20.3061	0	7.90419
0.2808	0.357698	12.0309	0.0356004	20.2803	0	7.9133
0.280232	0.355339	12.0257	0.0354569	20.2546	0	7.92238
0.279667	0.352998	12.0205	0.0353148	20.2289	0	7.93143
0.279104	0.350675	12.0153	0.035174	20.2034	0	7.94045
0.278542	0.348369	12.0102	0.0350345	20.1779	0	7.94943
0.277983	0.346081	12.0051	0.0348962	20.1525	0	7.95839
0.277426	0.34381	12.0001	0.0347592	20.1272	0	7.96732
0.276871	0.341556	11.995	0.0346234	20.102	0	7.97622
0.276318	0.339319	11.99	0.0344887	20.0769	0	7.98509
0.275766	0.337099	11.9851	0.0343553	20.0518	0	7.99394
0.275217	0.334895	11.9802	0.034223	20.0268	0	8.00275
0.274669	0.332707	11.9752	0.0340919	20.0019	0	8.01154
0.274123	0.330535	11.9704	0.0339619	19.9771	0	8.02031
0.273579	0.328379	11.9655	0.033833	19.9524	0	8.02904
0.273037	0.326239	11.9607	0.0337052	19.9278	0	8.03775
0.272497	0.324115	11.9559	0.0335784	19.9032	0	8.04643
0.271958	0.322005	11.9511	0.0334528	19.8787	0	8.05509
0.271421	0.319911	11.9463	0.0333282	19.8543	0	8.06372
0.270886	0.317832	11.9416	0.0332046	19.83	0	8.07233
0.270352	0.315768	11.9369	0.0330821	19.8058	0	8.08091
0.26982	0.313719	11.9322	0.0329606	19.7816	0	8.08946
0.26929	0.311684	11.9275	0.03284	19.7575	0	8.098
0.268761	0.309664	11.9228	0.0327205	19.7335	0	8.1065
0.268234	0.307658	11.9181	0.0326019	19.7096	0	8.11499
0.267708	0.305667	11.9135	0.0324843	19.6857	0	8.12345
0.267184	0.303689	11.9089	0.0323676	19.662	0	8.13188
0.266662	0.301725	11.9043	0.0322519	19.6382	0	8.1403
0.266141	0.299775	11.8997	0.0321371	19.6146	0	8.14869

0.265621	0.297838	11.8951	0.0320232	19.5911	0	8.15705
0.265103	0.295915	11.8906	0.0319102	19.5676	0	8.1654
0.264587	0.294006	11.886	0.0317981	19.5442	0	8.17372
0.264072	0.292109	11.8815	0.0316869	19.5208	0	8.18202
0.263559	0.290226	11.877	0.0315765	19.4976	0	8.1903
0.263047	0.288356	11.8725	0.031467	19.4744	0	8.19855
0.262536	0.286498	11.868	0.0313584	19.4513	0	8.20678
0.262027	0.284654	11.8635	0.0312506	19.4282	0	8.215
0.261643	0.282717	11.8656	0.0313297	19.4049	0	8.22578
0.261847	0.280272	11.8992	0.032316	19.3799	0	8.24883
0.262048	0.2778	11.9327	0.0332739	19.3552	0	8.27182
0.262248	0.2753	11.9661	0.0342043	19.3307	0	8.29476
0.262445	0.272774	11.9996	0.0351078	19.3065	0	8.31764
0.262641	0.270221	12.033	0.0359851	19.2826	0	8.34046
0.262835	0.267641	12.0663	0.0368369	19.2589	0	8.36323
0.263027	0.265033	12.0997	0.0376638	19.2354	0	8.38595
0.263218	0.262399	12.133	0.0384665	19.2122	0	8.40861
0.263408	0.259737	12.1663	0.0392457	19.1893	0	8.43123
0.263596	0.257049	12.1996	0.0400019	19.1665	0	8.45379
0.263783	0.254334	12.2329	0.0407357	19.144	0	8.47631
0.263969	0.251593	12.2662	0.0414477	19.1218	0	8.49878
0.264154	0.248825	12.2995	0.0421384	19.0997	0	8.52121
0.264338	0.246032	12.3328	0.0428084	19.0779	0	8.54359
0.264522	0.243212	12.366	0.0434583	19.0563	0	8.56593
0.264704	0.240367	12.3993	0.0440886	19.0349	0	8.58823
0.264886	0.237497	12.4327	0.0446997	19.0138	0	8.61049
0.265068	0.234602	12.466	0.0452921	18.9928	0	8.63271
0.265249	0.231682	12.4994	0.0458664	18.972	0	8.65489
0.26543	0.228739	12.5328	0.046423	18.9514	0	8.67704
0.265611	0.225773	12.5662	0.0469623	18.931	0	8.69915
0.265792	0.222783	12.5996	0.0474849	18.9108	0	8.72123
0.265973	0.219772	12.6331	0.047991	18.8908	0	8.74328
0.266154	0.216739	12.6667	0.0484813	18.871	0	8.7653
0.266336	0.213685	12.7003	0.048956	18.8513	0	8.78729
0.266518	0.210611	12.7339	0.0494155	18.8318	0	8.80925
0.2667	0.207517	12.7677	0.0498603	18.8125	0	8.83118
0.266883	0.204405	12.8014	0.0502907	18.7933	0	8.85309
0.267067	0.201276	12.8353	0.050707	18.7743	0	8.87498
0.267252	0.198129	12.8692	0.0511097	18.7554	0	8.89684
0.267437	0.194967	12.9032	0.0514991	18.7367	0	8.91869
0.267624	0.191791	12.9373	0.0518755	18.7181	0	8.94051
0.267812	0.1886	12.9715	0.0522392	18.6997	0	8.96232
0.268001	0.185397	13.0058	0.0525906	18.6814	0	8.98411
0.268192	0.182183	13.0402	0.0529299	18.6632	0	9.00588
0.268384	0.178958	13.0746	0.0532575	18.6452	0	9.02764
0.268578	0.175725	13.1092	0.0535736	18.6273	0	9.04939

0.268774	0.172484	13.144	0.0538786	18.6095	0	9.07112
0.268972	0.169237	13.1788	0.0541726	18.5918	0	9.09284
0.269172	0.165985	13.2138	0.054456	18.5743	0	9.11456
0.269374	0.16273	13.2489	0.0547289	18.5568	0	9.13627
0.269578	0.159473	13.2841	0.0549918	18.5394	0	9.15796
0.269785	0.156215	13.3195	0.0552447	18.5221	0	9.17966
0.269994	0.152959	13.3551	0.0554879	18.505	0	9.20135
0.270206	0.149705	13.3908	0.0557216	18.4879	0	9.22303
0.27042	0.146456	13.4266	0.0559462	18.4708	0	9.24471
0.270638	0.143212	13.4627	0.0561616	18.4539	0	9.26639
0.270859	0.139977	13.4989	0.0563683	18.437	0	9.28807
0.271082	0.136751	13.5353	0.0565663	18.4202	0	9.30975
0.27131	0.133536	13.5719	0.0567558	18.4035	0	9.33143
0.27154	0.130334	13.6087	0.0569371	18.3868	0	9.3531
0.271775	0.127147	13.6458	0.0571102	18.3702	0	9.37479
0.272013	0.123977	13.683	0.0572755	18.3536	0	9.39647
0.272255	0.120824	13.7204	0.0574329	18.337	0	9.41815
0.272501	0.117692	13.7581	0.0575828	18.3205	0	9.43984
0.272751	0.114582	13.796	0.0577252	18.3041	0	9.46154
0.273005	0.111496	13.8342	0.0578604	18.2876	0	9.48324
0.273264	0.108436	13.8726	0.0579883	18.2712	0	9.50494
0.273528	0.105403	13.9113	0.0581093	18.2548	0	9.52664
0.273797	0.1024	13.9503	0.0582234	18.2384	0	9.54835
0.27407	0.0994278	13.9895	0.0583307	18.222	0	9.57007
0.274349	0.0964886	14.0291	0.0584314	18.2056	0	9.59179
0.274633	0.0935842	14.0689	0.0585257	18.1892	0	9.61351
0.274922	0.0907163	14.1091	0.0586135	18.1728	0	9.63524
0.275217	0.0878867	14.1495	0.0586951	18.1564	0	9.65697
0.275518	0.0850971	14.1904	0.0587706	18.14	0	9.67871
0.275825	0.0823492	14.2315	0.0588401	18.1235	0	9.70045
0.276138	0.0796445	14.273	0.0589036	18.107	0	9.72218
0.276458	0.0769847	14.3149	0.0589613	18.0905	0	9.74392
0.276784	0.0743713	14.3572	0.0590134	18.0739	0	9.76566
0.277117	0.0718058	14.3999	0.0590598	18.0573	0	9.7874
0.277457	0.0692896	14.443	0.0591008	18.0406	0	9.80913
0.277805	0.0668242	14.4865	0.0591363	18.0239	0	9.83085
0.27816	0.0644107	14.5304	0.0591666	18.0071	0	9.85257
0.278523	0.0620505	14.5748	0.0591917	17.9902	0	9.87428
0.278893	0.0597447	14.6197	0.0592116	17.9732	0	9.89598
0.279272	0.0574944	14.665	0.0592266	17.9562	0	9.91766
0.279659	0.0553007	14.7109	0.0592367	17.9391	0	9.93932
0.280056	0.0531644	14.7573	0.0592419	17.9218	0	9.96095
0.280461	0.0510864	14.8042	0.0592424	17.9045	0	9.98256
0.280875	0.0490674	14.8517	0.0592382	17.8871	0	10.0041
0.281299	0.0471081	14.8998	0.0592294	17.8695	0	10.0257
0.281732	0.0452091	14.9485	0.0592162	17.8519	0	10.0472

0.282176	0.0433707	14.9978	0.0591985	17.8341	0	10.0686
0.28263	0.0415934	15.0477	0.0591764	17.8161	0	10.09
0.283094	0.0398774	15.0983	0.0591501	17.7981	0	10.1113
0.28357	0.0382228	15.1497	0.0591194	17.7799	0	10.1326
0.284056	0.0366296	15.2017	0.0590846	17.7615	0	10.1537
0.284554	0.0350978	15.2545	0.0590456	17.743	0	10.1748
0.285064	0.0336271	15.308	0.0590025	17.7244	0	10.1957
0.285586	0.0322173	15.3623	0.0589552	17.7056	0	10.2166
0.286119	0.0308678	15.4175	0.0589038	17.6867	0	10.2372
0.286665	0.0295782	15.4735	0.0588482	17.6676	0	10.2578
0.287224	0.0283477	15.5304	0.0587885	17.6483	0	10.2781
0.287795	0.0271756	15.5882	0.0587245	17.6289	0	10.2982
0.288379	0.026061	15.6469	0.0586563	17.6093	0	10.3181
0.288976	0.0250028	15.7066	0.0585836	17.5896	0	10.3378
0.289586	0.0240001	15.7673	0.0585065	17.5698	0	10.3571
0.290209	0.0230516	15.829	0.0584248	17.5498	0	10.3762
0.290845	0.0221561	15.8917	0.0583384	17.5297	0	10.3949
0.291494	0.021312	15.9556	0.058247	17.5095	0	10.4132
0.292156	0.0205181	16.0205	0.0581505	17.4892	0	10.4311
0.292831	0.0197727	16.0865	0.0580486	17.4687	0	10.4485
0.293517	0.0190744	16.1537	0.0579412	17.4483	0	10.4654
0.294216	0.0184214	16.2221	0.0578279	17.4277	0	10.4817
0.294927	0.0178121	16.2917	0.0577086	17.4071	0	10.4974
0.296105	0.0181147	16.3801	0.0574242	17.3769	0	10.5238
0.297663	0.0191805	16.4838	0.0569901	17.339	0	10.5583
0.299198	0.0202521	16.5876	0.0565305	17.3022	0	10.5909
0.300711	0.021329	16.6915	0.0560491	17.2665	0	10.6215
0.302202	0.0224105	16.7958	0.0555493	17.2317	0	10.65
0.303672	0.0234961	16.9003	0.0550338	17.198	0	10.6765
0.30512	0.024586	17.0053	0.0545055	17.1653	0	10.7007
0.306546	0.0256801	17.1108	0.0539667	17.1336	0	10.7227
0.307952	0.026779	17.2168	0.0534196	17.1028	0	10.7423
0.309336	0.0278834	17.3236	0.0528661	17.0731	0	10.7595
0.310699	0.0289947	17.4311	0.0523078	17.0443	0	10.7743
0.31204	0.0301142	17.5394	0.0517464	17.0165	0	10.7864
0.31336	0.0312438	17.6485	0.0511832	16.9897	0	10.796
0.314659	0.0323859	17.7586	0.0506195	16.9638	0	10.8029
0.315934	0.0335428	17.8695	0.0500565	16.9388	0	10.8071
0.317188	0.0347173	17.9814	0.0494954	16.9147	0	10.8087
0.318418	0.035912	18.094	0.0489377	16.8915	0	10.8077
0.319625	0.0371294	18.2074	0.0483848	16.8691	0	10.8043
0.320808	0.0383718	18.3213	0.0478382	16.8475	0	10.7985
0.321967	0.0396412	18.4358	0.0472997	16.8265	0	10.7905
0.323101	0.0409391	18.5506	0.0467709	16.8062	0	10.7804
0.324209	0.0422666	18.6656	0.0462536	16.7865	0	10.7685
0.325293	0.0436244	18.7806	0.0457494	16.7673	0	10.7548

0.326351	0.045013	18.8956	0.0452599	16.7486	0	10.7396
0.327384	0.0464324	19.0103	0.0447866	16.7304	0	10.723
0.328392	0.0478825	19.1247	0.0443308	16.7125	0	10.705
0.329374	0.049363	19.2387	0.0438934	16.695	0	10.686
0.330331	0.0508735	19.3522	0.0434754	16.6779	0	10.6658
0.331264	0.0524135	19.4651	0.0430775	16.6611	0	10.6448
0.332171	0.0539824	19.5774	0.0427003	16.6446	0	10.6228
0.333054	0.0555795	19.6889	0.0423441	16.6283	0	10.6001
0.333913	0.0572042	19.7996	0.0420091	16.6123	0	10.5767
0.334747	0.0588557	19.9096	0.0416954	16.5966	0	10.5526
0.335558	0.0605335	20.0187	0.041403	16.5811	0	10.528
0.336346	0.0622366	20.1269	0.0411318	16.5659	0	10.5027
0.33711	0.0639645	20.2341	0.0408816	16.5509	0	10.477
0.337852	0.0657164	20.3405	0.0406519	16.5361	0	10.4508
0.338571	0.0674916	20.4458	0.0404425	16.5216	0	10.4241
0.339268	0.0692892	20.5502	0.040253	16.5072	0	10.3971
0.339943	0.0711087	20.6535	0.0400829	16.4931	0	10.3697
0.340596	0.0729492	20.7558	0.0399317	16.4792	0	10.3419
0.341228	0.0748101	20.8571	0.0397988	16.4655	0	10.3138
0.341838	0.0766907	20.9573	0.0396838	16.452	0	10.2853
0.342428	0.0785902	21.0564	0.0395861	16.4388	0	10.2566
0.342998	0.0805079	21.1544	0.0395052	16.4257	0	10.2276
0.343547	0.0824431	21.2513	0.0394404	16.4129	0	10.1983
0.344076	0.0843952	21.3471	0.0393913	16.4003	0	10.1688
0.344586	0.0863634	21.4417	0.0393573	16.388	0	10.139
0.345076	0.088347	21.5352	0.0393379	16.3758	0	10.109
0.345546	0.0903454	21.6275	0.0393326	16.3639	0	10.0788
0.345998	0.092358	21.7187	0.0393408	16.3522	0	10.0484
0.346431	0.0943839	21.8086	0.039362	16.3407	0	10.0178
0.346846	0.0964226	21.8974	0.0393959	16.3295	0	9.98695
0.347242	0.0984734	21.985	0.039442	16.3184	0	9.95596
0.34762	0.100536	22.0713	0.0394998	16.3077	0	9.92478
0.34798	0.102609	22.1565	0.0395689	16.2971	0	9.89344
0.348323	0.104692	22.2403	0.0396491	16.2868	0	9.86193
0.348648	0.106784	22.323	0.0397398	16.2768	0	9.83027
0.348956	0.108886	22.4043	0.0398408	16.2669	0	9.79845
0.349247	0.110996	22.4844	0.0399518	16.2574	0	9.76649
0.349521	0.113113	22.5632	0.0400724	16.248	0	9.73438
0.349779	0.115238	22.6407	0.0402025	16.239	0	9.70213
0.35002	0.117368	22.7169	0.0403417	16.2301	0	9.66975
0.350244	0.119505	22.7917	0.0404898	16.2216	0	9.63724
0.350453	0.121647	22.8652	0.0406467	16.2132	0	9.6046
0.350646	0.123793	22.9373	0.0408121	16.2052	0	9.57184
0.350822	0.125943	23.0081	0.0409858	16.1974	0	9.53896
0.350984	0.128097	23.0775	0.0411678	16.1898	0	9.50597
0.351129	0.130254	23.1454	0.0413579	16.1826	0	9.47286

0.35126	0.132412	23.212	0.0415559	16.1755	0	9.43964
0.351375	0.134573	23.2771	0.0417619	16.1688	0	9.40632
0.351475	0.136734	23.3408	0.0419756	16.1623	0	9.3729
0.351561	0.138897	23.4029	0.0421971	16.1561	0	9.33937
0.351631	0.141059	23.4637	0.0424262	16.1502	0	9.30575
0.351687	0.14322	23.5229	0.042663	16.1445	0	9.27203
0.351728	0.145381	23.5805	0.0429074	16.1391	0	9.23822
0.351755	0.14754	23.6367	0.0431595	16.134	0	9.20432
0.351768	0.149697	23.6912	0.0434192	16.1292	0	9.17034
0.351766	0.151851	23.7442	0.0436865	16.1246	0	9.13627
0.351751	0.154003	23.7956	0.0439615	16.1203	0	9.10211
0.351721	0.15615	23.8454	0.0442442	16.1164	0	9.06788
0.351677	0.158294	23.8936	0.0445347	16.1127	0	9.03357
0.35162	0.160433	23.94	0.0448331	16.1092	0	8.99918
0.351549	0.162567	23.9848	0.0451393	16.1061	0	8.96472
0.351464	0.164696	24.0279	0.0454536	16.1033	0	8.93019
0.351366	0.166819	24.0693	0.045776	16.1007	0	8.89559
0.351255	0.168936	24.1089	0.0461065	16.0984	0	8.86093
0.35113	0.171045	24.1467	0.0464454	16.0965	0	8.8262
0.350991	0.173148	24.1828	0.0467927	16.0948	0	8.7914
0.35084	0.175244	24.217	0.0471486	16.0934	0	8.75655
0.350675	0.177331	24.2494	0.0475132	16.0923	0	8.72163
0.350497	0.17941	24.28	0.0478866	16.0915	0	8.68666
0.350306	0.181481	24.3086	0.0482691	16.091	0	8.65164
0.350102	0.183543	24.3353	0.0486608	16.0908	0	8.61656
0.349885	0.185595	24.3601	0.0490618	16.0909	0	8.58143
0.349655	0.187638	24.383	0.0494724	16.0912	0	8.54625
0.349413	0.189672	24.4038	0.0498927	16.0919	0	8.51102
0.349157	0.191695	24.4227	0.0503229	16.0929	0	8.47574
0.348889	0.193708	24.4395	0.0507633	16.0941	0	8.44042
0.348608	0.195711	24.4543	0.051214	16.0956	0	8.40506
0.348314	0.197703	24.467	0.0516753	16.0975	0	8.36965
0.348007	0.199684	24.4775	0.0521473	16.0996	0	8.33421
0.347688	0.201654	24.486	0.0526304	16.102	0	8.29873
0.347356	0.203613	24.4923	0.0531247	16.1047	0	8.26321
0.347012	0.205561	24.4965	0.0536305	16.1077	0	8.22765
0.346655	0.207497	24.4984	0.0541481	16.111	0	8.19206
0.346285	0.209422	24.4982	0.0546776	16.1145	0	8.15644
0.345903	0.211336	24.4957	0.0552194	16.1183	0	8.12079
0.345508	0.213238	24.4909	0.0557737	16.1224	0	8.08511
0.3451	0.215129	24.4839	0.0563408	16.1268	0	8.0494
0.34468	0.217008	24.4746	0.0569209	16.1314	0	8.01367
0.344248	0.218876	24.463	0.0575144	16.1363	0	7.97791
0.343803	0.220733	24.4491	0.0581215	16.1414	0	7.94213
0.343346	0.222579	24.4328	0.0587424	16.1468	0	7.90633
0.342876	0.224413	24.4141	0.0593776	16.1524	0	7.87051

0.342394	0.226237	24.3931	0.0600271	16.1583	0	7.83467
0.341899	0.228049	24.3697	0.0606915	16.1643	0	7.79882
0.341392	0.229852	24.3439	0.0613708	16.1707	0	7.76295
0.340873	0.231643	24.3158	0.0620655	16.1772	0	7.72707
0.340341	0.233425	24.2852	0.0627758	16.1839	0	7.69119
0.339797	0.235197	24.2522	0.0635019	16.1909	0	7.65529
0.339241	0.236959	24.2168	0.0642443	16.198	0	7.61939
0.338672	0.238711	24.179	0.065003	16.2053	0	7.58349
0.338092	0.240455	24.1388	0.0657785	16.2128	0	7.54759
0.337499	0.24219	24.0961	0.0665709	16.2204	0	7.5117
0.336894	0.243916	24.0511	0.0673806	16.2282	0	7.47581
0.336277	0.245634	24.0037	0.0682078	16.2361	0	7.43993
0.335649	0.247344	23.9539	0.0690526	16.2441	0	7.40406
0.335009	0.249047	23.9017	0.0699155	16.2523	0	7.36821
0.334357	0.250742	23.8472	0.0707965	16.2605	0	7.33238
0.333693	0.252431	23.7904	0.0716959	16.2688	0	7.29657
0.333018	0.254113	23.7313	0.0726138	16.2772	0	7.2608
0.332332	0.255788	23.6699	0.0735505	16.2856	0	7.22505
0.331635	0.257458	23.6063	0.074506	16.2941	0	7.18934
0.330927	0.259122	23.5405	0.0754806	16.3025	0	7.15367
0.330208	0.26078	23.4725	0.0764743	16.311	0	7.11805
0.329479	0.262433	23.4024	0.0774873	16.3194	0	7.08249
0.328739	0.264081	23.3303	0.0785195	16.3278	0	7.04697
0.327989	0.265723	23.2561	0.079571	16.3362	0	7.01152
0.32723	0.267361	23.18	0.0806418	16.3444	0	6.97614
0.326461	0.268994	23.1019	0.081732	16.3526	0	6.94084
0.325684	0.270621	23.0221	0.0828414	16.3606	0	6.90561
0.324897	0.272244	22.9404	0.08397	16.3685	0	6.87047
0.324102	0.273861	22.8571	0.0851176	16.3762	0	6.83542
0.323299	0.275473	22.7721	0.0862841	16.3837	0	6.80047
0.322489	0.277079	22.6856	0.0874693	16.391	0	6.76563
0.321671	0.278679	22.5977	0.088673	16.3981	0	6.73089
0.320846	0.280272	22.5083	0.0898949	16.4049	0	6.69628
0.320016	0.281858	22.4177	0.0911347	16.4114	0	6.6618
0.31918	0.283436	22.3259	0.0923921	16.4176	0	6.62745
0.318339	0.285005	22.233	0.0936667	16.4235	0	6.59324
0.317493	0.286565	22.139	0.094958	16.429	0	6.55918
0.316643	0.288114	22.0442	0.0962656	16.4342	0	6.52527
0.31579	0.289652	21.9486	0.097589	16.4389	0	6.49153
0.314934	0.291177	21.8524	0.0989276	16.4432	0	6.45795
0.314076	0.292689	21.7555	0.100281	16.447	0	6.42456
0.313216	0.294185	21.6581	0.101648	16.4504	0	6.39134
0.312356	0.295664	21.5604	0.103029	16.4532	0	6.35832
0.311496	0.297125	21.4624	0.104423	16.4555	0	6.32549
0.310636	0.298566	21.3643	0.105829	16.4573	0	6.29287
0.309778	0.299986	21.2661	0.107246	16.4585	0	6.26045

0.308922	0.301382	21.168	0.108674	16.4591	0	6.22825
0.308302	0.300747	21.0533	0.110317	16.4479	0	6.24985
0.307561	0.301643	20.9596	0.111749	16.4443	0	6.23019
0.306836	0.302528	20.8681	0.113174	16.44	0	6.21029
0.306126	0.303398	20.7789	0.114591	16.4351	0	6.19018
0.305433	0.304252	20.692	0.116	16.4296	0	6.16986
0.304755	0.305089	20.6072	0.1174	16.4234	0	6.14935
0.304094	0.305906	20.5246	0.11879	16.4166	0	6.12865
0.303449	0.306702	20.4442	0.120171	16.4091	0	6.10778
0.30282	0.307475	20.3659	0.121542	16.401	0	6.08675
0.302208	0.308223	20.2896	0.122902	16.3922	0	6.06557
0.301612	0.308944	20.2154	0.124252	16.3828	0	6.04425
0.301032	0.309635	20.1431	0.125591	16.3727	0	6.0228
0.300467	0.310296	20.0726	0.12692	16.3619	0	6.00123
0.299917	0.310923	20.0039	0.128237	16.3504	0	5.97956
0.299383	0.311515	19.937	0.129544	16.3382	0	5.95778
0.298863	0.31207	19.8716	0.13084	16.3254	0	5.9359
0.298357	0.312584	19.8078	0.132126	16.3118	0	5.91394
0.297865	0.313057	19.7455	0.133402	16.2975	0	5.89191
0.297385	0.313486	19.6845	0.134667	16.2825	0	5.8698
0.296919	0.313869	19.6247	0.135924	16.2668	0	5.84762
0.296464	0.314203	19.5661	0.137171	16.2503	0	5.82538
0.29602	0.314486	19.5086	0.138409	16.2331	0	5.80309
0.295587	0.314715	19.4521	0.139639	16.2151	0	5.78074
0.295164	0.314889	19.3964	0.140861	16.1963	0	5.75834
0.294751	0.315005	19.3415	0.142077	16.1767	0	5.7359
0.294347	0.31506	19.2873	0.143286	16.1563	0	5.71341
0.293951	0.315051	19.2337	0.144489	16.1351	0	5.69088
0.293562	0.314977	19.1805	0.145687	16.1131	0	5.66831
0.29318	0.314834	19.1277	0.14688	16.0901	0	5.64569
0.292804	0.31462	19.0752	0.14807	16.0663	0	5.62304
0.292434	0.314333	19.0229	0.149256	16.0416	0	5.60035
0.292069	0.313968	18.9707	0.150441	16.0159	0	5.57762
0.291707	0.313524	18.9184	0.151624	15.9892	0	5.55485
0.291349	0.312997	18.866	0.152806	15.9616	0	5.53203
0.290994	0.312384	18.8135	0.153988	15.9329	0	5.50917
0.290641	0.311683	18.7606	0.155171	15.9031	0	5.48626
0.290289	0.31089	18.7073	0.156355	15.8723	0	5.46331
0.289938	0.310001	18.6535	0.157542	15.8402	0	5.44029
0.289587	0.309015	18.5991	0.158733	15.807	0	5.41722
0.289235	0.307926	18.5439	0.159927	15.7726	0	5.39409
0.288881	0.306733	18.488	0.161127	15.7368	0	5.37088
0.288525	0.305431	18.4312	0.162333	15.6998	0	5.3476
0.288166	0.304016	18.3733	0.163546	15.6613	0	5.32424
0.287802	0.302486	18.3144	0.164766	15.6214	0	5.30079
0.287434	0.300836	18.2542	0.165995	15.58	0	5.27725

0.28706	0.299064	18.1926	0.167234	15.537	0	5.25359
0.28668	0.297164	18.1297	0.168483	15.4923	0	5.22982
0.286292	0.295133	18.0652	0.169744	15.446	0	5.20592
0.285896	0.292967	17.999	0.171017	15.3978	0	5.18188
0.28549	0.290663	17.931	0.172304	15.3478	0	5.15769
0.285073	0.288217	17.8611	0.173606	15.2958	0	5.13334
0.284645	0.285624	17.7892	0.174923	15.2417	0	5.1088
0.284204	0.282881	17.7151	0.176257	15.1855	0	5.08406
0.283749	0.279984	17.6386	0.177609	15.127	0	5.0591
0.283278	0.276929	17.5598	0.17898	15.0661	0	5.0339
0.28279	0.273713	17.4783	0.180371	15.0027	0	5.00845
0.282284	0.270332	17.394	0.181784	14.9367	0	4.98271
0.281758	0.266782	17.3068	0.183218	14.868	0	4.95667
0.281209	0.26306	17.2165	0.184677	14.7963	0	4.93028
0.280637	0.259164	17.123	0.18616	14.7216	0	4.90353
0.280039	0.25509	17.0259	0.18767	14.6437	0	4.87638
0.279413	0.250835	16.9252	0.189206	14.5624	0	4.84879
0.278756	0.246398	16.8206	0.190772	14.4776	0	4.82072
0.278066	0.241777	16.7119	0.192367	14.3891	0	4.79214
0.27734	0.236971	16.5988	0.193994	14.2966	0	4.76299
0.276575	0.231977	16.4812	0.195653	14.2	0	4.73322
0.275768	0.226797	16.3587	0.197345	14.099	0	4.70279
0.274914	0.221431	16.231	0.199072	13.9934	0	4.67163
0.27401	0.21588	16.0979	0.200834	13.8829	0	4.63968
0.273051	0.210145	15.9591	0.202632	13.7674	0	4.60686
0.272033	0.204231	15.8142	0.204468	13.6465	0	4.57311
0.27095	0.19814	15.6629	0.20634	13.52	0	4.53834
0.269796	0.191879	15.5048	0.208251	13.3875	0	4.50248
0.268565	0.185454	15.3396	0.210199	13.2488	0	4.46542
0.26725	0.178872	15.1669	0.212183	13.1035	0	4.42706
0.265844	0.172145	14.9862	0.214203	12.9513	0	4.38732
0.264338	0.165283	14.7973	0.216257	12.792	0	4.34606
0.262723	0.158299	14.5997	0.218342	12.6251	0	4.30319
0.26099	0.15121	14.3929	0.220456	12.4505	0	4.25858
0.259128	0.144032	14.1766	0.222592	12.2677	0	4.21211
0.257126	0.136785	13.9504	0.224745	12.0765	0	4.16365
0.254972	0.129492	13.714	0.226909	11.8766	0	4.11309
0.252653	0.122178	13.467	0.229073	11.6679	0	4.0603
0.250157	0.114869	13.2093	0.231227	11.4502	0	4.00517
0.24747	0.107595	12.9407	0.233357	11.2235	0	3.9476
0.24458	0.100388	12.6611	0.235448	10.9876	0	3.88752
0.241473	0.0932801	12.3706	0.237481	10.7428	0	3.82486
0.238137	0.0863071	12.0695	0.239435	10.4893	0	3.75959
0.234562	0.0795038	11.7582	0.241286	10.2275	0	3.69171
0.230741	0.0729058	11.4373	0.243009	9.95788	0	3.62129
0.226667	0.0665474	11.1077	0.244575	9.68124	0	3.54841

0.222339	0.0604611	10.7705	0.245956	9.39844	0	3.47324
0.217761	0.0546766	10.427	0.247121	9.11058	0	3.39597
0.212941	0.0492193	10.0787	0.24804	8.81887	0	3.31687
0.207892	0.0441099	9.7275	0.248687	8.52472	0	3.23626
0.202634	0.0393632	9.37515	0.249036	8.22961	0	3.15451
0.197194	0.0349881	9.02371	0.249069	7.93513	0	3.07202
0.191602	0.0309868	8.6752	0.248771	7.64289	0	2.98923
0.185894	0.0273554	8.33166	0.248137	7.35452	0	2.90659
0.180109	0.0240843	7.99503	0.247166	7.07155	0	2.82456
0.17429	0.0211587	7.66711	0.245869	6.79547	0	2.74358
0.168478	0.0185597	7.34955	0.244262	6.52759	0	2.66407
0.173583	0.0194915	7.46074	0.243202	6.62043	0	3.64684
0.161385	0.0150922	6.97438	0.240821	6.12503	0	2.53877
0.154441	0.0131926	6.61454	0.238393	5.87812	0	2.46021
0.148555	0.0115642	6.32074	0.235918	5.64699	0	2.38794
0.143151	0.0101582	6.0584	0.233319	5.42908	0	2.31968
0.138047	0.00894387	5.81614	0.230606	5.22376	0	2.2548
0.133196	0.00789677	5.59041	0.227814	5.0309	0	2.19315
0.128596	0.00699545	5.38001	0.224981	4.8504	0	2.13476
0.12425	0.00622067	5.18438	0.222142	4.68206	0	2.07962
0.120162	0.0055552	5.00301	0.219329	4.5256	0	2.02773
0.116335	0.0049838	4.83538	0.21657	4.38063	0	1.97904
0.112765	0.00449307	4.68087	0.213889	4.24667	0	1.93349
0.109447	0.00407134	4.53882	0.211306	4.12321	0	1.89098
0.106374	0.00370856	4.40852	0.208835	4.00969	0	1.8514
0.103536	0.00339606	4.28926	0.206489	3.90551	0	1.81463
0.10092	0.00312647	4.18029	0.204274	3.81008	0	1.78051
0.0985165	0.00289347	4.0809	0.202197	3.7228	0	1.74892
0.0963112	0.00269173	3.99039	0.200258	3.6431	0	1.7197
0.0942917	0.0025167	3.90807	0.198459	3.57041	0	1.6927
0.0924449	0.00236454	3.83331	0.196797	3.50418	0	1.66779
0.0907583	0.00223201	3.76548	0.195269	3.44389	0	1.64481
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0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483

0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483
0.0907593	0	3.76671	0.195271	3.44392	0	1.64483

Na2O	K2O	P2O5	FeOT	Mg#	Density of liquid (g/cc)
0	0	0	32.108869	18.0504688	3.197715
0.0306262	0.00332894	0	25.0541135	49.0535373	3.084654
0.0459609	0.00499575	0	21.5220587	60.2788808	3.031681
0.0551687	0.0059966	0	19.4013845	66.0747515	3.000975
0.0613103	0.00666416	0	17.9868518	69.6133935	2.981027
0.0673546	0.00732115	0	17.127926	71.3264585	2.966986
0.0741963	0.00806481	0	16.6252936	71.8727272	2.955858
0.0799996	0.00869561	0	16.2067246	72.3305303	2.946663
0.0849863	0.00923765	0	15.8534166	72.7181858	2.938962
0.0893199	0.00970869	0	15.5516419	73.0493463	2.932438
0.0931232	0.0101221	0	15.2912286	73.3346648	2.926857
0.0964902	0.0104881	0	15.0644417	73.5821434	2.922042
0.0994944	0.0108146	0	14.8653768	73.7979937	2.917858
0.102193	0.011108	0	14.689352	73.9874213	2.9142
0.104634	0.0113732	0	14.5327989	74.1543295	2.910983
0.106852	0.0116144	0	14.3926644	74.302031	2.90814
0.10888	0.0118348	0	14.2666044	74.4331914	2.905618
0.110742	0.0120372	0	14.152582	74.5501601	2.903371
0.11246	0.0122239	0	14.0491666	74.6544639	2.901364
0.114114	0.0124036	0	13.9564041	74.7416923	2.899393
0.115689	0.0125749	0	13.8723351	74.8161202	2.897514
0.117162	0.012735	0	13.7949975	74.8827281	2.89581
0.118544	0.0128852	0	13.7235769	74.9425291	2.89426
0.119844	0.0130265	0	13.6574607	74.9961994	2.892847
0.12107	0.0131598	0	13.5961381	75.0442087	2.891558
0.122229	0.0132858	0	13.5390001	75.087338	2.890379
0.123328	0.0134052	0	13.4857386	75.1259644	2.889301
0.124372	0.0135187	0	13.4359473	75.1605269	2.888313
0.125365	0.0136267	0	13.389219	75.1914734	2.887408
0.126313	0.0137297	0	13.3454474	75.219003	2.886577
0.127219	0.0138282	0	13.3041289	75.24371	2.885814
0.128086	0.0139224	0	13.265259	75.2654136	2.885114
0.128918	0.0140128	0	13.2286332	75.2845436	2.884472
0.129717	0.0140996	0	13.1938488	75.3015663	2.883882
0.130485	0.0141831	0	13.1610013	75.3162493	2.883341
0.131225	0.0142636	0	13.1297898	75.3290856	2.882845
0.131938	0.0143411	0	13.1002098	75.3399041	2.882391
0.132628	0.0144161	0	13.0719604	75.3492855	2.881975
0.133294	0.0144885	0	13.045038	75.3570602	2.881595
0.13394	0.0145587	0	13.0194426	75.363302	2.881248
0.134565	0.0146266	0	12.9949715	75.3682087	2.880933
0.135172	0.0146926	0	12.9715229	75.3719188	2.880646
0.135761	0.0147567	0	12.949095	75.3744285	2.880387
0.136334	0.0148189	0	12.9275878	75.3759589	2.880153

0.136892	0.0148795	0	12.9069986	75.3763415	2.879943
0.137434	0.0149385	0	12.8871283	75.3758577	2.879755
0.137964	0.014996	0	12.8680733	75.3745324	2.879588
0.13848	0.0150521	0	12.8497345	75.3723366	2.879441
0.138984	0.0151069	0	12.8321101	75.3692692	2.879313
0.139476	0.0151604	0	12.8150001	75.3657005	2.879202
0.139957	0.0152127	0	12.7986027	75.3612566	2.879108
0.140428	0.0152639	0	12.7827188	75.3562229	2.879029
0.140889	0.015314	0	12.7673457	75.3506013	2.878965
0.14134	0.0153631	0	12.7524843	75.344388	2.878916
0.141783	0.0154111	0	12.7380337	75.3378133	2.878879
0.142216	0.0154583	0	12.7240939	75.3305593	2.878856
0.142642	0.0155046	0	12.7105622	75.3228591	2.878844
0.14306	0.01555	0	12.6973413	75.3148537	2.878844
0.143471	0.0155946	0	12.6846285	75.3062528	2.878854
0.143874	0.0156385	0	12.6721238	75.297495	2.878875
0.144271	0.0156816	0	12.6601272	75.2880528	2.878906
0.144661	0.015724	0	12.6483387	75.2784516	2.878946
0.145045	0.0157657	0	12.6368574	75.268545	2.878995
0.145423	0.0158068	0	12.6256833	75.2582458	2.879053
0.145795	0.0158473	0	12.6148155	75.2476407	2.879119
0.146162	0.0158871	0	12.6041549	75.2367886	2.879193
0.146523	0.0159264	0	12.5936997	75.2257783	2.879274
0.146879	0.0159651	0	12.5835517	75.2144589	2.879362
0.147231	0.0160033	0	12.5736082	75.2028075	2.879457
0.147577	0.016041	0	12.563971	75.1909339	2.879559
0.14792	0.0160782	0	12.5544383	75.1788753	2.879667
0.148257	0.0161149	0	12.5451119	75.166655	2.879781
0.148591	0.0161512	0	12.53599	75.1541875	2.879901
0.148921	0.016187	0	12.5269726	75.1417094	2.880026
0.149246	0.0162224	0	12.5182597	75.1288343	2.880157
0.149568	0.0162574	0	12.5096522	75.1158587	2.880293
0.149886	0.016292	0	12.5011483	75.1028734	2.880434
0.150201	0.0163262	0	12.4928489	75.0895506	2.88058
0.150512	0.01636	0	12.4846531	75.076218	2.88073
0.15082	0.0163934	0	12.4766618	75.0627244	2.880885
0.151124	0.0164265	0	12.4686741	75.0491935	2.881044
0.151426	0.0164593	0	12.46089	75.0354136	2.881207
0.151724	0.0164917	0	12.4533095	75.0214734	2.881374
0.152019	0.0165239	0	12.4457326	75.0075847	2.881545
0.152312	0.0165557	0	12.4382584	74.9935984	2.881719
0.152602	0.0165872	0	12.4309887	74.9793607	2.881897
0.152889	0.0166184	0	12.4237217	74.965176	2.882079
0.153174	0.0166493	0	12.4165574	74.9508933	2.882264
0.153456	0.01668	0	12.4095967	74.9364501	2.882452
0.153735	0.0167104	0	12.4026387	74.9219699	2.882643

0.154012	0.0167405	0	12.3956834	74.9075431	2.882837
0.154287	0.0167704	0	12.3889317	74.8929559	2.883035
0.15456	0.0168	0	12.3822818	74.8781811	2.883235
0.15483	0.0168294	0	12.3756355	74.8635495	2.883437
0.155098	0.0168585	0	12.369091	74.8488214	2.883643
0.155364	0.0168874	0	12.3625492	74.8340562	2.883851
0.155628	0.0169161	0	12.3562101	74.819132	2.884061
0.15589	0.0169446	0	12.3497737	74.8043231	2.884274
0.15615	0.0169729	0	12.34354	74.7893554	2.884489
0.156408	0.0170009	0	12.3373081	74.7743519	2.884707
0.156665	0.0170288	0	12.331078	74.7594968	2.884926
0.156919	0.0170564	0	12.3250506	74.7442986	2.885148
0.157172	0.0170839	0	12.3189259	74.7293089	2.885372
0.157423	0.0171111	0	12.312903	74.7142227	2.885598
0.157672	0.0171382	0	12.3069819	74.6991328	2.885826
0.157919	0.0171651	0	12.3010635	74.6840062	2.886055
0.158165	0.0171919	0	12.2952469	74.6687834	2.886287
0.158409	0.0172184	0	12.2893321	74.653679	2.886521
0.158652	0.0172448	0	12.28362	74.6384163	2.886756
0.158893	0.017271	0	12.2779088	74.6232131	2.886993
0.159133	0.017297	0	12.2722003	74.6079733	2.887231
0.159371	0.0173229	0	12.2664936	74.5928858	2.887471
0.159608	0.0173487	0	12.2608878	74.5776103	2.887713
0.159843	0.0173743	0	12.2552847	74.5623923	2.887956
0.160077	0.0173997	0	12.2497834	74.5470788	2.888201
0.16031	0.017425	0	12.2441839	74.5319797	2.888448
0.160541	0.0174501	0	12.2386862	74.5167854	2.888695
0.160771	0.0174751	0	12.2332894	74.5014026	2.888944
0.161	0.0174999	0	12.2278953	74.4860784	2.889195
0.161227	0.0175247	0	12.2224021	74.4709714	2.889446
0.161453	0.0175492	0	12.2171107	74.4556139	2.889699
0.161678	0.0175737	0	12.2117211	74.4404729	2.889953
0.161902	0.017598	0	12.2064333	74.4252374	2.890209
0.162124	0.0176222	0	12.2011473	74.4099676	2.890466
0.162346	0.0176463	0	12.1958622	74.3947608	2.890723
0.162566	0.0176702	0	12.1905789	74.3796159	2.890982
0.162785	0.017694	0	12.1853974	74.3643767	2.891242
0.163003	0.0177177	0	12.1802168	74.3492013	2.891503
0.16322	0.0177413	0	12.175038	74.3339921	2.891766
0.163436	0.0177648	0	12.169861	74.3188457	2.892029
0.163651	0.0177881	0	12.1646849	74.3037639	2.892293
0.163865	0.0178114	0	12.1595106	74.2887456	2.892558
0.164077	0.0178345	0	12.1544372	74.2735382	2.892824
0.164289	0.0178575	0	12.1493656	74.2584917	2.893091
0.1645	0.0178804	0	12.1442958	74.2433149	2.893359
0.16471	0.0179032	0	12.1392269	74.228301	2.893628

0.164918	0.0179259	0	12.1341589	74.2133534	2.893898
0.165126	0.0179485	0	12.1291927	74.1982152	2.894169
0.165333	0.017971	0	12.1241283	74.1832999	2.89444
0.165539	0.0179934	0	12.1191648	74.1681954	2.894712
0.165744	0.0180157	0	12.1142031	74.1532545	2.894986
0.165949	0.0180379	0	12.1092423	74.1382826	2.895259
0.166152	0.01806	0	12.1042824	74.1233783	2.895534
0.166354	0.018082	0	12.0993243	74.1084417	2.89581
0.166706	0.0181214	0	12.1010787	74.0826258	2.896288
0.16777	0.0182439	0	12.1348623	74.0042683	2.897726
0.168838	0.0183668	0	12.1685432	73.9263361	2.899163
0.169907	0.0184902	0	12.2021232	73.8487288	2.900599
0.17098	0.0186141	0	12.2358005	73.7712347	2.902035
0.172055	0.0187383	0	12.2693769	73.6941703	2.903471
0.173133	0.0188631	0	12.3028515	73.6174384	2.904906
0.174215	0.0189884	0	12.3364243	73.540725	2.906341
0.175299	0.0191141	0	12.3698962	73.4644477	2.907776
0.176387	0.0192404	0	12.4033672	73.3884514	2.90921
0.177478	0.0193672	0	12.4368364	73.312536	2.910645
0.178572	0.0194946	0	12.4703047	73.2369058	2.912078
0.17967	0.0196225	0	12.5037721	73.1615635	2.913512
0.180771	0.019751	0	12.5372386	73.0863059	2.914946
0.181876	0.0198801	0	12.5707042	73.0113403	2.91638
0.182985	0.0200098	0	12.6040698	72.9367212	2.917813
0.184098	0.0201401	0	12.6375336	72.8621398	2.919247
0.185215	0.0202711	0	12.6710974	72.7876995	2.920681
0.186336	0.0204027	0	12.7045612	72.713507	2.922115
0.187462	0.020535	0	12.7381241	72.6393567	2.923549
0.188592	0.020668	0	12.771687	72.5654052	2.924983
0.189727	0.0208017	0	12.8052499	72.4916545	2.926418
0.190866	0.0209362	0	12.8388128	72.4181061	2.927853
0.19201	0.0210714	0	12.8724757	72.3446064	2.929288
0.193159	0.0212074	0	12.9062386	72.2711575	2.930724
0.194313	0.0213441	0	12.9400024	72.1978088	2.93216
0.195473	0.0214817	0	12.9737662	72.1246695	2.933597
0.196637	0.0216202	0	13.00773	72.0514314	2.935035
0.197808	0.0217595	0	13.0415947	71.9784526	2.936473
0.198984	0.0218997	0	13.0756603	71.9053774	2.937912
0.200166	0.0220408	0	13.1097268	71.8324094	2.939352
0.201354	0.0221828	0	13.1438933	71.7595047	2.940793
0.202548	0.0223258	0	13.1781616	71.6865542	2.942235
0.203749	0.0224698	0	13.2125308	71.6136694	2.943677
0.204956	0.0226148	0	13.2470009	71.5407434	2.945121
0.20617	0.0227609	0	13.2815728	71.4677762	2.946566
0.207391	0.022908	0	13.3161456	71.3950333	2.948013
0.208619	0.0230562	0	13.3509202	71.3220989	2.94946

0.209854	0.0232055	0	13.3858966	71.2489747	2.950909
0.211097	0.0233559	0	13.4208748	71.1759683	2.952359
0.212348	0.0235076	0	13.4560548	71.1028858	2.953811
0.213606	0.0236605	0	13.4913366	71.0296605	2.955265
0.214872	0.0238146	0	13.5267202	70.9564041	2.95672
0.216147	0.02397	0	13.5623065	70.8829644	2.958177
0.217431	0.0241267	0	13.5980946	70.8094563	2.959636
0.218723	0.0242848	0	13.6339854	70.735809	2.961096
0.220024	0.0244443	0	13.669978	70.6620245	2.962559
0.221335	0.0246051	0	13.7062742	70.5880225	2.964024
0.222655	0.0247675	0	13.7426731	70.5138848	2.965491
0.223985	0.0249313	0	13.7792738	70.4395751	2.966961
0.225325	0.0250967	0	13.816079	70.3650913	2.968433
0.226675	0.0252637	0	13.853086	70.2903257	2.969907
0.228036	0.0254323	0	13.8903975	70.2152388	2.971384
0.229407	0.0256026	0	13.9278117	70.1400223	2.972864
0.23079	0.0257745	0	13.9654295	70.0645252	2.974347
0.232184	0.0259483	0	14.0033509	69.9887133	2.975832
0.233591	0.0261239	0	14.0414759	69.9127391	2.977321
0.235009	0.0263013	0	14.0799045	69.8362243	2.978812
0.236439	0.0264806	0	14.1185376	69.759549	2.980307
0.237883	0.0266619	0	14.1574752	69.6824502	2.981806
0.23934	0.0268453	0	14.1967173	69.6049296	2.983308
0.24081	0.0270307	0	14.236163	69.5271393	2.984813
0.242294	0.0272183	0	14.2760141	69.4487804	2.986322
0.243792	0.027408	0	14.3160697	69.3701536	2.987836
0.245305	0.0276001	0	14.3565298	69.2909637	2.989353
0.246833	0.0277944	0	14.3971953	69.2115078	2.990875
0.248377	0.0279912	0	14.4383662	69.1313437	2.9924
0.249937	0.0281905	0	14.4797425	69.0507995	2.993931
0.251513	0.0283923	0	14.5215242	68.969699	2.995466
0.253106	0.0285967	0	14.5637122	68.8880434	2.997006
0.254717	0.0288039	0	14.6063056	68.8057179	2.998551
0.256346	0.0290138	0	14.6493053	68.722842	3.000101
0.257993	0.0292266	0	14.6927113	68.6392989	3.001657
0.259659	0.0294424	0	14.7365245	68.5552088	3.003218
0.261345	0.0296613	0	14.780744	68.4704557	3.004785
0.263052	0.0298833	0	14.8254707	68.3848944	3.006358
0.264779	0.0301086	0	14.8707037	68.2985288	3.007937
0.266529	0.0303373	0	14.9163448	68.2116248	3.009522
0.2683	0.0305695	0	14.9625931	68.1237753	3.011114
0.270095	0.0308053	0	15.0093504	68.0350047	3.012713
0.271913	0.0310448	0	15.0566149	67.9455605	3.01432
0.273756	0.0312881	0	15.1044875	67.8551788	3.015933
0.275624	0.0315355	0	15.1529691	67.7637395	3.017554
0.277518	0.031787	0	15.2020588	67.6714916	3.019184

0.27944	0.0320427	0	15.2517584	67.5781913	3.020821
0.281389	0.0323028	0	15.302067	67.4838426	3.022467
0.283368	0.0325675	0	15.3530846	67.3885521	3.024122
0.285376	0.0328369	0	15.404913	67.2919321	3.025786
0.287415	0.0331113	0	15.4573504	67.194275	3.027459
0.289485	0.0333906	0	15.5105986	67.0954207	3.029142
0.291588	0.0336752	0	15.5645576	66.9955168	3.030836
0.293725	0.0339652	0	15.6193274	66.8943013	3.03254
0.295897	0.0342608	0	15.6750071	66.791764	3.034254
0.298105	0.0345622	0	15.7314985	66.6879245	3.03598
0.30035	0.0348695	0	15.7889016	66.5826466	3.037718
0.302633	0.035183	0	15.8472155	66.476064	3.039467
0.304954	0.035503	0	15.9064411	66.3680554	3.041229
0.307316	0.0358294	0	15.9666784	66.258614	3.043003
0.30972	0.0361627	0	16.0279274	66.1477479	3.04479
0.312166	0.036503	0	16.0901881	66.0353373	3.046591
0.314655	0.0368505	0	16.1534605	65.9215178	3.048405
0.317188	0.0372055	0	16.2179446	65.8060202	3.050234
0.319767	0.0375681	0	16.2834404	65.689132	3.052076
0.322392	0.0379385	0	16.3500479	65.5705947	3.053934
0.325065	0.038317	0	16.4178653	65.4506704	3.055807
0.327785	0.0387038	0	16.4868944	65.3289802	3.057694
0.330555	0.0390992	0	16.5571343	65.2057961	3.059598
0.334267	0.0396047	0	16.6465945	65.0439704	3.061811
0.33878	0.0402043	0	16.7516967	64.8509783	3.06428
0.343332	0.0408111	0	16.8568782	64.6596353	3.066749
0.347926	0.0414256	0	16.9621399	64.4699606	3.069219
0.352562	0.0420482	0	17.0677818	64.2813042	3.07169
0.357245	0.0426794	0	17.1736048	64.0942212	3.074164
0.361976	0.0433196	0	17.279908	63.9081985	3.076642
0.366758	0.0439693	0	17.3866914	63.7232594	3.079125
0.371593	0.044629	0	17.4939568	63.5392887	3.081613
0.376485	0.0452992	0	17.6020024	63.3561858	3.084108
0.381435	0.0459805	0	17.7107291	63.1738364	3.086611
0.386448	0.0466733	0	17.820236	62.992271	3.089121
0.391524	0.0473782	0	17.930524	62.8115145	3.09164
0.396666	0.0480954	0	18.0417931	62.6311951	3.094168
0.401876	0.0488254	0	18.1538406	62.4516018	3.096704
0.407155	0.0495684	0	18.2668692	62.2724973	3.099247
0.412503	0.0503245	0	18.3805762	62.094296	3.101797
0.417921	0.0510939	0	18.4950625	61.9167503	3.104352
0.423408	0.0518764	0	18.6100272	61.7402633	3.106909
0.428964	0.0526721	0	18.7255703	61.5644433	3.109468
0.434588	0.0534808	0	18.8413909	61.3898242	3.112026
0.440279	0.0543023	0	18.9573881	61.2164017	3.114581
0.446036	0.0551365	0	19.0733637	61.0442881	3.117132

0.451859	0.0559834	0	19.1893159	60.8734885	3.119675
0.457747	0.0568429	0	19.3049456	60.7043747	3.12221
0.463699	0.057715	0	19.4202528	60.5366583	3.124736
0.469717	0.0585997	0	19.5351366	60.3706011	3.127251
0.4758	0.059497	0	19.6494979	60.2063185	3.129754
0.481949	0.0604072	0	19.7632376	60.0437797	3.132244
0.488164	0.0613302	0	19.8763539	59.882977	3.134721
0.494446	0.0622664	0	19.9886486	59.7239949	3.137184
0.500797	0.0632158	0	20.1001217	59.5669645	3.139633
0.507217	0.0641788	0	20.2108723	59.4117553	3.142066
0.513708	0.0651556	0	20.3207022	59.2584462	3.144485
0.520271	0.0661464	0	20.4296114	59.1071686	3.146888
0.526907	0.0671517	0	20.537499	58.9578817	3.149274
0.533619	0.0681716	0	20.6445668	58.8103331	3.151645
0.540407	0.0692065	0	20.7505139	58.6650088	3.154
0.547274	0.0702569	0	20.8555412	58.5213651	3.156338
0.554221	0.071323	0	20.9594487	58.3799142	3.158659
0.561251	0.0724053	0	21.0623364	58.2403779	3.160964
0.568364	0.0735041	0	21.1642052	58.1027407	3.163251
0.575564	0.07462	0	21.2649542	57.9671041	3.165522
0.582852	0.0757532	0	21.3645852	57.8335993	3.167776
0.590231	0.0769044	0	21.4630982	57.7019148	3.170013
0.597702	0.078074	0	21.5604923	57.572334	3.172232
0.605267	0.0792623	0	21.6567684	57.444693	3.174435
0.61293	0.0804701	0	21.7518274	57.3192384	3.17662
0.620693	0.0816977	0	21.8457684	57.1955458	3.178787
0.628557	0.0829458	0	21.9384914	57.0740119	3.180937
0.636526	0.0842148	0	22.0300982	56.9543597	3.183069
0.644602	0.0855054	0	22.1203879	56.8367988	3.185184
0.652788	0.0868182	0	22.2095614	56.7212423	3.187281
0.661086	0.0881537	0	22.2975178	56.6074885	3.189359
0.669499	0.0895125	0	22.384158	56.496084	3.19142
0.67803	0.0908954	0	22.469682	56.3863443	3.193463
0.686682	0.092303	0	22.5537907	56.2788853	3.195488
0.695457	0.093736	0	22.6367832	56.1733676	3.197494
0.704359	0.0951951	0	22.7183604	56.0698017	3.199483
0.713391	0.096681	0	22.7987223	55.9684115	3.201452
0.722556	0.0981944	0	22.8777689	55.8688386	3.203403
0.731857	0.0997362	0	22.9555011	55.7715246	3.205335
0.741297	0.101307	0	23.031918	55.6760031	3.207248
0.75088	0.102908	0	23.1069196	55.5828248	3.209142
0.760609	0.10454	0	23.1806077	55.4914124	3.211017
0.770488	0.106203	0	23.2528814	55.4023188	3.212873
0.78052	0.107899	0	23.3238398	55.3151222	3.214709
0.790709	0.109629	0	23.3933856	55.2299146	3.216525
0.801058	0.111393	0	23.4614161	55.1470983	3.218322

0.811572	0.113192	0	23.528134	55.0659899	3.220098
0.822254	0.115028	0	23.5933375	54.9872499	3.221855
0.833109	0.116901	0	23.6571275	54.9104554	3.22359
0.844139	0.118813	0	23.7193049	54.8359572	3.225306
0.85535	0.120765	0	23.7801679	54.7634333	3.227
0.866746	0.122758	0	23.8394183	54.6930314	3.228673
0.87833	0.124792	0	23.8970552	54.6248949	3.230325
0.890108	0.12687	0	23.9532795	54.5588055	3.231955
0.902083	0.128992	0	24.0077912	54.4950644	3.233564
0.914261	0.13116	0	24.0607894	54.433302	3.235151
0.926645	0.133376	0	24.1121759	54.3737643	3.236715
0.939241	0.135639	0	24.1619489	54.3165978	3.238257
0.952054	0.137953	0	24.2101093	54.261485	3.239776
0.965087	0.140318	0	24.256458	54.2086208	3.241272
0.978347	0.142735	0	24.3011941	54.1581006	3.242744
0.991838	0.145208	0	24.3442176	54.1098645	3.244193
1.00557	0.147736	0	24.3855294	54.0637492	3.245619
1.01953	0.150321	0	24.4250295	54.0200028	3.247019
1.03375	0.152966	0	24.462717	53.9787725	3.248396
1.04822	0.155673	0	24.4986919	53.939641	3.249747
1.06294	0.158442	0	24.532756	53.9029563	3.251074
1.07793	0.161275	0	24.5650075	53.868612	3.252375
1.09319	0.164176	0	24.5954473	53.8366007	3.25365
1.10872	0.167144	0	24.6238754	53.8071181	3.254899
1.12453	0.170184	0	24.6503918	53.7800571	3.256122
1.14063	0.173296	0	24.6749965	53.755412	3.257318
1.15702	0.176483	0	24.6976895	53.733023	3.258487
1.1737	0.179747	0	24.7182717	53.7133945	3.259629
1.19069	0.18309	0	24.7369413	53.6961679	3.260743
1.20799	0.186515	0	24.7535001	53.6813836	3.261828
1.2256	0.190023	0	24.7680472	53.6690927	3.262886
1.24354	0.193618	0	24.7804826	53.6595465	3.263914
1.2618	0.197303	0	24.7907063	53.6525332	3.264914
1.2804	0.201078	0	24.7989192	53.6480031	3.265884
1.29933	0.204949	0	24.8049204	53.6461555	3.266824
1.31861	0.208916	0	24.8088108	53.6468875	3.267735
1.33824	0.212983	0	24.8103895	53.6503992	3.268615
1.35823	0.217152	0	24.8098565	53.6563349	3.269464
1.37857	0.221428	0	24.8070127	53.6650483	3.270282
1.39929	0.225812	0	24.8018572	53.6765406	3.271069
1.42039	0.230309	0	24.79449	53.6907123	3.271824
1.44186	0.23492	0	24.784812	53.7075099	3.272547
1.46371	0.23965	0	24.7728232	53.7270896	3.273238
1.48596	0.244502	0	24.7585227	53.7493008	3.273897
1.50861	0.249479	0	24.7418114	53.7744001	3.274523
1.53165	0.254585	0	24.7226884	53.8022383	3.275115

1.5551	0.259823	0	24.7012546	53.8328724	3.275675
1.57896	0.265198	0	24.6774091	53.8661013	3.276201
1.60323	0.270712	0	24.6511528	53.902391	3.276694
1.62792	0.276371	0	24.6225857	53.941186	3.277152
1.65304	0.282177	0	24.5915069	53.9828498	3.277577
1.67858	0.288135	0	24.5580173	54.0274418	3.277968
1.70455	0.294249	0	24.5221169	54.0746636	3.278324
1.73094	0.300523	0	24.4838048	54.1246786	3.278646
1.75778	0.306961	0	24.4430828	54.1774948	3.278934
1.78504	0.313568	0	24.3998491	54.2330732	3.279188
1.81274	0.320349	0	24.3543046	54.2913737	3.279407
1.84088	0.327306	0	24.3063493	54.3523571	3.279591
1.86946	0.334446	0	24.2559841	54.4160352	3.279741
1.89847	0.341773	0	24.2032081	54.482575	3.279858
1.92792	0.349291	0	24.1481213	54.5515827	3.27994
1.9578	0.357006	0	24.0907237	54.6232254	3.279988
1.98811	0.364921	0	24.0310162	54.6975171	3.280002
2.01885	0.373042	0	23.9689988	54.7743214	3.279983
2.05001	0.381374	0	23.9047715	54.8537035	3.279931
2.08159	0.389921	0	23.8383343	54.9353759	3.279846
2.11358	0.39869	0	23.7696872	55.0196598	3.279729
2.14598	0.407684	0	23.6989311	55.1061645	3.27958
2.17878	0.416908	0	23.6261651	55.1949559	3.279399
2.21197	0.426369	0	23.5512901	55.2861558	3.279187
2.24554	0.436071	0	23.474507	55.3792695	3.278945
2.27948	0.446018	0	23.3957149	55.4747244	3.278673
2.31378	0.456218	0	23.3152156	55.5719188	3.278373
2.34843	0.466673	0	23.2328073	55.6712357	3.278043
2.38341	0.477391	0	23.1487918	55.7722233	3.277687
2.41871	0.488376	0	23.0630691	55.8750064	3.277303
2.45432	0.499634	0	22.9758401	55.9793894	3.276894
2.49021	0.511169	0	22.8872039	56.0852835	3.27646
2.52637	0.522987	0	22.7970614	56.1926631	3.276002
2.56279	0.535094	0	22.7057144	56.3012206	3.27552
2.59943	0.547495	0	22.613162	56.4109732	3.275017
2.63629	0.560195	0	22.5195051	56.5218277	3.274493
2.67334	0.573201	0	22.4247437	56.6336502	3.27395
2.71056	0.586517	0	22.3291787	56.7462761	3.273387
2.74793	0.60015	0	22.232811	56.8594186	3.272807
2.78542	0.614104	0	22.1358406	56.9730193	3.272211
2.82301	0.628387	0	22.0381684	57.0870505	3.2716
2.86068	0.643004	0	21.9399944	57.2014507	3.270975
2.8984	0.657961	0	21.8415204	57.3157066	3.270337
2.93614	0.673264	0	21.7427464	57.4299752	3.269688
2.97388	0.688921	0	21.6438724	57.5440389	3.269029
3.0116	0.704937	0	21.5449002	57.6577528	3.26836

3.04926	0.721321	0	21.4460298	57.7708952	3.267684
3.08129	0.735783	0	21.3307718	57.8857128	3.266716
3.1166	0.751946	0	21.2364049	57.9884299	3.266042
3.15165	0.768394	0	21.1442524	58.0879711	3.265382
3.18644	0.785133	0	21.0544134	58.1843452	3.264737
3.22095	0.802171	0	20.9668897	58.2775243	3.264105
3.25519	0.819518	0	20.8814795	58.3675698	3.263486
3.28915	0.837181	0	20.7982846	58.4544879	3.26288
3.32283	0.855171	0	20.7173041	58.538108	3.262286
3.35623	0.873498	0	20.638438	58.6186718	3.261703
3.38936	0.892174	0	20.5615872	58.6961261	3.26113
3.42221	0.911212	0	20.4868508	58.7704805	3.260566
3.45478	0.930622	0	20.4140288	58.8418027	3.26001
3.48709	0.950421	0	20.3430203	58.9101931	3.259461
3.51914	0.970621	0	20.2738253	58.9756332	3.258917
3.55092	0.991238	0	20.2064447	59.0381037	3.258379
3.58246	1.01229	0	20.1405767	59.0980965	3.257843
3.61375	1.03379	0	20.0763213	59.15518	3.25731
3.6448	1.05575	0	20.0135785	59.2096068	3.256777
3.67562	1.07821	0	19.9521465	59.2616056	3.256243
3.70622	1.10117	0	19.8919271	59.3112824	3.255708
3.7366	1.12465	0	19.8329176	59.3584795	3.25517
3.76678	1.14868	0	19.775018	59.4034544	3.254626
3.79675	1.17328	0	19.7181283	59.4461691	3.254077
3.82653	1.19848	0	19.6620476	59.4868585	3.25352
3.85613	1.22429	0	19.6067759	59.5255128	3.252954
3.88555	1.25075	0	19.5522123	59.5622465	3.252378
3.9148	1.27787	0	19.4982559	59.5971749	3.25179
3.94389	1.30569	0	19.4447058	59.6305382	3.251188
3.97282	1.33425	0	19.391562	59.6620304	3.250572
4.00161	1.36355	0	19.3387236	59.6920681	3.24994
4.03026	1.39365	0	19.2860906	59.7206196	3.24929
4.05877	1.42457	0	19.2335621	59.7476545	3.24862
4.08716	1.45636	0	19.1809363	59.773419	3.24793
4.11542	1.48903	0	19.1282141	59.7980577	3.247217
4.14357	1.52264	0	19.0753946	59.8212656	3.246481
4.1716	1.55723	0	19.0221769	59.8434162	3.245719
4.19952	1.59283	0	18.9685601	59.8646583	3.24493
4.22734	1.6295	0	18.9144442	59.8846605	3.244112
4.25506	1.66727	0	18.8597283	59.9038502	3.243264
4.28267	1.7062	0	18.8042115	59.9223288	3.242384
4.3102	1.74634	0	18.7479929	59.9396625	3.241471
4.33762	1.78774	0	18.6908725	59.9564086	3.240522
4.36496	1.83046	0	18.6326494	59.9723648	3.239535
4.3922	1.87456	0	18.5734218	59.9875552	3.23851
4.41935	1.9201	0	18.5128906	60.0022107	3.237444

4.4464	1.96716	0	18.450954	60.0163081	3.236335
4.47336	2.01579	0	18.387712	60.029561	3.235181
4.50023	2.06607	0	18.3228628	60.0425158	3.23398
4.52699	2.11808	0	18.2563064	60.0548374	3.232731
4.55365	2.1719	0	18.187941	60.0668141	3.23143
4.58021	2.22763	0	18.1176657	60.0782663	3.230076
4.60665	2.28534	0	18.0453805	60.089168	3.228665
4.63298	2.34514	0	17.9708836	60.0997865	3.227197
4.65919	2.40713	0	17.8939741	60.1100748	3.225667
4.68526	2.47142	0	17.8147502	60.1197422	3.224074
4.7112	2.53812	0	17.732811	60.1291673	3.222415
4.73699	2.60735	0	17.6480556	60.138328	3.220686
4.76262	2.67925	0	17.5603822	60.1472032	3.218885
4.78808	2.75395	0	17.4695881	60.1555854	3.217008
4.81337	2.8316	0	17.3755733	60.1636101	3.215051
4.83846	2.91235	0	17.2779351	60.1715078	3.213012
4.86334	2.99637	0	17.1766717	60.1789548	3.210886
4.888	3.08382	0	17.0714804	60.1862077	3.208669
4.91241	3.17491	0	16.9621594	60.1932204	3.206357
4.93656	3.26982	0	16.848406	60.1999212	3.203946
4.96042	3.36876	0	16.7301175	60.2062879	3.20143
4.98396	3.47197	0	16.6068912	60.21239	3.198805
5.00716	3.57967	0	16.4784226	60.2183277	3.196065
5.02999	3.69213	0	16.344509	60.2238825	3.193205
5.05241	3.8096	0	16.2048459	60.2293269	3.190218
5.07437	3.93238	0	16.0590297	60.234564	3.187099
5.09582	4.06077	0	15.906755	60.2396998	3.183841
5.11672	4.19509	0	15.7476164	60.2446388	3.180437
5.137	4.33568	0	15.5813085	60.2494895	3.17688
5.15658	4.4829	0	15.407425	60.2541566	3.173161
5.17539	4.63711	0	15.2254596	60.2588824	3.169275
5.19331	4.79872	0	15.0352042	60.2636337	3.165212
5.21025	4.96813	0	14.8361507	60.2682912	3.160964
5.22606	5.14576	0	14.627791	60.2734991	3.156524
5.2406	5.33204	0	14.4098152	60.2788299	3.151883
5.25368	5.52741	0	14.1818134	60.2845956	3.147033
5.26511	5.73228	0	13.9434748	60.2907586	3.141967
5.27464	5.94709	0	13.6943877	60.2978678	3.136678
5.282	6.17223	0	13.4344413	60.3057712	3.131161
5.28689	6.40806	0	13.163423	60.3149212	3.12541
5.28896	6.65488	0	12.881222	60.3251887	3.119425
5.28782	6.91294	0	12.5879257	60.3371769	3.113203
5.28305	7.18238	0	12.2838233	60.3509315	3.106748
5.27417	7.46322	0	11.9693058	60.3667754	3.100064
5.26071	7.75535	0	11.6449669	60.3848493	3.093162
5.24214	8.0585	0	11.3117003	60.4054736	3.086055

5.21796	8.37221	0	10.9706051	60.4287166	3.07876
5.18768	8.6958	0	10.6229849	60.4548272	3.0713
5.15083	9.02841	0	10.2703469	60.4839088	3.063701
5.10703	9.36894	0	9.9146028	60.5156576	3.055994
5.05597	9.71611	0	9.5575206	60.5502704	3.048214
4.99749	10.0684	0	9.2011846	60.5874614	3.040397
4.93153	10.4242	0	8.8476418	60.6270302	3.032583
4.85821	10.7818	0	8.4989646	60.6686983	3.024812
4.77783	11.1392	0	8.1571281	60.7120417	3.017124
4.69083	11.4947	0	7.823971	60.7567908	3.009559
4.59783	11.8463	0	7.5011802	60.8024037	3.002152
4.44547	11.5763	0	7.6169647	60.7739177	3.004164
4.45546	12.3651	0	7.1196265	60.5292026	2.991241
4.3584	12.7216	0	6.7535369	60.8070079	2.983431
4.25232	13.052	0	6.4544395	60.9304802	2.976604
4.14251	13.3662	0	6.1872359	61.0001305	2.970291
4.03134	13.6667	0	5.9403823	61.0515691	2.964345
3.92021	13.9539	0	5.7102864	61.0964004	2.958729
3.81017	14.2275	0	5.4957464	61.1381551	2.953437
3.7021	14.4871	0	5.296205	61.1776096	2.948468
3.59676	14.7326	0	5.1111558	61.2150564	2.943822
3.49481	14.9638	0	4.9400815	61.2503343	2.939497
3.39677	15.1809	0	4.7823585	61.2833338	2.935488
3.30308	15.384	0	4.6373223	61.3140216	2.931786
3.21404	15.5737	0	4.5042566	61.3423914	2.928384
3.12985	15.7504	0	4.3824424	61.3682622	2.925269
3.05064	15.9145	0	4.271118	61.3917867	2.922431
2.97643	16.0667	0	4.16956485	61.4128755	2.919856
2.90719	16.2077	0	4.07707008	61.4316412	2.917531
2.84282	16.338	0	3.99293253	61.4481813	2.915443
2.78319	16.4583	0	3.91651041	61.4624172	2.913578
2.7281	16.5693	0	3.84716247	61.4745036	2.911922
2.72812	16.5695	0	3.84839337	61.4671334	2.91192
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2.72812	16.5695	0	3.84839337	61.4671334
2.72812	16.5695	0	3.84839337	61.4671334

Pressure (GPa)	Temperature (K)	mass of liquid	SiO2	TiO2	Al2O3	Fe2O3
0.5	1723.15	100.312306	36.5857	14.1558	3.98755	0.72941
0.5	1723.15	200.346761	40.4993	7.24258	5.06392	0.536862
0.505	1723.15	300.377507	41.8068	4.93397	5.42345	0.460245
0.51	1723.15	373.950213	42.5948	4.04621	5.99979	0.43002
0.515	1723.15	435.98506	43.1861	3.54166	6.55564	0.413209
0.52	1723.15	498.074534	43.6266	3.16245	6.97226	0.400551
0.525	1723.15	560.168501	43.9672	2.86729	7.29646	0.390676
0.53	1723.15	622.232604	44.2386	2.63116	7.55631	0.382749
0.535	1723.15	684.242523	44.46	2.43805	7.76965	0.376231
0.54	1723.15	746.18058	44.6442	2.27726	7.9483	0.370766
0.545	1723.15	808.033642	44.8	2.14134	8.10041	0.366103
0.55	1723.15	869.246948	44.9493	2.02546	8.23136	0.362155
0.555	1723.15	929.757434	45.095	1.92559	8.34553	0.358778
0.56	1723.15	990.128373	45.2237	1.83823	8.44664	0.355774
0.565	1723.15	1050.356838	45.3384	1.76119	8.537	0.353076
0.57	1723.15	1110.440573	45.4415	1.69275	8.61841	0.350632
0.575	1723.15	1170.377854	45.5348	1.63157	8.6923	0.3484
0.58	1723.15	1230.167393	45.6198	1.57657	8.75982	0.346348
0.585	1723.15	1289.80825	45.6978	1.52685	8.82186	0.34445
0.59	1723.15	1349.299772	45.7697	1.48171	8.8792	0.342682
0.595	1723.15	1408.641544	45.8363	1.44055	8.93244	0.341029
0.6	1723.15	1467.833346	45.8983	1.40287	8.9821	0.339475
0.605	1723.15	1526.875125	45.9562	1.36826	9.02862	0.338007
0.61	1723.15	1585.766963	46.0106	1.33635	9.07236	0.336616
0.615	1723.15	1644.509059	46.0618	1.30686	9.11363	0.335292
0.62	1723.15	1703.101712	46.1101	1.27952	9.1527	0.334029
0.625	1723.15	1761.545302	46.1559	1.25411	9.18979	0.332819
0.63	1723.15	1819.840284	46.1995	1.23044	9.2251	0.331658
0.635	1723.15	1877.987169	46.2409	1.20833	9.25881	0.33054
0.64	1723.15	1935.986523	46.2806	1.18765	9.29107	0.32946
0.645	1723.15	1993.838956	46.3185	1.16826	9.322	0.328417
0.65	1723.15	2051.545115	46.3549	1.15005	9.35172	0.327405
0.655	1723.15	2109.105683	46.3899	1.13291	9.38035	0.326423
0.66	1723.15	2166.521367	46.4235	1.11677	9.40796	0.325467
0.665	1723.15	2223.7929	46.456	1.10153	9.43464	0.324536
0.67	1723.15	2280.921035	46.4875	1.08712	9.46046	0.323628
0.675	1723.15	2337.906543	46.5179	1.07349	9.48548	0.322741
0.68	1723.15	2394.750209	46.5473	1.06057	9.50978	0.321872
0.685	1723.15	2451.452831	46.576	1.04831	9.53339	0.321022
0.69	1723.15	2508.015216	46.6038	1.03666	9.55636	0.320188
0.695	1723.15	2564.438182	46.6308	1.02558	9.57874	0.319369
0.7	1723.15	2620.722553	46.6572	1.01504	9.60057	0.318565
0.705	1723.15	2676.869158	46.6829	1.00499	9.62189	0.317774
0.71	1723.15	2732.878831	46.708	0.995402	9.64272	0.316995

0.715	1723.15	2788.75241	46.7325	0.98625	9.66309	0.316228
0.72	1723.15	2844.490733	46.7565	0.977504	9.68304	0.315472
0.725	1723.15	2900.094643	46.78	0.96914	9.70258	0.314726
0.73	1723.15	2955.564981	46.8031	0.961134	9.72174	0.313989
0.735	1723.15	3010.902589	46.8256	0.953466	9.74055	0.313262
0.74	1723.15	3066.10831	46.8478	0.946115	9.75901	0.312543
0.745	1723.15	3121.182983	46.8695	0.939064	9.77716	0.311833
0.75	1723.15	3176.127448	46.8909	0.932296	9.795	0.31113
0.755	1723.15	3230.942543	46.9119	0.925795	9.81255	0.310434
0.76	1723.15	3285.629101	46.9326	0.919547	9.82982	0.309745
0.765	1723.15	3340.187955	46.953	0.913539	9.84683	0.309063
0.77	1723.15	3394.619935	46.973	0.907758	9.8636	0.308387
0.775	1723.15	3448.925866	46.9928	0.902193	9.88012	0.307716
0.78	1723.15	3503.106571	47.0122	0.896832	9.89642	0.307052
0.785	1723.15	3557.162869	47.0315	0.891665	9.9125	0.306392
0.79	1723.15	3611.095575	47.0504	0.886684	9.92837	0.305738
0.795	1723.15	3664.905499	47.0691	0.881879	9.94404	0.305089
0.8	1723.15	3718.593448	47.0876	0.877241	9.95952	0.304445
0.805	1723.15	3772.160225	47.1059	0.872764	9.97482	0.303805
0.81	1723.15	3825.606628	47.1239	0.868439	9.98994	0.303169
0.815	1723.15	3878.93345	47.1418	0.86426	10.0049	0.302537
0.82	1723.15	3932.141479	47.1595	0.860221	10.0197	0.30191
0.825	1723.15	3985.2315	47.1769	0.856314	10.0343	0.301286
0.83	1723.15	4038.204291	47.1942	0.852535	10.0488	0.300666
0.835	1723.15	4091.060628	47.2113	0.848878	10.0631	0.30005
0.84	1723.15	4143.801279	47.2283	0.845337	10.0773	0.299436
0.845	1723.15	4196.427008	47.2451	0.841909	10.0914	0.298827
0.85	1723.15	4248.938576	47.2617	0.838588	10.1053	0.29822
0.855	1723.15	4301.336737	47.2782	0.83537	10.1191	0.297617
0.86	1723.15	4353.622239	47.2945	0.832251	10.1328	0.297016
0.865	1723.15	4405.795828	47.3107	0.829227	10.1463	0.296419
0.87	1723.15	4457.858242	47.3268	0.826294	10.1598	0.295824
0.875	1723.15	4509.810216	47.3428	0.823449	10.1731	0.295232
0.88	1723.15	4561.652478	47.3586	0.820688	10.1863	0.294643
0.885	1723.15	4613.385753	47.3743	0.818009	10.1994	0.294056
0.89	1723.15	4665.010759	47.3898	0.815407	10.2124	0.293472
0.895	1723.15	4716.52821	47.4053	0.812882	10.2253	0.29289
0.9	1723.15	4767.938816	47.4206	0.810428	10.2381	0.292311
0.905	1723.15	4819.243278	47.4359	0.808045	10.2509	0.291734
0.91	1723.15	4870.442297	47.451	0.80573	10.2635	0.291159
0.915	1723.15	4921.536566	47.466	0.803479	10.276	0.290587
0.92	1723.15	4972.526773	47.481	0.801292	10.2884	0.290016
0.925	1723.15	5023.413601	47.4958	0.799165	10.3008	0.289448
0.93	1723.15	5074.19773	47.5106	0.797097	10.3131	0.288882
0.935	1723.15	5124.879833	47.5252	0.795085	10.3253	0.288318
0.94	1723.15	5175.460578	47.5398	0.793129	10.3374	0.287756

0.945	1723.15	5225.94063	47.5543	0.791225	10.3494	0.287195
0.95	1723.15	5276.320647	47.5687	0.789373	10.3613	0.286637
0.955	1723.15	5326.601283	47.583	0.78757	10.3732	0.28608
0.96	1723.15	5376.783189	47.5972	0.785816	10.385	0.285526
0.965	1723.15	5426.867007	47.6114	0.784108	10.3968	0.284973
0.97	1723.15	5476.853378	47.6254	0.782445	10.4084	0.284422
0.975	1723.15	5526.742936	47.6395	0.780825	10.42	0.283872
0.98	1723.15	5576.536313	47.6534	0.779248	10.4315	0.283325
0.985	1723.15	5626.234133	47.6673	0.777712	10.443	0.282779
0.99	1723.15	5675.837018	47.681	0.776216	10.4544	0.282234
0.995	1723.15	5725.345584	47.6948	0.774758	10.4657	0.281691
1	1723.15	5774.760442	47.7084	0.773338	10.477	0.28115
1.005	1723.15	5824.0822	47.722	0.771954	10.4882	0.280611
1.01	1723.15	5873.311461	47.7356	0.770606	10.4993	0.280073
1.015	1723.15	5922.448822	47.749	0.769292	10.5104	0.279536
1.02	1723.15	5971.494878	47.7624	0.768011	10.5214	0.279001
1.025	1723.15	6020.450218	47.7758	0.766762	10.5323	0.278468
1.03	1723.15	6069.315428	47.7891	0.765545	10.5432	0.277936
1.035	1723.15	6118.091086	47.8023	0.764358	10.5541	0.277405
1.04	1723.15	6166.777771	47.8155	0.763201	10.5649	0.276876
1.045	1723.15	6215.376054	47.8286	0.762073	10.5756	0.276348
1.05	1723.15	6263.886504	47.8417	0.760973	10.5863	0.275822
1.055	1723.15	6312.309682	47.8547	0.759901	10.5969	0.275297
1.06	1723.15	6360.64615	47.8677	0.758854	10.6075	0.274773
1.065	1723.15	6408.896463	47.8806	0.757834	10.618	0.274251
1.07	1723.15	6457.061171	47.8934	0.756839	10.6285	0.27373
1.075	1723.15	6505.140822	47.9062	0.755869	10.6389	0.273211
1.08	1723.15	6553.135959	47.919	0.754923	10.6493	0.272692
1.085	1723.15	6601.047122	47.9317	0.753999	10.6596	0.272175
1.09	1723.15	6648.874845	47.9444	0.753099	10.6699	0.27166
1.095	1723.15	6696.619659	47.957	0.752221	10.6801	0.271145
1.1	1723.15	6744.282092	47.9696	0.751364	10.6903	0.270632
1.105	1723.15	6791.862667	47.9821	0.750528	10.7004	0.27012
1.11	1723.15	6839.361905	47.9946	0.749713	10.7105	0.26961
1.115	1723.15	6886.780319	48.007	0.748918	10.7205	0.269101
1.12	1723.15	6934.118424	48.0194	0.748142	10.7305	0.268592
1.125	1723.15	6981.376726	48.0318	0.747385	10.7404	0.268085
1.13	1723.15	7028.555731	48.0441	0.746647	10.7503	0.26758
1.135	1723.15	7075.655939	48.0564	0.745926	10.7602	0.267075
1.14	1723.15	7122.677848	48.0686	0.745224	10.77	0.266572
1.145	1723.15	7169.621951	48.0808	0.744539	10.7798	0.26607
1.15	1723.15	7216.488737	48.0929	0.74387	10.7895	0.265569
1.155	1723.15	7263.278695	48.105	0.743218	10.7992	0.265069
1.16	1723.15	7309.992306	48.1171	0.742583	10.8088	0.264571
1.165	1723.15	7356.630049	48.1292	0.741962	10.8184	0.264073
1.17	1723.15	7403.192401	48.1412	0.741357	10.828	0.263577

1.175	1723.15	7449.679835	48.1531	0.740768	10.8375	0.263082
1.18	1723.15	7496.092819	48.1651	0.740192	10.847	0.262588
1.185	1723.15	7542.431819	48.1769	0.739631	10.8564	0.262095
1.19	1723.15	7588.697297	48.1888	0.739084	10.8658	0.261603
1.195	1723.15	7634.889713	48.2006	0.738551	10.8751	0.261112
1.2	1723.15	7681.009522	48.2124	0.738031	10.8845	0.260623
1.205	1723.15	7727.057177	48.2242	0.737524	10.8937	0.260135
1.21	1723.15	7773.033126	48.2359	0.73703	10.903	0.259647
1.215	1723.15	7781.441277	48.1681	0.739406	10.9433	0.259771
1.22	1723.15	7783.92891	48.0884	0.74222	10.9881	0.259985
1.225	1723.15	7786.191532	48.0088	0.745038	11.0326	0.260197
1.23	1723.15	7788.228319	47.9294	0.747859	11.077	0.260407
1.235	1723.15	7790.038352	47.85	0.750684	11.121	0.260616
1.24	1723.15	7791.620619	47.7707	0.753514	11.1649	0.260822
1.245	1723.15	7792.974014	47.6916	0.756347	11.2085	0.261027
1.25	1723.15	7794.097343	47.6125	0.759184	11.2518	0.261231
1.255	1723.15	7794.989323	47.5336	0.762025	11.295	0.261433
1.26	1723.15	7795.648584	47.4548	0.764871	11.3378	0.261634
1.265	1723.15	7796.07367	47.3761	0.767721	11.3804	0.261833
1.27	1723.15	7796.263042	47.2975	0.770576	11.4227	0.262032
1.275	1723.15	7796.215079	47.219	0.773436	11.4648	0.262229
1.28	1723.15	7795.928079	47.1407	0.776301	11.5066	0.262426
1.285	1723.15	7795.400258	47.0625	0.779172	11.5481	0.262622
1.29	1723.15	7794.629757	46.9844	0.782048	11.5894	0.262817
1.295	1723.15	7793.614639	46.9064	0.784929	11.6303	0.263011
1.3	1723.15	7792.35289	46.8286	0.787817	11.671	0.263205
1.305	1723.15	7790.842424	46.7508	0.790711	11.7115	0.263399
1.31	1723.15	7789.08108	46.6732	0.793611	11.7516	0.263593
1.315	1723.15	7787.066626	46.5958	0.796517	11.7914	0.263786
1.32	1723.15	7784.796758	46.5184	0.799431	11.8309	0.263979
1.325	1723.15	7782.269104	46.4412	0.802352	11.8702	0.264173
1.33	1723.15	7779.481224	46.3641	0.80528	11.9091	0.264366
1.335	1723.15	7776.430608	46.2871	0.808216	11.9477	0.26456
1.34	1723.15	7773.114681	46.2103	0.81116	11.986	0.264754
1.345	1723.15	7769.530803	46.1336	0.814112	12.024	0.264949
1.35	1723.15	7765.67627	46.057	0.817073	12.0617	0.265144
1.355	1723.15	7761.548312	45.9806	0.820043	12.099	0.265341
1.36	1723.15	7757.144098	45.9043	0.823022	12.136	0.265538
1.365	1723.15	7752.460733	45.8281	0.826011	12.1727	0.265736
1.37	1723.15	7747.495262	45.7521	0.829009	12.209	0.265935
1.375	1723.15	7742.244668	45.6762	0.832019	12.245	0.266136
1.38	1723.15	7736.705873	45.6005	0.835039	12.2806	0.266337
1.385	1723.15	7730.875738	45.5248	0.83807	12.3158	0.266541
1.39	1723.15	7724.751063	45.4494	0.841113	12.3507	0.266745
1.395	1723.15	7718.32859	45.374	0.844167	12.3853	0.266952
1.4	1723.15	7711.604997	45.2988	0.847234	12.4194	0.267161

1.405	1723.15	7704.576901	45.2238	0.850315	12.4532	0.267371
1.41	1723.15	7697.240859	45.1488	0.853408	12.4866	0.267583
1.415	1723.15	7689.593363	45.0741	0.856515	12.5196	0.267798
1.42	1723.15	7681.630843	44.9994	0.859637	12.5523	0.268015
1.425	1723.15	7673.349663	44.9249	0.862773	12.5845	0.268235
1.43	1723.15	7664.746121	44.8506	0.865925	12.6163	0.268457
1.435	1723.15	7655.816446	44.7764	0.869092	12.6476	0.268682
1.44	1723.15	7646.556798	44.7023	0.872276	12.6786	0.26891
1.445	1723.15	7636.963261	44.6284	0.875478	12.7091	0.269141
1.45	1723.15	7627.031848	44.5546	0.878696	12.7392	0.269375
1.455	1723.15	7616.75849	44.481	0.881933	12.7689	0.269612
1.46	1723.15	7606.139039	44.4076	0.885189	12.7981	0.269853
1.465	1723.15	7595.169261	44.3343	0.888464	12.8268	0.270097
1.47	1723.15	7583.844831	44.2611	0.89176	12.8551	0.270345
1.475	1723.15	7572.161332	44.1881	0.895076	12.8829	0.270597
1.48	1723.15	7560.114251	44.1152	0.898414	12.9103	0.270853
1.485	1723.15	7547.698968	44.0425	0.901774	12.9371	0.271113
1.49	1723.15	7534.910756	43.97	0.905158	12.9634	0.271378
1.495	1723.15	7521.744776	43.8976	0.908565	12.9893	0.271647
1.5	1723.15	7508.196066	43.8254	0.911998	13.0146	0.27192
1.505	1723.15	7494.25954	43.7533	0.915455	13.0394	0.272199
1.51	1723.15	7479.929978	43.6814	0.91894	13.0637	0.272482
1.515	1723.15	7465.202021	43.6096	0.922452	13.0874	0.272771
1.52	1723.15	7450.070163	43.5381	0.925992	13.1106	0.273065
1.525	1723.15	7434.528746	43.4666	0.929562	13.1332	0.273364
1.53	1723.15	7418.571951	43.3954	0.933163	13.1553	0.27367
1.535	1723.15	7402.193791	43.3243	0.936795	13.1767	0.273981
1.54	1723.15	7385.388106	43.2534	0.94046	13.1976	0.274298
1.545	1723.15	7368.148554	43.1826	0.944158	13.2179	0.274622
1.55	1723.15	7350.468607	43.112	0.947892	13.2376	0.274952
1.555	1723.15	7332.341542	43.0416	0.951662	13.2566	0.275289
1.56	1723.15	7313.76044	42.9714	0.95547	13.275	0.275632
1.565	1723.15	7294.718181	42.9014	0.959318	13.2928	0.275983
1.57	1723.15	7275.207438	42.8315	0.963205	13.3099	0.276342
1.575	1723.15	7255.220679	42.7618	0.967135	13.3263	0.276708
1.58	1723.15	7234.750165	42.6923	0.971109	13.342	0.277082
1.585	1723.15	7213.787955	42.623	0.975128	13.357	0.277464
1.59	1723.15	7192.325907	42.5538	0.979193	13.3714	0.277854
1.595	1723.15	7170.355688	42.4849	0.983308	13.3849	0.278253
1.6	1723.15	7147.868784	42.4161	0.987473	13.3978	0.278661
1.605	1723.15	7124.856514	42.3475	0.99169	13.4099	0.279078
1.61	1723.15	7101.310049	42.2792	0.995962	13.4212	0.279504
1.615	1723.15	7077.220434	42.211	1.00029	13.4317	0.279941
1.62	1723.15	7052.57862	42.143	1.00468	13.4414	0.280387
1.625	1723.15	7027.375492	42.0752	1.00913	13.4503	0.280843
1.63	1723.15	7001.601913	42.0077	1.01364	13.4584	0.281311

1.635	1723.15	6975.248772	41.9403	1.01821	13.4656	0.281789
1.64	1723.15	6948.307036	41.8731	1.02286	13.4719	0.282278
1.645	1723.15	6920.767809	41.8062	1.02757	13.4773	0.282779
1.65	1723.15	6892.622407	41.7395	1.03236	13.4818	0.283291
1.655	1723.15	6863.86243	41.6729	1.03722	13.4855	0.283816
1.66	1723.15	6834.479848	41.6066	1.04216	13.4881	0.284352
1.665	1723.15	6804.467092	41.5406	1.04718	13.4898	0.284901
1.67	1723.15	6773.817155	41.4747	1.05229	13.4906	0.285463
1.675	1723.15	6742.523691	41.409	1.05748	13.4904	0.286038
1.68	1723.15	6710.581127	41.3436	1.06276	13.4891	0.286626
1.685	1723.15	6677.984776	41.2784	1.06813	13.4869	0.287228
1.69	1723.15	6644.730945	41.2135	1.07359	13.4836	0.287842
1.695	1723.15	6610.817054	41.1487	1.07915	13.4794	0.288471
1.7	1723.15	6576.241735	41.0842	1.08482	13.474	0.289112
1.705	1723.15	6541.004944	41.02	1.09058	13.4677	0.289767
1.71	1723.15	6505.108049	40.956	1.09645	13.4603	0.290436
1.715	1723.15	6468.553916	40.8922	1.10242	13.4518	0.291118
1.72	1723.15	6431.346974	40.8286	1.10851	13.4423	0.291813
1.725	1723.15	6393.493275	40.7653	1.1147	13.4318	0.292521
1.73	1723.15	6355.000525	40.7022	1.12101	13.4202	0.293242
1.735	1723.15	6315.878108	40.6394	1.12744	13.4075	0.293975
1.74	1723.15	6276.137086	40.5768	1.13398	13.3939	0.29472
1.745	1723.15	6214.426449	40.5122	1.145	13.3487	0.296084
1.75	1723.15	6145.040388	40.4469	1.15785	13.2916	0.297673
1.755	1723.15	6076.589095	40.3819	1.17084	13.2348	0.29924
1.76	1723.15	6009.008617	40.3172	1.18397	13.1784	0.300785
1.765	1723.15	5942.236742	40.2528	1.19725	13.1223	0.302307
1.77	1723.15	5876.213334	40.1887	1.21069	13.0665	0.303808
1.775	1723.15	5810.880767	40.1249	1.22429	13.011	0.305286
1.78	1723.15	5746.184501	40.0615	1.23805	12.9557	0.306743
1.785	1723.15	5682.073815	39.9983	1.25199	12.9006	0.308178
1.79	1723.15	5618.50273	39.9356	1.26612	12.8458	0.309592
1.795	1723.15	5555.431127	39.8732	1.28043	12.7911	0.310983
1.8	1723.15	5492.826015	39.8112	1.29494	12.7365	0.312353
1.805	1723.15	5430.662855	39.7496	1.30964	12.682	0.313701
1.81	1723.15	5368.926752	39.6886	1.32456	12.6276	0.315026
1.815	1723.15	5307.613247	39.6281	1.33968	12.5732	0.316329
1.82	1723.15	5246.728414	39.5683	1.35502	12.5188	0.317608
1.825	1723.15	5186.288009	39.5091	1.37056	12.4644	0.318864
1.83	1723.15	5126.315634	39.4506	1.38631	12.41	0.320096
1.835	1723.15	5066.840098	39.3929	1.40227	12.3555	0.321302
1.84	1723.15	5007.892436	39.336	1.41843	12.301	0.322484
1.845	1723.15	4949.503072	39.2799	1.43478	12.2464	0.32364
1.85	1723.15	4891.699539	39.2247	1.45133	12.1919	0.324771
1.855	1723.15	4834.504968	39.1704	1.46807	12.1373	0.325876
1.86	1723.15	4777.937313	39.1171	1.485	12.0827	0.326954

1.865	1723.15	4722.009194	39.0646	1.50211	12.0282	0.328007
1.87	1723.15	4666.728166	39.013	1.51941	11.9737	0.329034
1.875	1723.15	4612.097222	38.9623	1.5369	11.9193	0.330034
1.88	1723.15	4558.115423	38.9125	1.55457	11.865	0.331009
1.885	1723.15	4504.778542	38.8635	1.57243	11.8108	0.331959
1.89	1723.15	4452.079671	38.8154	1.59048	11.7567	0.332883
1.895	1723.15	4400.009776	38.768	1.60872	11.7027	0.333782
1.9	1723.15	4348.558175	38.7215	1.62715	11.6488	0.334656
1.905	1723.15	4297.712941	38.6758	1.64579	11.5951	0.335506
1.91	1723.15	4247.461247	38.6308	1.66462	11.5416	0.336331
1.915	1723.15	4197.789643	38.5866	1.68367	11.4883	0.337133
1.92	1723.15	4148.684287	38.5431	1.70292	11.4351	0.337911
1.925	1723.15	4100.131131	38.5003	1.72239	11.3821	0.338666
1.93	1723.15	4052.116069	38.4581	1.74209	11.3293	0.339397
1.935	1723.15	4004.625056	38.4167	1.76201	11.2767	0.340106
1.94	1723.15	3957.644207	38.3758	1.78216	11.2243	0.340793
1.945	1723.15	3911.159864	38.3357	1.80255	11.1722	0.341457
1.95	1723.15	3865.158658	38.2961	1.82318	11.1202	0.3421
1.955	1723.15	3819.627555	38.2571	1.84407	11.0685	0.342721
1.96	1723.15	3774.553882	38.2187	1.86521	11.017	0.343321
1.965	1723.15	3729.925358	38.1808	1.88662	10.9658	0.343899
1.97	1723.15	3685.730107	38.1435	1.90829	10.9147	0.344458
1.975	1723.15	3641.95667	38.1067	1.93024	10.864	0.344995
1.98	1723.15	3598.594014	38.0705	1.95248	10.8135	0.345513
1.985	1723.15	3555.631529	38.0347	1.975	10.7632	0.346011
1.99	1723.15	3513.059033	37.9994	1.99783	10.7132	0.346489
1.995	1723.15	3470.866767	37.9647	2.02096	10.6634	0.346948
2	1723.15	3429.045391	37.9303	2.0444	10.614	0.347388
2.005	1723.15	3387.585977	37.8965	2.06816	10.5647	0.347808
2.01	1723.15	3346.480005	37.8631	2.09226	10.5158	0.34821
2.015	1723.15	3305.719352	37.8301	2.11669	10.4671	0.348594
2.02	1723.15	3265.296285	37.7975	2.14147	10.4187	0.34896
2.025	1723.15	3225.203452	37.7653	2.1666	10.3706	0.349307
2.03	1723.15	3185.433871	37.7336	2.19209	10.3228	0.349637
2.035	1723.15	3145.980926	37.7022	2.21796	10.2752	0.349949
2.04	1723.15	3106.838351	37.6712	2.24421	10.2279	0.350244
2.045	1723.15	3068.000226	37.6406	2.27085	10.181	0.350521
2.05	1723.15	3029.460962	37.6103	2.29789	10.1343	0.350782
2.055	1723.15	2991.215299	37.5804	2.32534	10.0879	0.351026
2.06	1723.15	2953.25829	37.5509	2.35321	10.0418	0.351253
2.065	1723.15	2915.585297	37.5217	2.3815	9.99604	0.351464
2.07	1723.15	2878.191977	37.4928	2.41024	9.95056	0.351658
2.075	1723.15	2841.074282	37.4642	2.43943	9.9054	0.351836
2.08	1723.15	2804.228439	37.4359	2.46909	9.86055	0.351999
2.085	1723.15	2767.650953	37.408	2.49921	9.81602	0.352145
2.09	1723.15	2731.33859	37.3803	2.52982	9.77181	0.352276

2.095	1723.15	2695.288375	37.353	2.56092	9.72792	0.352391
2.1	1723.15	2659.497583	37.3259	2.59253	9.68435	0.352491
2.105	1723.15	2623.963728	37.2991	2.62465	9.64112	0.352576
2.11	1723.15	2588.684562	37.2726	2.65731	9.59821	0.352645
2.115	1723.15	2553.658062	37.2463	2.6905	9.55565	0.3527
2.12	1723.15	2518.882426	37.2203	2.72426	9.51342	0.35274
2.125	1723.15	2484.356065	37.1946	2.75857	9.47154	0.352765
2.13	1723.15	2450.077597	37.1691	2.79347	9.43	0.352775
2.135	1723.15	2416.045841	37.1438	2.82896	9.38882	0.352771
2.14	1723.15	2382.259808	37.1188	2.86506	9.34799	0.352752
2.145	1723.15	2348.718697	37.094	2.90177	9.30751	0.352719
2.15	1723.15	2315.421888	37.0694	2.93912	9.2674	0.352672
2.155	1723.15	2282.368935	37.0451	2.97711	9.22765	0.35261
2.16	1723.15	2249.55956	37.0209	3.01576	9.18828	0.352534
2.165	1723.15	2216.99365	36.997	3.05509	9.14927	0.352445
2.17	1723.15	2184.671245	36.9733	3.0951	9.11065	0.352341
2.175	1723.15	2152.592537	36.9498	3.13582	9.0724	0.352224
2.18	1723.15	2120.757862	36.9265	3.17725	9.03454	0.352093
2.185	1723.15	2089.167694	36.9034	3.21941	8.99707	0.351948
2.19	1723.15	2057.822641	36.8804	3.26232	8.96	0.35179
2.195	1723.15	2026.723436	36.8577	3.30598	8.92332	0.351618
2.2	1723.15	1995.870932	36.8351	3.35042	8.88704	0.351432
2.205	1723.15	1965.266098	36.8127	3.39565	8.85117	0.351233
2.21	1723.15	1934.910013	36.7905	3.44169	8.8157	0.35102
2.215	1723.15	1904.803856	36.7685	3.48854	8.78065	0.350795
2.22	1723.15	1874.948905	36.7466	3.53623	8.74602	0.350555
2.225	1723.15	1845.346528	36.7249	3.58476	8.71181	0.350303
2.23	1723.15	1815.99818	36.7033	3.63416	8.67803	0.350037
2.235	1723.15	1786.905392	36.6819	3.68443	8.64468	0.349758
2.24	1723.15	1758.06977	36.6607	3.7356	8.61176	0.349465
2.245	1723.15	1729.492986	36.6396	3.78767	8.57928	0.34916
2.25	1723.15	1701.176772	36.6186	3.84066	8.54724	0.348841
2.255	1723.15	1673.122917	36.5978	3.89459	8.51564	0.348509
2.26	1723.15	1645.333255	36.5772	3.94946	8.4845	0.348164
2.265	1723.15	1617.809664	36.5567	4.00529	8.45381	0.347805
2.27	1723.15	1590.554057	36.5363	4.0621	8.42357	0.347434
2.275	1723.15	1563.568376	36.5161	4.11988	8.3938	0.34705
2.28	1723.15	1536.854586	36.496	4.17867	8.36449	0.346652
2.285	1723.15	1510.414666	36.4761	4.23846	8.33564	0.346242
2.29	1723.15	1484.250609	36.4562	4.29927	8.30726	0.345818
2.295	1723.15	1458.364405	36.4366	4.36111	8.27936	0.345382
2.3	1723.15	1432.758045	36.417	4.42399	8.25193	0.344932
2.305	1723.15	1407.433506	36.3976	4.48791	8.22498	0.344469
2.31	1723.15	1382.392749	36.3783	4.55288	8.19851	0.343994
2.315	1723.15	1357.637711	36.3592	4.61891	8.17252	0.343505
2.32	1723.15	1333.170295	36.3402	4.686	8.14701	0.343004

2.325	1723.15	1308.992367	36.3213	4.75417	8.12199	0.34249
2.33	1723.15	1285.105748	36.3026	4.8234	8.09746	0.341963
2.335	1723.15	1261.512206	36.284	4.89371	8.07341	0.341423
2.34	1723.15	1238.213449	36.2655	4.96509	8.04986	0.34087
2.345	1723.15	1215.211116	36.2472	5.03754	8.02679	0.340304
2.35	1723.15	1192.506775	36.229	5.11106	8.00421	0.339726
2.355	1723.15	1170.101912	36.211	5.18565	7.98212	0.339136
2.36	1723.15	1147.997923	36.1931	5.26129	7.96051	0.338532
2.365	1723.15	1126.196109	36.1753	5.33798	7.9394	0.337917
2.37	1723.15	1104.697671	36.1577	5.41572	7.91877	0.337289
2.375	1723.15	1083.503696	36.1402	5.49448	7.89862	0.336648
2.38	1723.15	1062.615159	36.1229	5.57426	7.87896	0.335996
2.385	1723.15	1042.032909	36.1058	5.65504	7.85977	0.335332
2.39	1723.15	1021.757665	36.0888	5.7368	7.84106	0.334656
2.395	1723.15	1001.790011	36.072	5.81951	7.82281	0.333968
2.4	1723.15	982.130387	36.0553	5.90317	7.80504	0.333268
2.405	1723.15	962.779086	36.0388	5.98773	7.78773	0.332558
2.41	1723.15	943.736242	36.0225	6.07318	7.77087	0.331836
2.415	1723.15	925.001832	36.0064	6.15948	7.75447	0.331104
2.42	1723.15	906.575667	35.9904	6.2466	7.73851	0.330361
2.425	1723.15	888.457384	35.9747	6.33451	7.72299	0.329607
2.43	1723.15	870.646446	35.9591	6.42316	7.7079	0.328844
2.435	1723.15	853.142135	35.9438	6.51251	7.69323	0.328071
2.44	1723.15	835.94355	35.9286	6.60253	7.67897	0.327289
2.445	1723.15	819.049601	35.9137	6.69316	7.66512	0.326498
2.45	1723.15	802.459007	35.899	6.78436	7.65166	0.325699
2.455	1723.15	786.170294	35.8845	6.87607	7.63859	0.324891
2.46	1723.15	770.181792	35.8702	6.96825	7.62589	0.324076
2.465	1723.15	754.491635	35.8562	7.06084	7.61355	0.323254
2.47	1723.15	739.097758	35.8425	7.15378	7.60157	0.322425
2.475	1723.15	723.9979	35.8289	7.24701	7.58993	0.32159
2.48	1723.15	709.189602	35.8157	7.34047	7.57861	0.32075
2.485	1723.15	694.670208	35.8027	7.43409	7.56761	0.319905
2.49	1723.15	680.436867	35.79	7.52782	7.55692	0.319056
2.495	1723.15	666.48654	35.7775	7.62159	7.54651	0.318203
2.5	1723.15	652.815997	35.7654	7.71533	7.53638	0.317347
2.505	1723.15	639.421824	35.7535	7.80897	7.52652	0.316488
2.51	1723.15	626.300428	35.742	7.90245	7.51692	0.315629
2.515	1723.15	613.448045	35.7308	7.9957	7.50755	0.314768
2.52	1723.15	600.86074	35.7199	8.08865	7.49841	0.313907
2.525	1723.15	588.53442	35.7093	8.18124	7.48948	0.313047
2.53	1723.15	576.464842	35.699	8.27339	7.48077	0.312188
2.535	1723.15	564.647615	35.6891	8.36504	7.47224	0.311331
2.54	1723.15	553.078217	35.6795	8.45614	7.4639	0.310476
2.545	1723.15	541.752	35.6703	8.5466	7.45573	0.309626
2.55	1723.15	530.664201	35.6615	8.63639	7.44773	0.308779

2.555	1723.15	521.801481	35.6484	8.69599	7.4525	0.308229
2.56	1723.15	511.821211	35.6402	8.7719	7.44587	0.307517
2.565	1723.15	502.076084	35.6326	8.84586	7.43914	0.306823
2.57	1723.15	492.556819	35.6256	8.91787	7.43232	0.306146
2.575	1723.15	483.254371	35.6191	8.98792	7.42543	0.305486
2.58	1723.15	474.159946	35.6133	9.05601	7.41847	0.304844
2.585	1723.15	465.265021	35.608	9.12216	7.41147	0.304218
2.59	1723.15	456.561356	35.6034	9.18636	7.40443	0.303611
2.595	1723.15	448.041004	35.5994	9.24865	7.39739	0.30302
2.6	1723.15	439.696319	35.596	9.30904	7.39035	0.302446
2.605	1723.15	431.519964	35.5933	9.36757	7.38335	0.301888
2.61	1723.15	423.504912	35.5912	9.42426	7.3764	0.301346
2.615	1723.15	415.644448	35.5898	9.47915	7.36953	0.30082
2.62	1723.15	407.932168	35.5891	9.53229	7.36276	0.300309
2.625	1723.15	400.361974	35.589	9.58371	7.35612	0.299812
2.63	1723.15	392.928072	35.5896	9.63345	7.34964	0.29933
2.635	1723.15	385.624965	35.5909	9.68157	7.34333	0.298861
2.64	1723.15	378.447446	35.5929	9.72811	7.33723	0.298404
2.645	1723.15	371.390588	35.5956	9.77312	7.33138	0.29796
2.65	1723.15	364.449742	35.5989	9.81664	7.32578	0.297527
2.655	1723.15	357.620519	35.603	9.85873	7.32048	0.297105
2.66	1723.15	350.898788	35.6078	9.89945	7.31551	0.296693
2.665	1723.15	344.280662	35.6133	9.93883	7.31089	0.29629
2.67	1723.15	337.76249	35.6195	9.97694	7.30666	0.295896
2.675	1723.15	331.340847	35.6264	10.0138	7.30285	0.29551
2.68	1723.15	325.012523	35.6341	10.0495	7.29949	0.295132
2.685	1723.15	318.774514	35.6425	10.0841	7.29662	0.294759
2.69	1723.15	312.624013	35.6516	10.1176	7.29426	0.294393
2.695	1723.15	306.558399	35.6615	10.1501	7.29245	0.294031
2.7	1723.15	300.575229	35.6722	10.1816	7.29123	0.293674
2.705	1723.15	294.672228	35.6836	10.2122	7.29063	0.29332
2.71	1723.15	288.847279	35.6959	10.2419	7.29069	0.292969
2.715	1723.15	283.098417	35.7089	10.2707	7.29144	0.292621
2.72	1723.15	277.423819	35.7227	10.2988	7.29293	0.292273
2.725	1723.15	271.821797	35.7373	10.3262	7.2952	0.291926
2.73	1723.15	266.290788	35.7528	10.3529	7.29828	0.291579
2.735	1723.15	260.829347	35.7691	10.3789	7.30221	0.291231
2.74	1723.15	255.436143	35.7862	10.4044	7.30705	0.290881
2.745	1723.15	250.109949	35.8043	10.4293	7.31284	0.290529
2.75	1723.15	244.849633	35.8232	10.4537	7.31961	0.290173
2.755	1723.15	239.654159	35.843	10.4776	7.32743	0.289813
2.76	1723.15	234.522574	35.8637	10.5012	7.33634	0.289448
2.765	1723.15	229.454004	35.8854	10.5243	7.34639	0.289078
2.77	1723.15	224.447652	35.9081	10.5472	7.35765	0.2887
2.775	1723.15	219.502787	35.9318	10.5699	7.37016	0.288315
2.78	1723.15	214.618746	35.9564	10.5923	7.38399	0.287921

2.785	1723.15	209.794922	35.9821	10.6145	7.3992	0.287517
2.79	1723.15	205.030766	36.0089	10.6367	7.41587	0.287102
2.795	1723.15	200.325778	36.0368	10.6588	7.43405	0.286676
2.8	1723.15	195.679509	36.0658	10.6809	7.45382	0.286236
2.805	1723.15	191.091552	36.0959	10.7031	7.47527	0.285782
2.81	1723.15	186.561541	36.1273	10.7253	7.49847	0.285312
2.815	1723.15	182.08915	36.1599	10.7478	7.52352	0.284825
2.82	1723.15	177.674087	36.1937	10.7705	7.55051	0.284319
2.825	1723.15	173.316095	36.2289	10.7935	7.57953	0.283793
2.83	1723.15	169.014948	36.2654	10.8169	7.6107	0.283245
2.835	1723.15	164.77045	36.3033	10.8407	7.64412	0.282672
2.84	1723.15	160.582436	36.3427	10.865	7.67991	0.282074
2.845	1723.15	156.450767	36.3835	10.8899	7.71821	0.281447
2.85	1723.15	152.375334	36.426	10.9155	7.75915	0.28079
2.855	1723.15	148.356053	36.47	10.9418	7.80287	0.280099
2.86	1723.15	144.392873	36.5158	10.9689	7.84953	0.279372
2.865	1723.15	140.48577	36.5633	10.997	7.89931	0.278606
2.87	1723.15	136.634752	36.6126	11.026	7.95237	0.277798
2.875	1723.15	132.839862	36.6639	11.0561	8.00891	0.276943
2.88	1723.15	129.101181	36.7172	11.0873	8.06913	0.276038
2.885	1723.15	125.418832	36.7726	11.1198	8.13326	0.275078
2.89	1723.15	121.792983	36.8302	11.1536	8.20153	0.274059
2.895	1723.15	118.223857	36.8901	11.1888	8.2742	0.272975
2.9	1723.15	114.711739	36.9524	11.2255	8.35153	0.27182
2.905	1723.15	111.256982	37.0173	11.2637	8.43382	0.270589
2.91	1723.15	107.860019	37.085	11.3036	8.52137	0.269274
2.915	1723.15	104.521376	37.1554	11.3451	8.61451	0.267868
2.92	1723.15	101.241684	37.229	11.3882	8.71359	0.266362
2.925	1723.15	98.021692	37.3057	11.433	8.81899	0.264748
2.93	1723.15	94.862287	37.3858	11.4795	8.93109	0.263016
2.935	1723.15	91.764509	37.4695	11.5275	9.05031	0.261155
2.94	1723.15	88.729567	37.557	11.577	9.17706	0.259155
2.945	1723.15	85.758859	37.6485	11.6278	9.31179	0.257002
2.95	1723.15	82.853988	37.7443	11.6797	9.45494	0.254686
2.955	1723.15	80.016772	37.8447	11.7324	9.60695	0.252191
2.96	1723.15	77.249253	37.9498	11.7854	9.76827	0.249505
2.965	1723.15	74.5537	38.06	11.8384	9.93931	0.246615
2.97	1723.15	71.932596	38.1754	11.8907	10.1204	0.243506
2.975	1723.15	69.388622	38.2964	11.9416	10.312	0.240167
2.98	1723.15	66.924611	38.4232	11.9903	10.5142	0.236587
2.985	1723.15	64.543503	38.5559	12.0358	10.7273	0.232756
2.99	1723.15	62.248262	38.6948	12.0771	10.9513	0.228668
2.995	1723.15	60.041797	38.8399	12.1132	11.1861	0.224322
3	1723.15	57.926849	38.9913	12.1427	11.4314	0.219718
3.005	1723.15	55.905881	39.1489	12.1645	11.6868	0.214865
3.01	1723.15	53.980969	39.3126	12.1774	11.9517	0.209775

3.015	1723.15	52.15369	39.4821	12.1803	12.2252	0.204467
3.02	1723.15	50.425036	39.6573	12.1722	12.5063	0.198967
3.025	1723.15	48.795349	39.8375	12.1524	12.7938	0.193306
3.03	1723.15	47.264284	40.0222	12.1203	13.0864	0.187519
3.035	1723.15	45.830807	40.2107	12.0756	13.3825	0.181646
3.04	1723.15	45.830807	40.2107	12.0756	13.3825	0.181646
3.045	1723.15	45.830807	40.2107	12.0756	13.3825	0.181646
3.05	1723.15	44.367484	40.3611	12.0506	13.687	0.175409
3.055	1723.15	43.121987	40.5536	11.9832	13.989	0.169383
3.06	1723.15	41.972154	40.747	11.9027	14.2881	0.163472
3.065	1723.15	40.91554	40.9383	11.813	14.5822	0.157707
3.07	1723.15	39.941425	41.1289	11.7136	14.8714	0.152066
3.075	1723.15	39.04604	41.3178	11.6058	15.1545	0.146588
3.08	1723.15	38.225324	41.504	11.4909	15.4298	0.141303
3.085	1723.15	37.47505	41.6863	11.3706	15.6963	0.136237
3.09	1723.15	36.790915	41.8639	11.2464	15.9529	0.13141
3.095	1723.15	36.168608	42.0359	11.1197	16.1988	0.126835
3.1	1723.15	35.603869	42.2015	10.9921	16.4332	0.122523
3.105	1723.15	35.092537	42.3599	10.8649	16.6558	0.118477
3.11	1723.15	34.630589	42.5108	10.7393	16.8663	0.114698
3.115	1723.15	34.214166	42.6535	10.6164	17.0646	0.111181
3.12	1723.15	33.839596	42.7879	10.4971	17.2508	0.107921
3.125	1723.15	33.50341	42.9136	10.3822	17.425	0.104908
3.13	1723.15	33.202347	43.0306	10.2723	17.5876	0.102132
3.135	1723.15	32.933363	43.1388	10.1678	17.739	0.0995796
3.14	1723.15	32.693625	43.2384	10.0691	17.8795	0.0972389
3.145	1723.15	32.48051	43.3294	9.97648	18.0097	0.0950962
3.15	1723.15	32.291596	43.4121	9.89	18.1302	0.0931382
3.155	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.16	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.165	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.17	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.175	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.18	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.185	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.19	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.195	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.2	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.205	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.21	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.215	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.22	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.225	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.23	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.235	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.24	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399

3.245	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.25	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.255	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.26	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.265	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.27	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.275	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.28	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.285	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.29	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.295	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.3	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.305	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.31	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.315	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.32	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.325	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.33	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.335	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.34	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.345	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.35	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.355	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.36	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.365	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.37	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.375	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.38	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.385	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.39	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.395	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.4	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.405	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.41	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.415	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.42	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.425	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.43	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.435	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.44	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.445	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.45	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.455	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.46	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.465	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.47	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399

3.475	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.48	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.485	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.49	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.495	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.5	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.505	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.51	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.515	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.52	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.525	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.53	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.535	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.54	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.545	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.55	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.555	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.56	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.565	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.57	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.575	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.58	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.585	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.59	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.595	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.6	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.605	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.61	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.615	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.62	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.625	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.63	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.635	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.64	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.645	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.65	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.655	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.66	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.665	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.67	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.675	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.68	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.685	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.69	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.695	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.7	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399

3.705	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.71	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.715	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.72	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.725	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.73	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.735	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.74	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.745	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.75	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.755	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.76	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.765	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.77	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.775	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.78	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.785	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.79	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.795	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.8	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.805	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.81	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.815	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.82	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.825	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.83	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.835	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.84	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.845	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.85	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.855	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.86	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.865	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.87	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.875	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.88	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.885	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.89	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.895	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.9	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.905	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.91	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.915	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.92	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.925	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.93	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399

3.935	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.94	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.945	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.95	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.955	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.96	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.965	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.97	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.975	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.98	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.985	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.99	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
3.995	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399
4	1723.15	32.291019	43.4129	9.89017	18.1306	0.0931399

weight percent concentration of oxides

Cr2O3	FeO	MnO	MgO	NiO	CaO	Na2O
0	31.4524	0	3.96761	0	9.12151	0
0.30474	21.0389	0.0749361	18.3226	0	6.86512	0.0459608
0.406513	17.5726	0.0999623	23.1168	0	6.11168	0.0613102
0.489801	16.2209	0.0966454	23.9309	0	6.10903	0.0738716
0.560145	15.4693	0.0881991	23.835	0	6.25703	0.0844809
0.612898	14.9215	0.0820554	23.7518	0	6.36746	0.092437
0.65395	14.5064	0.0774146	23.6779	0	6.45332	0.0986286
0.686843	14.1822	0.0737961	23.6112	0	6.52232	0.103589
0.713826	13.9226	0.0708978	23.5501	0	6.57929	0.107659
0.736395	13.7107	0.0685222	23.4933	0	6.62738	0.111063
0.755584	13.5348	0.066536	23.4401	0	6.66876	0.113957
0.756499	13.3883	0.0647951	23.384	0	6.70901	0.116525
0.741531	13.2649	0.0632413	23.3248	0	6.74888	0.118845
0.728081	13.1583	0.0618849	23.2686	0	6.78478	0.120899
0.715873	13.0654	0.0606865	23.2149	0	6.81744	0.122733
0.704694	12.9837	0.0596165	23.1635	0	6.8474	0.124384
0.694377	12.9114	0.0586522	23.1139	0	6.87511	0.125882
0.684791	12.8469	0.0577757	23.066	0	6.90091	0.127249
0.67583	12.7892	0.056973	23.0195	0	6.92508	0.128504
0.667407	12.7372	0.0562331	22.9743	0	6.94785	0.129663
0.659453	12.6901	0.0555469	22.9302	0	6.96941	0.130737
0.651908	12.6473	0.0549071	22.8872	0	6.98991	0.131738
0.644725	12.6082	0.0543076	22.8451	0	7.00948	0.132675
0.637861	12.5724	0.0537433	22.8038	0	7.02823	0.133555
0.631283	12.5395	0.0532102	22.7632	0	7.04625	0.134383
0.62496	12.5091	0.0527047	22.7234	0	7.06362	0.135167
0.618868	12.481	0.0522237	22.6841	0	7.08042	0.135909
0.612984	12.4549	0.0517647	22.6455	0	7.09669	0.136616
0.607289	12.4307	0.0513255	22.6074	0	7.11249	0.137289
0.601767	12.408	0.0509043	22.5698	0	7.12787	0.137932
0.596403	12.3868	0.0504992	22.5326	0	7.14286	0.138548
0.591185	12.367	0.050109	22.4959	0	7.1575	0.13914
0.586101	12.3484	0.0497323	22.4596	0	7.17181	0.139708
0.581141	12.3308	0.0493681	22.4236	0	7.18582	0.140256
0.576296	12.3143	0.0490153	22.388	0	7.19956	0.140784
0.571559	12.2986	0.0486731	22.3528	0	7.21305	0.141295
0.566922	12.2838	0.0483407	22.3178	0	7.22631	0.14179
0.562379	12.2698	0.0480174	22.2832	0	7.23935	0.142269
0.557924	12.2565	0.0477026	22.2488	0	7.25219	0.142735
0.553552	12.2438	0.0473957	22.2147	0	7.26484	0.143187
0.549258	12.2317	0.0470962	22.1809	0	7.27731	0.143628
0.545038	12.2201	0.0468037	22.1473	0	7.28962	0.144057
0.540888	12.2091	0.0465178	22.114	0	7.30178	0.144475
0.536805	12.1986	0.046238	22.0808	0	7.31379	0.144883

0.532784	12.1885	0.0459641	22.0479	0	7.32567	0.145282
0.528825	12.1788	0.0456957	22.0153	0	7.33741	0.145673
0.524922	12.1694	0.0454326	21.9828	0	7.34904	0.146055
0.521075	12.1605	0.0451744	21.9505	0	7.36055	0.146429
0.51728	12.1518	0.0449209	21.9184	0	7.37196	0.146796
0.513536	12.1435	0.044672	21.8864	0	7.38326	0.147156
0.50984	12.1354	0.0444273	21.8547	0	7.39446	0.14751
0.506191	12.1277	0.0441868	21.8231	0	7.40557	0.147857
0.502587	12.1201	0.0439502	21.7917	0	7.41659	0.148199
0.499026	12.1129	0.0437174	21.7605	0	7.42752	0.148535
0.495507	12.1058	0.0434881	21.7294	0	7.43837	0.148865
0.492028	12.0989	0.0432624	21.6985	0	7.44915	0.149191
0.488589	12.0923	0.04304	21.6677	0	7.45985	0.149511
0.485187	12.0858	0.0428208	21.6371	0	7.47048	0.149828
0.481822	12.0795	0.0426047	21.6066	0	7.48104	0.150139
0.478493	12.0733	0.0423916	21.5762	0	7.49153	0.150447
0.475199	12.0673	0.0421814	21.546	0	7.50196	0.15075
0.471938	12.0615	0.041974	21.516	0	7.51233	0.15105
0.46871	12.0558	0.0417694	21.486	0	7.52264	0.151346
0.465514	12.0502	0.0415673	21.4562	0	7.53289	0.151639
0.462349	12.0447	0.0413678	21.4265	0	7.54309	0.151928
0.459214	12.0394	0.0411707	21.397	0	7.55323	0.152214
0.45611	12.0341	0.040976	21.3675	0	7.56332	0.152497
0.453034	12.029	0.0407837	21.3382	0	7.57336	0.152777
0.449986	12.0239	0.0405936	21.309	0	7.58335	0.153053
0.446967	12.019	0.0404057	21.28	0	7.5933	0.153328
0.443974	12.0141	0.04022	21.251	0	7.60319	0.153599
0.441008	12.0093	0.0400364	21.2222	0	7.61305	0.153868
0.438068	12.0046	0.0398548	21.1934	0	7.62286	0.154134
0.435154	12	0.0396751	21.1648	0	7.63262	0.154398
0.432264	11.9954	0.0394975	21.1363	0	7.64235	0.15466
0.4294	11.9909	0.0393217	21.1079	0	7.65203	0.154919
0.426559	11.9864	0.0391477	21.0796	0	7.66168	0.155176
0.423742	11.982	0.0389756	21.0514	0	7.67129	0.155431
0.420948	11.9777	0.0388052	21.0233	0	7.68085	0.155684
0.418177	11.9734	0.0386366	20.9954	0	7.69039	0.155935
0.415429	11.9692	0.0384697	20.9675	0	7.69988	0.156184
0.412703	11.965	0.0383044	20.9397	0	7.70934	0.156432
0.409998	11.9609	0.0381408	20.912	0	7.71877	0.156677
0.407315	11.9568	0.0379787	20.8844	0	7.72816	0.156921
0.404654	11.9527	0.0378183	20.857	0	7.73752	0.157162
0.402013	11.9487	0.0376593	20.8296	0	7.74684	0.157403
0.399392	11.9447	0.0375019	20.8023	0	7.75614	0.157641
0.396792	11.9407	0.0373459	20.7751	0	7.7654	0.157878
0.394212	11.9368	0.0371914	20.748	0	7.77463	0.158114
0.391651	11.9329	0.0370383	20.721	0	7.78383	0.158347

0.38911	11.929	0.0368866	20.6941	0	7.793	0.15858
0.386587	11.9252	0.0367363	20.6673	0	7.80214	0.158811
0.384084	11.9214	0.0365873	20.6405	0	7.81125	0.159041
0.3816	11.9176	0.0364397	20.6139	0	7.82034	0.159269
0.379133	11.9138	0.0362934	20.5873	0	7.82939	0.159496
0.376685	11.91	0.0361484	20.5609	0	7.83842	0.159721
0.374255	11.9063	0.0360046	20.5345	0	7.84742	0.159946
0.371843	11.9026	0.0358621	20.5082	0	7.85639	0.160169
0.369448	11.8989	0.0357208	20.482	0	7.86534	0.16039
0.36707	11.8952	0.0355807	20.4559	0	7.87426	0.160611
0.36471	11.8916	0.0354419	20.4299	0	7.88315	0.160831
0.362366	11.8879	0.0353042	20.404	0	7.89202	0.161049
0.36004	11.8843	0.0351676	20.3781	0	7.90086	0.161266
0.357729	11.8807	0.0350322	20.3523	0	7.90968	0.161482
0.355436	11.877	0.0348979	20.3267	0	7.91847	0.161697
0.353158	11.8734	0.0347647	20.301	0	7.92724	0.161911
0.350896	11.8698	0.0346327	20.2755	0	7.93599	0.162124
0.348651	11.8663	0.0345017	20.2501	0	7.94471	0.162336
0.346421	11.8627	0.0343717	20.2247	0	7.9534	0.162547
0.344206	11.8591	0.0342428	20.1995	0	7.96208	0.162757
0.342007	11.8556	0.034115	20.1743	0	7.97073	0.162965
0.339823	11.852	0.0339882	20.1491	0	7.97935	0.163173
0.337654	11.8485	0.0338624	20.1241	0	7.98796	0.16338
0.3355	11.8449	0.0337375	20.0991	0	7.99654	0.163586
0.333361	11.8414	0.0336137	20.0743	0	8.0051	0.163792
0.331237	11.8379	0.0334909	20.0495	0	8.01364	0.163996
0.329127	11.8344	0.033369	20.0247	0	8.02215	0.164199
0.327031	11.8308	0.033248	20.0001	0	8.03064	0.164402
0.32495	11.8273	0.033128	19.9755	0	8.03912	0.164604
0.322882	11.8238	0.0330089	19.951	0	8.04757	0.164804
0.320829	11.8203	0.0328907	19.9266	0	8.056	0.165004
0.318789	11.8168	0.0327735	19.9023	0	8.0644	0.165204
0.316764	11.8133	0.0326571	19.878	0	8.07279	0.165402
0.314751	11.8098	0.0325416	19.8538	0	8.08116	0.1656
0.312753	11.8063	0.032427	19.8297	0	8.0895	0.165797
0.310767	11.8027	0.0323132	19.8057	0	8.09783	0.165993
0.308795	11.7992	0.0322003	19.7817	0	8.10614	0.166188
0.306836	11.7957	0.0320883	19.7578	0	8.11442	0.166383
0.30489	11.7922	0.031977	19.734	0	8.12269	0.166576
0.302957	11.7887	0.0318667	19.7102	0	8.13093	0.166769
0.301037	11.7852	0.0317571	19.6866	0	8.13916	0.166962
0.299129	11.7817	0.0316483	19.663	0	8.14736	0.167154
0.297234	11.7782	0.0315403	19.6394	0	8.15555	0.167344
0.295352	11.7747	0.0314332	19.616	0	8.16372	0.167535
0.293482	11.7712	0.0313268	19.5926	0	8.17187	0.167724
0.291624	11.7677	0.0312211	19.5693	0	8.17999	0.167913

0.289778	11.7642	0.0311163	19.546	0	8.1881	0.168101
0.287945	11.7606	0.0310122	19.5228	0	8.1962	0.168289
0.286123	11.7571	0.0309088	19.4997	0	8.20427	0.168476
0.284313	11.7536	0.0308062	19.4767	0	8.21232	0.168662
0.282516	11.7501	0.0307044	19.4537	0	8.22036	0.168848
0.280729	11.7466	0.0306032	19.4308	0	8.22837	0.169033
0.278955	11.743	0.0305028	19.408	0	8.23637	0.169217
0.277192	11.7395	0.0304031	19.3852	0	8.24435	0.169401
0.274865	11.7685	0.0312498	19.3607	0	8.26529	0.170347
0.272426	11.8024	0.0322191	19.3361	0	8.28814	0.171411
0.269961	11.8362	0.0331591	19.3118	0	8.31094	0.172478
0.267468	11.87	0.0340707	19.2877	0	8.33369	0.173548
0.264948	11.9038	0.0349546	19.2639	0	8.35639	0.174621
0.262401	11.9376	0.0358117	19.2404	0	8.37903	0.175697
0.259826	11.9713	0.0366427	19.2171	0	8.40163	0.176777
0.257225	12.005	0.0374483	19.1941	0	8.42417	0.17786
0.254597	12.0387	0.0382293	19.1713	0	8.44667	0.178946
0.251942	12.0724	0.0389863	19.1488	0	8.46913	0.180036
0.249259	12.1061	0.0397201	19.1265	0	8.49154	0.181129
0.246551	12.1397	0.0404312	19.1044	0	8.5139	0.182226
0.243816	12.1734	0.0411204	19.0826	0	8.53623	0.183327
0.241055	12.2071	0.0417882	19.0609	0	8.55851	0.184432
0.238268	12.2408	0.0424352	19.0395	0	8.58076	0.185541
0.235455	12.2745	0.043062	19.0183	0	8.60296	0.186654
0.232617	12.3082	0.0436692	18.9974	0	8.62514	0.187772
0.229755	12.3419	0.0442573	18.9766	0	8.64727	0.188894
0.226868	12.3757	0.0448268	18.956	0	8.66937	0.19002
0.223957	12.4095	0.0453783	18.9356	0	8.69144	0.191152
0.221023	12.4433	0.0459123	18.9154	0	8.71348	0.192288
0.218066	12.4772	0.0464292	18.8954	0	8.73548	0.193428
0.215087	12.5111	0.0469296	18.8756	0	8.75746	0.194574
0.212086	12.545	0.0474138	18.856	0	8.77942	0.195726
0.209065	12.5791	0.0478823	18.8365	0	8.80134	0.196882
0.206024	12.6131	0.0483356	18.8172	0	8.82325	0.198044
0.202963	12.6473	0.0487741	18.7981	0	8.84513	0.199212
0.199883	12.6814	0.0491981	18.7791	0	8.86699	0.200386
0.196787	12.7157	0.049608	18.7603	0	8.88882	0.201565
0.193673	12.7501	0.0500043	18.7417	0	8.91065	0.202751
0.190544	12.7845	0.0503873	18.7232	0	8.93245	0.203943
0.187401	12.819	0.0507574	18.7048	0	8.95424	0.205142
0.184244	12.8536	0.0511149	18.6866	0	8.97601	0.206347
0.181075	12.8883	0.0514601	18.6685	0	8.99777	0.207559
0.177894	12.9231	0.0517934	18.6505	0	9.01952	0.208778
0.174704	12.958	0.052115	18.6327	0	9.04126	0.210005
0.171505	12.9931	0.0524254	18.615	0	9.06299	0.211238
0.168299	13.0282	0.0527247	18.5974	0	9.08472	0.21248

0.165087	13.0635	0.0530132	18.5799	0	9.10643	0.213729
0.16187	13.0989	0.0532913	18.5625	0	9.12815	0.214986
0.158651	13.1345	0.0535592	18.5452	0	9.14986	0.216252
0.155429	13.1702	0.0538172	18.5281	0	9.17156	0.217526
0.152208	13.206	0.0540654	18.511	0	9.19327	0.218809
0.148989	13.242	0.0543042	18.494	0	9.21497	0.220101
0.145772	13.2782	0.0545337	18.477	0	9.23668	0.221402
0.142561	13.3145	0.0547543	18.4602	0	9.25839	0.222712
0.139356	13.3511	0.054966	18.4434	0	9.2801	0.224032
0.136159	13.3878	0.0551692	18.4267	0	9.30181	0.225362
0.132972	13.4246	0.055364	18.4101	0	9.32353	0.226702
0.129797	13.4617	0.0555506	18.3935	0	9.34526	0.228053
0.126636	13.499	0.0557291	18.377	0	9.36699	0.229415
0.12349	13.5365	0.0558999	18.3605	0	9.38873	0.230787
0.120361	13.5743	0.056063	18.3441	0	9.41048	0.232171
0.117251	13.6122	0.0562186	18.3277	0	9.43224	0.233567
0.114162	13.6504	0.0563669	18.3113	0	9.454	0.234975
0.111095	13.6889	0.0565081	18.295	0	9.47578	0.236395
0.108053	13.7276	0.0566422	18.2786	0	9.49757	0.237828
0.105038	13.7665	0.0567695	18.2623	0	9.51937	0.239273
0.102051	13.8058	0.05689	18.246	0	9.54118	0.240733
0.0990937	13.8453	0.057004	18.2298	0	9.563	0.242206
0.0961686	13.8851	0.0571115	18.2135	0	9.58483	0.243693
0.0932771	13.9252	0.0572126	18.1972	0	9.60668	0.245195
0.0904211	13.9656	0.0573076	18.1809	0	9.62853	0.246711
0.0876025	14.0064	0.0573965	18.1646	0	9.6504	0.248244
0.0848228	14.0475	0.0574794	18.1482	0	9.67228	0.249792
0.0820839	14.0889	0.0575565	18.1319	0	9.69417	0.251356
0.0793874	14.1307	0.0576279	18.1155	0	9.71607	0.252938
0.0767348	14.1728	0.0576936	18.099	0	9.73798	0.254536
0.0741279	14.2154	0.0577538	18.0825	0	9.7599	0.256153
0.0715681	14.2583	0.0578086	18.066	0	9.78182	0.257788
0.0690569	14.3017	0.0578581	18.0494	0	9.80376	0.259442
0.0665957	14.3455	0.0579024	18.0327	0	9.82569	0.261116
0.0641859	14.3897	0.0579415	18.016	0	9.84763	0.262809
0.0618287	14.4344	0.0579757	17.9992	0	9.86958	0.264524
0.0595254	14.4795	0.0580049	17.9823	0	9.89152	0.26626
0.0572771	14.5252	0.0580293	17.9653	0	9.91346	0.268018
0.0550849	14.5713	0.058049	17.9483	0	9.93539	0.269799
0.0529497	14.618	0.0580639	17.9311	0	9.95731	0.271604
0.0508724	14.6652	0.0580743	17.9138	0	9.97922	0.273433
0.0488539	14.713	0.0580803	17.8964	0	10.0011	0.275287
0.0468948	14.7614	0.0580818	17.8789	0	10.023	0.277168
0.0449957	14.8104	0.0580789	17.8613	0	10.0448	0.279075
0.0431572	14.86	0.0580718	17.8435	0	10.0666	0.28101
0.0413795	14.9102	0.0580604	17.8256	0	10.0884	0.282973

0.0396631	14.9612	0.0580449	17.8075	0	10.1101	0.284967
0.038008	15.0128	0.0580252	17.7893	0	10.1317	0.28699
0.0364144	15.0651	0.0580015	17.7709	0	10.1533	0.289046
0.0348821	15.1182	0.0579737	17.7524	0	10.1748	0.291134
0.033411	15.1721	0.0579418	17.7338	0	10.1962	0.293255
0.0320009	15.2268	0.057906	17.7149	0	10.2175	0.295412
0.0306512	15.2823	0.0578661	17.6959	0	10.2387	0.297604
0.0293615	15.3387	0.0578221	17.6768	0	10.2598	0.299833
0.0281312	15.3959	0.057774	17.6575	0	10.2807	0.3021
0.0269594	15.4541	0.0577217	17.638	0	10.3014	0.304406
0.0258454	15.5132	0.0576652	17.6183	0	10.3219	0.306752
0.024788	15.5733	0.0576044	17.5985	0	10.3421	0.30914
0.0237863	15.6344	0.0575391	17.5785	0	10.3621	0.31157
0.022839	15.6965	0.0574691	17.5584	0	10.3818	0.314044
0.0219449	15.7596	0.0573944	17.5382	0	10.4012	0.316563
0.0211026	15.8239	0.0573148	17.5178	0	10.4203	0.319127
0.0203106	15.8892	0.0572299	17.4973	0	10.4389	0.321738
0.0195674	15.9557	0.0571396	17.4767	0	10.4571	0.324397
0.0188714	16.0234	0.0570436	17.4561	0	10.4748	0.327104
0.0182209	16.0922	0.0569416	17.4353	0	10.4919	0.329861
0.0176143	16.1623	0.0568334	17.4145	0	10.5084	0.332668
0.0170499	16.2335	0.0567185	17.3937	0	10.5243	0.335527
0.0176457	16.3295	0.0563932	17.36	0	10.5545	0.339647
0.0186995	16.435	0.0559659	17.3221	0	10.589	0.344285
0.0197597	16.5407	0.0555115	17.2853	0	10.6214	0.348966
0.0208255	16.6465	0.0550338	17.2496	0	10.6518	0.35369
0.0218965	16.7527	0.0545361	17.2149	0	10.6801	0.358461
0.0229724	16.8592	0.0540217	17.1812	0	10.7062	0.36328
0.0240531	16.9661	0.0534933	17.1486	0	10.73	0.368151
0.025139	17.0736	0.0529535	17.1169	0	10.7515	0.373076
0.0262305	17.1817	0.0524046	17.0863	0	10.7706	0.378058
0.0273288	17.2906	0.0518486	17.0567	0	10.7872	0.383099
0.0284349	17.4002	0.0512873	17.0281	0	10.8013	0.388203
0.0295506	17.5106	0.0507224	17.0005	0	10.8127	0.393372
0.0306778	17.6219	0.0501554	16.9739	0	10.8215	0.398607
0.0318188	17.7341	0.0495877	16.9482	0	10.8276	0.403912
0.0329761	17.8472	0.0490208	16.9234	0	10.831	0.409288
0.0341523	17.9611	0.048456	16.8995	0	10.8318	0.414736
0.03535	18.0757	0.047895	16.8765	0	10.8301	0.420256
0.0365716	18.1911	0.0473393	16.8542	0	10.8259	0.425848
0.0378192	18.307	0.0467906	16.8327	0	10.8193	0.431512
0.0390947	18.4233	0.0462508	16.8119	0	10.8106	0.437248
0.0403994	18.5399	0.0457216	16.7917	0	10.7998	0.443053
0.0417343	18.6567	0.0452049	16.7721	0	10.7872	0.448928
0.0431001	18.7734	0.0447023	16.753	0	10.773	0.454873
0.044497	18.8899	0.0442154	16.7344	0	10.7572	0.460885

0.045925	19.0062	0.0437456	16.7162	0	10.74	0.466965
0.0473841	19.1221	0.0432942	16.6984	0	10.7215	0.473114
0.0488738	19.2375	0.0428621	16.681	0	10.702	0.479331
0.0503937	19.3524	0.0424502	16.6639	0	10.6814	0.485616
0.0519434	19.4667	0.0420592	16.6471	0	10.6598	0.49197
0.0535221	19.5802	0.0416895	16.6306	0	10.6375	0.498395
0.0551293	19.693	0.0413413	16.6144	0	10.6143	0.504891
0.0567643	19.8049	0.0410149	16.5985	0	10.5905	0.511459
0.0584263	19.9161	0.0407103	16.5828	0	10.566	0.5181
0.0601147	20.0263	0.0404273	16.5674	0	10.5409	0.524816
0.0618287	20.1356	0.0401657	16.5522	0	10.5153	0.531609
0.0635676	20.2439	0.0399253	16.5372	0	10.4892	0.53848
0.0653307	20.3512	0.0397057	16.5224	0	10.4626	0.545431
0.0671172	20.4576	0.0395064	16.5079	0	10.4356	0.552463
0.0689264	20.5629	0.039327	16.4936	0	10.4082	0.559579
0.0707575	20.6671	0.039167	16.4796	0	10.3804	0.56678
0.0726098	20.7703	0.0390258	16.4657	0	10.3523	0.57407
0.0744827	20.8724	0.0389028	16.4521	0	10.3238	0.581448
0.0763753	20.9734	0.0387976	16.4387	0	10.295	0.588919
0.078287	21.0732	0.0387094	16.4255	0	10.2659	0.596484
0.0802171	21.1719	0.0386378	16.4125	0	10.2366	0.604146
0.0821649	21.2695	0.0385821	16.3998	0	10.2069	0.611907
0.0841296	21.3659	0.0385417	16.3873	0	10.1771	0.619769
0.0861105	21.4612	0.0385162	16.375	0	10.147	0.627735
0.0881071	21.5552	0.0385049	16.3629	0	10.1166	0.635808
0.0901185	21.6481	0.0385073	16.3511	0	10.0861	0.64399
0.0921442	21.7397	0.038523	16.3395	0	10.0553	0.652284
0.0941834	21.8301	0.0385514	16.3282	0	10.0243	0.660693
0.0962355	21.9193	0.038592	16.3171	0	9.99318	0.66922
0.0982998	22.0072	0.0386444	16.3062	0	9.96184	0.677867
0.100376	22.0939	0.0387083	16.2955	0	9.93032	0.686638
0.102463	22.1793	0.0387831	16.2852	0	9.89864	0.695536
0.10456	22.2634	0.0388686	16.275	0	9.86678	0.704564
0.106667	22.3462	0.0389643	16.2651	0	9.83477	0.713725
0.108782	22.4277	0.0390699	16.2555	0	9.80259	0.723022
0.110907	22.5079	0.0391852	16.2461	0	9.77027	0.732459
0.113039	22.5868	0.0393099	16.237	0	9.73781	0.742039
0.115178	22.6643	0.0394436	16.2281	0	9.7052	0.751766
0.117324	22.7404	0.0395862	16.2195	0	9.67245	0.761644
0.119475	22.8152	0.0397375	16.2111	0	9.63957	0.771676
0.121632	22.8886	0.0398972	16.203	0	9.60656	0.781865
0.123794	22.9605	0.0400652	16.1952	0	9.57342	0.792217
0.125961	23.031	0.0402413	16.1877	0	9.54015	0.802734
0.12813	23.1001	0.0404254	16.1804	0	9.50677	0.813421
0.130303	23.1678	0.0406174	16.1734	0	9.47326	0.824282
0.132479	23.234	0.0408172	16.1667	0	9.43964	0.83532

0.134656	23.2986	0.0410248	16.1602	0	9.40591	0.846542
0.136835	23.3618	0.0412399	16.154	0	9.37207	0.85795
0.139014	23.4234	0.0414626	16.1481	0	9.33812	0.869549
0.141195	23.4835	0.0416929	16.1425	0	9.30406	0.881344
0.143374	23.5421	0.0419308	16.1372	0	9.2699	0.893339
0.145554	23.599	0.0421762	16.1322	0	9.23564	0.90554
0.147732	23.6544	0.0424291	16.1274	0	9.20128	0.917951
0.149908	23.7081	0.0426896	16.123	0	9.16683	0.930577
0.152082	23.7602	0.0429577	16.1188	0	9.13228	0.943423
0.154254	23.8106	0.0432335	16.115	0	9.09764	0.956494
0.156422	23.8593	0.0435169	16.1114	0	9.0629	0.969795
0.158587	23.9064	0.0438082	16.1081	0	9.02808	0.983333
0.160747	23.9516	0.0441073	16.1052	0	8.99317	0.997111
0.162904	23.9952	0.0444143	16.1025	0	8.95818	1.01114
0.165055	24.0369	0.0447295	16.1001	0	8.9231	1.02541
0.167201	24.0769	0.0450528	16.0981	0	8.88794	1.03995
0.169341	24.115	0.0453843	16.0963	0	8.8527	1.05475
0.171475	24.1513	0.0457243	16.0949	0	8.81738	1.06981
0.173602	24.1857	0.0460729	16.0937	0	8.78199	1.08516
0.175723	24.2182	0.0464301	16.0929	0	8.74653	1.10078
0.177836	24.2488	0.0467963	16.0924	0	8.71099	1.1167
0.179942	24.2775	0.0471714	16.0921	0	8.67538	1.1329
0.182039	24.3041	0.0475558	16.0922	0	8.6397	1.14941
0.184129	24.3288	0.0479495	16.0926	0	8.60395	1.16622
0.186209	24.3514	0.0483528	16.0933	0	8.56814	1.18335
0.188281	24.372	0.0487659	16.0944	0	8.53227	1.20079
0.190344	24.3905	0.049189	16.0957	0	8.49633	1.21856
0.192398	24.4069	0.0496222	16.0973	0	8.46033	1.23666
0.194442	24.4212	0.0500659	16.0993	0	8.42427	1.2551
0.196476	24.4333	0.0505202	16.1015	0	8.38816	1.27388
0.1985	24.4432	0.0509854	16.1041	0	8.35199	1.29301
0.200514	24.451	0.0514616	16.1069	0	8.31577	1.31251
0.202517	24.4565	0.0519492	16.1101	0	8.2795	1.33236
0.20451	24.4597	0.0524484	16.1135	0	8.24317	1.35259
0.206493	24.4607	0.0529595	16.1173	0	8.2068	1.37319
0.208465	24.4594	0.0534826	16.1213	0	8.17039	1.39418
0.210426	24.4557	0.0540182	16.1256	0	8.13392	1.41555
0.212376	24.4498	0.0545663	16.1303	0	8.09742	1.43733
0.214315	24.4414	0.0551274	16.1352	0	8.06088	1.4595
0.216244	24.4307	0.0557017	16.1403	0	8.02429	1.48208
0.218162	24.4175	0.0562895	16.1458	0	7.98768	1.50507
0.220069	24.402	0.056891	16.1515	0	7.95102	1.52849
0.221965	24.384	0.0575066	16.1575	0	7.91434	1.55232
0.223851	24.3636	0.0581365	16.1637	0	7.87763	1.57659
0.225726	24.3407	0.0587811	16.1702	0	7.84089	1.60129
0.227591	24.3153	0.0594405	16.1769	0	7.80413	1.62643

0.229445	24.2874	0.0601151	16.1838	0	7.76734	1.65201
0.231289	24.2571	0.0608052	16.191	0	7.73054	1.67803
0.233123	24.2243	0.0615111	16.1984	0	7.69372	1.70451
0.234948	24.1889	0.062233	16.206	0	7.65689	1.73144
0.236763	24.1511	0.0629713	16.2137	0	7.62005	1.75883
0.238568	24.1107	0.0637261	16.2217	0	7.58321	1.78667
0.240365	24.0679	0.0644977	16.2298	0	7.54636	1.81498
0.242152	24.0226	0.0652865	16.2381	0	7.50951	1.84374
0.243931	23.9748	0.0660926	16.2465	0	7.47267	1.87297
0.245701	23.9246	0.0669163	16.2551	0	7.43584	1.90266
0.247463	23.8719	0.0677578	16.2638	0	7.39902	1.93281
0.249217	23.8167	0.0686173	16.2725	0	7.36223	1.96341
0.250963	23.7592	0.069495	16.2814	0	7.32545	1.99448
0.252702	23.6993	0.0703911	16.2903	0	7.28871	2.02599
0.254433	23.6371	0.0713058	16.2993	0	7.25199	2.05796
0.256157	23.5725	0.0722391	16.3083	0	7.21532	2.09037
0.257874	23.5057	0.0731913	16.3173	0	7.17869	2.12322
0.259584	23.4367	0.0741623	16.3263	0	7.14211	2.1565
0.261287	23.3655	0.0751524	16.3353	0	7.10559	2.19021
0.262984	23.2922	0.0761614	16.3443	0	7.06913	2.22433
0.264673	23.2168	0.0771895	16.3531	0	7.03273	2.25886
0.266357	23.1394	0.0782366	16.3619	0	6.99642	2.29378
0.268033	23.06	0.0793027	16.3706	0	6.96018	2.32909
0.269702	22.9788	0.0803878	16.3791	0	6.92404	2.36477
0.271364	22.8958	0.0814915	16.3875	0	6.88799	2.40081
0.273019	22.8111	0.082614	16.3957	0	6.85204	2.43718
0.274667	22.7247	0.0837549	16.4037	0	6.81621	2.47389
0.276306	22.6368	0.084914	16.4115	0	6.78049	2.5109
0.277936	22.5474	0.0860912	16.419	0	6.7449	2.54821
0.279558	22.4566	0.087286	16.4262	0	6.70945	2.58579
0.28117	22.3646	0.0884981	16.4331	0	6.67413	2.62362
0.282771	22.2714	0.0897273	16.4397	0	6.63896	2.66168
0.284361	22.1772	0.0909729	16.4459	0	6.60395	2.69994
0.285939	22.0819	0.0922347	16.4517	0	6.56911	2.7384
0.287503	21.9859	0.0935121	16.4571	0	6.53443	2.77701
0.289054	21.8891	0.0948045	16.4621	0	6.49994	2.81576
0.290589	21.7916	0.0961115	16.4666	0	6.46563	2.85463
0.292107	21.6937	0.0974324	16.4706	0	6.43152	2.89358
0.293607	21.5953	0.0987665	16.4742	0	6.39761	2.93259
0.295087	21.4967	0.100113	16.4771	0	6.36391	2.97163
0.296546	21.3978	0.101472	16.4795	0	6.33042	3.01069
0.297983	21.2989	0.102842	16.4814	0	6.29715	3.04972
0.299394	21.2001	0.104222	16.4826	0	6.26411	3.0887
0.300779	21.1014	0.105612	16.4831	0	6.23131	3.12761
0.302136	21.0029	0.107011	16.483	0	6.19874	3.16642
0.303462	20.9048	0.108418	16.4822	0	6.16642	3.2051

0.302308	20.7882	0.1101	16.4676	0	6.20012	3.23635
0.303154	20.6977	0.111486	16.4625	0	6.17989	3.2722
0.303983	20.6096	0.112863	16.4567	0	6.15945	3.30772
0.304794	20.5238	0.11423	16.4502	0	6.13882	3.34293
0.305584	20.4404	0.115588	16.4431	0	6.11799	3.37781
0.306351	20.3593	0.116934	16.4352	0	6.09699	3.41237
0.307094	20.2805	0.118271	16.4267	0	6.07583	3.4466
0.30781	20.2038	0.119596	16.4174	0	6.05452	3.48051
0.308498	20.1293	0.12091	16.4075	0	6.03306	3.5141
0.309155	20.0568	0.122214	16.3968	0	6.01148	3.54738
0.309779	19.9863	0.123506	16.3854	0	5.98977	3.58035
0.310368	19.9176	0.124787	16.3733	0	5.96795	3.61302
0.310919	19.8508	0.126058	16.3604	0	5.94603	3.6454
0.311431	19.7857	0.127318	16.3469	0	5.92402	3.67749
0.311901	19.7221	0.128567	16.3325	0	5.90191	3.7093
0.312327	19.6601	0.129807	16.3175	0	5.87973	3.74085
0.312707	19.5994	0.131036	16.3017	0	5.85747	3.77213
0.313038	19.5401	0.132257	16.2851	0	5.83515	3.80317
0.313317	19.4819	0.133469	16.2677	0	5.81276	3.83396
0.313543	19.4249	0.134672	16.2495	0	5.79032	3.86452
0.313712	19.3688	0.135868	16.2306	0	5.76782	3.89486
0.313823	19.3136	0.137057	16.2108	0	5.74527	3.92499
0.313873	19.2591	0.138239	16.1902	0	5.72267	3.95491
0.313858	19.2053	0.139415	16.1688	0	5.70003	3.98464
0.313778	19.152	0.140587	16.1465	0	5.67734	4.01419
0.313628	19.0992	0.141754	16.1233	0	5.65461	4.04356
0.313406	19.0467	0.142917	16.0992	0	5.63184	4.07276
0.313109	18.9945	0.144078	16.0741	0	5.60902	4.10181
0.312735	18.9424	0.145236	16.0481	0	5.58617	4.1307
0.312281	18.8902	0.146394	16.0212	0	5.56327	4.15945
0.311743	18.8381	0.14755	15.9932	0	5.54032	4.18806
0.311118	18.7857	0.148707	15.9642	0	5.51733	4.21654
0.310405	18.733	0.149865	15.9341	0	5.49429	4.2449
0.309598	18.68	0.151025	15.9029	0	5.4712	4.27314
0.308696	18.6264	0.152188	15.8705	0	5.44805	4.30126
0.307695	18.5723	0.153355	15.8369	0	5.42484	4.32927
0.306592	18.5175	0.154526	15.8021	0	5.40156	4.35718
0.305383	18.4618	0.155702	15.7661	0	5.37822	4.38498
0.304065	18.4053	0.156885	15.7286	0	5.35479	4.41268
0.302634	18.3477	0.158074	15.6898	0	5.33129	4.44029
0.301087	18.289	0.159272	15.6496	0	5.30769	4.46779
0.29942	18.2291	0.160479	15.6078	0	5.28399	4.4952
0.29763	18.1679	0.161696	15.5645	0	5.26018	4.52251
0.295713	18.1052	0.162923	15.5195	0	5.23626	4.54973
0.293666	18.041	0.164163	15.4728	0	5.2122	4.57684
0.291484	17.9751	0.165415	15.4243	0	5.188	4.60386

0.289163	17.9074	0.166681	15.3739	0	5.16365	4.63077
0.286701	17.8378	0.167961	15.3216	0	5.13912	4.65758
0.284093	17.7662	0.169258	15.2672	0	5.11441	4.68427
0.281336	17.6923	0.170571	15.2107	0	5.0895	4.71085
0.278426	17.6162	0.171902	15.1519	0	5.06436	4.73731
0.27536	17.5376	0.173253	15.0908	0	5.03899	4.76364
0.272133	17.4565	0.174623	15.0271	0	5.01335	4.78984
0.268743	17.3725	0.176014	14.9609	0	4.98743	4.81589
0.265186	17.2857	0.177428	14.8919	0	4.96119	4.8418
0.26146	17.1957	0.178866	14.8201	0	4.93461	4.86754
0.257561	17.1025	0.180328	14.7452	0	4.90766	4.8931
0.253487	17.0059	0.181817	14.6672	0	4.8803	4.91848
0.249235	16.9056	0.183332	14.5858	0	4.8525	4.94367
0.244804	16.8014	0.184876	14.5009	0	4.82422	4.96863
0.240191	16.6932	0.18645	14.4123	0	4.79542	4.99337
0.235396	16.5806	0.188054	14.3198	0	4.76605	5.01785
0.230419	16.4635	0.189691	14.2232	0	4.73606	5.04206
0.225258	16.3415	0.19136	14.1222	0	4.7054	5.06598
0.219914	16.2145	0.193064	14.0167	0	4.674	5.08957
0.21439	16.0821	0.194803	13.9064	0	4.64181	5.11281
0.208686	15.9439	0.196578	13.7911	0	4.60875	5.13567
0.202806	15.7998	0.19839	13.6704	0	4.57475	5.15809
0.196755	15.6493	0.200239	13.5442	0	4.53974	5.18005
0.190536	15.4921	0.202126	13.412	0	4.50361	5.20148
0.184158	15.3279	0.20405	13.2737	0	4.46629	5.22233
0.177627	15.1562	0.206011	13.1288	0	4.42768	5.24252
0.170954	14.9766	0.208008	12.9772	0	4.38766	5.26199
0.164149	14.7888	0.210039	12.8184	0	4.34614	5.28062
0.157226	14.5924	0.212103	12.6521	0	4.30299	5.29833
0.150199	14.3868	0.214195	12.478	0	4.2581	5.31498
0.143086	14.1718	0.216313	12.2959	0	4.21134	5.33041
0.135906	13.947	0.21845	12.1054	0	4.16259	5.34447
0.12868	13.7119	0.220599	11.9062	0	4.11172	5.35695
0.121432	13.4663	0.222753	11.6982	0	4.05862	5.36762
0.11419	13.21	0.2249	11.4812	0	4.00317	5.37621
0.10698	12.9427	0.227028	11.2551	0	3.94527	5.38241
0.0998349	12.6643	0.229122	11.0198	0	3.88483	5.38589
0.0927861	12.375	0.231165	10.7754	0	3.8218	5.38625
0.0858679	12.0749	0.233136	10.5223	0	3.75613	5.38307
0.0791149	11.7645	0.235014	10.2606	0	3.68783	5.37586
0.072562	11.4442	0.236772	9.99104	0	3.61694	5.36412
0.0662432	11.115	0.238383	9.71419	0	3.54356	5.34734
0.060191	10.7779	0.239819	9.43095	0	3.46784	5.32495
0.054435	10.4342	0.24105	9.14236	0	3.38999	5.29645
0.0490008	10.0854	0.242047	8.84965	0	3.31027	5.26132
0.0439095	9.73328	0.242781	8.5542	0	3.22899	5.21914

0.0391767	9.37967	0.243227	8.25749	0	3.14654	5.16955
0.0348116	9.02661	0.243366	7.96112	0	3.06332	5.11232
0.0308174	8.67617	0.243181	7.66673	0	2.97977	5.04734
0.0271909	8.3304	0.242665	7.37594	0	2.89637	4.9747
0.0239231	7.9913	0.241816	7.09036	0	2.81356	4.89461
0.0239231	7.9913	0.241816	7.09036	0	2.81356	4.89461
0.0239231	7.9913	0.241816	7.09036	0	2.81356	4.89461
0.0209809	7.65448	0.24159	6.79247	0	2.71522	4.81866
0.0183756	7.3282	0.240065	6.52152	0	2.63527	4.72403
0.0160804	7.01776	0.238258	6.26037	0	2.55753	4.62319
0.0140751	6.7236	0.236149	6.01068	0	2.48257	4.51714
0.0123241	6.44308	0.233864	5.77209	0	2.41011	4.40735
0.0108023	6.17703	0.231412	5.54527	0	2.34042	4.29485
0.00948482	5.92595	0.228821	5.33067	0	2.27372	4.18068
0.00834799	5.69008	0.226128	5.12856	0	2.21016	4.0659
0.00736956	5.46945	0.22337	4.93901	0	2.14986	3.95152
0.00652906	5.26389	0.220586	4.76195	0	2.09288	3.83851
0.00580795	5.07306	0.217808	4.59716	0	2.03921	3.72772
0.00518968	4.8965	0.215068	4.4443	0	1.98885	3.61991
0.00465965	4.73366	0.212392	4.30295	0	1.94173	3.51573
0.00420511	4.58387	0.209804	4.1726	0	1.89777	3.4157
0.003815	4.44646	0.20732	4.0527	0	1.85685	3.32024
0.00347981	4.32067	0.204954	3.94267	0	1.81887	3.22963
0.00319139	4.20578	0.202717	3.8419	0	1.78366	3.14408
0.00294281	4.10103	0.200615	3.74978	0	1.7511	3.06367
0.00272818	4.00569	0.198651	3.66569	0	1.72102	2.98843
0.0025425	3.91906	0.196828	3.58905	0	1.69327	2.9183
0.00238156	3.84044	0.195143	3.51929	0	1.66771	2.85317
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K2O	P2O5	FeOT	Mg#	Density of liquid (g/cc)
0	0	32.108869	18.0504688	3.197715
0.00499574	0	21.5220758	60.2787311	3.031043
0.00666415	0	17.9868205	69.6134303	2.979839
0.00802952	0	16.607918	71.9771286	2.954262
0.00918271	0	15.8411881	72.8411515	2.937029
0.0100475	0	15.2819959	73.4781542	2.924561
0.0107205	0	14.8580084	73.9628692	2.915185
0.0112597	0	14.5266741	74.3410544	2.907923
0.0117021	0	14.2612079	74.642271	2.902167
0.012072	0	14.0443894	74.8857602	2.897519
0.0123866	0	13.8642927	75.0853227	2.893709
0.0126658	0	13.7142395	75.2437305	2.890353
0.012918	0	13.5878002	75.3688338	2.88733
0.0131412	0	13.4784966	75.4738381	2.884751
0.0133405	0	13.3831684	75.5623459	2.882534
0.01352	0	13.2992688	75.6374638	2.880616
0.0136828	0	13.22496	75.7011563	2.878949
0.0138314	0	13.1586132	75.7554693	2.877493
0.0139679	0	13.099205	75.8014847	2.876216
0.0140938	0	13.0456138	75.8406084	2.875094
0.0142106	0	12.9970261	75.8737572	2.874106
0.0143194	0	12.9528275	75.9017434	2.873233
0.0144212	0	12.9124063	75.9252281	2.872462
0.0145168	0	12.8753544	75.944674	2.87178
0.0146069	0	12.8412628	75.9605521	2.871177
0.014692	0	12.8097261	75.9734954	2.870645
0.0147728	0	12.7805371	75.9835384	2.870175
0.0148495	0	12.7533922	75.9912585	2.869761
0.0149227	0	12.728186	75.9966315	2.869398
0.0149926	0	12.704514	76.0002246	2.869081
0.0150596	0	12.6823753	76.0019487	2.868804
0.0151239	0	12.6616645	76.002027	2.868566
0.0151857	0	12.6421807	76.0006601	2.868361
0.0152452	0	12.6237203	75.998054	2.868188
0.0153027	0	12.6063824	75.9941412	2.868043
0.0153582	0	12.5898652	75.9893535	2.867924
0.015412	0	12.5742669	75.9833812	2.86783
0.0154641	0	12.5594848	75.9765326	2.867758
0.0155147	0	12.5454198	75.9687844	2.867706
0.0155638	0	12.5319692	75.9603652	2.867674
0.0156117	0	12.5191321	75.9512739	2.867659
0.0156583	0	12.5068085	75.9415718	2.86766
0.0157038	0	12.4950966	75.931196	2.867677
0.0157482	0	12.4838955	75.9201266	2.867708

0.0157916	0	12.4731052	75.9086735	2.867753
0.015834	0	12.4627248	75.8968373	2.86781
0.0158755	0	12.4526534	75.8845989	2.867878
0.0159162	0	12.4430901	75.8717474	2.867958
0.0159561	0	12.4337358	75.8587217	2.868047
0.0159952	0	12.4247887	75.8451456	2.868147
0.0160337	0	12.4160497	75.8314789	2.868255
0.0160714	0	12.407717	75.8172612	2.868372
0.0161085	0	12.3994906	75.8030187	2.868497
0.0161451	0	12.3916705	75.7883074	2.86863
0.016181	0	12.3839567	75.7734866	2.86877
0.0162164	0	12.3764483	75.7584935	2.868917
0.0162512	0	12.3692444	75.7430962	2.86907
0.0162856	0	12.3621468	75.7276731	2.869229
0.0163195	0	12.3552528	75.7119947	2.869395
0.0163529	0	12.3484642	75.6962068	2.869565
0.0163859	0	12.3418801	75.6802468	2.869741
0.0164185	0	12.3355005	75.6641147	2.869922
0.0164507	0	12.3292245	75.6477896	2.870108
0.0164825	0	12.3230521	75.6314428	2.870299
0.0165139	0	12.3169833	75.6149885	2.870493
0.016545	0	12.311119	75.5983618	2.870692
0.0165757	0	12.3052574	75.5816925	2.870895
0.0166061	0	12.2995994	75.5648518	2.871101
0.0166362	0	12.293945	75.5480537	2.871311
0.016666	0	12.2884924	75.5310872	2.871525
0.0166955	0	12.2830443	75.5140752	2.871742
0.0167248	0	12.277698	75.4970454	2.871962
0.0167537	0	12.2724553	75.4798208	2.872185
0.0167824	0	12.2673144	75.4625785	2.872411
0.0168109	0	12.2621771	75.4453796	2.87264
0.016839	0	12.2571416	75.4280761	2.872871
0.016867	0	12.2521088	75.4108178	2.873105
0.0168947	0	12.2471787	75.3934535	2.873342
0.0169222	0	12.2423504	75.3759847	2.873581
0.0169495	0	12.2375248	75.35865	2.873822
0.0169766	0	12.232801	75.3411226	2.874066
0.0170034	0	12.2280799	75.3236413	2.874311
0.0170301	0	12.2234606	75.3060557	2.874559
0.0170566	0	12.2188431	75.2885181	2.874808
0.0170829	0	12.2142283	75.2711166	2.87506
0.017109	0	12.2097144	75.2535235	2.875313
0.0171349	0	12.2052032	75.2359778	2.875568
0.0171607	0	12.2006938	75.2184811	2.875825
0.0171863	0	12.1962862	75.200881	2.876083
0.0172117	0	12.1918804	75.1833304	2.876343

0.0172369	0	12.1874755	75.165831	2.876605
0.0172621	0	12.1831733	75.1482272	2.876868
0.017287	0	12.178872	75.1305846	2.877133
0.0173118	0	12.1745734	75.1130816	2.877399
0.0173365	0	12.1702757	75.0955402	2.877666
0.017361	0	12.1659798	75.0781409	2.877935
0.0173854	0	12.1617848	75.0605496	2.878204
0.0174096	0	12.1575925	75.0430085	2.878476
0.0174337	0	12.1534011	75.0255206	2.878748
0.0174577	0	12.1492106	75.0080864	2.879021
0.0174816	0	12.1451219	74.9905504	2.879296
0.0175053	0	12.140935	74.9732216	2.879572
0.0175289	0	12.1368499	74.9556994	2.879848
0.0175524	0	12.1327657	74.9382316	2.880126
0.0175758	0	12.1285824	74.9210661	2.880405
0.017599	0	12.1245009	74.9036148	2.880684
0.0176222	0	12.1204212	74.8863101	2.880965
0.0176452	0	12.1164424	74.8689061	2.881247
0.0176681	0	12.1123645	74.8516205	2.881529
0.0176909	0	12.1082884	74.834483	2.881812
0.0177136	0	12.1043132	74.8171536	2.882097
0.0177362	0	12.1002398	74.7999419	2.882382
0.0177587	0	12.0962673	74.7827252	2.882667
0.0177811	0	12.0921957	74.7656281	2.882954
0.0178034	0	12.0882259	74.7485255	2.883241
0.0178256	0	12.084257	74.7313869	2.883529
0.0178478	0	12.0802899	74.714211	2.883818
0.0178698	0	12.0762228	74.697346	2.884107
0.0178917	0	12.0722575	74.6802876	2.884397
0.0179135	0	12.068294	74.6632869	2.884688
0.0179353	0	12.0643305	74.6463472	2.884979
0.0179569	0	12.0603688	74.6294659	2.885271
0.0179785	0	12.056408	74.6125496	2.885564
0.018	0	12.052449	74.5956923	2.885857
0.0180214	0	12.0484909	74.5788956	2.886151
0.0180427	0	12.0444328	74.5623189	2.886445
0.0180639	0	12.0404765	74.5455489	2.88674
0.0180851	0	12.036522	74.528839	2.887036
0.0181061	0	12.0325675	74.5121924	2.887332
0.0181271	0	12.0286148	74.4955102	2.887628
0.018148	0	12.024663	74.4789868	2.887925
0.0181689	0	12.0207121	74.4624297	2.888223
0.0181896	0	12.0167621	74.4458387	2.888521
0.0182103	0	12.0128139	74.4294065	2.888819
0.0182309	0	12.0088657	74.4129423	2.889118
0.0182514	0	12.0049193	74.3965405	2.889417

0.0182719	0	12.0009738	74.3801054	2.889717
0.0182923	0	11.9969292	74.3638935	2.890017
0.0183126	0	11.9929855	74.3475875	2.890318
0.0183328	0	11.9890427	74.3313465	2.890619
0.018353	0	11.9851008	74.3150727	2.89092
0.0183731	0	11.9811607	74.298863	2.891222
0.0183932	0	11.9771215	74.2828787	2.891524
0.0184131	0	11.9731823	74.266704	2.891827
0.0185219	0	12.0022939	74.196061	2.89312
0.0186445	0	12.0363865	74.1173349	2.894564
0.0187677	0	12.0703773	74.0390366	2.896006
0.0188913	0	12.1043663	73.9609093	2.897449
0.0190154	0	12.1383544	73.8830539	2.898891
0.01914	0	12.1723398	73.8054759	2.900333
0.0192651	0	12.2062243	73.7282333	2.901775
0.0193907	0	12.2401079	73.6512699	2.903217
0.0195169	0	12.2739897	73.5744887	2.904658
0.0196436	0	12.3078706	73.4979916	2.906099
0.0197709	0	12.3417497	73.421681	2.907541
0.0198988	0	12.3755288	73.3457137	2.908982
0.0200273	0	12.4094061	73.269881	2.910423
0.0201565	0	12.4432834	73.1941349	2.911864
0.0202862	0	12.4771598	73.1186843	2.913305
0.0204166	0	12.5110353	73.0434282	2.914747
0.0205477	0	12.5449099	72.9684724	2.916188
0.0206795	0	12.5787845	72.8936097	2.91763
0.020812	0	12.6127591	72.8187887	2.919072
0.0209452	0	12.6467337	72.7441682	2.920514
0.0210791	0	12.6807074	72.6697514	2.921957
0.0212138	0	12.7147811	72.5953822	2.9234
0.0213493	0	12.7488557	72.5212177	2.924844
0.0214856	0	12.7829294	72.4472624	2.926288
0.0216228	0	12.817204	72.3730971	2.927733
0.0217608	0	12.8513786	72.299299	2.929178
0.0218996	0	12.8857541	72.2254008	2.930624
0.0220394	0	12.9200296	72.1517662	2.932071
0.02218	0	12.9545069	72.0780339	2.933519
0.0223217	0	12.9890842	72.0043646	2.934967
0.0224643	0	13.0236624	71.9308063	2.936417
0.0226078	0	13.0583415	71.8572049	2.937867
0.0227524	0	13.0931224	71.7836687	2.939319
0.0228981	0	13.1280033	71.7100942	2.940772
0.0230448	0	13.1629869	71.6364783	2.942226
0.0231927	0	13.1980705	71.5629359	2.943681
0.0233417	0	13.2333568	71.4892013	2.945138
0.0234918	0	13.2686449	71.4155857	2.946596

0.0236431	0	13.3041339	71.3417838	2.948056
0.0237957	0	13.3397247	71.2679496	2.949517
0.0239495	0	13.3755182	71.1939297	2.95098
0.0241046	0	13.4114135	71.1199914	2.952444
0.0242611	0	13.4474115	71.0459132	2.953911
0.0244189	0	13.4836113	70.9716558	2.955379
0.0245781	0	13.5200138	70.8971078	2.95685
0.0247388	0	13.556519	70.8226467	2.958323
0.0249009	0	13.5933269	70.7477458	2.959797
0.0250646	0	13.6302375	70.6728233	2.961274
0.0252298	0	13.6672508	70.5978806	2.962754
0.0253966	0	13.7045677	70.5225014	2.964236
0.025565	0	13.7420873	70.4469533	2.965721
0.0257352	0	13.7798105	70.3711236	2.967208
0.0259071	0	13.8178373	70.294976	2.968698
0.0260808	0	13.8559677	70.2187008	2.970191
0.0262563	0	13.8944017	70.1419971	2.971688
0.0264337	0	13.9331402	70.06498	2.973187
0.026613	0	13.9720823	69.987574	2.974689
0.0267943	0	14.011228	69.9100098	2.976195
0.0269777	0	14.0507791	69.8318713	2.977705
0.0271632	0	14.0905338	69.7535789	2.979218
0.0273509	0	14.1305939	69.6747505	2.980735
0.0275408	0	14.1709585	69.5955045	2.982256
0.027733	0	14.2116276	69.515843	2.983781
0.0279275	0	14.252703	69.4356161	2.98531
0.0281245	0	14.2940829	69.3548607	2.986844
0.028324	0	14.3357682	69.2738113	2.988382
0.0285262	0	14.3778598	69.1920857	2.989925
0.0287309	0	14.4202568	69.1098351	2.991472
0.0289385	0	14.4631601	69.0268817	2.993025
0.0291488	0	14.5063688	68.9435256	2.994583
0.0293621	0	14.5500847	68.8593523	2.996146
0.0295784	0	14.5942078	68.7745116	2.997715
0.0297979	0	14.6387372	68.6891261	2.99929
0.0300205	0	14.6837738	68.6029309	3.000871
0.0302465	0	14.7292176	68.5160749	3.002458
0.0304759	0	14.7752686	68.4282677	3.004051
0.0307089	0	14.8217277	68.3399238	3.005651
0.0309455	0	14.8687949	68.2505129	3.007258
0.031186	0	14.9163702	68.1603043	3.008872
0.0314303	0	14.9645536	68.0691554	3.010494
0.0316787	0	15.0133469	67.9770672	3.012123
0.0319313	0	15.0627483	67.8840459	3.013761
0.0321883	0	15.1127587	67.7899714	3.015406
0.0324497	0	15.1633799	67.6949667	3.017061

0.0327158	0	15.2148101	67.598627	3.018724
0.0329867	0	15.2668502	67.5013662	3.020396
0.0332626	0	15.3196011	67.4029198	3.022078
0.0335436	0	15.3731619	67.3032737	3.023769
0.03383	0	15.4275344	67.2024309	3.025471
0.0341219	0	15.4827168	67.1001503	3.027184
0.0344195	0	15.5387109	66.9966831	3.028907
0.034723	0	15.5956167	66.8918932	3.030642
0.0350326	0	15.6533342	66.7858033	3.032388
0.0353485	0	15.7120634	66.6781358	3.034146
0.0356709	0	15.7717052	66.5690373	3.035917
0.036	0	15.8323578	66.4585024	3.0377
0.0363361	0	15.8940239	66.3464083	3.039497
0.0366793	0	15.9567008	66.2328935	3.041307
0.03703	0	16.0203903	66.1179639	3.04313
0.0373882	0	16.0852924	66.0012209	3.044968
0.0377542	0	16.1512062	65.8830822	3.04682
0.0381282	0	16.2183317	65.7632791	3.048687
0.0385105	0	16.2866689	65.6419516	3.050569
0.0389013	0	16.3561178	65.5189912	3.052467
0.0393007	0	16.4268775	65.3943927	3.05438
0.039709	0	16.498748	65.2684446	3.056309
0.0402644	0	16.5959756	65.0910754	3.058642
0.0408819	0	16.7029057	64.8952254	3.061131
0.0415072	0	16.810016	64.7009079	3.06362
0.0421405	0	16.9172065	64.5082803	3.066111
0.0427825	0	17.0247763	64.3168264	3.068604
0.0434335	0	17.1326272	64.1267005	3.071099
0.0440941	0	17.2408574	63.9379265	3.073599
0.0447647	0	17.3496687	63.749989	3.076104
0.0454459	0	17.4590602	63.5631832	3.078615
0.0461383	0	17.5692328	63.3771334	3.081133
0.0468423	0	17.6800847	63.1920008	3.083658
0.0475584	0	17.7917177	63.0076768	3.086191
0.0482871	0	17.9042309	62.8240585	3.088733
0.0490287	0	18.0176234	62.6410366	3.091282
0.0497837	0	18.1318961	62.4586357	3.093839
0.0505521	0	18.2469472	62.2770121	3.096403
0.0513343	0	18.3626776	62.0963163	3.098972
0.0521301	0	18.4791864	61.9161632	3.101545
0.0529395	0	18.5961718	61.7370965	3.10412
0.0537625	0	18.7135356	61.5591152	3.106695
0.054599	0	18.831176	61.3822189	3.109268
0.0554488	0	18.9489939	61.206541	3.111836
0.0563118	0	19.0666884	61.0323219	3.114399
0.057188	0	19.1841586	60.8596877	3.116954

0.0580773	0	19.3014063	60.6884924	3.1195
0.0589797	0	19.4182306	60.5189808	3.122035
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0.0608243	0	19.6503081	60.1852089	3.127069
0.0617666	0	19.7654631	60.0209082	3.129567
0.0627225	0	19.8797947	59.8586015	3.132051
0.0636923	0	19.9934038	59.6981543	3.134519
0.064676	0	20.1060904	59.539795	3.136973
0.0656741	0	20.2180554	59.383124	3.139411
0.0666867	0	20.3289979	59.2286327	3.141833
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0.068757	0	20.5480199	58.9254473	3.146628
0.0698153	0	20.6559994	58.7768406	3.149001
0.0708896	0	20.7630573	58.6302344	3.151356
0.0719802	0	20.8689954	58.4856992	3.153695
0.0730876	0	20.9738137	58.3433658	3.156016
0.0742121	0	21.0776113	58.2028091	3.15832
0.0753543	0	21.18029	58.0644225	3.160607
0.0765146	0	21.2818489	57.9280439	3.162876
0.0776934	0	21.3821889	57.7937709	3.165127
0.0788914	0	21.4814091	57.6614746	3.16736
0.0801089	0	21.5795122	57.531286	3.169576
0.0813466	0	21.6763955	57.403158	3.171773
0.0826049	0	21.7721617	57.2769594	3.173953
0.0838845	0	21.8666099	57.1529014	3.176114
0.085186	0	21.9599401	57.0308943	3.178257
0.0865099	0	22.0519532	56.9109968	3.180382
0.0878568	0	22.1427492	56.7932326	3.182489
0.0892275	0	22.2323272	56.6774388	3.184576
0.0906226	0	22.320589	56.5637097	3.186646
0.0920428	0	22.4076346	56.4519209	3.188696
0.0934888	0	22.493364	56.3424705	3.190728
0.0949613	0	22.5777763	56.2348928	3.192741
0.0964611	0	22.6608733	56.1294745	3.194734
0.0979889	0	22.7426541	56.0262034	3.196709
0.0995456	0	22.8231196	55.9249142	3.198664
0.101132	0	22.9022689	55.8257468	3.200599
0.102749	0	22.9800038	55.7286424	3.202515
0.104397	0	23.0563234	55.6337408	3.204411
0.106078	0	23.1313277	55.5407704	3.206287
0.107792	0	23.2049176	55.4499774	3.208143
0.10954	0	23.2769922	55.3614569	3.209979
0.111323	0	23.3476524	55.2750894	3.211794
0.113143	0	23.4168991	55.1907097	3.213589
0.115	0	23.4847305	55.1084611	3.215362
0.116895	0	23.5510484	55.028436	3.217115

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0.122823	0	23.7407184	54.8013399	3.222244
0.124884	0	23.8008805	54.7300491	3.22391
0.126989	0	23.85953	54.6609261	3.225553
0.129139	0	23.916466	54.5941692	3.227175
0.131337	0	23.9718885	54.5294068	3.228773
0.133583	0	24.0255975	54.4671434	3.230349
0.135879	0	24.0776939	54.4069572	3.231901
0.138226	0	24.1280768	54.3492505	3.233429
0.140626	0	24.1767471	54.2937048	3.234934
0.14308	0	24.2238048	54.2403622	3.236415
0.145591	0	24.268949	54.1896764	3.237871
0.148159	0	24.3124806	54.1410221	3.239302
0.150787	0	24.3541005	54.0948508	3.240709
0.153476	0	24.3940069	54.051106	3.24209
0.156228	0	24.4320016	54.0096732	3.243445
0.159045	0	24.4681837	53.9707523	3.244774
0.161929	0	24.5024532	53.9341287	3.246077
0.164882	0	24.534811	53.900103	3.247353
0.167906	0	24.5652562	53.8685148	3.248601
0.171003	0	24.5937888	53.8392032	3.249823
0.174176	0	24.6202097	53.812672	3.251016
0.177425	0	24.644718	53.7885595	3.252182
0.180755	0	24.6671155	53.7670603	3.253319
0.184167	0	24.6874995	53.7482255	3.254426
0.187664	0	24.7057727	53.7318393	3.255505
0.191248	0	24.7219333	53.7180535	3.256554
0.194922	0	24.7359822	53.7070177	3.257573
0.198688	0	24.7478185	53.6985209	3.258562
0.20255	0	24.757444	53.6928668	3.25952
0.206509	0	24.7649569	53.6896454	3.260446
0.21057	0	24.7701581	53.6893633	3.261341
0.214735	0	24.7730476	53.6917099	3.262205
0.219007	0	24.7737245	53.6968934	3.263036
0.223389	0	24.7720906	53.704703	3.263834
0.227885	0	24.768045	53.7153942	3.2646
0.232497	0	24.7617868	53.7289219	3.265333
0.23723	0	24.7530178	53.7452782	3.266031
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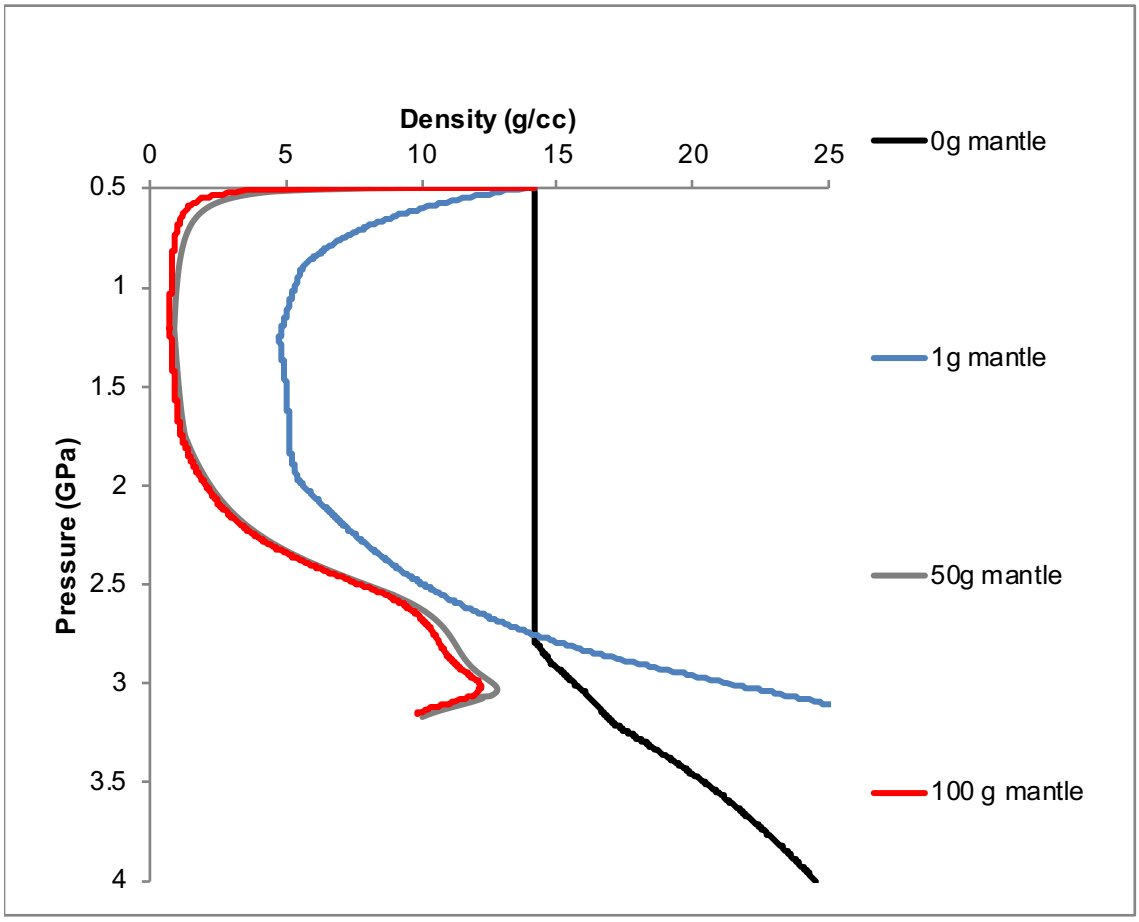
Density (g/cc)
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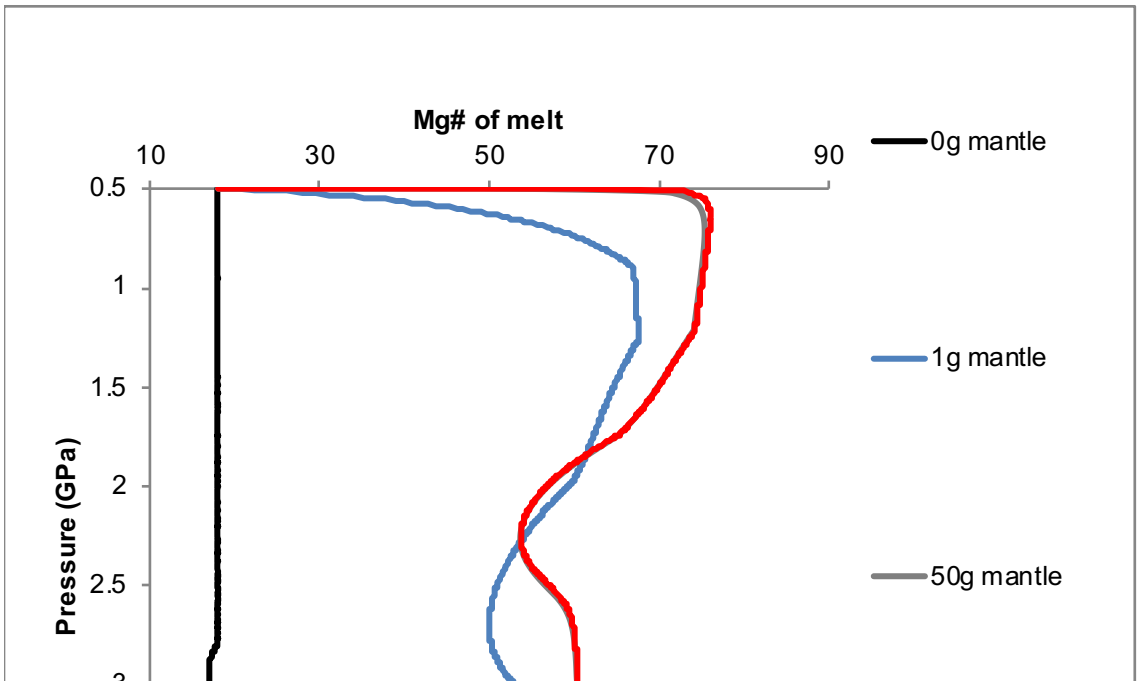
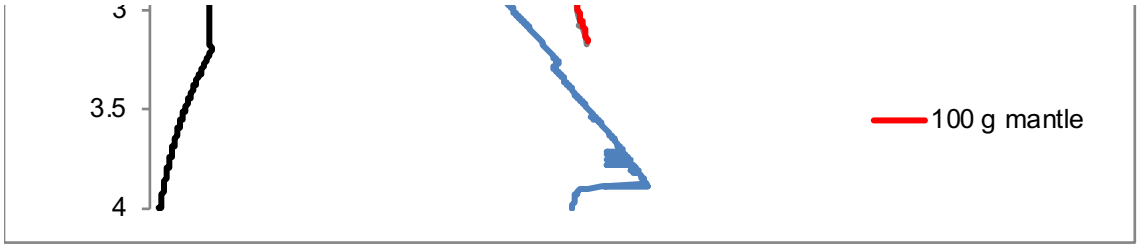
5
10
15
20
25
0.5
1
1.5
2
2.5
3
3.5
4
Pressure (GPa)
0g mantle
1g mantle
50g mantle
100 g mantle


Mg# of melt
10
30
50
70
90
0.5
1
1.5
2
2.5
Pressure (GPa)
0g mantle
1g mantle
50g mantle


3
3.5
4
100 g mantle

Supporting Information for

Exploring the Sensitivity of Lunar Interior Structure from Geophysical and Geochemical Constraints

H. Fuqua Haviland[1*], P. M. Bremner[1*], A. Mallik[2,3*], M. R. Diamond[4*], S. Panovska[5], S. J. Lock[6]

[1]Heliophysics and Planetary Science Branch, Marshall Space Flight Center.

[2]Bayerisches Geoinstitut, University of Bayreuth, Bayreuth, Germany.

[3]Department of Geosciences, University Arizona.

[4]Earth and Planetary Science Department, University of California, Berkeley.

[5]GFZ Helmholtz-Zentrum Potsdam.

[6]Division of Geological and Planetary Sciences, California Institute of Technology.

Corresponding author: Heidi Fuqua Haviland (heidi.haviland@nasa.gov)

**These authors contributed equally.*

Contents of this file

Additional Supporting Information (Files uploaded separately)

Supplemental Table S6: excel table with pMELTS composition

Description of supplemental materials

Provided below are a glossary of key terms, additional figures and tables as a supplement to those provided in the manuscript, and additional description of calculations. This includes the results from the full range of temperature profiles (MaxT, MeanT, MinT), and compositional model subclasses, compositionally homogeneous Hauri (CH-H), compositionally homogeneous Taylor (CH-T) and

compositionally stratified (CS). Model compositions are defined in Figure 1 and temperature profiles are defined in Figure 2 of the main text. Section S1 provides additional description of the ilmenite sinking calculations discussed in the main text. Table S7 is uploaded separately.

Glossary:

BC-RMSND: Bulk Chemistry RMSND
BurnMan: equation of state algorithm developed for Earth's lower mantle, v0.90 (Cottaar et al, 2014, 2016)
CH: Compositionally homogeneous
CH-H: Hauri compositional model, accounting for the removal of a 40 km GRAIL-era crust (Hauri et al., 2015)
CH-T: Taylor compositional model, accounting for the removal of a 70 km Apollo-era crust (S.R. Taylor, 1982)
CMB: Core-Mantle Boundary
Comb-RMSND: RMSND from combined GL2norm and BCl2norm
CS: Compositionally stratified
DE: Differential Evolution optimization algorithm (Price et al., 2005)
G-RMSND: composition model RMSND relative to mass and MOI
Ga: equivalent to Gyr meaning Billion Years ago
GRAIL: NASA's Gravity Recovery and Interior Laboratory mission
LMO: Lunar Magma Ocean
LRO: NASA's Lunar Reconnaissance Orbiter currently orbiting the Moon.
R_L : Standard Gravity Reference Lunar Radius, R_L = 1,738 km (*Williams et al.*, 2014)
MaxT: selenotherm based on upper bounds resulting from integrating (Gagnepain-Beyneix et al., 2006; Khan et al., 2006, 2007)
MeanT: selenotherm based on mean of MinT and MaxT.
MinT: selenotherm based on lower bounds from integrated profiles, same as MaxT.
Model class: a laterally averaged 1D compositional profile of the Moon (CH-H, CH-T, CS)
Model subclass: the pairing of a the 3 lunar temperature profiles with one of the 3 model classes (total of 9)
MO: Magma Ocean
MOI: Moment of Inertia, Table S3, (Williams et al., 2014)
Myr: Million years ago
R_{core} : Core Radius, ~400 km (Weber et al., 2011; Garcia et al., 2011, 2012; Hood et al., 1999)
R_{crust}: Thickness of Crust, 40km (Wieczorek et al., 2013, (average crustal thickness))
RMSND: Root Mean Square Normalized Deviation
Selenoman: equations of state algorithm developed herein for the Moon based on Burnman codes
Selenotherm: lunar temperature profile, akin to a geotherm of Earth
zscore: the number of standard deviations ($n\sigma$) of the model *value* from the reference (*ref*) values normalized by the measurement error (*stderr)* (equation 1)

Supplemental Tables

Table S1. Burnman inputs [mineral end member weight fractions] for each layer in the Compositionally Homogeneous Hauri (CH-H), Taylor (CH-T) and Compositionally Stratified (CS) Model Classes.

Homogeneous - Hauri (CH-H): Radius (km)	plg_an	sp_sp	sp_hc	ol_fo	ol_fa	opx_en	opx_fs	cpx_di	cpx_he	gt_py	gt_al	gt_gr	ilm	fe_fcc	fe_bcc
Inner Core	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Outer Core	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Lower Ilmenite	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.660	0.000	0.000	0.000	0.160	0.000	0.000
Lower Mantle	0.000	0.000	0.000	0.636	0.075	0.186	0.018	0.045	0.004	0.023	0.006	0.007	0.000	0.000	0.000
Mid Mantle	0.000	0.000	0.000	0.636	0.075	0.186	0.018	0.045	0.004	0.023	0.006	0.007	0.000	0.000	0.000
Upper Mantle	0.000	0.030	0.004	0.582	0.071	0.228	0.026	0.054	0.005	0.000	0.000	0.000	0.000	0.000	0.000
Upper Ilmenite	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.660	0.000	0.000	0.000	0.160	0.000	0.000
Crust	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Homogeneous - Taylor (CH-T): Radius (km)	plg_an	sp_sp	sp_hc	ol_fo	ol_fa	opx_en	opx_fs	cpx_di	cpx_he	gt_py	gt_al	gt_gr	ilm	fe_fcc	fe_bcc
Inner Core	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Outer Core	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Lower Ilmenite	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.660	0.000	0.000	0.000	0.160	0.000	0.000
Lower Mantle	0.000	0.000	0.000	0.524	0.100	0.240	0.035	0.064	0.008	0.018	0.007	0.005	0.000	0.000	0.000
Mid Mantle	0.000	0.000	0.000	0.525	0.098	0.244	0.037	0.057	0.008	0.018	0.007	0.006	0.000	0.000	0.000
Upper Mantle	0.000	0.024	0.005	0.484	0.092	0.277	0.047	0.063	0.009	0.000	0.000	0.000	0.000	0.000	0.000
Upper Ilmenite	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.660	0.000	0.000	0.000	0.160	0.000	0.000
Crust	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Stratigraphic Model (CS): Radius (km)	plg_an	sp_sp	sp_hc	ol_fo	ol_fa	opx_en	opx_fs	cpx_di	cpx_he	gt_py	gt_al	gt_gr	ilm	fe_fcc	fe_bcc
Inner Core	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Outer Core	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Lower Ilmenite	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.660	0.000	0.000	0.000	0.160	0.000	0.000
Lower Mantle	0.000	0.000	0.000	0.827	0.102	0.052	0.008	0.000	0.000	0.009	0.002	0.000	0.000	0.000	0.000
Mid Mantle	0.000	0.000	0.000	0.918	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Upper Mantle 3	0.000	0.000	0.000	0.000	0.000	0.883	0.117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Upper Mantle 2	0.000	0.000	0.000	0.489	0.133	0.000	0.000	0.274	0.104	0.000	0.000	0.000	0.000	0.000	0.000
Upper Mantle 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.532	0.469	0.000	0.000	0.000	0.000	0.000	0.000
Upper Ilmenite	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.660	0.000	0.000	0.000	0.160	0.000	0.000
Crust	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mineral abbreviations: plg_an: plagioclase_anorthite; sp_sp: spinel_spinel; sp_hc: spinel_hercynite; ol_fo: olivine_forsterite; ol_fa: olivine_fayalite; opx_en: orthopyroxene_enstatite; opx_fs: orthopyroxene_ferrosilite; cpx_di: clinopyroxene_diopside; cpx_he: clinopyroxene_hedenbergite; gt_py: garnet_pyrope; gt_al: garnet_almandine; gt_gr: garnet_grossular; ilm: ilmenite; fe_fcc: iron_face-centered-cubic; fe_bcc: iron_body-centered-cubic.

Table S2. Published bulk silicate Moon compositions. All compositions are reported in weight percent. Final rows gives the unweighted average and standard deviations of the published compositions which were used to compare to the models calculated in this work.

SiO_2	TiO_2	Al_2O_3	FeO	MgO	CaO	Sum	Reference
45.90	0.30	6.00	10.50	32.40	4.90	100	Taylor and Bence (1975), Taylor (1980) (CI value of Mg/Si assumed)
45.84	0.20	4.61	13.07	32.47	3.81	100	Wanke et al. (1977) (CI value of Mg/Si assumed)
44.98	0.30	4.22	13.96	32.83	3.71	100	Ringwood (1977)
43.52	0.39	7.62	13.07	29.25	6.16	100	Morgan et al. (1978) (model 4B, CI value of Mg/Si assumed)
44.98	0.30	4.22	13.96	32.83	3.71	100	Ringwood (1979)
48.63	0.40	5.02	12.96	29.14	3.85	100	Buck and Toksoz (1980)
44.50	0.18	3.78	12.71	35.66	3.16	100	Wanke and Dreibus (1982)
44.79	0.31	6.19	11.04	33.02	4.64	100	Taylor (1982)
41.70	0.19	4.16	10.32	40.30	3.33	100	Delano and Lindsey (1983)
42.52	0.19	3.69	13.57	37.03	2.99	100	Jones and Delano (1989)
45.90	-	4.60	13.10	32.60	3.80	100	Wanke and Dreibus (1986)
43.47	0.30	3.74	12.32	37.13	3.05	100	Ringwood et al. (1987)
44.83	0.19	3.92	12.46	35.28	3.32	100	O'Neill (1991)
49.90	-	6.90	10.80	27.50	4.90	100	Kuskov (1997)
50.00	-	6.30	10.40	28.50	4.80	100	Kuskov and Kronrod (1998) Model I
48.50	-	5.90	11.70	29.60	4.30	100	Kuskov and Kronrod (1998) Model II
43.75	0.30	6.05	13.10	32.26	4.54	100	Taylor (1999)
47.17	0.18	3.90	9.31	36.35	3.08	100	Warren (2005) (Mg/Si = 1.1*CI)
47.20	0.18	3.90	9.32	36.31	3.09	100	Warren (2005) (Mg/Si = 1.1*CI, excluding 1.2 wt.% core)
47.42	0.17	3.63	9.37	36.53	2.88	100	Warren (2005) (Th = 65 ppb)
48.72	0.18	3.90	9.00	35.11	3.09	100	Warren (2005) (Mg/Si = 1.03*CI)
45.69	0.18	3.90	9.61	37.52	3.09	100	Warren (2005) (Mg/Si = 1.17*CI)

47.73	0.18	3.91	8.36	36.73	3.09	100	Warren (2005) (MgO/FeO = 4.4)
46.50	0.18	3.90	10.53	35.80	3.09	100	Warren (2005) (MgO/FeO = 3.4)
48.64	0.17	3.62	10.70	34.01	2.87	100	Warren and Dauphas (2014)
45.43	0.20	4.49	8.13	38.16	3.58	100	Hauri et al. (2015)
46.09	**0.24**	**4.70**	**11.28**	**34.01**	**3.72**	**100**	**Average**
2.21	**0.07**	**1.16**	**1.80**	**3.31**	**0.83**		**Standard Deviation (1σ)**

Table S3. Values of observed lunar mass and normalized moment of inertia used to determine model misfit (Williams et al., 2014). The average of the published bulk silicate Moon compositions along with the 1σ standard deviation show in Table S2.

(A)	**Mass**	**MOI**	**Radius**
Value	7.34630e22 kg	0.392728	1,738 km
Standard Error	0.00088e22 kg	0.000012	

(B)	**SiO_2**	**TiO_2**	**Al_2O_3**	**FeO**	**MgO**	**CaO**
Average (weight %)	46.09	0.24	4.70	11.28	34.01	3.72
Standard dev (weight %)	2.21	0.07	1.16	1.80	3.31	0.83

Table S4. ASPECT Model parameters.

Parameters	**Value**
Thickness of the ilmenite-rich layer	30 km
Inner radius of 2D spherical shell	330 km
Outer radius of 2D spherical shell	1,670 km
Mantle density	3,400 kg m^{-3} [a]
Surface gravity acceleration	1.62 ms^{-2}
Mantle thermal expansion coefficient	2E-5 K^{-1}
Mantle thermal conductivity	3.0 W m^{-1} K^{-1}
Mantle specific heat capacity	1,000 J kg^{-1} K^{-1}
Surface temperature	250 K
Reference temperature	1,600 K [a]
Mantle viscosity	1.0^{21} Pa s[a]
Thermal viscosity exponent	9.0
Ilmenite-rich layer density	3,790 kg m^{-3}
Composition viscosity prefactor	1E-3
Radiogenic heating rate	8.4927E-12 W/kg

[a](*Laneuville et al.*, 2014)

Table S5. Full Summary of layer thickness constraints.

Summary of layer thickness constraints under 2σ (G, BC) and 3σ (Combined, 3σ to include sufficient population size) for all model subclasses. Thickness ranges (Δd, *km*) and volumes (*km*^{3}) are tabulated and compared with the original ranges tested in Table 1 for the best fitting models. The reduced normalized range is 1 minus the normalized difference between the best fit Δd ranges and the maximum extent of the original. Since the reduced normalized ranges are relative to the same initial values, they indicate which *RMSND* values provide the best constraints of individual layers. More reduction from the initial range equals a lower % value. Model counts can be found in supplemental text S2.

Layer Name	***G-RMSND* Range Δd (*km*)**	**Reduced Normalized Range (%)**	***BC-RMSND* Range Δd (*km*)**	**Reduced Normalized Range (%)**	***Comb-RMSND* Range Δd (*km*)**	**Reduced Normalized Range (%)**
Inner Core	0 – 320	53%	0 – 598	100%	8 – 341	56%
Outer Core	43 – 338	49%	0 – 512	85%	1 – 338	56%
Lower Ilmenite	1 – 489	98%	0 – 480	96%	2 – 308	61%
Lower Mantle	13 – 974	57%	0 – 1,435	85%	15 – 999	58%
Mid Mantle	0 – 1,002	59%	0 – 1,391	82%	4 – 923	54%
Upper Mantle (CS:1,2,3)	0 – 883	52%	0 – 1,391	82%	0 – 863	51%
Upper Ilmenite	1 – 57	3%	0 – 25	1%	2 – 24	1%
Total Core	**234 – 401**	**14%**	**0 – 874**	**73%**	**269 – 387**	**10%**
Total Mantle	**926 – 1,352**	**25%**	**788 – 1,691**	**53%**	**1,093 – 1,352**	**15%**
	vol. (*km*^{3})		**vol. (*km*^{3})**		**vol. (*km*^{3})**	
Lower Ilmenite Volume	0 – 1.6e9	12%	0 – 8.8e8	7%	0 – 7.7e8	6%
Upper Ilmenite Volume	0 – 2.0e9	22%	0 – 8.9e8	4%	0 – 8.5e8	4%
Total Ilmenite Volume	**1.5e8 – 2.9e9**	**13%**	**2.2e8 – 9.0e8**	**3%**	**1.5e8 – 1.0e9**	**4%**

See Text S1 for Table S6.

Table S7 is uploaded separately

Supplemental Figures

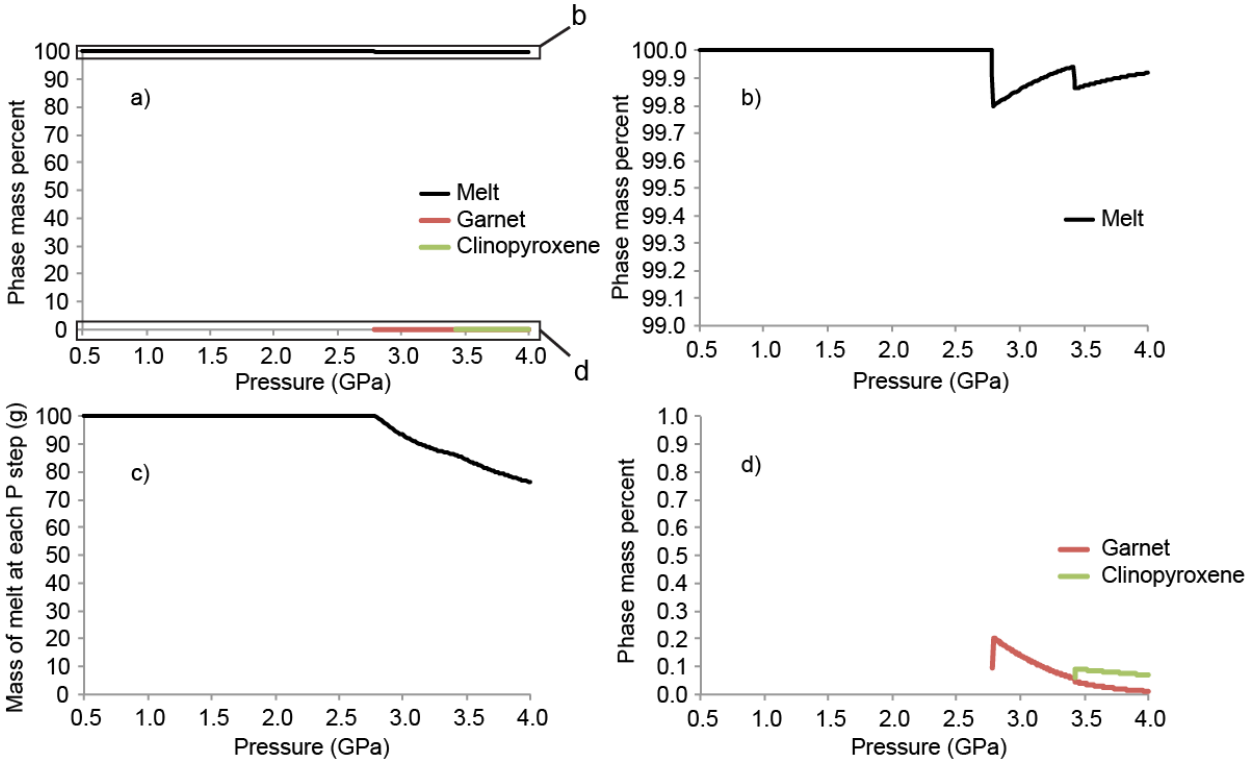


Figure S1. Mass of phases at each pressure step during sinking of Ti-rich partial melt through the lunar mantle at 1450 °C, without assimilating the surrounding mantle. The process is buffered at IW. a) Melt, garnet and clinopyroxene masses at each pressure. b) Magnification of box labeled 'b' in sub-panel a). c) Mass of melt at each pressure step. The mass of melt decreases deeper than 2.5 GPa due to saturation of garnet and/or clinopyroxene at the liquidus. d) Magnification of the box labeled 'd' in sub-panel a). The mass of phases at 1250 °C and 1350 °C as well as the composition of all the phases are available upon request to the corresponding author.

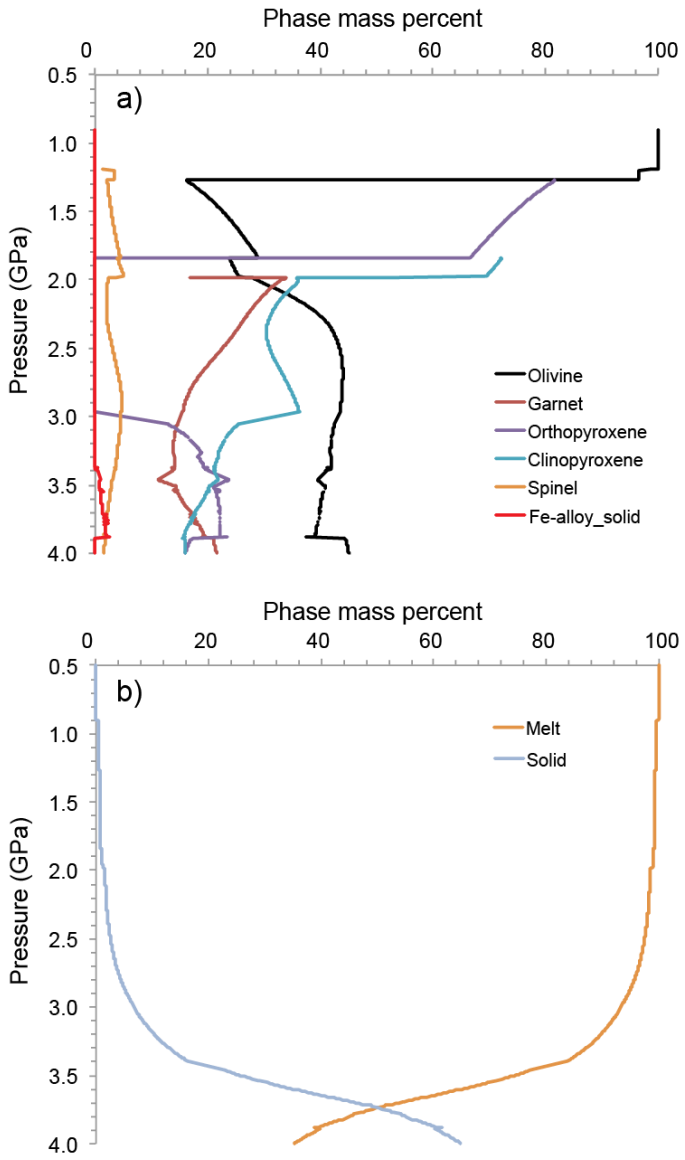


Figure S2. Percentage of mass of phases at each pressure step for assimilation of 2 g of mantle buffered at IW, for isothermal sinking of Ti-rich melt through the lunar mantle at 1450 °C. a) Mass percent of solid phases b) Mass percent of melt versus total solid phases. The solid phases formed at each pressure step are fractionated, and the residual melt after fractionation makes its way to the next pressure step where it is assimilated by 2 g of lunar mantle. Around 1 GPa, the residual melt enters sub-liquidus field by crystallizing olivine at its liquidus. The phase equilibria due to assimilation of 50 and 100 grams of the mantle, as well as the composition of all the phases will be available upon request to the corresponding author.

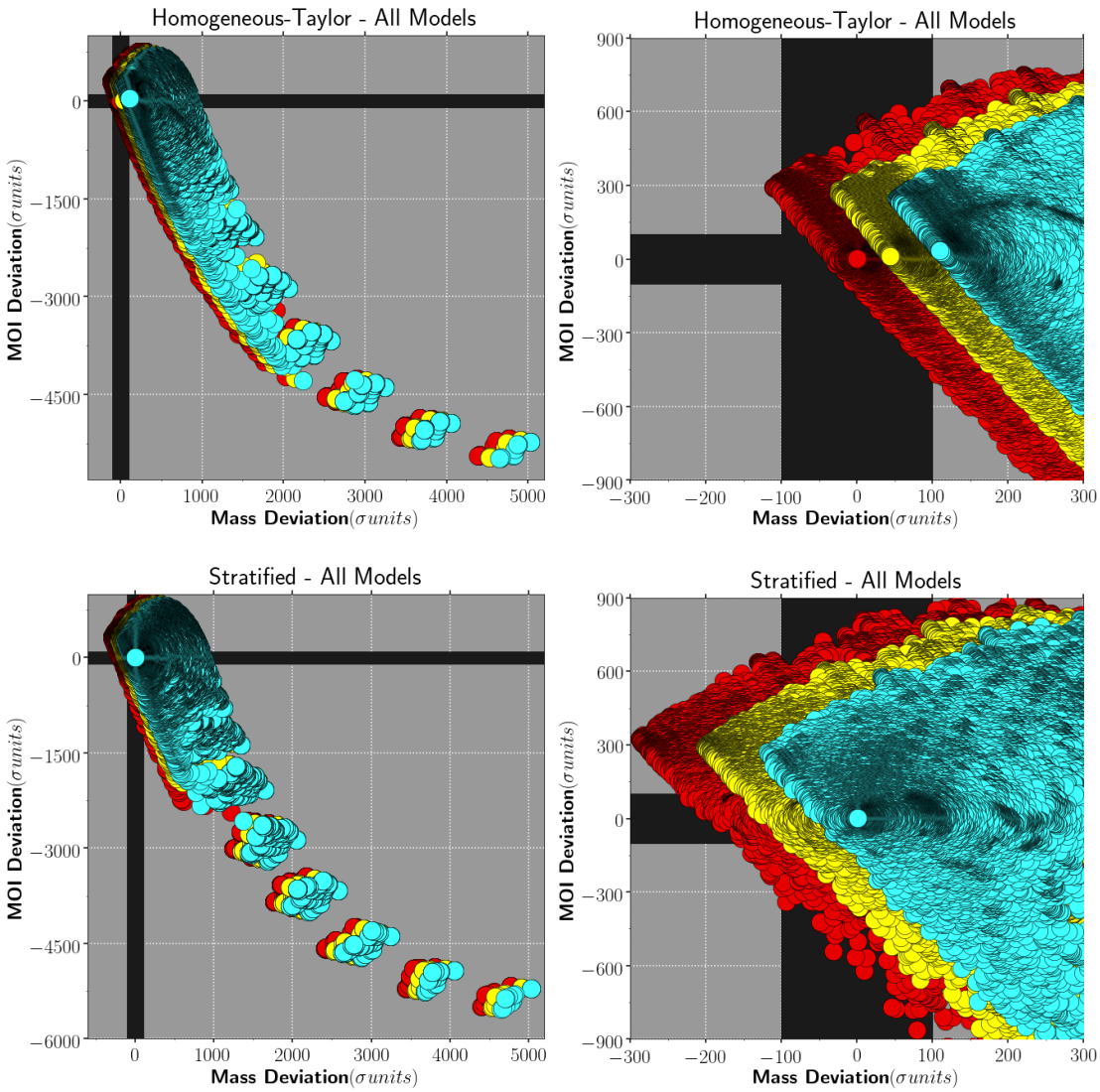
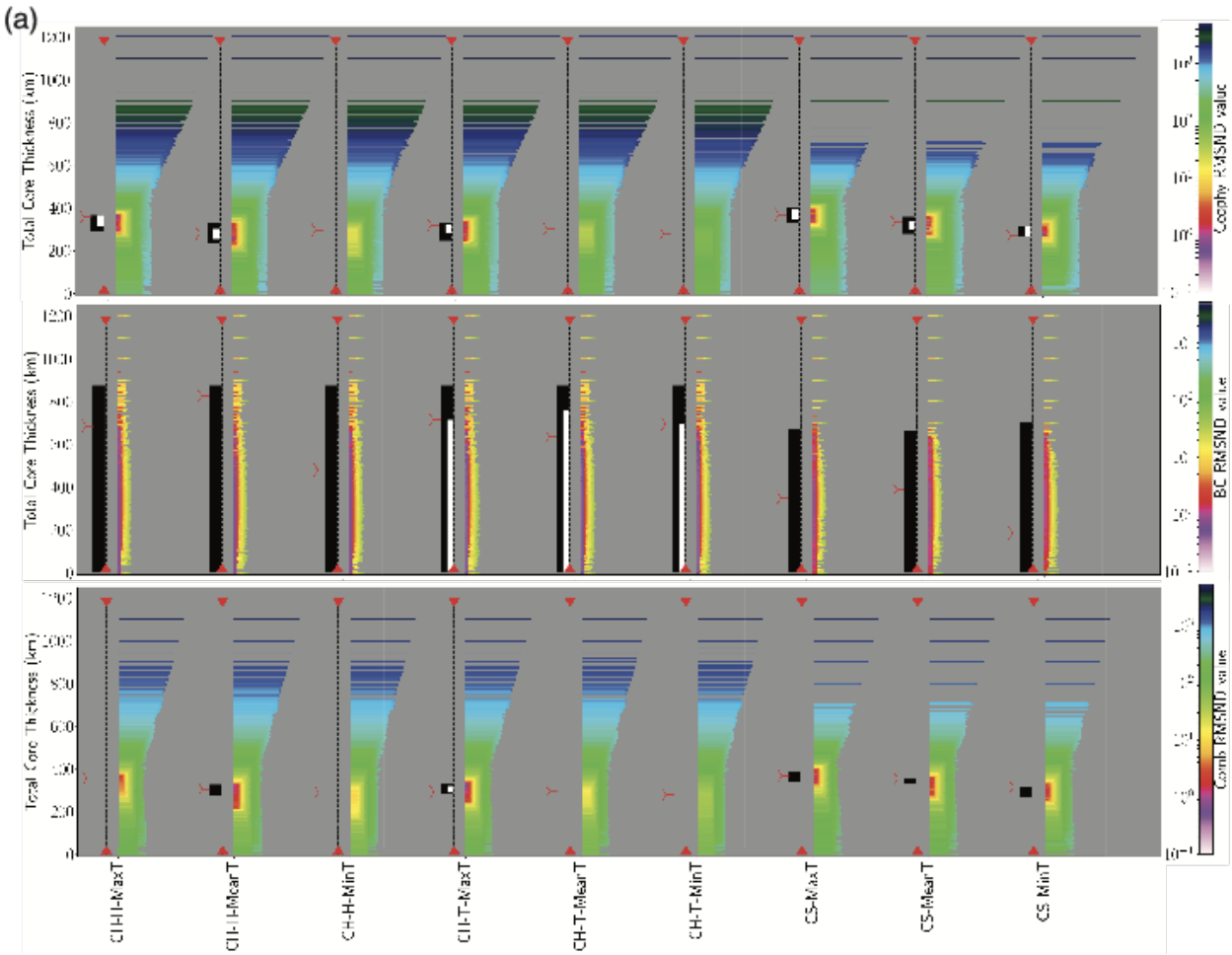
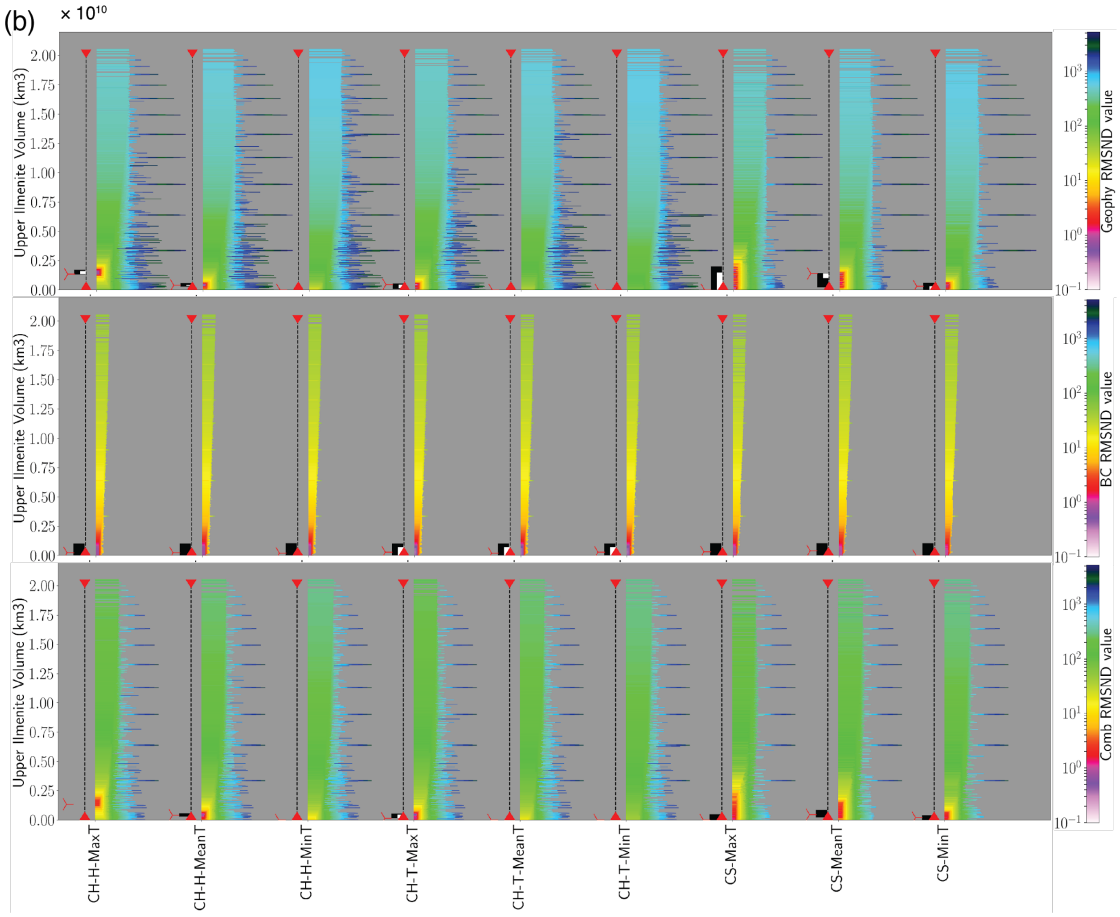


Figure S3. The influence of temperature is shown for the three subclasses for the CH-T (top panels) and CS (bottom panels) model classes for all models (left panels) and a zoomed window (right panels) as a function of the number of standard deviation misfits from observational Mass and MOI. Similar to Figure 3 (b), a systematic shift is visible where decreased model temperature corresponds to increased model mass, and is due to material densification with decreasing temperature. MaxT (red), MeanT (yellow), and MinT (cyan).


(a)
Total Core Thickness (km)
CH-H-MaxT
CH-H-MeanT
CH-H-MinT
CH-T-MaxT
CH-T-MeanT
CH-T-MinT
CS-MaxT
CS-MeanT
CS-MinT
Coothy RMSND value
BC RMSND value
Comb RMSND value


(b)
× 10¹⁰
Upper Ilmenite Volume (km3)
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Geophy RMSND value
BC RMSND value
Comb RMSND value
CH-H-MaxT
CH-H-MeanT
CH-H-MinT
CH-T-MaxT
CH-T-MeanT
CH-T-MinT
CS-MaxT
CS-MeanT
CS-MinT

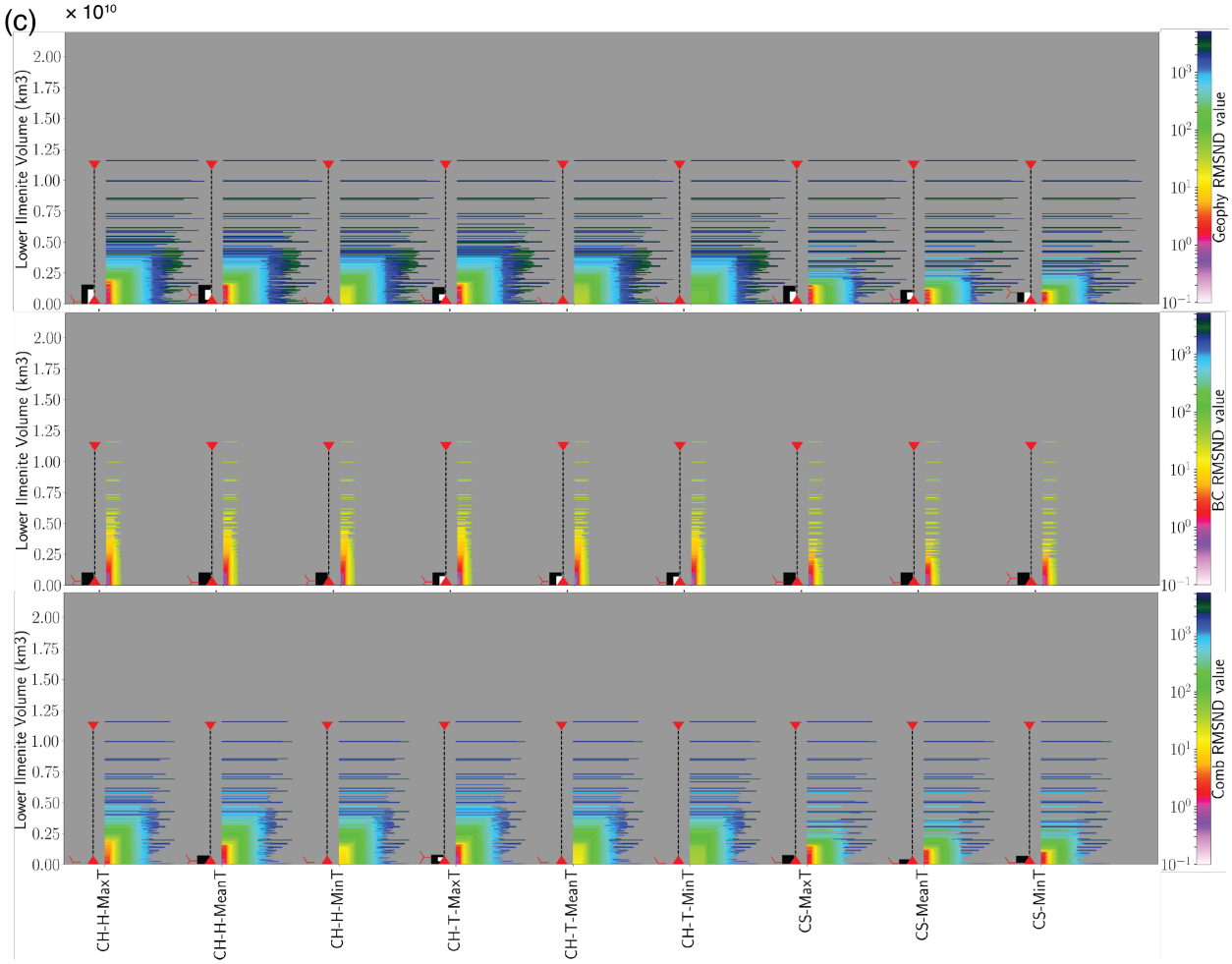

(c)
× 10¹⁰
Lower Ilmenite Volume (km3)
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Geophy RMSND value
BC RMSND value
Comb RMSND value
10^3
10^2
10^1
10^0
10^{-1}
CH-H-MaxT
CH-H-MeanT
CH-H-MinT
CH-T-MaxT
CH-T-MeanT
CH-T-MinT
CS-MaxT
CS-MeanT
CS-MinT

Figure S4 (d): Total Ilmenite Volume

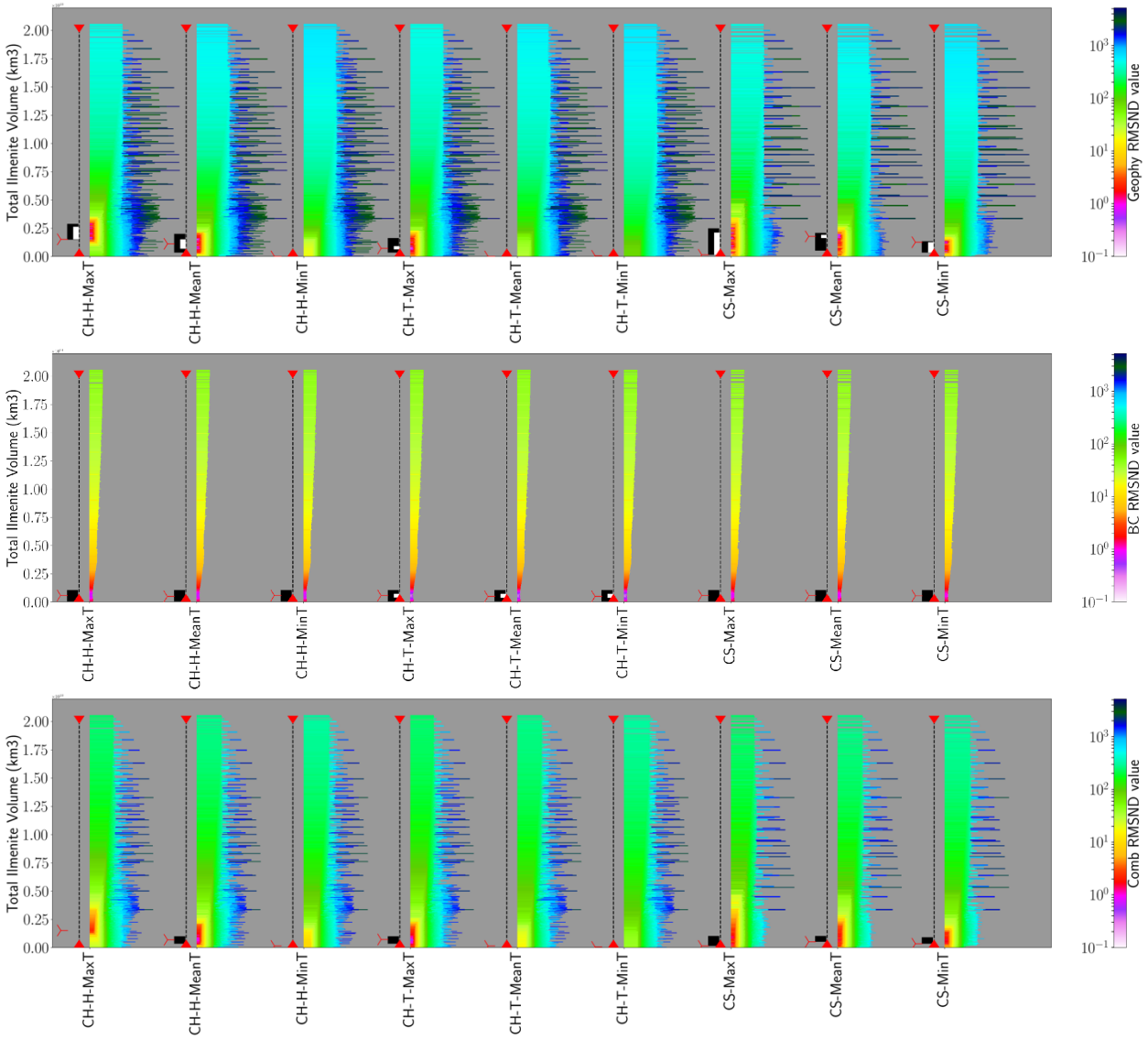


Figure S4. Enhanced box-and-whisker plots of the Total Core thickness (a), upper ilmenite-rich layer volume (b), and lower ilmenite-rich layer volume (c), and Total Ilmenite Volume (d), for all model subclasses (as labeled on x-axis). Each sampled lunar candidate model plots as a left-justified line where the length and color are vary according to the model's G-RMSND (top panels), BC-RMSND (middle panels), and Comb-RMSND value (bottom panels). High RMSND values correspond to the longer horizontal lines, and low RMSND values to short lines. Low RMSND values are plotted on top of larger values. To the left of each column of scaled lines are the "simplified" ranges where the min/max sampled layer thickness (or volume) is shown by red triangles and connected by a black dotted line. The black and white boxes indicate that all components within the RMSND value are less than or equal to 1σ and 3σ (1 or 3 zscores) misfit, respectively. The best fit thickness (or volume) is

marked with a red arrow tail for each model subclass. For additional Box and Whisker plots, see Figure 7.

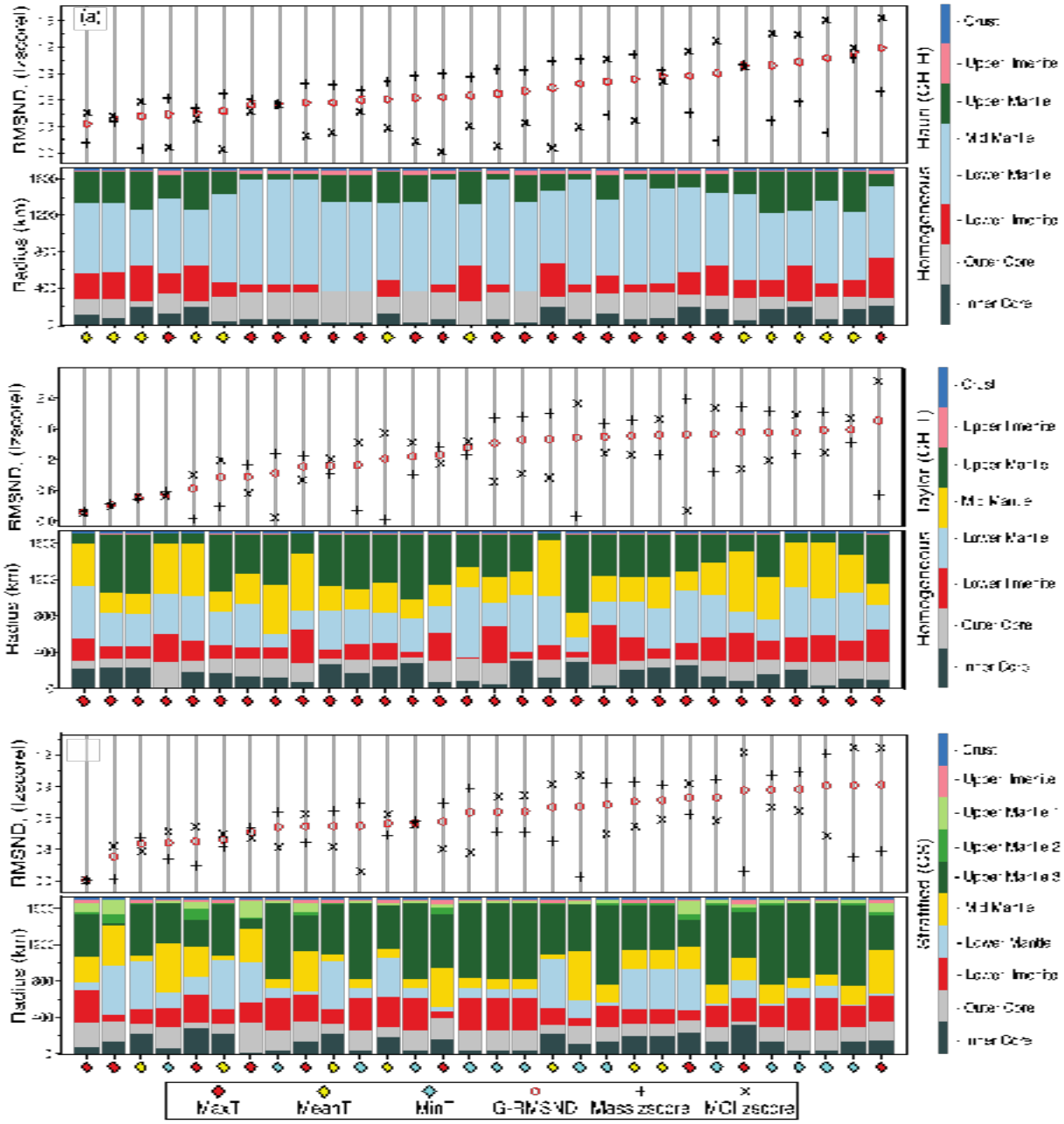


Figure S5. The top thirty best-fit models for (a) CH-H, (b) CH-T, and (c) CS model classes are compared in terms of deviations for Mass, MOI, and RMSND (top panel); and model stratigraphic structure with color coded layers (bottom panel). The stratigraphic legend is to the right of each set of panels. Diamonds along the x-axis indicate model temperature profile. Models are ordered by lowest G-RMSND. For compositional description of each layer, see Figure 1.

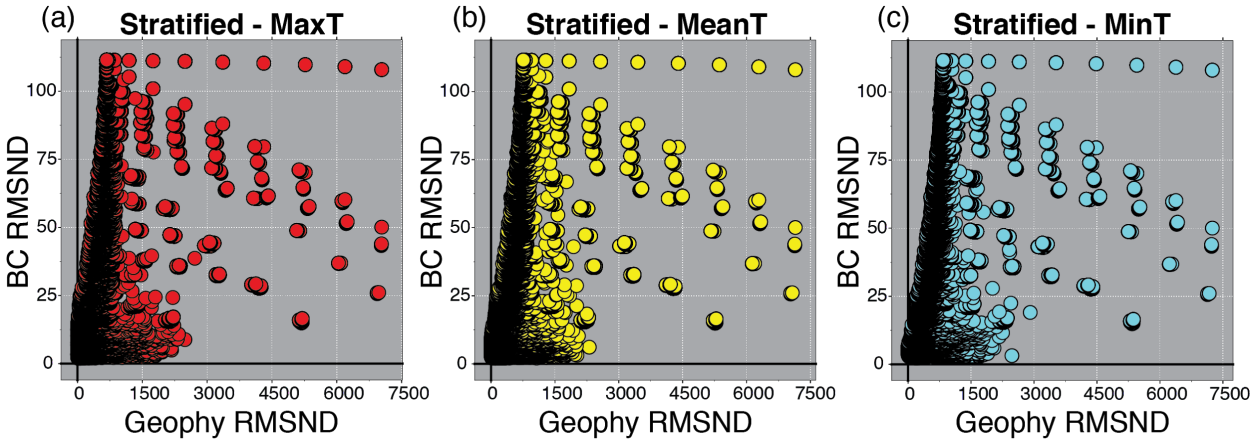


Figure S6. CS model class bulk chemistry RMSND compared to geophysical RMSND. Each circle represents a sampled lunar model candidate, and is colored according to thermal profile. For a given BC-RMSND value, sampled models span a wide range of G-RMSND values. However, the lowest G-RMSND values only correspond to low BC-RMSND values. Nearly equivalent distributions were observed for the CH-H and CH-T model classes.

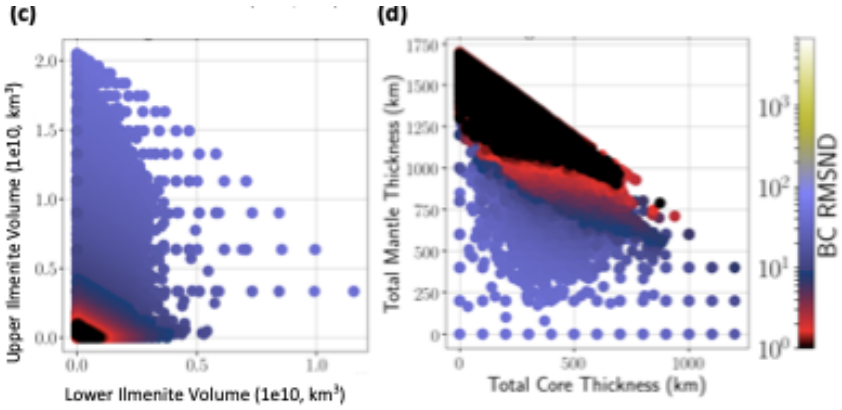


Figure S7. Layer trends are plotted for BC-RMSND values, see Figure 5e,f for G-RMSND results. The difference in patterns of the low RMSND values suggests that Mass and MOI provide better constraints of the Total Core size, but that the volume of ilmenite is better constrained with bulk composition.

See Text S1 for Figures S8, S9, S10, and S11.

Text S1. The sinking mechanism of an ilmenite-rich layer to the CMB as a partial melt

We found that an ilmenite-rich layer at the CMB today is consistent with, although not required by, the geochemical and geophysical constraints we applied. Additionally, we found that large volumes of ilmenite-rich material just beneath crust (upper ilmenite layer) penalize a model's fit to MOI and bulk chemistry constraints. Therefore, if a subcrustal ilmenite-rich layer existed post-LMO crystallization, then a significant fraction of the layer must have sunk into or through the mantle via some transport mechanism and remain stable over the lifetime of the Moon. However, we also observed that most of our best-fit models retained a small, but finite, volume of ilmenite just below the crust.

Here we explore the viability of potential mechanisms to transport ilmenite-rich material from the upper mantle of the early post-LMO crystallization to the CMB and whether it was possible to simultaneously retain a volume of ilmenite in the shallow mantle. We considered the early Moon in terms of composition and temperature profile and tested two end member cases: that ilmenite sinks as a melt, or as a solid. We begin with reviewing the proposed overturn processes (Section 1.1) Next, we present calculations of the density of melt of an ilmenite-rich layer at different depths in the mantle and consider the effect of possible assimilation of mantle material on the ability of ilmenite-rich partial melt to percolate to depth in the lunar mantle.We then assess the sinking and stability of this ilmenite-rich layer during mantle overturn and solid-state convection (Section S1.2) and draw conclusions (S1.3).

Text S1.1 Background: A review of Mantle Overturn Processes

Given that this study is motivated by the search for fingerprints of the overturn process in the present-day Moon, here we explore the details of LMO crystallization and overturn mechanisms, and their implications for a lunar dynamo. Pristine high-Ti ultramafic glasses acquired during the Apollo missions (Delano, 1986) imply Ti-enrichment within the lunar mantle. Phase equilibria experiments indicate that the high-Ti glasses found in basaltic lavas on the surface of the Moon are in equilibrium with a mantle assemblage as deep as 250 – 500 km (Delano, 1980; Green et al., 1975; Wagner & Grove, 1997). Such a deep source requires a mechanism which enrich portions of the lunar mantle in Ti. The most titaniferous layer formed during LMO fractional crystallization is an ilmenite-rich layer crystallized from the remnant liquid at a depth of ~100 km from the lunar surface, after ~95% crystallization of the LMO

(Elardo et al., 2011; Elkins Tanton et al., 2002; Snyder et al., 1992). Such an ilmenite-rich layer, estimated to be about 16% ilmenite and 84% clinopyroxene (Snyder et al., 1992), would have a density of 3.8 g/cm^3 as a solid, ~0.4-0.5 g/cm^3 denser than the underlying olivine+orthopyroxene-bearing mantle. Therefore, one mechanism for the sinking of an ilmenite-rich layer through the underlying mantle is solid-state advection driven by this density contrast. This would allow a shallow Ti-rich layer to sink to the deep mantle where it could later erupt to the surface as high-Ti lavas (Herbert, 1980; Hess & Parmentier, 1995; Ringwood & Kesson, 1976; de Vries et al., 2010). Alternatively, Elkins-Tanton et al. (2002) suggested that the high viscosity of this layer would prevent sinking as a solid. They suggested that the layer must have been partially molten and percolated through the underlying mantle. The layer could overturn while still in the partially molten state at the end of LMO crystallization (a possibility examined by Boukaré et al. (2018)) or could be heated by impact or radiogenic heating after MO solidification, resulting in partial melting and sinking of the partial melt through the underlying mantle (Elkins Tanton et al., 2002). Open questions still remain. The global extent of the LMO (Khan et al., 2014; Charlier et al., 2018, and references therein), the overturn sequence in terms of local small-scale or global large-scale transport mechanisms and the feasibility of such a mechanism for transporting ilmenite to the CMB is still unresolved (Borg et al., 2011; Dygert et al., 2016; Elkins Tanton et al., 2002; Li et al., 2019; Yu et al., 2019; Zhao et al., 2019).

Once a high-density (potentially partial-melt) layer has been produced at the CMB, the question arises as to its stability. Some studies suggest a partial melt layer would have a higher density than the surrounding mantle and so be stable at the CMB (Khan et al., 2014; Weber et al., 2011). Additionally, de Vries et al. (2010) showed ilmenite-rich cumulates can sink through the mantle and survive at the CMB during mantle convection using geodynamic simulations. They demonstrate this through analyzing a 2D convection model varying the density and internal heat production of the ilmenite-rich layer over 4.5 Ga. Recently, Mallik et al. (2019) evaluated the consequence of two possible scenarios: if the deep mantle partial melt is denser than the overlying mantle, the thermal state can be used to constrain the temperatures at the CMB; else, the partial melt could ascend reactively through the overlying mantle and contribute to the formation of mare basalts.

Text S1.1.1 Methods: Melt Calculations for an Early Moon

We test the hypothesis that a partial melt of an ilmenite-rich layer could sink to the CMB by percolation through the underlying mantle. We estimated the density of a partial melt composition of an ilmenite-rich layer as the melt sinks, using the Gibbs free energy minimization algorithm pMELTS (Ghiorso et al., 2002). We assumed that the melt sinks isothermally from 0.5 – 4 GPa (close to the pressure of CMB) across a range of lunar mantle temperatures from 1,200 – 1,450 °C. We allowed a fixed mass of mantle to be hybridized and assimilated by the melt as it sinks by porous reactive flow, as suggested by (Elkins Tanton et al., 2002), to capture two end member scenarios: (i) without the assimilation of the surrounding mantle, and (ii) continuously assimilating the surrounding mantle, maintaining equilibrium with the surrounding solid.

We chose the most Fe+Ti-rich partial melt composition of a modeled high-Ti cumulate composition (Van Orman & Grove, 2000) as our starting melt to equilibrate with our pMELTS modeled lunar mantle composition (Taylor, 1982) (see Table S6). We chose the most Fe+Ti-rich melt composition to estimate the maximum density contrast with the mantle and so place an upper limit on the ability of the melt to sink.

To validate the density of the titanium-rich melts calculated by pMELTS, we compared the densities of Apollo 14 black glass estimated by X-ray absorption (Sakamaki et al., 2010) and sink-float methods (Circone & Agee, 1996; Vander Kaaden et al., 2015) to the density of black glass estimated by pMELTS under the same range of pressure-temperature conditions (0.5 - 4 GPa, 1427 °C, 1430 °C, and 1827 °C; Figure S8 and S9). At 1427 °C, the densities from X-ray absorption, the sink-float method, and pMELTS, are nearly parallel to 2 GPa, at which point a kink in the calculated density curve develops due to the black glass crossing the liquidus at this depth. Such sub-liquidus conditions at ~2 GPa and 1427 °C are consistent with experimental phase equilibria of Apollo 14 black glass (Wagner & Grove, 1997). In contrast, the density as a function of depth of Sakamaki et al. (2010) at 1427 °C does not predict sub-liquidus conditions because density was measured by them at 1.19 GPa only and extrapolated to higher pressures using a Birch-Murnaghan equation of state. The density parameterization of Vander Kaaden et al. (2015) is based on sink-float experiments of Circone and Agee (1996) which were performed at temperatures higher than 1427 °C and at pressures greater than 1.5 GPa. This parameterization also linearly extrapolates for conditions above 1.5 GPa. The density of black glass estimated by

pMELTS agrees and lies within the density estimates of Vander Kaaden et al. (2015) and Sakamaki et al. (2010).

To simulate an open-system assimilation process, we used the fractional crystallization function in pMELTS to calculate the phase equilibria and densities of the melt and mantle from 0.5 – 4 GPa, at pressure steps of 0.005 GPa. While the mass of mantle assimilated at each pressure step was held constant within a run, the mass of mantle was varied across runs to test the effect of melt density on extent of mantle assimilation. The starting condition of the calculations was the Fe+Ti-rich partial melt at 0.5 GPa and fO_2 buffered at the iron to wüstite transformation (IW; within the range of oxygen fugacity conditions estimated for the lunar interior (Herd, 2008)). As the melt sank, it was equilibrated with 0 g, 2 g, 50 g, and 100 g of mantle mass (Figures S10) at each pressure step. When solid phases crystallized due to assimilation of mantle, the solids were fractionated *in-situ* such that only the residual melt proceeds to subsequent pressure steps, evolving the composition of the residual melt with depth. Three different calculations were run along mantle temperatures of 1250 °C, 1350 °C, and 1450 °C, see Figure S9.

Text S1.1.2. Results: Melt Calculations for an Early Moon

We find a crossover point between the density of modeled lunar mantle and the density of the melt at depth (Figure S10). Above the crossover, the melt is less dense than the mantle; thus, is positively buoyant. Below the crossover point, with increasing depth the melt becomes denser than the surrounding mantle, therefore, is negatively buoyant. This crossover depth occurs at ~180 km for the end member scenario of no mantle assimilation. Mantle assimilation increases the depth of the crossover, and with 50 g of mantle assimilation no crossover occurs and the melt remains positively buoyant over the depth range of our calculations. Therefore, in order for the ilmenite-bearing layer to percolate to depth as a melt, a mechanism is needed to transport the melt to depths below the crossover.

Can Fe+Ti-rich melt sink through the lunar mantle if it does not assimilate the surrounding mantle? Independent of temperature, the Fe+Ti-rich melt (without assimilating the mantle) is less dense than the surrounding mantle at shallow depths and is negatively buoyant relative to the lunar mantle between pressures of 1.6 - 1.8 GPa, or a depth of ~200 km (Figure S10). Therefore, an Fe+Ti-rich melt can sink through the lunar mantle due to negative buoyancy, possibly

accumulating at the base of the mantle. A major impact, such as during those during the Late Heavy Bombardment, can create a partially molten zone through sinking of Fe+Ti-rich melt as deep as 180-200 km (Morrison, 1998). This event would enable the Fe+Ti-rich partial melt of the ilmenite-rich layer to overcome the depth of the density barrier, after which it would sink to the CMB without impedance. Percolation may pose a limitation at low melt fractions.

Can Fe+Ti-rich melt sink through the lunar mantle if it does assimilate the surrounding mantle? With increasing proportion of mantle assimilation, the density of the residual melt initially sharply decreases with pressure, below which the melt density increases with depth (Figure S10a). This initial density decrease of the residual melt results from the dissolution of the assimilating mantle in the melt (causing a decrease in the TiO_2 and an increase in the Mg# of the melt composition; see Figure S10b and S10c and Table S6) because the condition is super-liquidus for the bulk composition of the Fe+Ti-rich melt and the assimilated mantle. The density decrease due to assimilation extends to 1.2 GPa (~200 km depth). At greater pressures, the melt density increases due to a combination of fractionation of mineral phases with depth (Figure S10) and the compressibility of the residual melt with increasing pressure. In the case of the lowest amount of mantle assimilation considered (2 *wt%* of mantle), the melt becomes negatively buoyant at 2.5 GPa, equivalent to a depth of 500 km. To our knowledge, no process can explain a mechanism to force the Fe+Ti-rich melt to reach such a deep density barrier. With 50-100 *wt%* of mantle assimilation, the residual melt is positively buoyant relative to the mantle at all pressures, implying that such a residual melt would never sink through the mantle. Thus, significant mantle assimilation in a Fe+Ti-rich melt inhibits the sinking of melt through the lunar mantle.

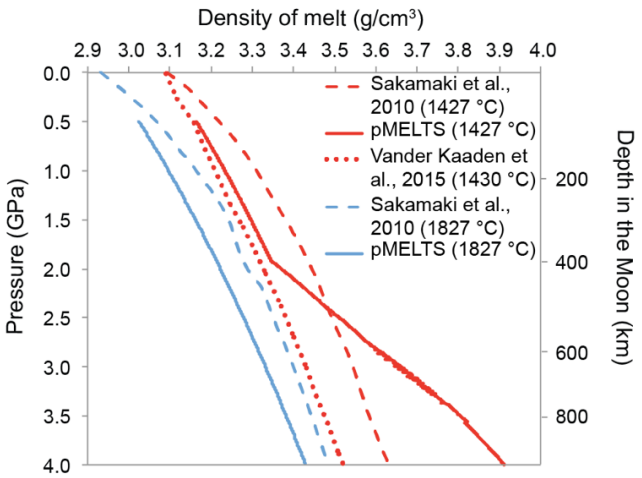


Figure S8. Density profiles of Apollo 14 black glass estimated by X-ray absorption technique (*Sakamaki et al.*, 2010) compared to density profiles of the high Fe+Ti-composition as calculated in pMELTS in Table S5.

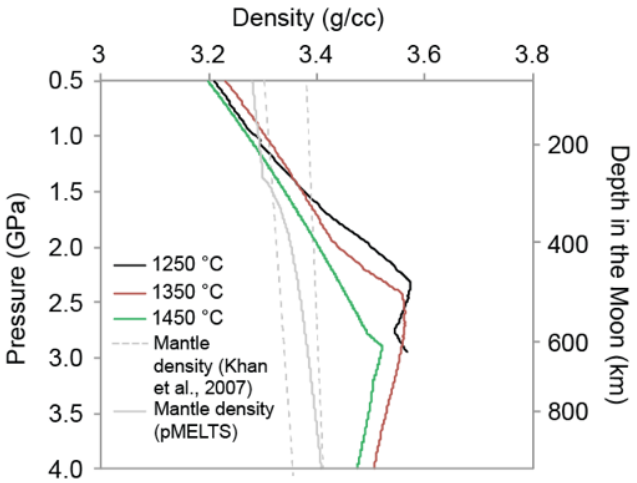


Figure S9. Density of isothermal Ti-rich melts as a function of pressure (left), or depth (right), at 1250 °C (black), 1350 °C (red), and 1450 °C (green), calculated by pMELTS. Melt composition starts at 0.5 GPa. Solid phases formed along the liquidus due to increasing pressure are fractionated before the next pressure step. The range of lunar mantle densities estimated by Khan et al. (2007) (gray dashed lines) bracket the mantle density estimated by pMELTS (solid gray line).

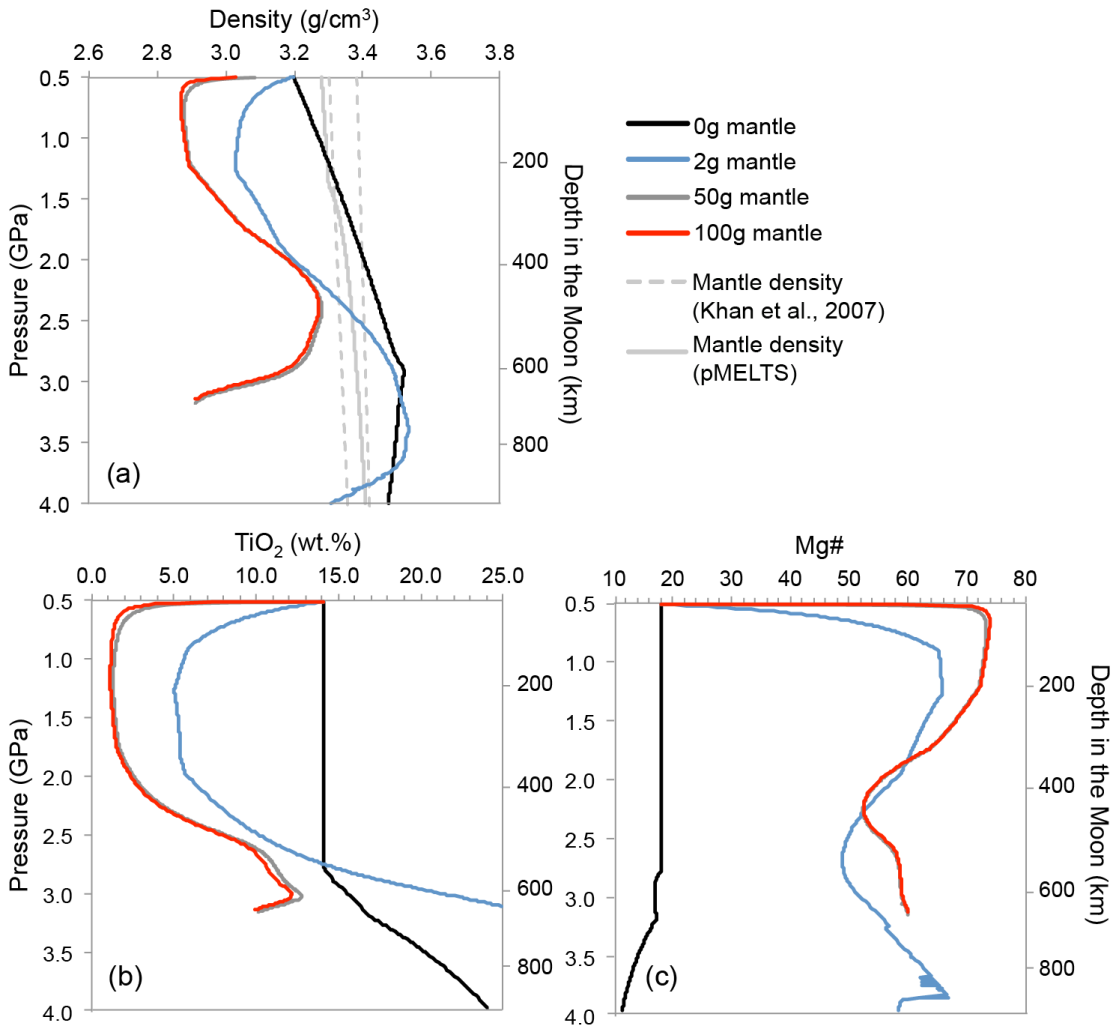


Figure S10. (a) Density of Fe+Ti-rich melts at 1450 °C, buffered at IW, for 0 g (black), 2 g (blue), 50 g (dark grey), and 100 g (red) of mantle assimilated with 100 g of Fe-Ti rich partial melt at each pressure-step of 0.005 GPa from 0.5 to 4 GPa. The composition of the Fe+Ti-rich melt at the starting pressure of 0.5 GPa is the same as reported in Table 1. See Figure S8-S9 for additional melt descriptions of this process. (b) TiO_2 concentration in weight percent, and (c) Mg# [molar MgO/(molar MgO+ molar FeO)×100] of Fe+Ti-rich melts at 1450 °C, buffered at IW, for 0 wt% (black), 2 wt% (blue), 50 wt% (dark grey), and 100 wt% (red) of mantle assimilated at each pressure-step of 0.005 GPa from 0.5 to 4 GPa. The composition of the Fe+Ti-rich melt at the starting pressure of 0.5 GPa is the same as reported in Table S5.

Table S6. Starting compositions used in modeling sinking of a Ti-rich partial melt through the lunar mantle.

Oxide	Ti-rich partial melt (wt. %)[a]	Lunar mantle (wt. %)[b]
SiO_2	36.70	44.40
TiO_2	14.20	0.31
Al_2O_3	4.00	6.14
Cr_2O_3	-	0.61
FeO	32.20	10.90
MnO	-	0.15
MgO	3.98	32.70
CaO	9.15	4.60
Na_2O	-	0.09
K_2O	-	0.01

[a] Partial melt of modeled Ti-rich cumulate from van Orman and Grove (2000). The melt was generated at 1.8 GPa, 1290 °C.
[b] Taylor (1982)

Text S1.2.1. Discussion: Impacts as a Melt Transport Mechanism

One potential mechanism to overcome this density barrier is for the Fe+Ti-rich material to be mechanically forced to higher pressures during cratering events. Material below the impact point is pushed deeper into the mantle during the formation of the transient crater, although often only momentarily before rebounding. The impact shock wave could also provide energy to re-melt an ilmenite layer. In order to allow percolation of ilmenite-rich melt to the CMB, material must have remained at pressures greater than the crossover pressure after the impact, either by permanent depression of material layers or by mixing with material deeper in the mantle, e.g., by Kelvin-Helmholtz instabilities. However, it is unlikely that impacts alone can transport enough ilmenite-rich material to depth to produce the proposed 150 km thick partially molten layer at the

CMB. It would require all impacts that produced craters >200 km (Head et al., 2010) to transport 50% of the ilmenite-rich-layer below the crater to pressures in excess of the density crossover for long enough for those melts to percolate deeper into the mantle. This is a highly unlikely scenario and so we discount impacts as a potential transport mechanism.

Text S1.2.2. Sinking of an Ilmenite-Rich Layer to the CMB as a Solid

Text S1.2.2.1 Methods: Convection Modeling

Another possible mechanism for transport of ilmenite-rich material to the CMB is by solid-state mantle convection. Here we study the physical process and rheology of mantle overturn, as well as the stability of a solid dense Fe+Ti-rich layer after overturn, using the ASPECT mantle convection code version 1.1 (http://aspect.dealii.org) (Kronbichler et al., 2012), see Table S4. We simulated a 2D annulus with a core radius of 330 km and a homogeneous mantle with the exception of an initially sub-crustal ilmenite layer. The initial density and thermal profile were set to the post-differentiation and solidification of the early magma ocean, i.e. ~0.2 Ga after formation of the Moon occurring at t = 0 Ga within our simulation. The simulation tested the persistence of the ilmenite-rich layer to the present day, ~4 Ga. ASPECT was originally created for the Earth where gravity is considered constant within the mantle. This is not the case for the Moon with a much smaller core. Therefore, we developed two new plugins for ASPECT to capture the physics of the mantle dynamics for this project: (1) a gravity function to calculate the changing lunar gravity over the mantle depths; and (2) boundary temperatures that vary with position and time. The latter was employed in the lower boundary temperature setting, such that the temperature of the core decreases with time. A list of all ASPECT model parameters is provided in Table S4.

The initial state was set to the post-differentiation and solidification of the early magma ocean, i.e. ~0.2 Ga after formation of the Moon occurring at 0 Ga in our model. The model started with a crustal ilmenite-rich dense layer (3,790 kg/m^3) at the top of the mantle at 1,640 km radius or 30 km thickness considering geometric effects. These capture the rheology of the crustal ilmenite-rich layer. We used a temperature-dependent viscosity of the form, $\eta(T) = \eta_0 \exp(\beta(T - T_0)/T_0)$, where β is the thermal viscosity exponent (we used β=9), and η_0 is the

reference viscosity at the reference temperature T_0. For the bulk mantle, we used a reference viscosity of 10^{21} Pa·s, density of 3400 kg/m^3, and temperature of 1600 K (*Laneuville et al.*, 2014). The lunar surface gravitational acceleration is g = 1.62 m/s^2. Gravity linearly decreased with depth: g = 1.58 m/s^2 at the top of the mantle, and g = 0.86 m/s^2 at the CMB. The boundary conditions for a hot early Moon are 1,673.15 K and 1,708.15 K at the top of the mantle and CMB, respectively. The ilmenite-rich layer contained a viscosity pre-factor of 10^{-3} Pa·s. This is lower than purposed in previous estimates (Elkins Tanton et al., 2002) and consistent with recent laboratory studies of dislocation creep flow laws (Dygert et al., 2016).

The CMB temperature decreased with time and was assumed to cool linearly. The time dependence was set such that the core reaches the estimated modern CMB temperature (1673.15 K) (Gagnepain-Beyneix et al., 2006) at current day. This is consistent within the selenotherms used in this project, see Figure 2. The initial CMB temperature decreased linearly with time as the core cooled. Following *Hagerty et al.*, (2006) for the estimated abundance of heat-producing elements within the lunar mantle, including a concentration of 0.039 ppm U, 0.15 ppm Th, and 212 ppm K, we estimated a radiogenic heating rate of 8.5e-12 W/kg. Adiabatic heating and heating from shear friction were considered negligible. The boundary conditions were free slip both at the surface and the CMB. We used a globally refined mesh without adaptive refinement.

Text S1.2.2.2 Results: Convection Modeling

The ASPECT lunar convection model shows that a dense, near-surface ilmenite-rich layer is gravitationally unstable and sinks toward the CMB on a timescale of ~100 Myr (Figure S11). We do not see any remnant of the original layer remaining at the top of the mantle after 4 Ga. The model shows some mixing of the dense ilmenite rich layer with mantle material; however, the majority sinks to form a ~150 km thick layer at the CMB with density of 3,435 kg/m^3 (Figure S11f, red colored layer) that persists throughout the 1 Ga of the model calculation. This confirms that the ilmenite-rich layer need not be partially molten during sinking to the CMB, contrary to Elkins-Tanton et al. (2002), and the viscosity of the solid ilmenite-rich layer is low enough for down dwellings to form. Longer runs (>1 Myr) also confirm the long term stability of the ilmenite layer at the CMB.

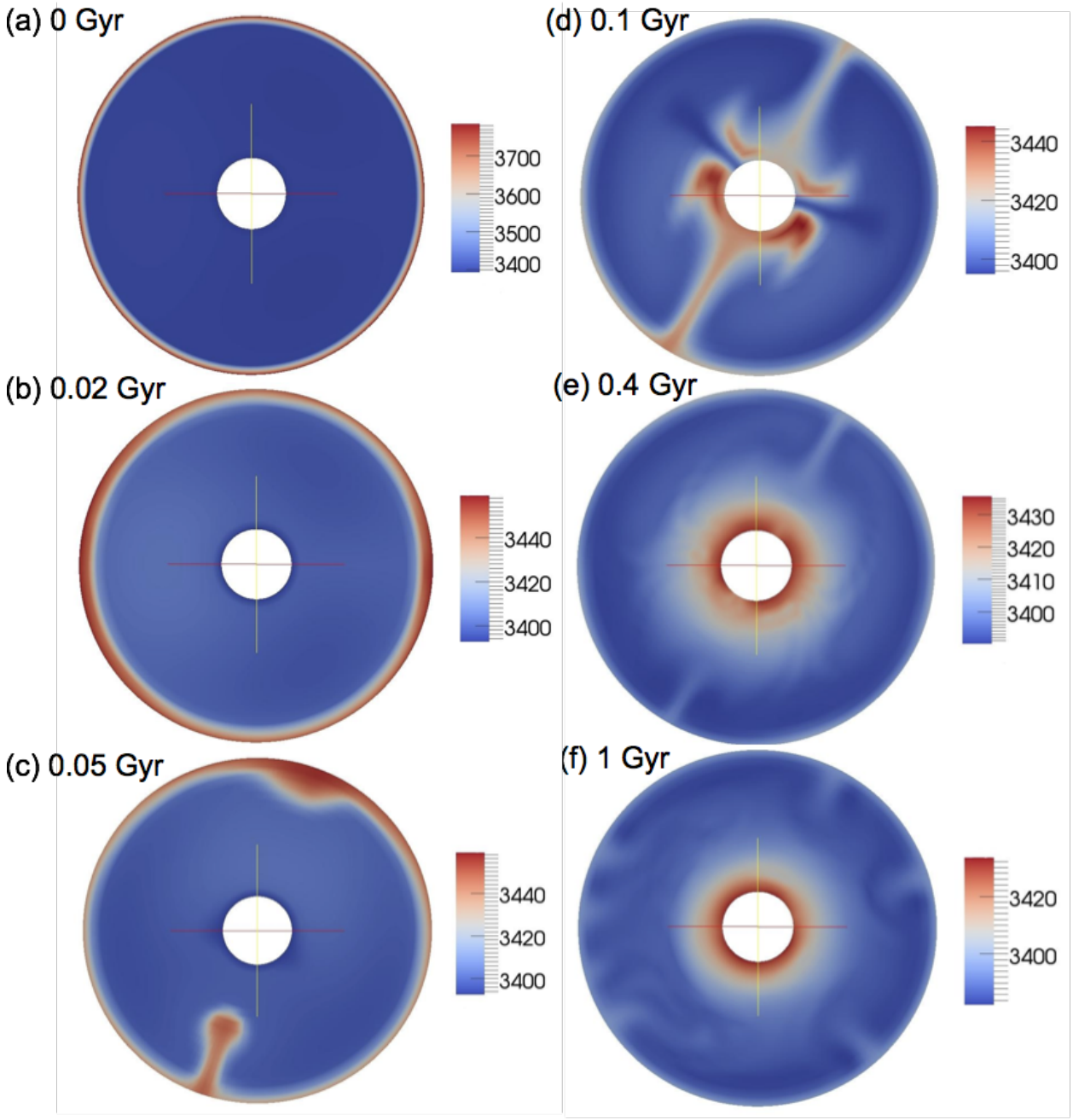


Figure S11. Snapshots of the 2D lunar mantle convection model presenting sections of density (given in kg/m^3). Initially, an ilmenite-rich layer with a thickness of 30 km is set on top of the mantle at radius of 1,640 km. Note the different color scales used at each time.

Text S1.3 Discussion

We find that both scenarios of no assimilation and impacts associated with high burial efficiency are unlikely to lead to the sinking of a partially molten, upper ilmenite-rich layer.

However, we observe that the upper ilmenite can sink as a solid during lunar mantle overturn (Section *S1.2.2.2*). Given that the viscosity of the ilmenite-rich layer is lower than olivine-rich mantle (Dygert et al., 2016), it is unnecessary to assume that viscosity is a constraint to downwelling in its solid state (Figure S11). After sinking, the ilmenite-rich layer at the CMB is found to be stable, at least up to 1 Ga since the onset of overturn. Therefore, our study affirms that the upper ilmenite can sink into the lower mantle, in accordance with the mantle overturn discussed in previous studies (Hess & Parmentier, 1995; Li et al., 2019; de Vries et al., 2010; Yu et al., 2019; Zhong et al., 2000).

Text S2. Model Count List by Subclass and Sigma

Text S2.1 Geophysics RMSND – CH-Hauri

39197 PassedModels_ModelA_Hauri_maxT_100000_sig-EQV-RMSND_geophy.dat
35077 PassedModels_ModelA_Hauri_maxT_1000_sig-EQV-RMSND_geophy.dat
4837 PassedModels_ModelA_Hauri_maxT_100_sig-EQV-RMSND_geophy.dat
620 PassedModels_ModelA_Hauri_maxT_10_sig-EQV-RMSND_geophy.dat
890 PassedModels_ModelA_Hauri_maxT_12_sig-EQV-RMSND_geophy.dat
1368 PassedModels_ModelA_Hauri_maxT_15_sig-EQV-RMSND_geophy.dat
11 PassedModels_ModelA_Hauri_maxT_1_sig-EQV-RMSND_geophy.dat
1982 PassedModels_ModelA_Hauri_maxT_20_sig-EQV-RMSND_geophy.dat
2352 PassedModels_ModelA_Hauri_maxT_25_sig-EQV-RMSND_geophy.dat
24 PassedModels_ModelA_Hauri_maxT_2_sig-EQV-RMSND_geophy.dat
63 PassedModels_ModelA_Hauri_maxT_3_sig-EQV-RMSND_geophy.dat
21259 PassedModels_ModelA_Hauri_maxT_500_sig-EQV-RMSND_geophy.dat
3564 PassedModels_ModelA_Hauri_maxT_50_sig-EQV-RMSND_geophy.dat
154 PassedModels_ModelA_Hauri_maxT_5_sig-EQV-RMSND_geophy.dat
405 PassedModels_ModelA_Hauri_maxT_8_sig-EQV-RMSND_geophy.dat

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36217 PassedModels_ModelA_Hauri_meanT_1000_sig-EQV-RMSND_geophy.dat
4891 PassedModels_ModelA_Hauri_meanT_100_sig-EQV-RMSND_geophy.dat
619 PassedModels_ModelA_Hauri_meanT_10_sig-EQV-RMSND_geophy.dat
874 PassedModels_ModelA_Hauri_meanT_12_sig-EQV-RMSND_geophy.dat
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19 PassedModels_ModelA_Hauri_meanT_2_sig-EQV-RMSND_geophy.dat
50 PassedModels_ModelA_Hauri_meanT_3_sig-EQV-RMSND_geophy.dat
19771 PassedModels_ModelA_Hauri_meanT_500_sig-EQV-RMSND_geophy.dat
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409 PassedModels_ModelA_Hauri_meanT_8_sig-EQV-RMSND_geophy.dat

46679 PassedModels_ModelA_Hauri_minT_100000_sig-EQV-RMSND_geophy.dat
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0 PassedModels_ModelA_Hauri_minT_3_sig-EQV-RMSND_geophy.dat
23086 PassedModels_ModelA_Hauri_minT_500_sig-EQV-RMSND_geophy.dat
2126 PassedModels_ModelA_Hauri_minT_50_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Hauri_minT_5_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Hauri_minT_8_sig-EQV-RMSND_geophy.dat

Text S2.2 Geophysics RMSND – CH-Taylor

40811 PassedModels_ModelA_Taylor_maxT_100000_sig-EQV-RMSND_geophy.dat
36715 PassedModels_ModelA_Taylor_maxT_1000_sig-EQV-RMSND_geophy.dat
5527 PassedModels_ModelA_Taylor_maxT_100_sig-EQV-RMSND_geophy.dat
631 PassedModels_ModelA_Taylor_maxT_10_sig-EQV-RMSND_geophy.dat
955 PassedModels_ModelA_Taylor_maxT_12_sig-EQV-RMSND_geophy.dat
1555 PassedModels_ModelA_Taylor_maxT_15_sig-EQV-RMSND_geophy.dat
5 PassedModels_ModelA_Taylor_maxT_1_sig-EQV-RMSND_geophy.dat
2499 PassedModels_ModelA_Taylor_maxT_20_sig-EQV-RMSND_geophy.dat
3223 PassedModels_ModelA_Taylor_maxT_25_sig-EQV-RMSND_geophy.dat
14 PassedModels_ModelA_Taylor_maxT_2_sig-EQV-RMSND_geophy.dat
36 PassedModels_ModelA_Taylor_maxT_3_sig-EQV-RMSND_geophy.dat
21669 PassedModels_ModelA_Taylor_maxT_500_sig-EQV-RMSND_geophy.dat
4435 PassedModels_ModelA_Taylor_maxT_50_sig-EQV-RMSND_geophy.dat
137 PassedModels_ModelA_Taylor_maxT_5_sig-EQV-RMSND_geophy.dat
386 PassedModels_ModelA_Taylor_maxT_8_sig-EQV-RMSND_geophy.dat

44871 PassedModels_ModelA_Taylor_meanT_100000_sig-EQV-RMSND_geophy.dat
40298 PassedModels_ModelA_Taylor_meanT_1000_sig-EQV-RMSND_geophy.dat
4629 PassedModels_ModelA_Taylor_meanT_100_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_10_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_12_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_15_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_1_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_20_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_25_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_2_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_3_sig-EQV-RMSND_geophy.dat
22716 PassedModels_ModelA_Taylor_meanT_500_sig-EQV-RMSND_geophy.dat

88 PassedModels_ModelA_Taylor_meanT_50_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_5_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_meanT_8_sig-EQV-RMSND_geophy.dat

49801 PassedModels_ModelA_Taylor_minT_100000_sig-EQV-RMSND_geophy.dat
44672 PassedModels_ModelA_Taylor_minT_1000_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_100_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_10_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_12_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_15_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_1_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_20_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_25_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_2_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_3_sig-EQV-RMSND_geophy.dat
25235 PassedModels_ModelA_Taylor_minT_500_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_50_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_5_sig-EQV-RMSND_geophy.dat
0 PassedModels_ModelA_Taylor_minT_8_sig-EQV-RMSND_geophy.dat

Text S2.3 Geophysics RMSND – CS

37533 PassedModels_ModelB_Orig_maxT_100000_sig-EQV-RMSND_geophy.dat
34287 PassedModels_ModelB_Orig_maxT_1000_sig-EQV-RMSND_geophy.dat
6374 PassedModels_ModelB_Orig_maxT_100_sig-EQV-RMSND_geophy.dat
439 PassedModels_ModelB_Orig_maxT_10_sig-EQV-RMSND_geophy.dat
662 PassedModels_ModelB_Orig_maxT_12_sig-EQV-RMSND_geophy.dat
990 PassedModels_ModelB_Orig_maxT_15_sig-EQV-RMSND_geophy.dat
6 PassedModels_ModelB_Orig_maxT_1_sig-EQV-RMSND_geophy.dat
1653 PassedModels_ModelB_Orig_maxT_20_sig-EQV-RMSND_geophy.dat
2339 PassedModels_ModelB_Orig_maxT_25_sig-EQV-RMSND_geophy.dat
19 PassedModels_ModelB_Orig_maxT_2_sig-EQV-RMSND_geophy.dat
34 PassedModels_ModelB_Orig_maxT_3_sig-EQV-RMSND_geophy.dat
19151 PassedModels_ModelB_Orig_maxT_500_sig-EQV-RMSND_geophy.dat
4416 PassedModels_ModelB_Orig_maxT_50_sig-EQV-RMSND_geophy.dat
85 PassedModels_ModelB_Orig_maxT_5_sig-EQV-RMSND_geophy.dat
271 PassedModels_ModelB_Orig_maxT_8_sig-EQV-RMSND_geophy.dat

42667 PassedModels_ModelB_Orig_meanT_100000_sig-EQV-RMSND_geophy.dat
39172 PassedModels_ModelB_Orig_meanT_1000_sig-EQV-RMSND_geophy.dat
7051 PassedModels_ModelB_Orig_meanT_100_sig-EQV-RMSND_geophy.dat
354 PassedModels_ModelB_Orig_meanT_10_sig-EQV-RMSND_geophy.dat
494 PassedModels_ModelB_Orig_meanT_12_sig-EQV-RMSND_geophy.dat
701 PassedModels_ModelB_Orig_meanT_15_sig-EQV-RMSND_geophy.dat
5 PassedModels_ModelB_Orig_meanT_1_sig-EQV-RMSND_geophy.dat
1087 PassedModels_ModelB_Orig_meanT_20_sig-EQV-RMSND_geophy.dat
1439 PassedModels_ModelB_Orig_meanT_25_sig-EQV-RMSND_geophy.dat
16 PassedModels_ModelB_Orig_meanT_2_sig-EQV-RMSND_geophy.dat
40 PassedModels_ModelB_Orig_meanT_3_sig-EQV-RMSND_geophy.dat
22375 PassedModels_ModelB_Orig_meanT_500_sig-EQV-RMSND_geophy.dat
2777 PassedModels_ModelB_Orig_meanT_50_sig-EQV-RMSND_geophy.dat
82 PassedModels_ModelB_Orig_meanT_5_sig-EQV-RMSND_geophy.dat
216 PassedModels_ModelB_Orig_meanT_8_sig-EQV-RMSND_geophy.dat

41189 PassedModels_ModelB_Orig_minT_100000_sig-EQV-RMSND_geophy.dat
37527 PassedModels_ModelB_Orig_minT_1000_sig-EQV-RMSND_geophy.dat
6095 PassedModels_ModelB_Orig_minT_100_sig-EQV-RMSND_geophy.dat
361 PassedModels_ModelB_Orig_minT_10_sig-EQV-RMSND_geophy.dat
513 PassedModels_ModelB_Orig_minT_12_sig-EQV-RMSND_geophy.dat
749 PassedModels_ModelB_Orig_minT_15_sig-EQV-RMSND_geophy.dat
8 PassedModels_ModelB_Orig_minT_1_sig-EQV-RMSND_geophy.dat
1191 PassedModels_ModelB_Orig_minT_20_sig-EQV-RMSND_geophy.dat
1622 PassedModels_ModelB_Orig_minT_25_sig-EQV-RMSND_geophy.dat
22 PassedModels_ModelB_Orig_minT_2_sig-EQV-RMSND_geophy.dat
61 PassedModels_ModelB_Orig_minT_3_sig-EQV-RMSND_geophy.dat
19354 PassedModels_ModelB_Orig_minT_500_sig-EQV-RMSND_geophy.dat
2888 PassedModels_ModelB_Orig_minT_50_sig-EQV-RMSND_geophy.dat
128 PassedModels_ModelB_Orig_minT_5_sig-EQV-RMSND_geophy.dat
222 PassedModels_ModelB_Orig_minT_8_sig-EQV-RMSND_geophy.dat

Text S2.4 BC-RMSND – CH-Hauri

39197 PassedModels_ModelA_Hauri_maxT_100000_sig-EQV-RMSND_bulkchem.dat
35073 PassedModels_ModelA_Hauri_maxT_1000_sig-EQV-RMSND_bulkchem.dat
4780 PassedModels_ModelA_Hauri_maxT_100_sig-EQV-RMSND_bulkchem.dat
165 PassedModels_ModelA_Hauri_maxT_10_sig-EQV-RMSND_bulkchem.dat
317 PassedModels_ModelA_Hauri_maxT_12_sig-EQV-RMSND_bulkchem.dat
741 PassedModels_ModelA_Hauri_maxT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_1_sig-EQV-RMSND_bulkchem.dat
1651 PassedModels_ModelA_Hauri_maxT_20_sig-EQV-RMSND_bulkchem.dat
2197 PassedModels_ModelA_Hauri_maxT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_3_sig-EQV-RMSND_bulkchem.dat
21120 PassedModels_ModelA_Hauri_maxT_500_sig-EQV-RMSND_bulkchem.dat
3547 PassedModels_ModelA_Hauri_maxT_50_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_5_sig-EQV-RMSND_bulkchem.dat
63 PassedModels_ModelA_Hauri_maxT_8_sig-EQV-RMSND_bulkchem.dat

40494 PassedModels_ModelA_Hauri_meanT_100000_sig-EQV-RMSND_bulkchem.dat
36216 PassedModels_ModelA_Hauri_meanT_1000_sig-EQV-RMSND_bulkchem.dat
4881 PassedModels_ModelA_Hauri_meanT_100_sig-EQV-RMSND_bulkchem.dat
451 PassedModels_ModelA_Hauri_meanT_10_sig-EQV-RMSND_bulkchem.dat
726 PassedModels_ModelA_Hauri_meanT_12_sig-EQV-RMSND_bulkchem.dat
1133 PassedModels_ModelA_Hauri_meanT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_meanT_1_sig-EQV-RMSND_bulkchem.dat
1700 PassedModels_ModelA_Hauri_meanT_20_sig-EQV-RMSND_bulkchem.dat
2103 PassedModels_ModelA_Hauri_meanT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_meanT_2_sig-EQV-RMSND_bulkchem.dat
9 PassedModels_ModelA_Hauri_meanT_3_sig-EQV-RMSND_bulkchem.dat
19677 PassedModels_ModelA_Hauri_meanT_500_sig-EQV-RMSND_bulkchem.dat
3270 PassedModels_ModelA_Hauri_meanT_50_sig-EQV-RMSND_bulkchem.dat
47 PassedModels_ModelA_Hauri_meanT_5_sig-EQV-RMSND_bulkchem.dat
244 PassedModels_ModelA_Hauri_meanT_8_sig-EQV-RMSND_bulkchem.dat

46679 PassedModels_ModelA_Hauri_minT_100000_sig-EQV-RMSND_bulkchem.dat
41656 PassedModels_ModelA_Hauri_minT_1000_sig-EQV-RMSND_bulkchem.dat
5489 PassedModels_ModelA_Hauri_minT_100_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_10_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_12_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_1_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_20_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_3_sig-EQV-RMSND_bulkchem.dat
23034 PassedModels_ModelA_Hauri_minT_500_sig-EQV-RMSND_bulkchem.dat

2119 PassedModels_ModelA_Hauri_minT_50_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_5_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_8_sig-EQV-RMSND_bulkchem.dat

Text S2.5 BC-RMSND – CH-Taylor

40811 PassedModels_ModelA_Taylor_maxT_100000_sig-EQV-RMSND_bulkchem.dat
36714 PassedModels_ModelA_Taylor_maxT_1000_sig-EQV-RMSND_bulkchem.dat
5518 PassedModels_ModelA_Taylor_maxT_100_sig-EQV-RMSND_bulkchem.dat
566 PassedModels_ModelA_Taylor_maxT_10_sig-EQV-RMSND_bulkchem.dat
867 PassedModels_ModelA_Taylor_maxT_12_sig-EQV-RMSND_bulkchem.dat
1485 PassedModels_ModelA_Taylor_maxT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_maxT_1_sig-EQV-RMSND_bulkchem.dat
2449 PassedModels_ModelA_Taylor_maxT_20_sig-EQV-RMSND_bulkchem.dat
3195 PassedModels_ModelA_Taylor_maxT_25_sig-EQV-RMSND_bulkchem.dat
7 PassedModels_ModelA_Taylor_maxT_2_sig-EQV-RMSND_bulkchem.dat
20 PassedModels_ModelA_Taylor_maxT_3_sig-EQV-RMSND_bulkchem.dat
21534 PassedModels_ModelA_Taylor_maxT_500_sig-EQV-RMSND_bulkchem.dat
4430 PassedModels_ModelA_Taylor_maxT_50_sig-EQV-RMSND_bulkchem.dat
98 PassedModels_ModelA_Taylor_maxT_5_sig-EQV-RMSND_bulkchem.dat
307 PassedModels_ModelA_Taylor_maxT_8_sig-EQV-RMSND_bulkchem.dat

44871 PassedModels_ModelA_Taylor_meanT_100000_sig-EQV-RMSND_bulkchem.dat
40280 PassedModels_ModelA_Taylor_meanT_1000_sig-EQV-RMSND_bulkchem.dat
4628 PassedModels_ModelA_Taylor_meanT_100_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_10_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_12_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_1_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_20_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_3_sig-EQV-RMSND_bulkchem.dat
22600 PassedModels_ModelA_Taylor_meanT_500_sig-EQV-RMSND_bulkchem.dat
83 PassedModels_ModelA_Taylor_meanT_50_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_5_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_8_sig-EQV-RMSND_bulkchem.dat

49801 PassedModels_ModelA_Taylor_minT_100000_sig-EQV-RMSND_bulkchem.dat

44654 PassedModels_ModelA_Taylor_minT_1000_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_100_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_10_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_12_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_1_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_20_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_3_sig-EQV-RMSND_bulkchem.dat
25175 PassedModels_ModelA_Taylor_minT_500_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_50_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_5_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_8_sig-EQV-RMSND_bulkchem.dat

Text S2.6 BC-RMSND – CS

37533 PassedModels_ModelB_Orig_maxT_100000_sig-EQV-RMSND_bulkchem.dat
34287 PassedModels_ModelB_Orig_maxT_1000_sig-EQV-RMSND_bulkchem.dat
6361 PassedModels_ModelB_Orig_maxT_100_sig-EQV-RMSND_bulkchem.dat
239 PassedModels_ModelB_Orig_maxT_10_sig-EQV-RMSND_bulkchem.dat
414 PassedModels_ModelB_Orig_maxT_12_sig-EQV-RMSND_bulkchem.dat
735 PassedModels_ModelB_Orig_maxT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_maxT_1_sig-EQV-RMSND_bulkchem.dat
1460 PassedModels_ModelB_Orig_maxT_20_sig-EQV-RMSND_bulkchem.dat
2185 PassedModels_ModelB_Orig_maxT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_maxT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_maxT_3_sig-EQV-RMSND_bulkchem.dat
19075 PassedModels_ModelB_Orig_maxT_500_sig-EQV-RMSND_bulkchem.dat
4379 PassedModels_ModelB_Orig_maxT_50_sig-EQV-RMSND_bulkchem.dat
16 PassedModels_ModelB_Orig_maxT_5_sig-EQV-RMSND_bulkchem.dat
115 PassedModels_ModelB_Orig_maxT_8_sig-EQV-RMSND_bulkchem.dat

42667 PassedModels_ModelB_Orig_meanT_100000_sig-EQV-RMSND_bulkchem.dat
39154 PassedModels_ModelB_Orig_meanT_1000_sig-EQV-RMSND_bulkchem.dat
7026 PassedModels_ModelB_Orig_meanT_100_sig-EQV-RMSND_bulkchem.dat
202 PassedModels_ModelB_Orig_meanT_10_sig-EQV-RMSND_bulkchem.dat
353 PassedModels_ModelB_Orig_meanT_12_sig-EQV-RMSND_bulkchem.dat
595 PassedModels_ModelB_Orig_meanT_15_sig-EQV-RMSND_bulkchem.dat

0 PassedModels_ModelB_Orig_meanT_1_sig-EQV-RMSND_bulkchem.dat
1010 PassedModels_ModelB_Orig_meanT_20_sig-EQV-RMSND_bulkchem.dat
1395 PassedModels_ModelB_Orig_meanT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_meanT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_meanT_3_sig-EQV-RMSND_bulkchem.dat
22336 PassedModels_ModelB_Orig_meanT_500_sig-EQV-RMSND_bulkchem.dat
2767 PassedModels_ModelB_Orig_meanT_50_sig-EQV-RMSND_bulkchem.dat
14 PassedModels_ModelB_Orig_meanT_5_sig-EQV-RMSND_bulkchem.dat
83 PassedModels_ModelB_Orig_meanT_8_sig-EQV-RMSND_bulkchem.dat

41189 PassedModels_ModelB_Orig_minT_100000_sig-EQV-RMSND_bulkchem.dat
37515 PassedModels_ModelB_Orig_minT_1000_sig-EQV-RMSND_bulkchem.dat
6071 PassedModels_ModelB_Orig_minT_100_sig-EQV-RMSND_bulkchem.dat
247 PassedModels_ModelB_Orig_minT_10_sig-EQV-RMSND_bulkchem.dat
442 PassedModels_ModelB_Orig_minT_12_sig-EQV-RMSND_bulkchem.dat
680 PassedModels_ModelB_Orig_minT_15_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_minT_1_sig-EQV-RMSND_bulkchem.dat
1139 PassedModels_ModelB_Orig_minT_20_sig-EQV-RMSND_bulkchem.dat
1586 PassedModels_ModelB_Orig_minT_25_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_minT_2_sig-EQV-RMSND_bulkchem.dat
0 PassedModels_ModelB_Orig_minT_3_sig-EQV-RMSND_bulkchem.dat
19325 PassedModels_ModelB_Orig_minT_500_sig-EQV-RMSND_bulkchem.dat
2883 PassedModels_ModelB_Orig_minT_50_sig-EQV-RMSND_bulkchem.dat
13 PassedModels_ModelB_Orig_minT_5_sig-EQV-RMSND_bulkchem.dat
164 PassedModels_ModelB_Orig_minT_8_sig-EQV-RMSND_bulkchem.dat

Text S2.7 Comb-RMSND – CH-Hauri

39197 PassedModels_ModelA_Hauri_maxT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
35073 PassedModels_ModelA_Hauri_maxT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
4780 PassedModels_ModelA_Hauri_maxT_100_sig-EQV-RMSND_geophy-bulkchem.dat
165 PassedModels_ModelA_Hauri_maxT_10_sig-EQV-RMSND_geophy-bulkchem.dat
317 PassedModels_ModelA_Hauri_maxT_12_sig-EQV-RMSND_geophy-bulkchem.dat
741 PassedModels_ModelA_Hauri_maxT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_1_sig-EQV-RMSND_geophy-bulkchem.dat
1651 PassedModels_ModelA_Hauri_maxT_20_sig-EQV-RMSND_geophy-bulkchem.dat
2197 PassedModels_ModelA_Hauri_maxT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_2_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_3_sig-EQV-RMSND_geophy-bulkchem.dat
21120 PassedModels_ModelA_Hauri_maxT_500_sig-EQV-RMSND_geophy-bulkchem.dat

3547 PassedModels_ModelA_Hauri_maxT_50_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_maxT_5_sig-EQV-RMSND_geophy-bulkchem.dat
63 PassedModels_ModelA_Hauri_maxT_8_sig-EQV-RMSND_geophy-bulkchem.dat

40494 PassedModels_ModelA_Hauri_meanT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
36216 PassedModels_ModelA_Hauri_meanT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
4881 PassedModels_ModelA_Hauri_meanT_100_sig-EQV-RMSND_geophy-bulkchem.dat
451 PassedModels_ModelA_Hauri_meanT_10_sig-EQV-RMSND_geophy-bulkchem.dat
726 PassedModels_ModelA_Hauri_meanT_12_sig-EQV-RMSND_geophy-bulkchem.dat
1133 PassedModels_ModelA_Hauri_meanT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_meanT_1_sig-EQV-RMSND_geophy-bulkchem.dat
1700 PassedModels_ModelA_Hauri_meanT_20_sig-EQV-RMSND_geophy-bulkchem.dat
2103 PassedModels_ModelA_Hauri_meanT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_meanT_2_sig-EQV-RMSND_geophy-bulkchem.dat
9 PassedModels_ModelA_Hauri_meanT_3_sig-EQV-RMSND_geophy-bulkchem.dat
19677 PassedModels_ModelA_Hauri_meanT_500_sig-EQV-RMSND_geophy-bulkchem.dat
3270 PassedModels_ModelA_Hauri_meanT_50_sig-EQV-RMSND_geophy-bulkchem.dat
47 PassedModels_ModelA_Hauri_meanT_5_sig-EQV-RMSND_geophy-bulkchem.dat
244 PassedModels_ModelA_Hauri_meanT_8_sig-EQV-RMSND_geophy-bulkchem.dat

46679 PassedModels_ModelA_Hauri_minT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
41656 PassedModels_ModelA_Hauri_minT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
5489 PassedModels_ModelA_Hauri_minT_100_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_10_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_12_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_1_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_20_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_2_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_3_sig-EQV-RMSND_geophy-bulkchem.dat
23034 PassedModels_ModelA_Hauri_minT_500_sig-EQV-RMSND_geophy-bulkchem.dat
2119 PassedModels_ModelA_Hauri_minT_50_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_5_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Hauri_minT_8_sig-EQV-RMSND_geophy-bulkchem.dat

Text S2.8 Comb-RMSND – CH-Taylor

40811 PassedModels_ModelA_Taylor_maxT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
36714 PassedModels_ModelA_Taylor_maxT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
5518 PassedModels_ModelA_Taylor_maxT_100_sig-EQV-RMSND_geophy-bulkchem.dat
566 PassedModels_ModelA_Taylor_maxT_10_sig-EQV-RMSND_geophy-bulkchem.dat
867 PassedModels_ModelA_Taylor_maxT_12_sig-EQV-RMSND_geophy-bulkchem.dat
1485 PassedModels_ModelA_Taylor_maxT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_maxT_1_sig-EQV-RMSND_geophy-bulkchem.dat
2449 PassedModels_ModelA_Taylor_maxT_20_sig-EQV-RMSND_geophy-bulkchem.dat
3195 PassedModels_ModelA_Taylor_maxT_25_sig-EQV-RMSND_geophy-bulkchem.dat
7 PassedModels_ModelA_Taylor_maxT_2_sig-EQV-RMSND_geophy-bulkchem.dat
20 PassedModels_ModelA_Taylor_maxT_3_sig-EQV-RMSND_geophy-bulkchem.dat
21534 PassedModels_ModelA_Taylor_maxT_500_sig-EQV-RMSND_geophy-bulkchem.dat
4430 PassedModels_ModelA_Taylor_maxT_50_sig-EQV-RMSND_geophy-bulkchem.dat
98 PassedModels_ModelA_Taylor_maxT_5_sig-EQV-RMSND_geophy-bulkchem.dat
307 PassedModels_ModelA_Taylor_maxT_8_sig-EQV-RMSND_geophy-bulkchem.dat

44871 PassedModels_ModelA_Taylor_meanT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
40280 PassedModels_ModelA_Taylor_meanT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
4628 PassedModels_ModelA_Taylor_meanT_100_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_10_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_12_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_1_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_20_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_2_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_3_sig-EQV-RMSND_geophy-bulkchem.dat
22600 PassedModels_ModelA_Taylor_meanT_500_sig-EQV-RMSND_geophy-bulkchem.dat
83 PassedModels_ModelA_Taylor_meanT_50_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_5_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_meanT_8_sig-EQV-RMSND_geophy-bulkchem.dat

49801 PassedModels_ModelA_Taylor_minT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
44654 PassedModels_ModelA_Taylor_minT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_100_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_10_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_12_sig-EQV-RMSND_geophy-bulkchem.dat

0 PassedModels_ModelA_Taylor_minT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_1_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_20_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_2_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_3_sig-EQV-RMSND_geophy-bulkchem.dat
25175 PassedModels_ModelA_Taylor_minT_500_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_50_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_5_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelA_Taylor_minT_8_sig-EQV-RMSND_geophy-bulkchem.dat

Text S2.9 Comb-RMSND – CS

37533 PassedModels_ModelB_Orig_maxT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
34287 PassedModels_ModelB_Orig_maxT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
6361 PassedModels_ModelB_Orig_maxT_100_sig-EQV-RMSND_geophy-bulkchem.dat
239 PassedModels_ModelB_Orig_maxT_10_sig-EQV-RMSND_geophy-bulkchem.dat
414 PassedModels_ModelB_Orig_maxT_12_sig-EQV-RMSND_geophy-bulkchem.dat
735 PassedModels_ModelB_Orig_maxT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_maxT_1_sig-EQV-RMSND_geophy-bulkchem.dat
1460 PassedModels_ModelB_Orig_maxT_20_sig-EQV-RMSND_geophy-bulkchem.dat
2185 PassedModels_ModelB_Orig_maxT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_maxT_2_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_maxT_3_sig-EQV-RMSND_geophy-bulkchem.dat
19075 PassedModels_ModelB_Orig_maxT_500_sig-EQV-RMSND_geophy-bulkchem.dat
4379 PassedModels_ModelB_Orig_maxT_50_sig-EQV-RMSND_geophy-bulkchem.dat
16 PassedModels_ModelB_Orig_maxT_5_sig-EQV-RMSND_geophy-bulkchem.dat
115 PassedModels_ModelB_Orig_maxT_8_sig-EQV-RMSND_geophy-bulkchem.dat

42667 PassedModels_ModelB_Orig_meanT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
39154 PassedModels_ModelB_Orig_meanT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
7026 PassedModels_ModelB_Orig_meanT_100_sig-EQV-RMSND_geophy-bulkchem.dat
202 PassedModels_ModelB_Orig_meanT_10_sig-EQV-RMSND_geophy-bulkchem.dat
353 PassedModels_ModelB_Orig_meanT_12_sig-EQV-RMSND_geophy-bulkchem.dat
595 PassedModels_ModelB_Orig_meanT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_meanT_1_sig-EQV-RMSND_geophy-bulkchem.dat
1010 PassedModels_ModelB_Orig_meanT_20_sig-EQV-RMSND_geophy-bulkchem.dat
1395 PassedModels_ModelB_Orig_meanT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_meanT_2_sig-EQV-RMSND_geophy-bulkchem.dat

0 PassedModels_ModelB_Orig_meanT_3_sig-EQV-RMSND_geophy-bulkchem.dat
22336 PassedModels_ModelB_Orig_meanT_500_sig-EQV-RMSND_geophy-bulkchem.dat
2767 PassedModels_ModelB_Orig_meanT_50_sig-EQV-RMSND_geophy-bulkchem.dat
14 PassedModels_ModelB_Orig_meanT_5_sig-EQV-RMSND_geophy-bulkchem.dat
83 PassedModels_ModelB_Orig_meanT_8_sig-EQV-RMSND_geophy-bulkchem.dat

41189 PassedModels_ModelB_Orig_minT_100000_sig-EQV-RMSND_geophy-bulkchem.dat
37515 PassedModels_ModelB_Orig_minT_1000_sig-EQV-RMSND_geophy-bulkchem.dat
6071 PassedModels_ModelB_Orig_minT_100_sig-EQV-RMSND_geophy-bulkchem.dat
247 PassedModels_ModelB_Orig_minT_10_sig-EQV-RMSND_geophy-bulkchem.dat
442 PassedModels_ModelB_Orig_minT_12_sig-EQV-RMSND_geophy-bulkchem.dat
680 PassedModels_ModelB_Orig_minT_15_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_minT_1_sig-EQV-RMSND_geophy-bulkchem.dat
1139 PassedModels_ModelB_Orig_minT_20_sig-EQV-RMSND_geophy-bulkchem.dat
1586 PassedModels_ModelB_Orig_minT_25_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_minT_2_sig-EQV-RMSND_geophy-bulkchem.dat
0 PassedModels_ModelB_Orig_minT_3_sig-EQV-RMSND_geophy-bulkchem.dat
19325 PassedModels_ModelB_Orig_minT_500_sig-EQV-RMSND_geophy-bulkchem.dat
2883 PassedModels_ModelB_Orig_minT_50_sig-EQV-RMSND_geophy-bulkchem.dat
13 PassedModels_ModelB_Orig_minT_5_sig-EQV-RMSND_geophy-bulkchem.dat
164 PassedModels_ModelB_Orig_minT_8_sig-EQV-RMSND_geophy-bulkchem.dat