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Development of depth profiling for solar wind
noble gases in Genesis diamond-like carbon on
silicon substrate targets by using isotope
nanoscope

(Genesis DOS 試料中に打ち込まれた太陽風
希ガス同位体の同位体ナノスコープによる
深さ方向分析法の開発)

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ABSTRACT

The Sun preserves a chemical composition of the early solar system except for H, He, and Li because of nucleosyntheses. Particles with energy of a few keV per atomic mass unit are continuously released from the Sun to outer space as a solar wind. The solar wind (hereafter SW) composition should contain not only a present solar activity but also a history of the solar system evolution, of which physicochemical property such as elemental and isotopic fractionation in SW particles is one of the important issues to understand a solar activity at a time of the SW irradiation. Airless bodies are exposed to SW at all times (space weathering). The SW particles were incorporated in regolith of airless body and regolith breccia meteorites. Therefore, a mechanism of space weathering can be revealed from the regolith materials, which leads to understanding of an evolution of the asteroid surface.

Noble gases are chemically inert and primordial noble gases are depleted in natural solid materials such as planets and asteroid solid materials. Noble gases are very sensitive to secondary addition into the solid materials. Therefore, noble gases can be utilized as a tracer to investigate the space weathering and the solar activity from the SW irradiated materials. Elemental and isotopic compositions of the Sun have been determined by measurements of primitive meteorites, which are relatively enriched in volatile elements. The volatile elements such as noble gases have been determined by photospheric spectroscopy observations. On the other hand, the isotopic compositions of noble gases were obtained by measurements of the SW irradiated materials such as lunar regolith and artificial targets in the space. Recently, Genesis spacecraft mission by NASA was carried out in order to determine the composition of the Sun and estimate that of the solar nebula. During the Genesis mission, energy, elemental composition of SW had been measured by *in-situ* apparatuses, and the SW was directly collected on various substrates. The data of SW collected samples was used for the comparison with data of previous SW research (i.e., Apollo results), and the estimation on the extent of elemental fractionations of solar composition. Especially, the energy distribution, flux of the SW, and

isotopic and elemental composition of the SW noble gases are well determined by *in-situ* measurements (e.g., Reisenfeld et al., 2013) and laboratory measurements (Grimberg et al., 2008; Heber et al., 2009). Therefore, the SW in the Genesis substrates is the most optimal sample to determine the composition of SW noble gases. In order to discuss the space weathering and the solar activity, an interaction between the implanted SW and the substrate (ion-solid interaction) is an important issue. The SW particles have various energies depends on their acceleration mechanisms. A depth profile of the implanted particles into the substrate is correlated with the energy distribution of SW particles. However, depth profiling of noble gases was not established because (1) an implant depth of SW noble gases is much shallower than 1 μm and (2) a conventional depth profiling with secondary ion mass spectrometry (SIMS) was hard to measure noble gases because of their high ionization potentials. Laser ionization mass nanoscope (LIMAS) was developed to measure depth profiles for noble gas isotopes (Bajo et al., 2015), which is a type of secondary neutral mass spectrometer. LIMAS consists of a Ga liquid metal ion source and an aberration corrector for sputtering of nanometer scale area on samples, a femtosecond laser for tunneling-ionization of the sputtered neutrals, and a multi-turn time-of-flight mass spectrometer (TOF-MS) for isotope analysis.

A high mass resolution to separate target ion and interference ions and a high sensitivity for target isotopes are required for depth profiling of implanted SW. I have evaluated the performance of a multi-turn TOF-MS (MULTUM II) equipped with the ion injection optics of LIMAS (Section 2). The mass-resolving power of LIMAS increased linearly with increasing the flight path length, and reached 620,000 (FWHM) at 1,000 multi-turn cycles of MULTUM II (flight path length: 1.3 km). The transmittance of LIMAS decreased to 60–70% after 20 multi-turn cycles of MULTUM II, compared with the linear mode transmittance due to collisions of flight ions with residual gas in mass spectrometer. The transmittance per multi-turn cycle became constant (99.96%) after 20 multi-turn cycles. A useful yield of 3×10^{-3} for Si ions was obtained for LIMAS at 30 multi-turn cycles of MULTUM II. From these evaluations, I conclude that LIMAS transmittance is comparable to those for commercial SIMS

measurements.

I developed high precision depth profiling for noble gas isotopes (Section 3). To investigate the precise He depth distribution of the Genesis diamond-like-carbon (DOS) sample, three attempts were made as follows: (1) the interfering ions for ^4He were removed with ion gates. (2) A pumping speed for vacuum generation was increased by using an ion pump with a higher pumping speed for noble gases (Agilent VacIon Plus 500 “StarCell”). (3) A measurement area was enlarged in order to reduce an crater edge effect. As a result, ^4He in the deep region ~ 300 nm from the surface could be determined to 4×10^{17} atoms cm^{-3} in the Genesis sample. By these improvements I could measure high energy components of SW- ^4He . Moreover, depth profiling of ^{20}Ne was determined from the sample for the first time. This depth profiling can be a useful technique to study the evolution of the Sun and the mechanism of the space weathering of solar system objects using SW noble gases.

1. INTRODUCTION

It is considered that the chemical composition of the Sun was not changed from early solar system (except for H and He). In general, it is accepted that the surface of the Sun has preserved the original, largely unfractionated composition of the protosolar nebula (Bochesler, 2000; von Steiger et al., 2001). In a standard model of the Sun, the composition of outer convective zone (OCZ) of the Sun remains nearly unchanged throughout the main sequence phase of the Sun's lifetime (Bochsler, 2000). Therefore, the OCZ represents solar abundances with a few exception (i.e., H and He), and the composition of OCZ is reflected by the photospheric composition (Heber et al., 2009). Although a large number of observations and measurements exist to determine OCZ abundances such as helioseismology and photosphere spectroscopy, these methods are all indirect and mostly accompanied by large uncertainties due to complex and uncertain model assumptions (von Steiger et al., 2001). The solar wind is the only way to directly probe the Sun's OCZ to measure the solar corpuscular radiation.

Solar wind (SW) is a plasma flow including energetic particles of a few keV per nucleon, which mainly consists of H and He, and releases from the Sun out into space. Therefore, the survey for understanding of physical and chemical mechanism of SW provides not only information of present Sun activity but also that of the Sun formation.

Airless bodies in solar system have been exposed by SW since the solar system formation. This evidence has been obtained by moon regolith samples and samples dollected from asteroid's Itokawa (Nagao et al., 2011). In this way, it is important to investigate the relationships of ion-solid interaction between SW and the samples to understand evolution of asteroid surface. Noble gas isotope analysis is a key method for understanding the Sun activity and the SW implantation mechanism. The noble gases are insert and highly volatile elements. These elements were incorporated in the gas phase during the accretion of the solar nebula. Therefore, noble gases depleted in the solid materials such as terrestrial planets and asteroids.

A projected range of SW particles depends on its energy and target

material. The particle with a higher energy penetrates deeper in the same material. Therefore, the particle energy can be estimated by implantation profile (concentration) of noble gas isotopes from samples. In other words, the ion-solid interaction can be estimated from the spatial distribution of SW components in the sample. By using this method, activity of present Sun and ancient Sun could be estimated from implanted samples.

To study an ion-solid interaction, a sample, of which implant energy and fluence for an element are well determined, is required. The first attempt to collect the present Solar Wind Composition (SWC) was carried out on the moon, where the SW was collected for time periods of 77 minutes in July 1969 (Apollo 11) to 45 hours 5 minutes in April 1972 (Apollo 16) (Geiss et al., 2004). The NASA Genesis mission returned SW samples to determine precise SW composition in terrestrial laboratories (Burnett et al., 2003). In this mission, the observation and the collection of the SW particles were carried out in space for ~2.3 years from August 2001 (Reisenfeld et al., 2013). The energy distributions of light noble gases were recorded by on-board instruments. Bulk compositions of noble gases (abundance and isotopic ratios) in returned samples were measured by using conventional noble gas mass spectrometers with a UV laser aberration method (Heber et al., 2009; 2012) and with a closed-system stepwise etching (CSSE) method (Grimberg et al., 2008). However, the depth distribution of noble gas in the Genesis samples was not determined because a conventional depth profiling utilized by secondary ion mass spectrometer (e.g., Gnaser and Oechsner, 1991) was not able to measure noble gases because of their high ionization potentials (He: 24.6 eV and Ne: 21.6 eV). In order to measure the noble gas depth profile, a system capable to ionize noble gas is required.

Laser Ionization MAss nanoScope (LIMAS) is a sputtered neutral mass spectrometer (SNMS) with strong-field photoionization (Fig. 1) (Ebata et al., 2012), which was developed to measure SW particles from extraterrestrial materials collected by planetary exploration missions (Bajo et al., 2015). They reported He depth profiling from Genesis sample by LIMAS as the first report of noble gases depth profiling. In their report, the depth profiling down to 140 nm in Genesis sample were measured. As a result, ^4He concentrations to 120 nm

consistent with that of the Transport of Ions in Matter (TRIM) simulation, and ^4He fluence was $\sim 8.5 \times 10^{14} \text{ cm}^{-2}$. On the other hand, the ^4He concentration in the region deeper than 120 nm, which should correspond to the high energy SW, was not detected because the signal intensities were smaller than those from residual He gas in the sample chamber.

It is also necessary to determine implantation of other noble gas isotopes such as ^{20}Ne to understand the physical behavior of ion-solid interaction. The secondary abundant noble gas isotope in SW is ^{20}Ne ($^4\text{He}/^{20}\text{Ne} = 656$), and the third is ^3He ($^4\text{He}/^3\text{He} = 2160$) (Heber et al., 2009). A high sensitivity detection system (i.e. high mass resolution and high useful yield) with low background for noble gases are required for depth profiling of SW noble gases implanted deeper than 120 nm.

In this study, I first evaluated the sensitivity and mass-resolving power of LIMAS for qualitative noble gas isotopic analysis. This is described in section 2, which is essentially taken from a paper published in Surface Interface Analysis (Tonotani et al., 2016). I conducted to investigate the mass resolving power and the transmittance and useful yield of LIMAS. Firstly, I determined the optimal parameters for an injection optics of LIMAS, which consist of ion extraction from a sample surface and ion introduction into multi-turn time-of-flight mass spectrometer (MULTUM II). Secondary, I developed mass calibration method for correcting the modulation of load voltage for MULTUM II and the injection timing for the ion injection optics. Finally, I evaluated mass-resolving power and transmittance and useful yield for quantitative analysis.

I then carried out the depth profile analysis of ^4He and ^{20}Ne in a Genesis diamond-like-carbon film on silicon (DOS) target using the parameters I determined. This content is described in section 3. In order to investigate of spatial distribution of noble gas isotopes in Genesis samples, I improved depth profiling methods for noble gases from that of Bajo et al. (2015) as follows; (1) Elimination of the contamination of interfering ions; (2) Reduction of He residual gas by using an ion pump with a faster exhaust velocity; and (3) Expansion of the raster area on the sample. I could obtain the spatial distribution of ^4He and ^{20}Ne derived from SW in Genesis-DOS sample with these

improvements. Finally, I discuss some implications by comparing the present results with the previous studies for the noble gas composition of the Genesis samples.

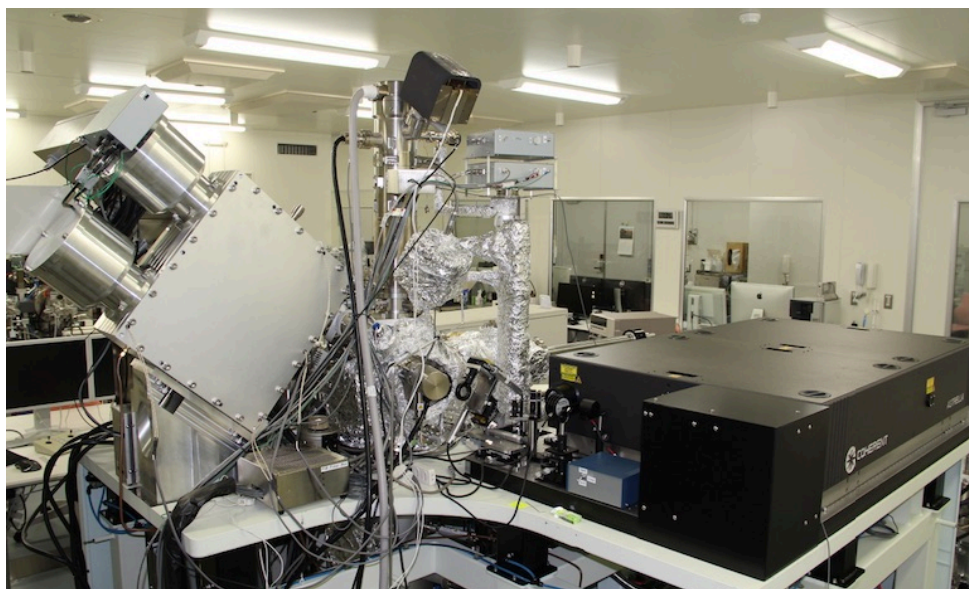


Figure 1. Photograph of Laser Ionization MAss nanoScope (LIMAS).

2. EVALUATION OF MULTI-TURN TIME-OF-FLIGHT MASS SPECTROMETER OF LASER IONIZATION MASS NANOSCOPE

2.1. INTRODUCTION

LIMAS consists of a Ga liquid metal ion source and an aberration corrector for sputtering of nanometer scale area on samples, a femtosecond laser for tunneling-ionization of the sputtered neutrals, and a multi-turn time-of-flight (TOF) mass spectrometer for isotope analysis (Fig. 2). The primary beam diameter can be focused in the range from 1 μm to 10 nm, depending on the primary ion current. Therefore, LIMAS is an advantageous novel instrument for in-situ nanometer-scale analysis, especially for atoms with high ionization energy. The high mass-resolving power can be used to separate objective ions from isobar molecular ions, which is useful in trace element analysis of complex materials such as natural samples.

The mass-resolving power of LIMAS reaches up to 40,000 after 400 multi-turn cycles (the flight path length of 520 m). However, it has been reported that the incremental rate of the mass-resolving power reduces after 200 multi-turn cycles (Ebata et al., 2012). In this section, I reevaluated the sensitivity, mass-resolving power, and transmittance characteristics of LIMAS to optimize ion optics parameters.

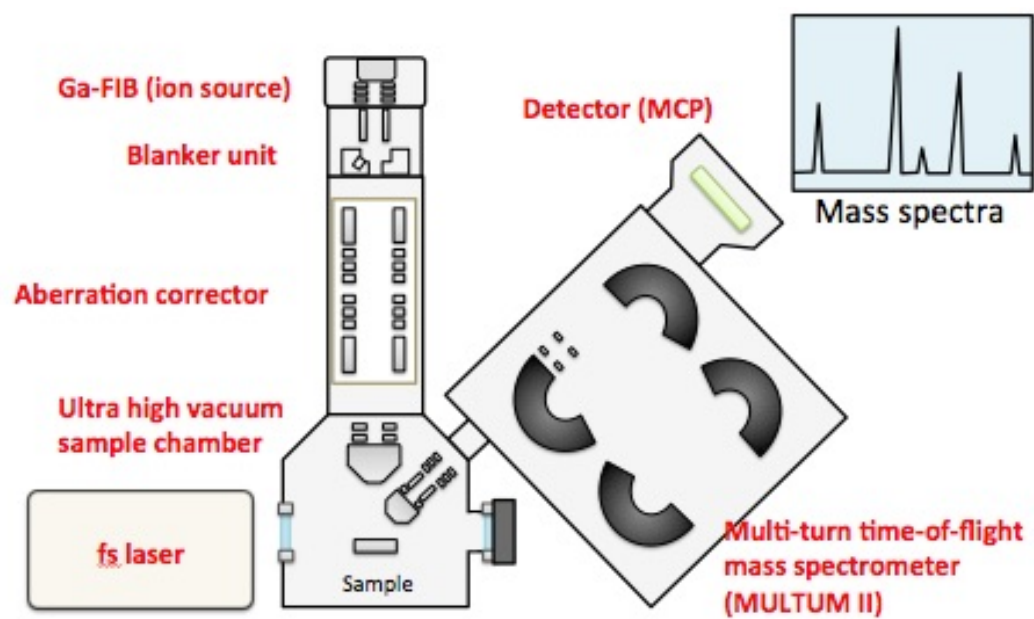


Figure 2. Schematic of laser ionization mass nanoscope (LIMAS)

2.2. INSTRUMENT

The basic instrumental configuration, operation sequence, and preliminary performance of LIMAS have been described by Ebata et al. (2012). The development of the timing control of operation is described in Bajo et al. (2016). LIMAS consists of a Ga-liquid metal ion source with an aberration corrector to sputter samples. The aberration corrector was used for a beam focus of a primary Ga beam. Sputtering of a sample surface was carried out by a pulsed primary beam. The shot position on the sample surface is controlled by an aperture voltage of FIB. The femtosecond laser system has been replaced to obtain a stronger field for tunneling ionization of inert elements such as He. Ebata et al. (2012) reported that Ne can be almost ionized by using the fs-laser system of LIMAS. The newly installed laser is a Ti-sapphire one-box type ultrafast amplifier (Astrella, Coherent, USA) in this study. This laser generates 35-fs-wide pulses with a pulse energy of 6 mJ, at the repetition rate of 1 kHz. The laser beam was focused to a diameter of 50 μm above the sample surface with a power density of $\sim 10^{20} \text{ W m}^{-2}$. The pressure of the sample chamber was kept at $3.0 \times 10^{-8} \text{ Pa}$ with an ionpump system (combination of 300 L s^{-1} ion pump, titanium sublimation pump, and 400 L s^{-1} non evaporation getter (NEG) pump).

A schematic of the ion injection optics in LIMAS is shown in Fig. 3. The ion injection optics introduces ions generated in the sputtered neutrals plume into MULTUM II, which has three sequential extraction lenses (L1, L2, and L3), two sets of einzel lenses (E1 and E2), and X-Y double deflectors. The potential difference between the first extraction lens (L1) and a sample can be varied from 0 to $-1,000 \text{ V}$ by adjusting the L1 voltage. The extracted ions are finally accelerated by the accelerating voltage (-4 kV) of L3. Voltage in the ion injection optics and MULTUM II are set to -4 kV .

MULTUM II is designed to achieve a perfect space and time focusing ion optics for a multi-turn TOF mass spectrometer (Okumura et al., 2004). Flight path lengths of ion species are expanded by multi-turn of ions keeping the same trajectory in MULTUM II under the constant temporal width of the ion packet.

Consequently, the high mass-resolving power can be realized in the multi-turn mode. MULTUM II is composed of four toroidal electrodes. The length of one cycle is 1.308 m. The timing of extraction into MULTUM II and release into the detector (i.e., the number of multi-turn cycles) of the ion sequence can be controlled using the on-off control of an incident sector electrode voltage and an exit sector electrode voltage (Bajo et al., 2016).

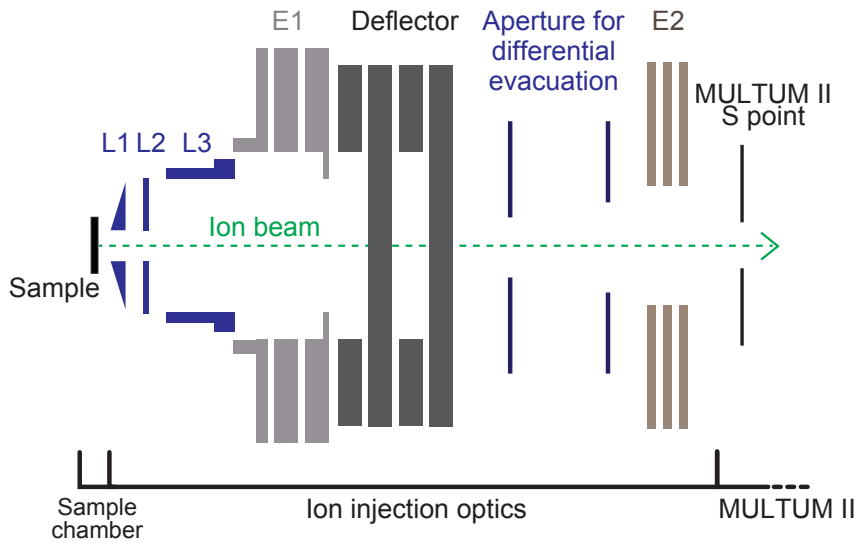


Figure 3. Schematic of the ion injection optics for LIMAS.

2.3. EXPERIMENTAL PROCEDURE

I used numerical simulations of ion trajectories in the ion injection optics from a sample surface to determine load voltages of all lenses of the ion injection optics and all MULTUM II electrodes.

2.3.1. Simulation

Ion trajectories in the ion injection optics were simulated by using SIMION 8.1 (Scientific Instrument Service, Inc.). The simulation was performed in two dimensions because the ion injection trajectory has spherical symmetry. The energy and ejection angle of ionized ions are determined by a sputtering process. I analyzed the relationship between the loading voltages of L1 and L2, which serve to extract ions from a sample surface to E1. The initial kinetic energies of the ions were set at 1, 2, 3, 5, 10 or 20 eV; the emission points were set at 0 or ± 25 μm from the optical axis on the sample surface; and the emission angles were 0, ± 15 , ± 30 , ± 45 , ± 60 or ± 85 degrees relative to the sample surface normal.

2.3.2 Measurement

The relative transmittance of the ion injection optics was measured using: $^{24}\text{Mg}^{2+}$ ion signals from a Mg metal substrate. The voltages for the L1 and L2 lenses of the ion injection optics were adjusted to maximize the signals at 100 multi-turn cycles. The voltages were varied from -900 to -400 V for L1 and from $-4,000$ to $-1,000$ V for L2. The voltages for E1 and E2 of the ion injection optics were adjusted to obtain maximal signals for each L1-L2 combination. After adjusting the lens voltages, mass spectra were measured 1,000 times. The repetition rate was set to 500 Hz because each of the 100 multi-turn cycles was ~ 1.2 -ms-long (the TOF for multi-turning duration of ~ 0.5 ms and data processing time of ~ 0.7 ms). The TOFs for 1 multi-turn cycle, ion injection optics and ion detection optics were 5.2 μs , 2.3 μs and 1.0 μs for $^{24}\text{Mg}^{2+}$, respectively. The

TOFs of extracted ions can be calculated from their flight lengths and their ion velocities. In order to simplify the mass spectra, I selected injection ion into a trajectory of the MULTUM II by using pulsed modulations of electrostatic fields for an electric sector and two ion gates in MULTUM II (Bajo et al., 2016). In this study, a range of m/z was selected from 12 ($^{24}\text{Mg}^{2+}$) to 26 ($^{26}\text{Mg}^{+}$).

The mass-resolving power and transmittance characteristics of ion signals in the multi-turn mode were obtained for the optimal parameters. The mass spectra from the Mg substrate were measured 1,000 times for each multi-turn cycle, for different repetition rates. Because the multi-turn cycle period increases with increasing the number of cycles, the repetition rate must be changed when the sum of TOF of the ion and the data processing time exceeds 1 ms/pulse. For example, the repetition rate was 1 kHz at multi-turn cycles for $^{24}\text{Mg}^{2+}$ smaller than 57 (TOF < 299.7 μs), and 500 Hz at 58 multi-turn cycles (TOF = 304.9 μs). As a result, the repetition rate ranged from 1 kHz (at 0–40 multi-turn cycles) to 167 Hz (at 1,000 multi-turn cycles). Note that the practical repetition rate included experimental time margins.

To determine the useful yields for LIMAS, I used a Si wafer and applied conventional depth profiling procedures (e.g. Bajo et al., 2015). Because the crater volume must be determined precisely, the geometry of the sputtered crater was measured by using a 3D laser scanning confocal microscope (VK-X200. KEYENCE, Inc.).

2.4. RESULTS AND DISCUSSION

2.4.1. Lens parameters for the ion injection optics

To discuss the transmittance of sputtered ions obtained in the numerical simulation, the energy and emission angle distributions of the sputtered atoms should be considered. I corrected these effects by assuming the Sigmund-Thompson relation for the sputtered atoms (Bajo et al., 2016). The relative ion transmittance for the numerical simulation versus the L1 and L2 voltages is shown in Fig. 4a. A narrow belt-like distribution of relatively strong transmittance indicates that the L1 and L2 voltages are positively correlated. A higher transmittance is obtained for higher negative operation voltages of both lenses.

The experimentally measured transmittance is shown in Fig. 4b as a function of the load voltages L1 and L2. The pattern is similar to the simulation results, indicating that the characteristics of the ion injection optics are basically captured by the simulation. However, the measurement results show that the acceptable condition of the ion injection optics is broader in real measurements than in the simulations. Peak shapes of $^{24}\text{Mg}^{2+}$ in the mass spectra were nearly the same throughout the parametric range in Fig. 4. Therefore, we determined the optimal parameters as -700 V for the L1 lens and $-3,300$ V for the L2 lens of the ion injection optics. The voltages for the einzel lenses were set to $-1,260$ V for E1 and $-2,700$ V for E2.

2.4.2 Mass-resolving power

The mass-resolving power R for an m/z of a TOF mass spectrometer is given by

$$R = \frac{t}{2\Delta t} \quad , \quad (1)$$

where t is the TOF from the ion source to the ion detector and Δt is the peak width, for the m/z .

The peak width, defined by the full width at half maximum (FWHM) of a $^{24}\text{Mg}^{2+}$ spectral peak, is plotted as a function of the TOF (Fig. 4a). In these measurements, I averaged over peaks from 1,000 spectra. The FWHM is almost constant (~ 6 ns) up to the TOF of 1,000 μs . After 1,000 μs (200 multi-turn cycles), the FWHM increases with increasing the number of cycles. The saturation of the mass-resolving power ($R = \sim 10^5$) indicates that the FWHM increases linearly with increasing the TOF.

Post-ionized ions at the ion source in the sample chamber are accelerated into MULTUM II by an acceleration voltage U . Modulation of the acceleration voltage ΔU may change the ion velocity in the ion injection optics. In this case, t is modulated as $\Delta t = (1/2)(\Delta U/U)t_u$, where t_u is the TOF from ion source to MULTUM II at U . MULTUM II consists of four electric sectors subject to the electric field E . If E is modulated by ΔE , ion trajectories in the field change without changing the ion speed. Consequently, t is modulated as $\Delta t = (\Delta E/E)(t - t_u)$. Modulation of the application time to the L1 lens of the ion injection optics, Δt_{L1} , is also considered. By using the error propagation theory, R can be written as:

$$R = \left[\left\{ \left(\frac{2\Delta E}{E} \right) \left(1 - \frac{t_u}{t} \right) \right\}^2 + \left(\frac{\Delta U}{U} \right)^2 \left(\frac{t_u}{t} \right)^2 + \left(\frac{2\Delta t_{L1}}{t} \right)^2 + \left(\frac{2\Delta t_0}{t} \right)^2 \right]^{-1/2} \quad (2)$$

where Δt_0 is the initial peak width for the m/z , depending on conditions of sputtering and post ionization.

Therefore, the mass resolution of LIMAS is saturated by modulations of the electric field E for the electric sectors for a large t . I measured the modulation of the electric field for several tens of seconds, corresponding to the duration of 1,000 spectral measurements. The voltage modulation was ~ 5 ppm (peak to peak).

This modulation corresponds to $R = 10^5$ and is consistent with the saturation value of the mass-resolving power in Fig. 5a. The agreement between the measurements of voltage modulation of the electric field and modulation of single spectra suggests that the electric field stability needs to be improved to achieve higher mass-resolving power by LIMAS for the accumulation mode.

If the TOF modulations for an objective mass are calibrated for all TOF mass spectra generated by single post-ionization, i.e., for all 1,000 spectra in this study, then all the modulations except that of Δt_0 in Eq. (2) could be canceled. I applied flight time normalization for peak maxima of $^{24}\text{Mg}^{2+}$, and then averaged over the 1000 spectra. The normalized mass spectra of $^{24}\text{Mg}^{2+}$ are shown in Fig. 6. As can be seen in Fig. 4, peak tailing for less than 20 multi-turn cycles is larger than that for more than 50 multi-turn cycles, demonstrating that ion trajectories of the $^{24}\text{Mg}^{2+}$ packet are not stable for less than 20 multi-turn cycles. However, after 20 multi-turn cycles, the shapes become similar to one another and the intensity gradually decreases as the number of cycles increases (Fig. 7). As a result, the FWHM of the $^{24}\text{Mg}^{2+}$ spectra increase slightly for less than 20 multi-turn cycles, but become smaller and constant (~ 4.1 ns) after 20 multi-turn cycles (Fig. 5b). Indeed, the mass-resolving power increases linearly with the number of multi-turn cycles and reaches 6.2×10^5 at 1,000 multi-turn cycles corresponding to the flight path length of 1,312 m. The results demonstrate that the nature of perfect space and time focusing ion optics for MULTUM II is realized at least for 1,000 multi-turn cycles.

The TOF normalization would be principally useful to other m/z peaks. I, however, note the effects of frequencies of voltage modulations of the electric field E for other m/z peaks because of the difference of TOF for each m/z . Peak widths for $^{24}\text{Mg}^+$ after normalization to the TOF of $^{24}\text{Mg}^{2+}$ are shown in Fig. 5c as a function of the TOF for $^{24}\text{Mg}^+$. The characteristics are essentially the same as the case for $^{24}\text{Mg}^{2+}$ without TOF normalization (Fig. 5a). This result suggests that the voltage modulations ΔE around frequencies of 1000 μs must be improved to achieve a higher mass-resolving power by LIMAS when the mass spectra read to be accumulated.

2.4.3. Transmittance and useful yield

Ion intensities in LIMAS decrease with the flight path length (Fig. 7). During the first 20 multi-turn cycles, the ion intensity rapidly decreases to 60–70% of the initial value; then, the ion intensity decreases gradually with

increasing the number of cycles. The rapid reduction in the ion intensity results from the divergence of the ions trajectories owing to the existence of non-adapted ion components with large spatial deviation, angular deviation, and energy deviation in the initial extracted ion packet (Toyoda et al., 2003). Various ion peak shapes observed during the first 20 multi-turn cycles (Fig. 6) support this explanation.

The peak shape observation suggests that the ion trajectories converge after 20 multi-turn cycles (Fig. 6). Small-angle scattering caused by collisions with residual gas in the vacuum becomes significant for disturbances of the converged ion trajectories. Decreasing ion intensities by collision with residual gas can be written as [6]:

$$I(l) = I_0 \exp(-l/\lambda) , \quad (3)$$

where I is the ion intensity, I_0 is the initial intensity, l is the flight path length, and λ is the mean free path.

I derived the values of I_0 and λ by using the method of least squares on the data from 20 to 1000 multi-turn cycles (Fig. 5). As a result, I obtained I_0 of 1 V and λ of 4,000 m. The mean free path λ can also be estimated from the following equation:

$$\lambda = (kT)/(2^{1/2} \sigma P) \quad (4)$$

where k is the Boltzmann constant, T is the temperature (296 K), σ is the collision cross-section (N_2 gas: $4.2 \times 10^{-19} \text{ m}^2$, which is estimated as abundant residual gas species in MULTUM II), and P is the pressure. By using the calculated λ value, I estimated the pressure P of $2 \times 10^{-6} \text{ Pa}$ in the MULTUM II, which is consistent with the monitored pressure by a B-A ionization gauge (Canon ANELVA Corp.) in MULTUM II ($2.5 \times 10^{-6} \text{ Pa}$). The estimated ion transmittance after 20 multi-turn cycles was 99.96% per cycle.

A useful yield of Si for LIMAS was determined by measuring a depth profile of a silicon wafer. A useful yield was defined as the number of detected atoms divided by the number of atoms sputtered from the sample. The number of the sputtered atoms was calculated by noting the volume of the sputtered crater and the crystal structure of the sample.

LIMAS mainly generates post-ionized ions of $^{28}\text{Si}^+$, $^{28}\text{Si}^{2+}$, $^{28}\text{Si}^{3+}$, and

$^{28}\text{Si}^{4+}$ for Si ions from the Si neutral plume with the ratios of 1.0:3.5:3.0:1.9. I counted the numbers of these four ion species and used the total count as the number of detected Si atoms to calculate the useful yields. The exact numbers of multi-turn cycles for the $^{28}\text{Si}^+$, $^{28}\text{Si}^{2+}$, $^{28}\text{Si}^{3+}$, and $^{28}\text{Si}^{4+}$ ions were 20, 28, 34, and 39 multi-turn cycles, respectively. The total Si count was 2.1×10^8 ions. The crater volume was $2.0 \mu\text{m} \times 3.2 \mu\text{m} \times 211 \text{ nm}$, equivalent to 6.7×10^{10} Si atoms extracted. As a result, the useful yield of Si for LIMAS at 30 multi-turn cycles was 3×10^{-3} . Assuming the transmittance of ion intensity in Fig. 7, the useful yields for Si were estimated as 5×10^{-3} in the linear mode, and as 2×10^{-3} at 1,000 multi-turn cycles. The calculated useful yields for LIMAS are comparable to those of commercial SIMS instruments (e.g., the useful yield of Si for Cameca ims 6f is 7×10^{-3} (Hervig et al., 2006)). I thus conclude that LIMAS is an instrument with a satisfactory high mass-resolving power and a high useful yield for microanalysis.

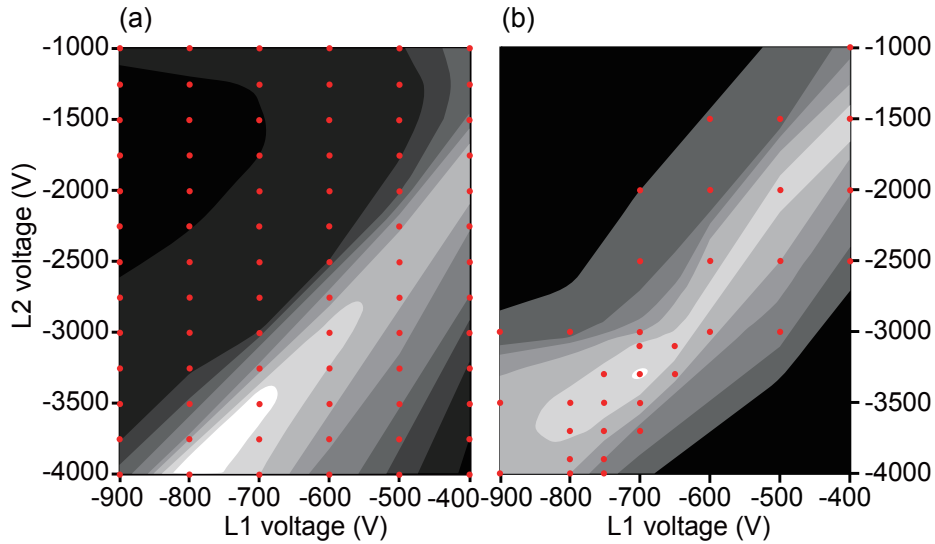


Figure 4. Contour maps of ion transmittance for the ion injection optics. (a) Numerical simulation, (b) integrated ion signal intensity of $^{24}\text{Mg}^{2+}$. White color corresponds to the higher transmittance. The red points are the data points of numerical simulations and measurements.

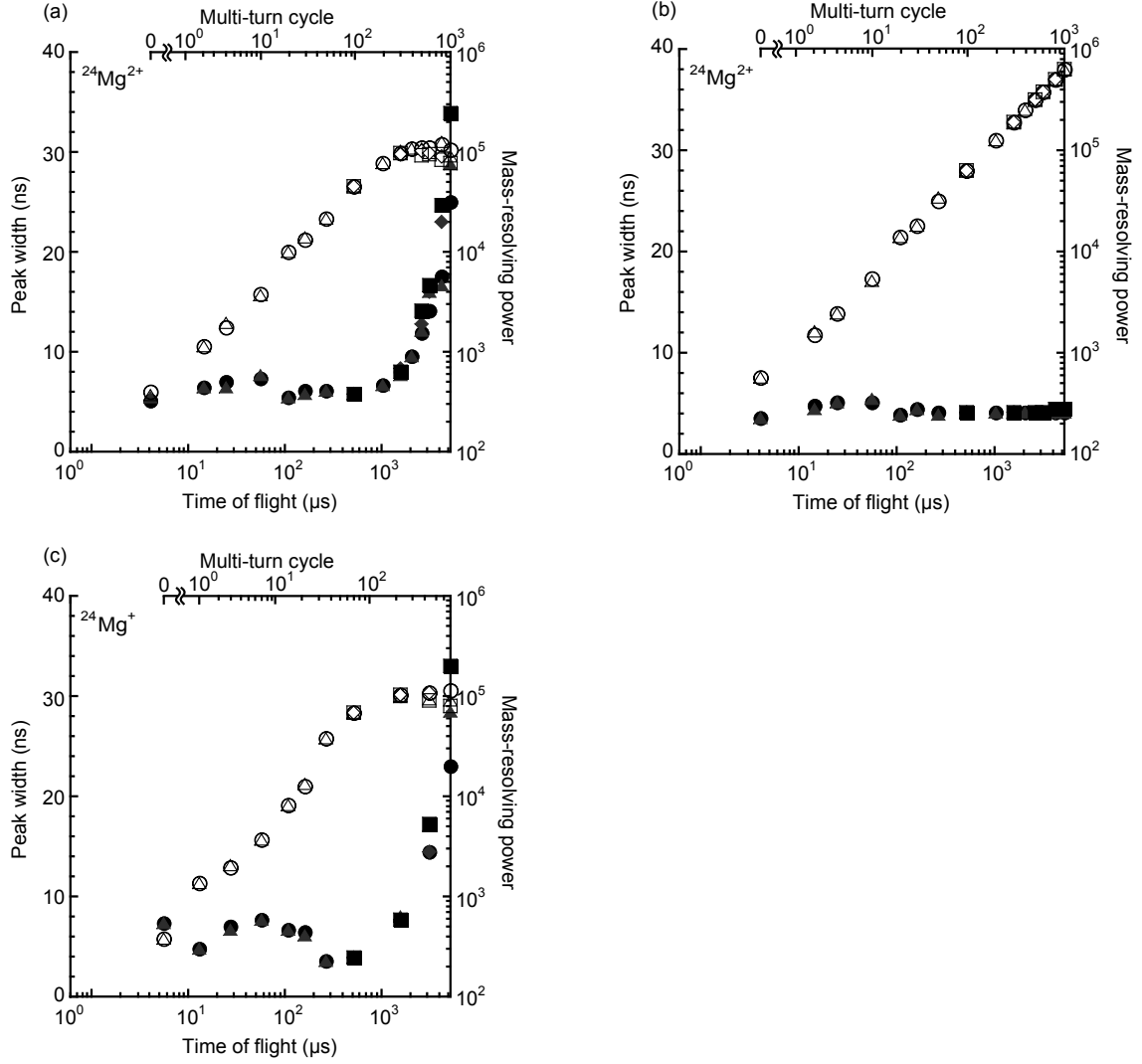


Figure 5. Peak width, defined by the FWHM and the mass-resolving power as a function of the time of flight (a) for $^{24}\text{Mg}^{2+}$ before the TOF normalization, (b) for $^{24}\text{Mg}^{2+}$ after the TOF normalization to $^{24}\text{Mg}^{2+}$ and (c) for $^{24}\text{Mg}^{+}$ after the TOF normalization to $^{24}\text{Mg}^{2+}$. The closed symbols denote the peak widths, while the open symbols denote the mass-resolving power. Different symbols correspond to different independent experiments.

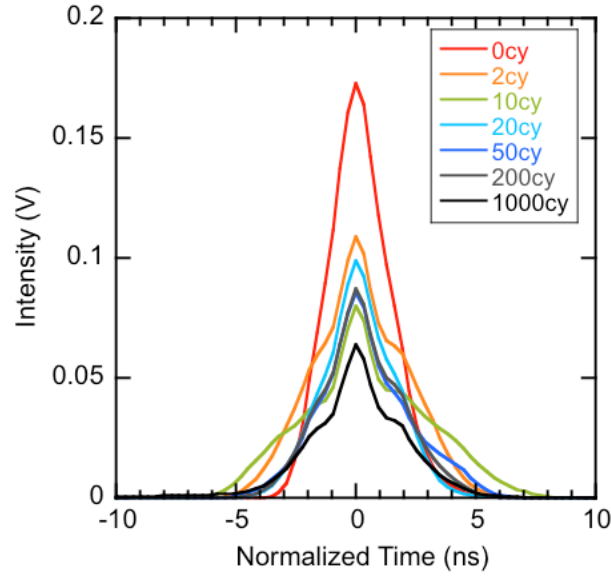


Figure 6. Mass spectra of $^{24}\text{Mg}^{2+}$ for multi-turn cycles, calibrated by using flight time normalization.

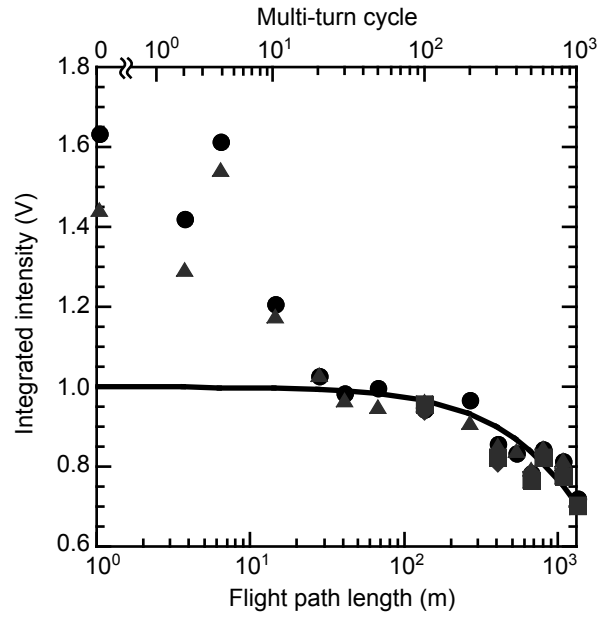


Figure 7. Ion intensity (99% of the area under the peak) of $^{24}\text{Mg}^{2+}$, as a function of the flight path length. Different symbols correspond to different independent experiments. The solid curve is the least mean squares approximation of Eq. (3), calculated for the data from 20 to 1,000 multi-turn cycles.

2.5. CONCLUSIONS

The main conclusions of this study are as follows:

1. Optimal parameters for the ion injection optics of LIMAS were determined by a combination of simulation and measurement.
2. The mass-resolving power did not increase after the TOF of 1,000 μs (200 multi-turn cycles) in the simple accumulation mode, owing to the TOF modulation of ion packets, in previous study. I developed a correction method for the mass calibration. As a result, the mass-resolving power of 6.2×10^5 was achieved at the TOF of 5 ms (1,000 multi-turn cycles corresponding to flight path length of 1,312 m).
3. The ion transmittance of LIMAS was limited by the divergent trajectories of post-ionized ions in the first 20 multi-turn cycles of MULTUM II, and by the collisions with residual gas in MULTUM II for multi-turn cycles more than 20.
4. The estimated useful yields of Si were 5×10^{-3} in the linear mode, and 2×10^{-3} at 1,000 multi-turn cycles.

I conclude that LIMAS is an instrument with a satisfactory high mass-resolving power and a high useful yield for microanalysis.

3. SEARCH OF HIGH SENSITIVE DEPTH PROFILING METHOD FOR SOLER WIND NOBLE GASES BY USING LIMAS

3.1. INTRODUCTION

Genesis spacecraft mission by NASA was carried out in order to determine the composition of the Sun and the solar nebula. In the Genesis mission, *in-situ* measurements of SW and the collection of SW were carried out. Reisenfeld et al. (2003) reported that the Genesis spacecraft E array collector was irradiated by coronal mass ejection (CME) during the flight. The irradiated samples were returned and measured in laboratory. The noble gas bulk composition in Genesis-DOS was measured by using the combined method of UV laser aberration and mass spectroscopy (Heber et al., 2009; 2012). Heber et al. (2009) reported that the dose of ^4He ion implants in the Genesis-DOS sample is $8.2 \times 10^{14} \text{ atoms cm}^{-2}$, and ^{20}Ne ion implants in the Genesis-DOS sample is $1.3 \times 10^{12} \text{ atoms cm}^{-2}$. Noble gas isotope compositions in bulk metallic glass (BMG) were measured by CSSE method (Grimberg et al., 2008). The energy distribution and fluence of noble gases are therefore well known by *in-situ* measurement by research of the spacecraft. However, analyses of the SW noble gases under high spatial resolution had not been carried out, because of a depth profiling method for noble gases was not developed.

Bajo et al. (2015) carried out depth profiling in the Genesis-DOS sample by LIMAS. They reported the method to calculate the energy distribution of the SW from the spatial distribution. However, the ^4He concentration of sample deeper than 120 nm from the surface, corresponding to implanted depth of CME, was equivalent to the residual He gas amount of $\sim 3 \times 10^{18} \text{ atoms cm}^{-3}$ in the sample chamber. Therefore, the $^4\text{He}^+$ depth distribution of deep region (>120 nm) in the Genesis-DOS sample has not yet been determined. The concentration of ^4He in deep area should be surveyed with improved analysis method in this study. Moreover, the depth distribution of $^{20,22}\text{Ne}$ could also be obtained by the method. Therefore, I carried out the depth profile analysis for the noble gas

isotopes (^4He and ^{20}Ne) in the Genesis-DOS sample based on the analytical condition described in section 2.

3.2. EXPERIMENTAL

3.2.1. Samples

I prepared a Genesis mission sample for analysis, which was a diamond-like-carbon film deposited on silicon wafer substrate "Genesis-DOS 60939" (Jurewicz et al., 2003), which was numbered by NASA. The Genesis-DOS sample was equipped on B/C arrays of the Genesis spacecraft.

As a standard sample for determination of the relative sensitivity factors (RSF) of He and Ne, I prepared ion implanted DOS samples for ^4He and ^{22}Ne . The ^4He and ^{22}Ne ions were implanted into non-flight DOS wafers at NIMS. The calculation procedure of RSF was based on Bajo et al. (2015). These samples were used to calculate the concentration of He and Ne from obtained ion intensities. A standard for ^4He (He-DOS) was irradiated by $^4\text{He}^+$ with an energy of 15 keV and a fluence of $1 \times 10^{16} \text{ cm}^{-2}$ (Leonard Kroko, Inc). A standard for ^{22}Ne (Ne-DOS) was irradiated by $^{22}\text{Ne}^+$ with an energy of 27 keV and a fluence of $2 \times 10^{15} \text{ cm}^{-2}$. I also prepared sample of non-flight DOS (Blank-DOS) to evaluate backgrounds of He and Ne during the measurements.

3.2.2. Analytical condition

Measurement conditions were as follows; A pulse width of primary beam was set to 600 ns. Sputtered neutrals were ionized by a femtosecond laser beam (Astrella, Coherent, USA). This system generates 30-fs pulses with a pulse energy of 5.6 mJ, at the repetition rate of 1 kHz. The fs laser pulse was focused to a diameter of $\sim 50 \mu\text{m}$ above the sample surface with a power density of $\sim 10^{20} \text{ W m}^{-2}$. Extraction of ions to MS was made with the optimal conditions described in the section 2 (acceleration voltage is -4 kV, L1 lens voltage is -700 V, L2 lens voltage is -3300 V). Ions of m/z of 4 to 22 were multi-turned in MULTUM II. Vacuum in the sample chamber was 2×10^{-8} to $3 \times 10^{-8} \text{ Pa}$. In this study, $^4\text{He}^+$, $^{12}\text{C}^+$, $^{12}\text{C}^{2+}$, $^{12}\text{C}^{3+}$ and $^{20}\text{Ne}^+$ ions were measured. The primary beam pulse of each data point was set to 100 shots because data integration is required for depth profiling. Beam-shot numbers per one layer was 22500 (15 spots $\times$ 15 spots $\times$

100 mass scan).

The primary beam diameter is the important factor in this analysis. A pulsed primary beam of ^{69}Ga (30 keV and 40~50 nA) was focused by the aberration corrector to the spot of 1.5 μm in diameter. ^4He from a sputtered crater edge could be a contaminant for a spot analysis. Therefore, depth profiling was carried out as a raster analysis to reduce the ^4He contamination from the crater edge.

Another important point is a beam interval step for the raster analysis, when the step depends on the diameter of primary beam. Bajo et al. (2015) reported that the interval step was set to 15 x 15 spots for 0.8 μm of primary beam diameter (total raster area: 10 x 15 μm).

Depths of sputtered craters were measured after the depth profiling analysis of LIMAS by an atomic force microprobe (Asylum Technology, MFP-3D-BIO-J). The depth of one layer was estimated from a crater depth and the number of layers. The center areas of the sputtered craters were used to determine the depth profiles without crater edge effects (5 x 5 spots). Obtained data are analog (V) and digital data (ion count). Ion counts per one pulsed primary beam were calculated by dividing single shot numbers of one layer by ion counts obtained from one layer (i.e., Count/ Mass scan/ Pixel, hereafter Cnt/MSc/Px). The calibration factor (RSF) of ^4He in Standard samples (He-DOS) was calculated from $\sum^4\text{He}/\sum^{12}\text{C}$ and the ^4He total fluence of $1 \times 10^{16} \text{ cm}^{-2}$. The calibration factor (RSF) of ^{20}Ne in Standard samples (Ne-DOS) was also calculated from $\sum^{22}\text{Ne}/\sum^{12}\text{C}$ and the ^{22}Ne total fluence of $2 \times 10^{15} \text{ cm}^{-2}$. The concentration of each layer was estimated from $\sum^4\text{He}/\sum^{12}\text{C}$ (or $\sum^{22}\text{Ne}/\sum^{12}\text{C}$) of each layer multiplied by the RSF. This calculation is the same as that described in Bajo et al. (2015).

3.3. RESULTS AND DISCUSSION

3.3.1. Improvement of vacuum condition and He background

The high ^4He background should be reduced to obtain the spatial distribution of SW noble gas isotopes in the deep region of the Genesis-DOS sample. Plausible reasons of the high ^4He background are; (1) the presence of interfering ion, (2) the contamination of residual He gas in the sample chamber, and (3) the effect of ^4He contamination from a creator edge, where the He concentration is higher. Therefore, I first investigated the main cause of high He background for the depth profiling. Blank-DOS sample and He-DOS sample were used for this purpose.

3.3.1.1. Effects of interfering ions

$^{12}\text{C}^{3+}$ is an interfering ion for $^4\text{He}^+$ in DOS sample, of which m/z is 4. Bajo et al. (2015) reported that the interfering ion did not contribute to the $^4\text{He}^+$ ion counts due to the mass-resolving power of 8600 at 10% valley when the flight path length was 68 m (52 multi-turn cycles). However, the intensity and the shape of the detected mass spectrum could be changed because the new high power laser system and the optimal extraction condition was used in this study. Therefore, the relationship between the target ion and the interfering ion should be reevaluated.

For the evaluation, I compared with $^{12}\text{C}^{3+}$ and $^4\text{He}^+$ spectra by using the Blank-DOS sample at 52 multi-turn cycles (Fig. 8a). As a result, I found that the tail of $^{12}\text{C}^{3+}$ spectrum contributed to the TOF of $^4\text{He}^+$ spectrum. The tail effect could be due to the increase of $^{12}\text{C}^{3+}$ signals with the replaced laser system.

There are two possible ways to eliminate the interfering ion such as $^{12}\text{C}^{3+}$. One method is to increase the number of multi-turn cycles to separate $^{12}\text{C}^{3+}$ from $^4\text{He}^+$. Another one is to eliminate the interfering ion using ion gates (IGs) (Bajo et al., 2016; Tonotani et al., 2016).

$^{12}\text{C}^{3+}$ spectrum was obtained at 100 multi-turn cycles to compare with that of 52 multi-turn cycles. However, the tail of $^{12}\text{C}^{3+}$ remained to be large

enough to contribute the TOF of $^4\text{He}^+$ spectrum.

Elimination of interfering ion was carried out using IGs I and II. Two IGs are mounted in the MULTUM II. The timings and durations of activation of IGs I and II were independently adjusted in order to eliminate interference peaks and to obtain target mass spectra.

As a result, $^{12}\text{C}^{3+}$ with tail was eliminated at 100 multi-turn cycles (Fig. 8d). However, $^{12}\text{C}^{3+}$ spectrum could not be eliminated enough at 52 multi-turn cycles (Fig. 8c). This result indicates that the elimination is difficult at 52 multi-turn cycles. Consequently, the number of cycles was set to 100 multi-turn cycles with using IGs I and II in this study.

Under these condition, ^4He decreased from $(1.1 \pm 0.04) \times 10^{-2}$ to $(6.4 \pm 1.1) \times 10^{-4}$ Cnt/MSc/Px in Blank-DOS sample. However, that of the sample chamber did not decrease (Table 1). This indicates that the contamination from He residual gas in the sample chamber causes to the high ^4He background.

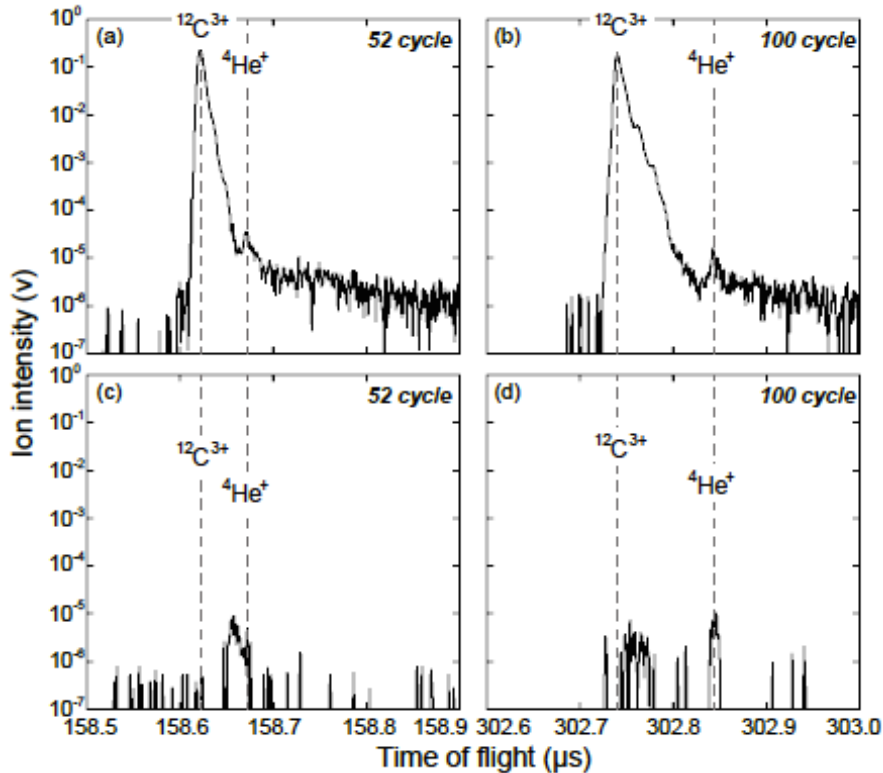


Figure 8. Spectra of $^{12}\text{C}^{3+}$ and $^4\text{He}^+$ of Blank-DOS sample. (a) 52 multi-turn cycle without ion gates, (b) 100 multi-turn cycle without ion gates, (c) 52 multi-turn cycle with ion gates, (d) 100 multi-turn cycle with ion gates.

Table 1. ^4He counts from the sample chamber and ^4He background in each sample.

	Residual ^4He in sample chamber after Blank-DOS (Cnt/Msc/Px)		^4He background Blank-DOS (Cnt/Msc/Px)		^4He background He-DOS (Cnt/Msc/Px)	
	(SE)		(SE)		(SE)	
Bajo et al., 2015	2.0E-4 ~ 3.0E-4	–	3.0.E-04	–	3.0.E-04	–
Using section 2 condition & high power laser	1.3E-04	1.5E-05	1.1E-02	4.3E-04	–	–
Increasing muti- tuning & using IG	5.9E-04	4.4E-05	6.4E-04	1.1E-04	–	–
Elimination of He gas in sample chamber	3.1E-05	2.6E-06	5.3E-05	2.0E-05	6.4.E-04	1.2.E-04

Table 2. Relationship of the raster area with the ^4He background concentration.

	Raster area	Analysis area	^4He background			
			He-DOS	(SE)	Genesis-DOS	(SE)
Bajo et al., 2015	15	5	3.00.E-04	–	3.00.E-04	–
This study	18	3	2.82.E-04	1.17.E-04	–	–
	18	5	4.41.E-04	8.89.E-05	–	–
	18	8	3.25.E-04	6.60.E-05	–	–
	18	10	5.42.E-04	5.12.E-05	–	–
	30	5	–	–	4.00.E-05	2.23.E-05
	30	14	–	–	8.67.E-05	1.70.E-05

3.3.1.2. Effects of residual He gas in sample chamber

If the residual He gas in the sample chamber induces the high He background, it should be reduced. Therefore, an ion pump beneath the sample chamber equipped with a high vacuum speed was replaced (Agilent VacIon Plus 500 (StarCell) [discharged speed is 420 L s^{-1}] and a NEG pump [discharged speed is 1300 L s^{-1}]). The discharge speed of this ion pump was twice as larger that of previous ion pumps. As a result, the pressure of sample chamber became less than $1.7 \times 10^{-8} \text{ Pa}$, and H , H_2O and N_2 gas decreased 20 %, which were the main residual gas in the sample chamber.

With the new ion pump, ^4He in sample chamber was $(3.1 \pm 0.3) \times 10^{-5}$ Cnt/MSc/Px, and residual He gas decreased 90% comparing with that of the previous setting. ^4He amounts in the Blank-DOS sample with the new pumping system was $(5.3 \pm 2.0) \times 10^{-5}$ Cnt/MSc/Px (Table 1). Therefore, ^4He gas in Blank-DOS decreased 90% comparing with that of before setting. It is thus suggested that the high He amount in the Blank-DOS sample before setting was caused by residual gas in the sample chamber.

However, the ^4He background was $(6.4 \pm 1.2) \times 10^{-4}$ Cnt/MSc/Px for the He-DOS sample (Table 1).

3.3.1.3. Effects of the He contamination from creator edge

The high ^4He background in the He-DOS sample might have been caused by the He contamination from the crater edge (i.e., edge effect). I carried out the confirmation by changing the raster area and analysis area, whether the contribution of edge effect. If the ^4He background is lower for the larger raster area, it suggests that the He background come from the crater edge. I only changed the analysis area under the fixed raster condition 18×18 spots (corresponding to $14 \times 20 \mu\text{m}$) to check the He background.

As a result, the ^4He background was 2.9×10^{-4} Cnt/MSc/Px for the 3×3 spots, 4.4×10^{-4} Cnt/MSc/Px for the 5×5 spots, 3.3×10^{-4} Cnt/MSc/Px for the 8×8 spots and 5.5×10^{-4} Cnt/MSc/Px for the 10×10 spots of analysis area, respectively (Table 2). Therefore, the ^4He background value slightly contributes to raster area size (i.e., the ^4He background of the analysis area of 3×3 spots is lower than that of 10×10 spots). However, the ^4He background is almost the same when the analysis area size is $< 20\%$ of the raster area. Consequently, the high ^4He background in the He-DOS sample is considered that ^4He in He-DOS sample is slightly enriched than that of other sample.

The same analysis was also carried out for the Genesis-DOS sample with the raster area of 30×30 spots (corresponding to $23 \times 30 \mu\text{m}$) for the isotope analysis of trace amount such as ^{20}Ne . The ^4He background of the Genesis-DOS was $(4.0 \pm 0.2) \times 10^{-4}$ Cnt/MSc/Px (1.6×10^{17} atoms cm^{-3}) for $5 \times$

5 spots of the analysis area, $(8.7 \pm 1.7) \times 10^{-5}$ Cnt/MSc/Px (3.5×10^{17} atoms cm^{-3}) for the 14×14 spots of analysis area, respectively (Table 2).

This ^4He background was more than one order of magnitude lower compared with that in Bajo et al. (2015) (3×10^{18} atoms cm^{-3}) most likely due to contribute the residual He gas in the sample chamber. Depth profiling of Genesis-DOS sample was carried out based on these results.

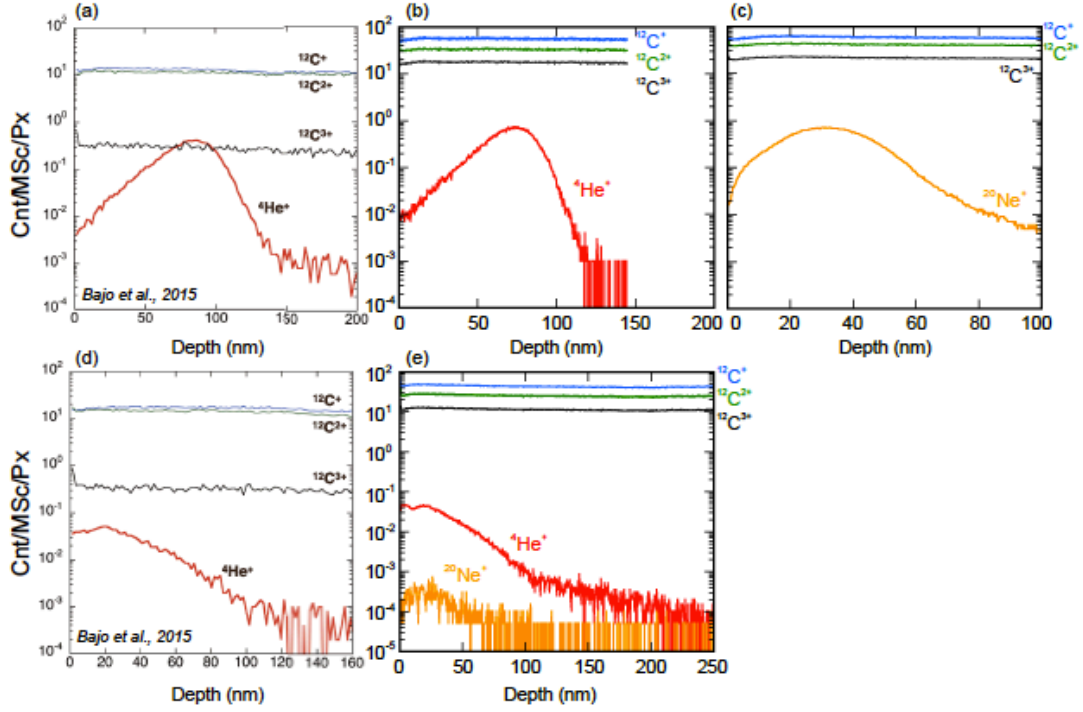


Figure 9. Depth profiles of Bajo et al. (2015) (a,d) and those after the installation of a high discharged speed ion pump (b,c,e). (a) and (b) are the depth profiles of the He-DOS sample. (c) is the depth profiles of the Ne-DOS sample. (d) and (e) are the depth profiles of the Genesis-DOS 60939. Note that the vertical axis is shown down to 10^{-5} Cnt/MSc/Px for (e).

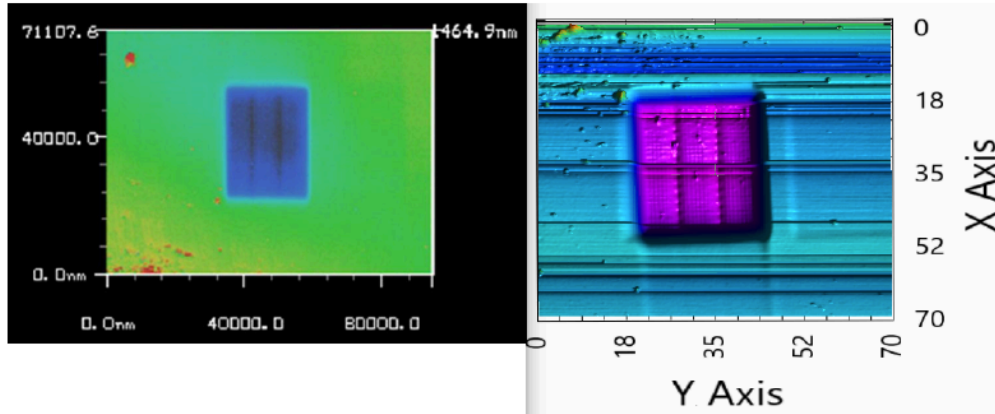


Figure 10. Images of a sputtered crater on Genesis-DOS 60939 obtained by a laser scanning confocal microscope (Left image) and an atomic force microscope (Right image).

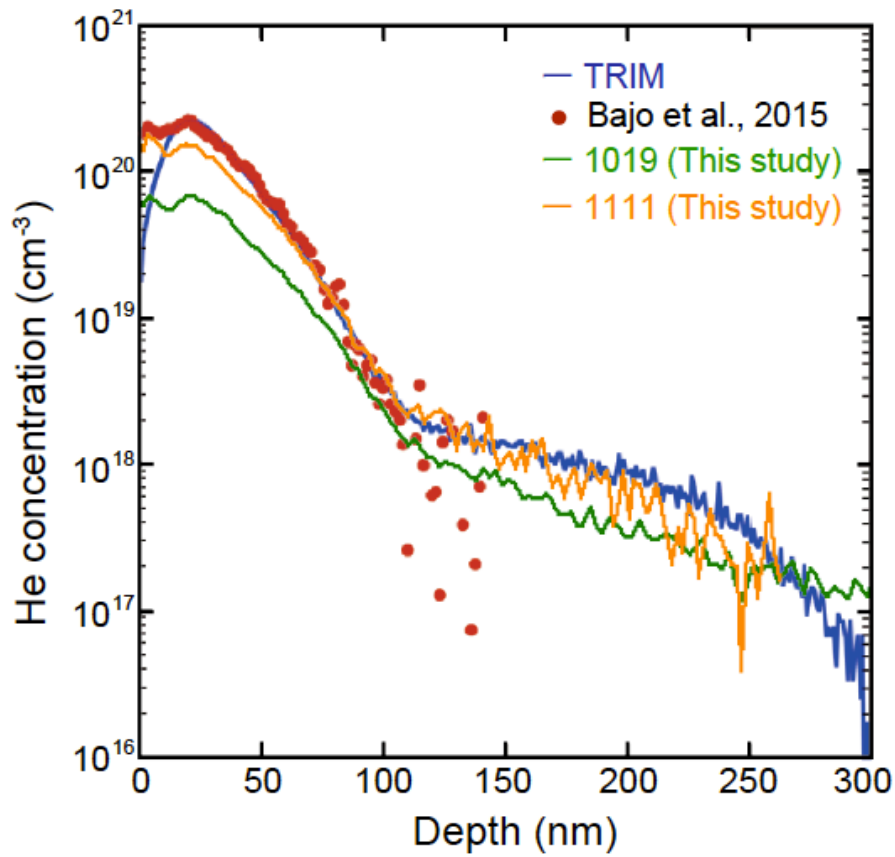


Figure 11. Composition of the ^4He depth profiles of Genesis-DOS 60939 analysis (this study and Bajo et al. (2015)) with the TRIM simulation. The ^4He profiles in the present study were obtained with smoothing of 5 layers.

3.3.2. ^4He and ^{20}Ne depth profiling of Genesis-DOS sample

The ^4He background in the Genesis-DOS sample was reduced (Table 2), and the ^4He depth profiling was carried out. Fig. 10 shows an example of the crater image after depth profiling. Implantation of high energetic particles (CMEs) was confirmed by LIMAS for the first time (Fig. 9e).

Heber et al. (2009) reported that ^{20}Ne is the second most abundant noble gas in the Genesis samples, and that $^4\text{He}/^{20}\text{Ne}$ ratio was 656. The ^{20}Ne profile in the Genesis-DOS sample was measured by using this method at the same time. The depth profile of ^{20}Ne of the SW origin was also obtained (Fig. 9e). Consequently, we were able to discuss the elemental distribution of SW.

^4He and ^{20}Ne concentration profiles were calculated from $\sum^4\text{He}/\sum^{12}\text{C}$ and $\sum^{20}\text{Ne}/\sum^{12}\text{C}$ ratios, and these concentrations were compared with the simulation with Transport of Ions in Matter (TRIM) (Fig. 11). The TRIM simulation is a Monte Carlo program and is useful to analyze ion implantation profiles (Ziegler et al., 2012). The obtained SW profiles are consistent with the TRIM simulation except for the uppermost 15 nm, which was also shown in Bajo et al. (2015). Yurimoto et al. (2016) suggested that the discordance of the depth profile near the surface was caused by effusion He from silicon substrate, which could explain the disturbances found in this study and in Bajo et al. (2015). The ^4He near the surface might be enriched because the effective He effusion is expected to occur abruptly when the network of defects connects to the surface of the Genesis-DOS sample. The ^4He and ^{20}Ne fluence was calculated by depth profile results (Table 3). The ^4He fluence was $(5.3 \pm 2.0) \times 10^{14} \text{ cm}^{-2}$ and the ^{20}Ne fluence was $1.4 \times 10^{12} \text{ cm}^{-2}$, which are consistent with those obtained from the DOS sample with a UV laser aberration MS by Heber et al. (2009) (^4He : $8.2 \times 10^{14} \text{ cm}^{-2}$, ^{20}Ne : $1.3 \times 10^{12} \text{ cm}^{-2}$) and from the BMG sample using a CSSE method by Grimberg et al. (2008) (^4He : $5.4 \times 10^{14} \text{ cm}^{-2}$, ^{20}Ne : $1.2 \times 10^{12} \text{ cm}^{-2}$) and the SWC analysis in space by Reisenfeld et al. (2013) (^4He : $8.1 \times 10^{14} \text{ cm}^{-2}$).

The $^4\text{He}/^{20}\text{Ne}$ bulk value ($\sum^4\text{He}/\sum^{20}\text{Ne}$) was calculated as 518 (Appendix 4_2a), which is consistent with the DOS data by Heber et al. (2009)

(He/Ne = 648 ± 1) and the Apollo SWC research result by Geiss et al. (2004) (570 ± 70). This is lower than the solar photospheric $^4\text{He}/^{20}\text{Ne}$ (e.g., $^4\text{He}/^{20}\text{Ne}$ is 850 in Anders and Grevesse., 1989; $^4\text{He}/^{20}\text{Ne}$ is 1177 in Lodders., 2003).

Fig. 12a shows a ^4He depth profile obtained by the CSSE method (Grimberg et al. (2008)). They reported that the peak of ^4He depth profiles were at ~ 40 nm deep from the sample surface and the peak of ^{20}Ne profiles were at the region deeper than 40 nm from the sample surface. However, the peaks of depth profiles of ^4He and ^{20}Ne in this study were found to be located at about 20 nm from the surface (Fig. 12b). In this study, this result relates to the profile of $^4\text{He}/^{20}\text{Ne}$ ratio (Fig. 12c, d), $^4\text{He}/^{20}\text{Ne}$ ratio decreased down to smaller than 100 in the deep region (> 80 nm). Grimberg et al. (2008) used the CSSE method for noble gas isotopes analysis, where the released noble gases by stepwise etching were measured by a mass spectrometer. Therefore, He from creator edge was included in the analyzed. Consequently, this method could not be appropriate as a quantitative depth profiling for noble gas isotopes. On the other hand, the method used in this study is the best quantitative noble gas isotope analysis because data except for He from edge are used.

The useful yield of each ion was estimated from ^4He in the He-DOS sample and ^{20}Ne in the Ne-DOS sample (Table 4). The useful yield of ^{12}C was estimated from the number of detected atoms divided by the number of atoms sputtered from the sample. The useful yields of ^4He and ^{22}Ne were calculated from the number of detected atoms divided by the dose amounts of each ion in the analysis area. I found that useful yields of ^{12}C and ^4He ions were improved from those of Bajo et al. (2015) (Useful yield of ^{12}C : 7×10^{-5} , ^4He : 4×10^{-5}) (Table 4). Therefore, I conclude that a high sensitive depth profiling method for noble gas isotopes was established for LIMAS in this thesis.

Table 3. Fluence of noble gas isotopes in the Genesis-DOS estimated in this study.

Target Mass	Data number	$\Sigma ^4\text{He}/\Sigma \text{C}^*$	$\Sigma ^4\text{He}/\Sigma \text{C}^*$	Standard Dose amount ($\times 10^{16} \text{ cm}^{-2}$)	^4He Fluence ($\times 10^{14} \text{ cm}^{-2}$)
		^4He -DOS 15keV	Genesis-DOS		
^4He	1019	3.669	0.124	1	3.4
	1111	0.721	0.053		7.3
	mean				5.3 (2.0)

Target Mass	Data number	$\Sigma ^{22}\text{Ne}/\Sigma \text{C}^*$	$\Sigma ^{20}\text{Ne}/\Sigma \text{C}^*$	Standard Dose amount ($\times 10^{15} \text{ cm}^{-2}$)	^{20}Ne Fluence ($\times 10^{12} \text{ cm}^{-2}$)
		Ne-DOS 30keV	Genesis-DOS		
Ne	1111	0.664	0.00047	2	1.4

" $^{12}\text{C}^+$ estimate*" and " $^{12}\text{C}^{3+}$ estimate*" were calculated by using C ratio without IG in each analysis for the estimation of total C ratio.

Table 4. Useful yield of ^{12}C and ^4He in the He-DOS sample and ^{22}Ne in the Ne-DOS sample

		Sample	$\Sigma \text{C}_{\text{ana}}$	A/D ratio	Ion count		
					^{12}C	^4He	^{22}Ne
Bajo et al.,2015		He-DOS	—	—	—	—	—
This study	1019(5/30spot)	He-DOS	3.72.E+05	2.84.E-03	1.31.E+08	9.38.E+05	—
	1111(5/18spot)	He-DOS	1.88.E+05	1.13.E-03	1.66.E+08	2.76.E+05	—
	1111(5/18spot)	Ne-DOS	7.09.E+05	1.31.E-03	5.42.E+08	—	1.39.E+06

		Sample	Sputtered area			Dose amount (cm^{-2})		Useful yield		
			W (μm)	L (μm)	H (nm)	^4He	^{22}Ne	^{12}C	^4He	^{22}Ne
Bajo et al.,2015		He-DOS	—	—	—	—	—	7.00.E-05	4.00.E-05	—
This study	1019(5/30spot)	He-DOS	3.3	4.4	329.8	2.73E+15	—	1.82.E-04	2.32.E-03	—
	1111(5/18spot)	He-DOS	3.8	5.3	200.0	1.39E+16	—	2.86.E-04	1.00.E-04	—
	1111(5/18spot)	Ne-DOS	3.6	5.2	100.0	—	3.01E+15	2.00.E-03	—	2.50.E-03

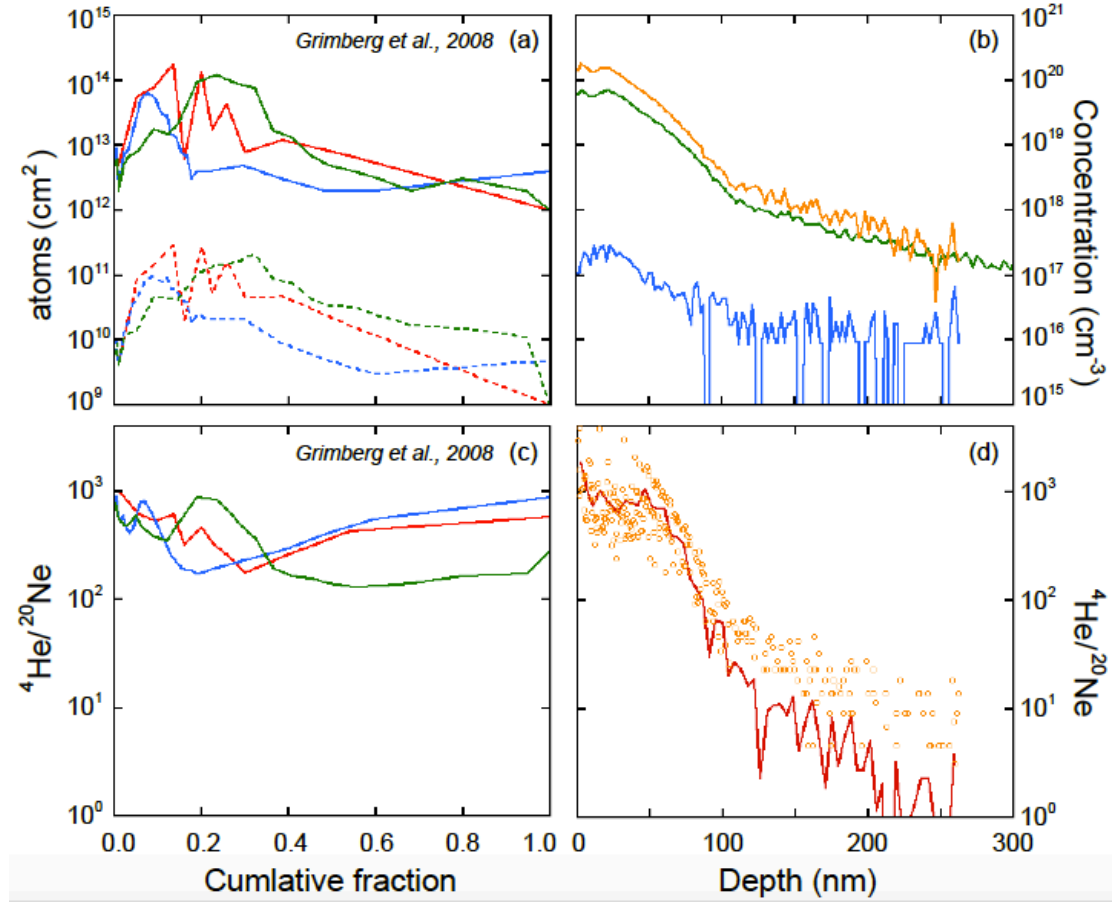


Figure 12. Comparison with those obtained by the CSSE method (Grimberg et al., 2008) of ^4He and ^{20}Ne depth profiles of this study. Curves in (a) and (c) were ^4He , ^{20}Ne and $^4\text{He}/^{20}\text{Ne}$ profiles by Grimberg et al. (2008). Horizontal axis of (a) and (c) were normalized using a cumulative fraction method. Curves in (b) and (d) were ^4He , ^{20}Ne and $^4\text{He}/^{20}\text{Ne}$ profiles in this thesis. (a) solid curves represent three ^4He profile data and dotted curves represent three ^{20}Ne profile data. (b) yellow and green curves are two ^4He profiles and blue curve is a ^{20}Ne profile after the smoothing of 5 layers. (c) $^4\text{He}/^{20}\text{Ne}$ profile was obtained based on result of (a). (d) Open circles are the $^4\text{He}/^{20}\text{Ne}$ ratio based on the result of (b), and a red curve shows smoothed data for every 10 symbols.

3.4. IMPLICATIONS

The distributions of noble gas isotopes in the Genesis sample were successfully by the improved depth profiling with LIMAS.

The depth profile of noble gas provides information of ion-solid interaction. The ion-solid interaction was conventionally calculated with the TRIM simulation. However, the TRIM simulations may overestimate the projected range of ions for low-energy ion implantation (less than several kiloelectron volts) (Nakajima et al., 2001). Consequently, the TRIM simulation data need to be collated with one of depth profiles using SW implanted samples.

In this study, ^4He and ^{20}Ne depth profiles were obtained. However, other noble gas isotopes must be also analyzed. Especially, ^3He profile and its composition with ^4He could provide important information on the solar evolution, and ^{22}Ne also provide important physical information for the Sun's activity by comparing with ^{20}Ne .

For example, the present abundance of ^3He in the Sun is considered to be different from the Sun. ^3He and ^4He formed as intermediate- and final products of H burning in the Sun, respectively. The Sun evolution could be investigated by comparison of ^3He with ^4He ; $^3\text{He}/^4\text{He}$ ratio of the proto Sun should be lower than that of the present Sun because ^3He was produced by D-burning in the young Sun (Wieler, 2002). Such an evidence was also reported from Q gas compositions in primitive meteorites (Geiss J. and Reeves H., 1972). Therefore, if the depth profile of $^3\text{He}/^4\text{He}$ in the Genesis-DOS sample was obtained, the spatial distribution of $^3\text{He}/^4\text{He}$ of the present Sun would be clarified. This $^3\text{He}/^4\text{He}$ ratio of the present Sun should be compared with primitive materials in the solar system and presolar materials.

A heavy isotope of Ne (^{22}Ne) is well known to be enriched in solar energetic particles (SEPs) (Leske et al., 1999). However, the relationship between SEPs and SW has not yet been clarified because $^{20}\text{Ne}/^{22}\text{Ne}$ of SEPs ratio depends on each release event from the Sun. If the depth distribution of $^{20}\text{Ne}/^{22}\text{Ne}$ in the Genesis sample is obtained, the physical chemical relationship of SW and SEPs might be able to understand by comparing the energy

distribution of SW with the energy distribution of SEPs .

Moreover, various kind samples should be investigated to understand the ion-solid interaction. In this study, the Genesis-DOS sample was only used for depth profiling. However, various substrates were exposed to the SW during the Genesis mission (e.g., Sapphire, Silicon) (Jurewicz et al., 2002). If non-DOS Genesis samples were measured using this method, it would help us understand the mechanism of the ion-solid interaction.

Purpose of this study was to establish a high precision depth profiling technique for various samples and various noble gas isotopes. The new information about present Sun and the solar system evolution could be obtained by using this method. If the depth distributions of noble gas isotopes in ancient implanted samples (i.e., lunar regolith and the asteroidal regolith) were measured with this method, they could provide the ancient Sun's activity, and we would be able to evaluate the desorption mechanism of noble gases from the surface of materials by comparing with the TRIM simulation. Therefore, the understand of space weathering is also provided with this method.

I conclude that a high precision depth profiling technique was established in this study, and this method will be quite useful for analytical survey of the Sun's evolution and the solar system evolution.

3.5. CONCLUSIONS

A high sensitivity analytical method is required to understand the depth distribution of SW-origin noble gas isotopes in the Genesis-DOS sample. However, the ^4He concentration in the deep region of the sample (>120 nm), which corresponds to the implanted depth of CME, was equivalent to the residual He gas amount of $\sim 3 \times 10^{18} \text{ cm}^{-3}$ in the sample chamber. The ^4He spatial distribution of the deep region (>120 nm) in the Genesis sample has not yet been obtained ^4He background. In this study, I investigated the causes of the He high background and the way to suppress it. These possible factors for the high background are; (1) the contamination of interfering ion ($^{12}\text{C}^{3+}$), (2) the effect of the residual He gas, and (3) the He contamination from the crater edge.

Due to eliminate the interfering ion, the multi-turn cycle of MULTUM II was increased to 100 cycles to separate $^4\text{He}^+$ from $^{12}\text{C}^{3+}$. The interfering ion was then eliminated by ion gates. A high discharge ion pump was also set to reduce the residual He gas in the sample chamber of LIMAS. Moreover, the raster areas of the primary beam were enlarged by four times to reduce the ^4He contamination from crater edge. As a result, He background became more than one order of magnitude lower in the Genesis-DOS sample compared with that in a previous study (Bajo et al, 2015).

I confirmed the evidence of implantation of CME particles in the deep region of the Genesis-DOS sample with an improved depth profiling technique using LIMAS for first time.

Moreover, the ^{20}Ne depth profile was also measured for first time with this method. Thus, the analytical method for quantitative depth profiling was established to discuss elemental fractionation of the SW.

The bulk $^4\text{He}/^{20}\text{Ne}$ was 518, which is consistent other analyses using the DOS and that of the Apollo SWC research. These depth profiles showed the reduction of $^4\text{He}/^{20}\text{Ne}$ ratio in the deep region.

The useful yield in standard samples (He-DOS and Ne-DOS) of each ions (i.e., C, ^4He , ^{20}Ne ions) was estimated to be $1.8\text{-}2.9 \times 10^{-4}$, $0.1\text{-}2.3 \times 10^{-3}$ and 2.5×10^{-3} for C, ^4H and ^{20}Ne , respectively. These results indicate the better than

that of previous research using LIMAS.

From the above result, I conclude establishment of depth profiling for high sensitive noble gas isotopes.

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Appendix

Appendix1_1a. Ion intensity (Cnt/MSc/Px) and the calculated ⁴He concentrations of He-DOS 15keV (He standard) with Ion gate.

Analysis day: 2016.10.19		⁴ He Dose amount (/cm ²):		1.00E+16 (Bajo et al., 2015)				
Analysis sample: He-DOS 15keV		Σ(⁴ He/C):		3.669				
Raster area: 30px		Relative sensitivity factor (without corr.)		2.73E+15				
Analysis area: 5px		Average of ⁴ He conc. Background (atoms/cm ³)		3.60E+17		Average of ⁴ He background (Cnt/MSc/Px):		
						6.38.E-04		
Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
0.57	8.80.E-02	99.2	74.1	1.77.E-03	17.3	190.6	4.62.E-04	2.19E+19
1.15	2.22.E-02	53.9	48.6	5.02.E-04	10.2	112.8	1.96.E-04	9.33E+18
1.72	3.83.E-02	54.9	46.8	0.00.E+00	10.2	111.9	3.42.E-04	1.63E+19
2.29	4.12.E-02	55.5	46.3	0.00.E+00	10.2	112.0	3.68.E-04	1.75E+19
2.87	3.59.E-02	55.4	45.6	0.00.E+00	10.1	111.2	3.23.E-04	1.54E+19
3.44	5.37.E-02	55.8	45.5	0.00.E+00	10.1	111.4	4.82.E-04	2.29E+19
4.01	5.00.E-02	55.9	44.9	7.90.E-04	10.1	110.8	4.51.E-04	2.14E+19
4.59	4.25.E-02	55.8	44.1	8.91.E-04	10.0	110.0	3.86.E-04	1.84E+19
5.16	5.25.E-02	56.1	44.6	0.00.E+00	10.1	110.8	4.74.E-04	2.25E+19
5.74	4.70.E-02	57.0	44.8	5.55.E-04	10.2	112.0	4.20.E-04	2.00E+19
6.31	5.45.E-02	57.9	45.3	0.00.E+00	10.3	113.5	4.80.E-04	2.28E+19
6.88	5.38.E-02	57.4	45.1	0.00.E+00	10.2	112.7	4.78.E-04	2.27E+19
7.46	6.20.E-02	59.8	45.6	6.39.E-04	10.5	115.9	5.35.E-04	2.54E+19
8.03	6.03.E-02	58.8	46.1	3.81.E-04	10.5	115.3	5.23.E-04	2.49E+19
8.60	6.02.E-02	59.5	45.7	0.00.E+00	10.5	115.7	5.21.E-04	2.47E+19
9.18	5.60.E-02	58.7	45.4	0.00.E+00	10.4	114.6	4.89.E-04	2.32E+19
9.75	6.61.E-02	57.8	45.2	7.01.E-04	10.3	113.2	5.83.E-04	2.77E+19
10.32	5.10.E-02	58.3	44.7	3.37.E-03	10.3	113.3	4.50.E-04	2.14E+19
10.90	6.74.E-02	60.5	46.7	6.11.E-04	10.7	117.9	5.72.E-04	2.72E+19
11.47	6.73.E-02	60.7	46.3	0.00.E+00	10.7	117.6	5.72.E-04	2.72E+19
12.04	5.65.E-02	61.6	46.7	0.00.E+00	10.8	119.2	4.74.E-04	2.25E+19
12.62	6.88.E-02	60.5	45.3	5.38.E-04	10.6	116.5	5.91.E-04	2.81E+19
13.19	7.94.E-02	60.5	46.2	0.00.E+00	10.7	117.4	6.77.E-04	3.22E+19
13.77	6.29.E-02	60.4	45.8	6.03.E-04	10.6	116.8	5.39.E-04	2.56E+19
14.34	8.01.E-02	60.9	46.2	4.34.E-04	10.7	117.8	6.80.E-04	3.23E+19
14.91	7.25.E-02	60.8	46.5	9.67.E-04	10.7	118.0	6.14.E-04	2.92E+19
15.49	7.05.E-02	60.4	46.3	5.89.E-04	10.7	117.4	6.01.E-04	2.85E+19
16.06	7.10.E-02	59.5	45.3	0.00.E+00	10.5	115.3	6.16.E-04	2.93E+19
16.63	8.11.E-02	59.3	45.8	0.00.E+00	10.5	115.7	7.01.E-04	3.33E+19
17.21	9.12.E-02	60.0	45.9	0.00.E+00	10.6	116.5	7.83.E-04	3.72E+19
17.78	7.81.E-02	59.3	46.2	0.00.E+00	10.5	116.0	6.73.E-04	3.20E+19
18.35	9.05.E-02	60.7	46.0	3.39.E-04	10.7	117.3	7.72.E-04	3.67E+19
18.93	8.37.E-02	60.1	46.2	0.00.E+00	10.6	117.0	7.16.E-04	3.40E+19
19.50	9.58.E-02	60.1	46.5	8.35.E-04	10.6	117.2	8.17.E-04	3.88E+19
20.07	9.28.E-02	60.2	46.0	0.00.E+00	10.6	116.7	7.95.E-04	3.78E+19
20.65	1.10.E-01	60.6	46.1	0.00.E+00	10.7	117.4	9.36.E-04	4.45E+19
21.22	1.22.E-01	59.9	46.7	4.76.E-05	10.6	117.2	1.04.E-03	4.96E+19
21.80	1.16.E-01	60.2	46.5	3.17.E-04	10.7	117.3	9.89.E-04	4.70E+19
22.37	1.17.E-01	59.8	46.6	2.94.E-04	10.6	117.1	1.00.E-03	4.75E+19
22.94	1.29.E-01	57.2	45.1	0.00.E+00	10.2	112.5	1.14.E-03	5.44E+19
23.52	1.29.E-01	56.3	44.9	2.89.E-04	10.1	111.4	1.15.E-03	5.48E+19
24.09	1.23.E-01	56.0	45.2	9.89.E-04	10.1	111.3	1.10.E-03	5.24E+19
24.66	1.32.E-01	54.3	44.6	0.00.E+00	9.9	108.8	1.21.E-03	5.75E+19
25.24	1.55.E-01	55.3	44.4	7.90.E-04	10.0	109.7	1.42.E-03	6.73E+19
25.81	1.34.E-01	56.2	45.1	0.00.E+00	10.1	111.3	1.20.E-03	5.72E+19
26.38	1.69.E-01	58.4	46.3	0.00.E+00	10.5	115.2	1.47.E-03	6.99E+19
26.96	1.58.E-01	58.0	45.4	0.00.E+00	10.3	113.8	1.39.E-03	6.60E+19
27.53	1.68.E-01	57.7	45.6	3.42.E-04	10.3	113.6	1.47.E-03	7.01E+19
28.10	1.62.E-01	57.0	45.0	3.22.E-04	10.2	112.2	1.44.E-03	6.86E+19
28.68	1.71.E-01	56.1	44.9	0.00.E+00	10.1	111.1	1.54.E-03	7.33E+19
29.25	1.89.E-01	57.1	45.3	1.19.E-03	10.2	112.6	1.68.E-03	7.97E+19
29.83	1.71.E-01	56.9	44.8	3.78.E-04	10.2	111.8	1.53.E-03	7.27E+19
30.40	2.00.E-01	56.8	44.8	5.69.E-04	10.2	111.8	1.79.E-03	8.49E+19
30.97	1.87.E-01	56.2	44.6	1.68.E-04	10.1	110.9	1.69.E-03	8.02E+19
31.55	2.03.E-01	56.5	45.1	0.00.E+00	10.1	111.7	1.82.E-03	8.64E+19
32.12	1.95.E-01	55.6	44.8	0.00.E+00	10.0	110.4	1.77.E-03	8.40E+19
32.69	2.01.E-01	57.0	45.1	6.73.E-04	10.2	112.4	1.79.E-03	8.52E+19
33.27	2.20.E-01	56.9	45.0	3.90.E-04	10.2	112.1	1.96.E-03	9.31E+19

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
33.84	2.36.E-01	56.6	44.9	0.00.E+00	10.1	111.6	2.11.E-03	1.00E+20
34.41	2.34.E-01	56.4	45.0	2.66.E-04	10.1	111.5	2.10.E-03	9.96E+19
34.99	2.29.E-01	56.3	45.1	0.00.E+00	10.1	111.5	2.05.E-03	9.76E+19
35.56	2.48.E-01	56.0	44.5	0.00.E+00	10.0	110.6	2.25.E-03	1.07E+20
36.13	2.49.E-01	55.4	44.6	1.20.E-03	10.0	109.9	2.26.E-03	1.07E+20
36.71	2.57.E-01	54.1	44.7	4.46.E-04	9.9	108.7	2.36.E-03	1.12E+20
37.28	2.62.E-01	55.3	44.9	6.61.E-04	10.0	110.3	2.38.E-03	1.13E+20
37.86	2.61.E-01	54.4	43.5	3.33.E-04	9.8	107.8	2.42.E-03	1.15E+20
38.43	2.75.E-01	53.3	44.2	0.00.E+00	9.7	107.2	2.56.E-03	1.22E+20
39.00	2.98.E-01	53.0	44.0	7.12.E-04	9.7	106.7	2.80.E-03	1.33E+20
39.58	3.01.E-01	54.2	43.9	0.00.E+00	9.8	107.9	2.79.E-03	1.32E+20
40.15	2.88.E-01	54.9	44.6	0.00.E+00	9.9	109.5	2.63.E-03	1.25E+20
40.72	3.29.E-01	54.7	44.5	4.85.E-04	9.9	109.0	3.02.E-03	1.43E+20
41.30	3.33.E-01	54.7	45.1	0.00.E+00	10.0	109.8	3.03.E-03	1.44E+20
41.87	3.33.E-01	54.4	44.6	6.03.E-04	9.9	108.9	3.06.E-03	1.45E+20
42.44	3.34.E-01	54.8	44.7	0.00.E+00	9.9	109.5	3.05.E-03	1.45E+20
43.02	3.63.E-01	55.4	44.5	4.68.E-04	10.0	109.8	3.31.E-03	1.57E+20
43.59	3.48.E-01	54.5	44.1	2.44.E-04	9.8	108.4	3.21.E-03	1.52E+20
44.16	3.68.E-01	53.9	44.3	0.00.E+00	9.8	108.0	3.41.E-03	1.62E+20
44.74	3.96.E-01	54.1	44.7	0.00.E+00	9.9	108.7	3.64.E-03	1.73E+20
45.31	3.82.E-01	54.3	44.9	0.00.E+00	9.9	109.1	3.50.E-03	1.66E+20
45.89	4.03.E-01	55.5	45.4	7.62.E-04	10.1	111.0	3.63.E-03	1.73E+20
46.46	4.37.E-01	54.6	44.4	0.00.E+00	9.9	108.8	4.01.E-03	1.91E+20
47.03	4.28.E-01	54.5	44.0	5.46.E-04	9.8	108.3	3.95.E-03	1.88E+20
47.61	4.49.E-01	54.5	44.9	0.00.E+00	9.9	109.3	4.10.E-03	1.95E+20
48.18	4.48.E-01	52.5	43.9	6.78.E-04	9.6	106.1	4.22.E-03	2.00E+20
48.75	4.67.E-01	54.2	43.8	0.00.E+00	9.8	107.7	4.33.E-03	2.06E+20
49.33	4.69.E-01	54.7	44.2	0.00.E+00	9.9	108.8	4.31.E-03	2.05E+20
49.90	4.99.E-01	54.9	44.7	0.00.E+00	9.9	109.5	4.55.E-03	2.16E+20
50.47	4.93.E-01	54.5	44.6	5.32.E-05	9.9	109.1	4.52.E-03	2.15E+20
51.05	5.27.E-01	53.7	44.3	0.00.E+00	9.8	107.8	4.89.E-03	2.32E+20
51.62	5.53.E-01	51.0	43.6	0.00.E+00	9.4	104.0	5.32.E-03	2.53E+20
52.19	5.91.E-01	48.8	42.7	4.85.E-04	9.1	100.6	5.88.E-03	2.79E+20
52.77	5.72.E-01	48.0	42.6	5.32.E-05	9.0	99.6	5.74.E-03	2.73E+20
53.34	5.76.E-01	47.4	42.9	0.00.E+00	9.0	99.3	5.80.E-03	2.76E+20
53.92	6.20.E-01	49.3	43.2	0.00.E+00	9.2	101.7	6.09.E-03	2.89E+20
54.49	6.33.E-01	50.8	43.9	0.00.E+00	9.5	104.1	6.08.E-03	2.89E+20
55.06	6.05.E-01	50.2	43.5	5.66.E-04	9.4	103.1	5.87.E-03	2.79E+20
55.64	6.63.E-01	50.6	43.6	3.08.E-05	9.4	103.6	6.40.E-03	3.04E+20
56.21	6.60.E-01	52.1	43.7	1.09.E-03	9.6	105.3	6.27.E-03	2.98E+20
56.78	7.01.E-01	53.7	43.9	0.00.E+00	9.8	107.4	6.53.E-03	3.10E+20
57.36	7.24.E-01	55.8	45.3	0.00.E+00	10.1	111.2	6.51.E-03	3.09E+20
57.93	6.93.E-01	56.6	45.3	4.01.E-04	10.2	112.1	6.18.E-03	2.94E+20
58.50	7.59.E-01	54.9	44.5	0.00.E+00	9.9	109.3	6.94.E-03	3.30E+20
59.08	7.68.E-01	54.6	44.1	4.74.E-04	9.9	108.6	7.07.E-03	3.36E+20
59.65	7.85.E-01	53.8	44.1	5.02.E-04	9.8	107.7	7.28.E-03	3.46E+20
60.22	8.12.E-01	53.4	44.2	0.00.E+00	9.8	107.4	7.56.E-03	3.59E+20
60.80	8.72.E-01	52.5	44.0	0.00.E+00	9.6	106.0	8.22.E-03	3.91E+20
61.37	8.31.E-01	53.0	43.7	0.00.E+00	9.7	106.4	7.81.E-03	3.71E+20
61.95	8.61.E-01	53.2	44.2	0.00.E+00	9.7	107.1	8.04.E-03	3.82E+20
62.52	9.27.E-01	53.8	44.3	0.00.E+00	9.8	107.8	8.59.E-03	4.08E+20
63.09	9.83.E-01	54.7	44.7	0.00.E+00	9.9	109.3	8.99.E-03	4.27E+20
63.67	9.53.E-01	54.0	44.7	0.00.E+00	9.9	108.6	8.78.E-03	4.17E+20
64.24	9.73.E-01	53.0	44.2	3.39.E-04	9.7	106.9	9.10.E-03	4.33E+20
64.81	1.02.E+00	53.6	44.5	9.42.E-04	9.8	107.9	9.48.E-03	4.51E+20
65.39	1.07.E+00	53.3	44.1	0.00.E+00	9.7	107.1	9.95.E-03	4.73E+20
65.96	1.10.E+00	53.4	44.3	4.12.E-04	9.8	107.5	1.03.E-02	4.88E+20
66.53	1.09.E+00	51.6	43.6	7.87.E-04	9.5	104.7	1.05.E-02	4.97E+20
67.11	1.11.E+00	50.6	43.1	0.00.E+00	9.4	103.1	1.08.E-02	5.11E+20
67.68	1.18.E+00	50.5	43.1	2.13.E-03	9.3	102.9	1.14.E-02	5.43E+20
68.25	1.17.E+00	50.4	42.8	0.00.E+00	9.3	102.4	1.14.E-02	5.41E+20
68.83	1.19.E+00	52.7	44.8	0.00.E+00	9.7	107.2	1.11.E-02	5.27E+20
69.40	1.26.E+00	53.1	44.2	0.00.E+00	9.7	107.0	1.18.E-02	5.61E+20
69.97	1.27.E+00	52.7	43.5	0.00.E+00	9.6	105.8	1.20.E-02	5.71E+20

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
70.55	1.31.E+00	52.2	43.7	0.00.E+00	9.6	105.5	1.24.E-02	5.89E+20
71.12	1.38.E+00	51.3	43.8	2.77.E-04	9.5	104.6	1.32.E-02	6.25E+20
71.70	1.36.E+00	49.8	43.0	4.34.E-04	9.3	102.0	1.34.E-02	6.35E+20
72.27	1.35.E+00	48.7	42.7	0.00.E+00	9.1	100.6	1.34.E-02	6.38E+20
72.84	1.46.E+00	48.7	42.8	6.31.E-04	9.1	100.6	1.45.E-02	6.89E+20
73.42	1.48.E+00	48.2	42.2	5.86.E-04	9.0	99.4	1.48.E-02	7.06E+20
73.99	1.57.E+00	46.6	42.3	0.00.E+00	8.9	97.8	1.61.E-02	7.64E+20
74.56	1.55.E+00	48.2	42.2	3.28.E-04	9.0	99.4	1.56.E-02	7.42E+20
75.14	1.62.E+00	49.9	43.3	2.52.E-04	9.3	102.5	1.58.E-02	7.53E+20
75.71	1.74.E+00	51.4	44.2	0.00.E+00	9.6	105.2	1.65.E-02	7.85E+20
76.28	1.68.E+00	50.1	43.0	0.00.E+00	9.3	102.4	1.64.E-02	7.81E+20
76.86	1.77.E+00	48.8	42.5	0.00.E+00	9.1	100.5	1.76.E-02	8.39E+20
77.43	1.84.E+00	49.7	42.8	0.00.E+00	9.2	101.8	1.80.E-02	8.57E+20
78.00	1.87.E+00	48.0	42.4	0.00.E+00	9.0	99.5	1.88.E-02	8.94E+20
78.58	1.90.E+00	45.4	41.7	5.07.E-04	8.7	95.8	1.98.E-02	9.42E+20
79.15	1.95.E+00	46.4	41.7	6.59.E-04	8.8	96.9	2.02.E-02	9.58E+20
79.73	1.94.E+00	44.4	41.0	1.44.E-03	8.5	93.9	2.07.E-02	9.84E+20
80.30	2.01.E+00	45.0	41.3	0.00.E+00	8.6	94.9	2.12.E-02	1.01E+21
80.87	2.10.E+00	44.5	41.3	0.00.E+00	8.6	94.4	2.22.E-02	1.06E+21
81.45	2.13.E+00	47.3	42.2	0.00.E+00	8.9	98.5	2.17.E-02	1.03E+21
82.02	2.14.E+00	48.9	42.9	0.00.E+00	9.2	100.9	2.13.E-02	1.01E+21
82.59	2.23.E+00	49.7	43.0	6.45.E-05	9.3	102.0	2.19.E-02	1.04E+21
83.17	2.35.E+00	50.6	43.7	0.00.E+00	9.4	103.7	2.27.E-02	1.08E+21
83.74	2.41.E+00	50.2	43.5	0.00.E+00	9.4	103.0	2.34.E-02	1.11E+21
84.31	2.41.E+00	48.5	43.0	0.00.E+00	9.1	100.6	2.39.E-02	1.14E+21
84.89	2.54.E+00	49.3	43.6	6.87.E-04	9.3	102.3	2.48.E-02	1.18E+21
85.46	2.55.E+00	47.4	42.8	0.00.E+00	9.0	99.2	2.57.E-02	1.22E+21
86.03	2.67.E+00	48.2	43.2	6.84.E-04	9.1	100.6	2.66.E-02	1.26E+21
86.61	2.58.E+00	48.3	42.5	0.00.E+00	9.1	99.8	2.59.E-02	1.23E+21
87.18	2.70.E+00	49.1	42.4	0.00.E+00	9.1	100.7	2.68.E-02	1.27E+21
87.76	2.71.E+00	49.4	43.6	6.39.E-04	9.3	102.3	2.65.E-02	1.26E+21
88.33	2.73.E+00	51.0	44.0	4.18.E-04	9.5	104.5	2.61.E-02	1.24E+21
88.90	2.87.E+00	52.2	44.2	3.17.E-04	9.6	106.0	2.71.E-02	1.29E+21
89.48	2.85.E+00	51.9	43.6	1.21.E-03	9.5	105.0	2.72.E-02	1.29E+21
90.05	2.93.E+00	51.1	43.2	3.11.E-04	9.4	103.7	2.82.E-02	1.34E+21
90.62	2.93.E+00	49.1	42.8	0.00.E+00	9.2	101.0	2.91.E-02	1.38E+21
91.20	2.99.E+00	47.2	41.5	4.46.E-04	8.9	97.5	3.07.E-02	1.46E+21
91.77	3.17.E+00	47.4	42.4	7.40.E-04	9.0	98.8	3.21.E-02	1.53E+21
92.34	3.21.E+00	46.0	41.7	3.50.E-04	8.8	96.5	3.33.E-02	1.58E+21
92.92	3.24.E+00	47.6	42.0	0.00.E+00	9.0	98.6	3.28.E-02	1.56E+21
93.49	3.22.E+00	47.3	42.5	3.39.E-04	9.0	98.8	3.26.E-02	1.55E+21
94.06	3.31.E+00	48.8	42.9	2.35.E-04	9.2	100.8	3.28.E-02	1.56E+21
94.64	3.33.E+00	47.9	41.8	6.17.E-04	9.0	98.7	3.37.E-02	1.60E+21
95.21	3.52.E+00	48.6	42.7	5.27.E-04	9.1	100.5	3.50.E-02	1.66E+21
95.79	3.55.E+00	49.6	42.8	1.09.E-03	9.2	101.6	3.49.E-02	1.66E+21
96.36	3.57.E+00	50.1	43.3	0.00.E+00	9.3	102.7	3.47.E-02	1.65E+21
96.93	3.52.E+00	50.5	42.8	6.36.E-04	9.3	102.6	3.43.E-02	1.63E+21
97.51	3.59.E+00	51.1	43.0	8.16.E-04	9.4	103.5	3.47.E-02	1.65E+21
98.08	3.68.E+00	51.9	44.0	5.58.E-04	9.6	105.5	3.49.E-02	1.66E+21
98.65	3.75.E+00	51.3	43.9	6.64.E-04	9.5	104.7	3.58.E-02	1.70E+21
99.23	3.82.E+00	50.3	43.2	3.39.E-04	9.3	102.8	3.72.E-02	1.77E+21
99.80	3.83.E+00	49.7	43.0	3.33.E-04	9.3	101.9	3.76.E-02	1.79E+21
100.37	3.70.E+00	50.4	43.3	1.16.E-03	9.4	103.1	3.59.E-02	1.71E+21
100.95	3.93.E+00	51.2	43.8	0.00.E+00	9.5	104.5	3.76.E-02	1.79E+21
101.52	3.98.E+00	53.5	44.9	0.00.E+00	9.8	108.3	3.68.E-02	1.75E+21
102.09	3.95.E+00	53.8	44.7	3.90.E-04	9.8	108.4	3.64.E-02	1.73E+21
102.67	3.92.E+00	51.4	42.4	0.00.E+00	9.4	103.2	3.80.E-02	1.81E+21
103.24	3.98.E+00	52.3	43.4	6.45.E-05	9.6	105.3	3.78.E-02	1.80E+21
103.82	4.07.E+00	52.4	44.1	5.49.E-04	9.6	106.2	3.83.E-02	1.82E+21
104.39	4.18.E+00	51.8	43.7	0.00.E+00	9.5	105.1	3.98.E-02	1.89E+21
104.96	4.08.E+00	51.9	43.3	1.15.E-03	9.5	104.8	3.89.E-02	1.85E+21
105.54	4.00.E+00	50.1	42.6	5.24.E-04	9.3	102.0	3.92.E-02	1.86E+21
106.11	4.22.E+00	49.9	42.9	8.16.E-04	9.3	102.0	4.14.E-02	1.97E+21
106.68	4.07.E+00	48.6	42.1	0.00.E+00	9.1	99.8	4.08.E-02	1.94E+21

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
107.26	4.14.E+00	48.2	42.3	0.00.E+00	9.0	99.6	4.15.E-02	1.97E+21
107.83	4.15.E+00	48.3	42.3	6.19.E-04	9.0	99.6	4.16.E-02	1.98E+21
108.40	4.12.E+00	50.0	42.9	1.98.E-03	9.3	102.1	4.03.E-02	1.92E+21
108.98	4.17.E+00	50.3	42.8	5.13.E-04	9.3	102.5	4.07.E-02	1.93E+21
109.55	4.08.E+00	50.5	43.1	0.00.E+00	9.4	103.0	3.96.E-02	1.88E+21
110.12	4.03.E+00	50.4	42.4	0.00.E+00	9.3	102.1	3.95.E-02	1.87E+21
110.70	3.84.E+00	50.6	42.9	0.00.E+00	9.3	102.8	3.74.E-02	1.78E+21
111.27	3.97.E+00	50.9	42.6	1.26.E-03	9.3	102.8	3.86.E-02	1.84E+21
111.85	3.98.E+00	49.5	42.2	0.00.E+00	9.2	100.9	3.95.E-02	1.88E+21
112.42	4.07.E+00	50.1	43.1	0.00.E+00	9.3	102.6	3.97.E-02	1.89E+21
112.99	3.92.E+00	47.3	41.6	0.00.E+00	8.9	97.8	4.01.E-02	1.90E+21
113.57	3.94.E+00	47.5	42.3	0.00.E+00	9.0	98.7	3.99.E-02	1.90E+21
114.14	3.70.E+00	48.8	42.3	5.35.E-04	9.1	100.2	3.70.E-02	1.76E+21
114.71	3.82.E+00	47.8	41.8	4.29.E-04	9.0	98.5	3.88.E-02	1.84E+21
115.29	3.79.E+00	45.4	41.2	0.00.E+00	8.6	95.2	3.98.E-02	1.89E+21
115.86	3.65.E+00	46.6	41.7	0.00.E+00	8.8	97.1	3.76.E-02	1.78E+21
116.43	3.59.E+00	46.6	41.3	7.43.E-04	8.8	96.7	3.72.E-02	1.77E+21
117.01	3.55.E+00	46.9	41.8	4.01.E-04	8.9	97.5	3.64.E-02	1.73E+21
117.58	3.43.E+00	48.3	42.6	0.00.E+00	9.1	100.0	3.43.E-02	1.63E+21
118.15	3.35.E+00	50.6	43.2	9.08.E-04	9.4	103.2	3.25.E-02	1.54E+21
118.73	3.38.E+00	51.8	43.3	0.00.E+00	9.5	104.6	3.23.E-02	1.53E+21
119.30	3.29.E+00	52.6	43.9	2.89.E-04	9.6	106.1	3.10.E-02	1.47E+21
119.88	3.07.E+00	51.3	43.0	0.00.E+00	9.4	103.7	2.96.E-02	1.41E+21
120.45	3.03.E+00	49.8	42.6	1.00.E-03	9.2	101.6	2.98.E-02	1.42E+21
121.02	3.05.E+00	46.5	41.5	4.71.E-04	8.8	96.9	3.15.E-02	1.50E+21
121.60	3.01.E+00	46.4	41.9	6.45.E-04	8.8	97.2	3.10.E-02	1.47E+21
122.17	2.81.E+00	47.5	41.8	0.00.E+00	8.9	98.3	2.86.E-02	1.36E+21
122.74	2.64.E+00	49.5	42.8	1.07.E-03	9.2	101.6	2.60.E-02	1.24E+21
123.32	2.73.E+00	52.8	44.7	0.00.E+00	9.7	107.3	2.54.E-02	1.21E+21
123.89	2.55.E+00	54.3	44.9	0.00.E+00	9.9	109.1	2.33.E-02	1.11E+21
124.46	2.42.E+00	53.4	44.2	0.00.E+00	9.7	107.3	2.25.E-02	1.07E+21
125.04	2.42.E+00	52.4	43.4	5.46.E-04	9.6	105.4	2.29.E-02	1.09E+21
125.61	2.38.E+00	51.7	43.7	3.50.E-04	9.5	105.0	2.26.E-02	1.08E+21
126.18	2.15.E+00	51.1	43.2	0.00.E+00	9.4	103.6	2.08.E-02	9.87E+20
126.76	2.03.E+00	51.2	43.1	6.25.E-04	9.4	103.7	1.96.E-02	9.31E+20
127.33	2.02.E+00	50.7	43.4	0.00.E+00	9.4	103.5	1.95.E-02	9.27E+20
127.91	1.94.E+00	51.6	43.9	1.93.E-03	9.5	105.1	1.84.E-02	8.75E+20
128.48	1.83.E+00	51.5	43.4	4.01.E-04	9.5	104.4	1.76.E-02	8.35E+20
129.05	1.69.E+00	50.7	42.3	0.00.E+00	9.3	102.3	1.65.E-02	7.86E+20
129.63	1.64.E+00	50.1	42.3	5.32.E-04	9.2	101.6	1.61.E-02	7.65E+20
130.20	1.52.E+00	50.6	43.4	0.00.E+00	9.4	103.4	1.47.E-02	6.98E+20
130.77	1.45.E+00	51.9	42.9	2.19.E-04	9.5	104.2	1.40.E-02	6.63E+20
131.35	1.42.E+00	51.9	43.1	1.35.E-03	9.5	104.5	1.36.E-02	6.45E+20
131.92	1.33.E+00	50.6	42.7	0.00.E+00	9.3	102.7	1.30.E-02	6.17E+20
132.49	1.27.E+00	50.0	42.7	0.00.E+00	9.3	102.0	1.24.E-02	5.89E+20
133.07	1.16.E+00	48.8	41.7	8.74.E-04	9.0	99.6	1.16.E-02	5.53E+20
133.64	1.11.E+00	50.7	42.4	9.08.E-04	9.3	102.5	1.08.E-02	5.13E+20
134.21	1.03.E+00	51.2	43.0	0.00.E+00	9.4	103.7	9.89.E-03	4.70E+20
134.79	1.01.E+00	50.5	42.9	3.56.E-04	9.3	102.7	9.85.E-03	4.68E+20
135.36	8.57.E-01	50.5	42.5	5.30.E-04	9.3	102.4	8.37.E-03	3.98E+20
135.93	8.13.E-01	49.3	41.7	1.01.E-03	9.1	100.1	8.13.E-03	3.86E+20
136.51	8.18.E-01	48.0	41.5	7.01.E-05	8.9	98.4	8.31.E-03	3.95E+20
137.08	7.41.E-01	46.0	41.9	0.00.E+00	8.8	96.7	7.67.E-03	3.64E+20
137.66	6.84.E-01	45.3	41.1	7.73.E-04	8.6	95.0	7.20.E-03	3.42E+20
138.23	6.41.E-01	48.0	41.9	2.19.E-04	9.0	98.9	6.48.E-03	3.08E+20
138.80	5.73.E-01	50.0	42.3	6.36.E-04	9.2	101.5	5.64.E-03	2.68E+20
139.38	5.58.E-01	50.5	42.9	0.00.E+00	9.3	102.7	5.44.E-03	2.58E+20
139.95	5.25.E-01	48.1	41.0	1.40.E-03	8.9	98.1	5.35.E-03	2.54E+20
140.52	4.89.E-01	47.9	42.0	1.57.E-04	9.0	98.9	4.94.E-03	2.35E+20
141.10	4.51.E-01	49.5	42.1	0.00.E+00	9.1	100.7	4.48.E-03	2.13E+20
141.67	4.07.E-01	50.8	42.7	4.85.E-04	9.3	102.8	3.96.E-03	1.88E+20
142.24	3.68.E-01	51.4	43.4	4.96.E-04	9.5	104.2	3.53.E-03	1.68E+20
142.82	3.28.E-01	49.0	41.9	9.75.E-04	9.1	99.9	3.28.E-03	1.56E+20
143.39	3.12.E-01	47.8	41.8	0.00.E+00	9.0	98.6	3.16.E-03	1.50E+20

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
143.96	2.89.E-01	46.1	41.1	0.00.E+00	8.7	95.9	3.01.E-03	1.43E+20
144.54	2.61.E-01	45.8	40.9	0.00.E+00	8.7	95.3	2.74.E-03	1.30E+20
145.11	2.35.E-01	48.3	41.4	0.00.E+00	9.0	98.7	2.38.E-03	1.13E+20
145.69	2.47.E-01	49.8	42.5	0.00.E+00	9.2	101.5	2.43.E-03	1.16E+20
146.26	1.89.E-01	50.1	43.0	1.54.E-03	9.3	102.3	1.85.E-03	8.78E+19
146.83	1.94.E-01	48.1	41.2	0.00.E+00	8.9	98.3	1.98.E-03	9.39E+19
147.41	1.91.E-01	47.8	42.2	8.52.E-04	9.0	98.9	1.93.E-03	9.17E+19
147.98	1.53.E-01	46.8	41.0	0.00.E+00	8.8	96.6	1.58.E-03	7.53E+19
148.55	1.35.E-01	47.7	41.7	0.00.E+00	8.9	98.4	1.38.E-03	6.54E+19
149.13	1.31.E-01	48.7	41.7	0.00.E+00	9.0	99.4	1.32.E-03	6.26E+19
149.70	1.27.E-01	48.3	41.5	1.21.E-03	9.0	98.7	1.29.E-03	6.12E+19
150.27	1.03.E-01	47.1	41.4	6.67.E-04	8.8	97.3	1.05.E-03	5.01E+19
150.85	9.58.E-02	46.2	40.3	3.39.E-04	8.6	95.1	1.01.E-03	4.79E+19
151.42	7.81.E-02	46.6	41.3	0.00.E+00	8.8	96.6	8.08.E-04	3.84E+19
151.99	8.59.E-02	44.9	40.8	0.00.E+00	8.6	94.3	9.11.E-04	4.33E+19
152.57	7.96.E-02	42.7	39.3	0.00.E+00	8.2	90.2	8.83.E-04	4.20E+19
153.14	7.03.E-02	40.9	38.8	0.00.E+00	8.0	87.6	8.02.E-04	3.81E+19
153.72	6.03.E-02	41.8	39.9	0.00.E+00	8.2	89.8	6.71.E-04	3.19E+19
154.29	6.25.E-02	42.7	40.4	2.13.E-04	8.3	91.4	6.84.E-04	3.25E+19
154.86	5.50.E-02	42.3	40.1	0.00.E+00	8.2	90.6	6.07.E-04	2.88E+19
155.44	5.27.E-02	42.7	40.3	0.00.E+00	8.3	91.3	5.78.E-04	2.74E+19
156.01	4.52.E-02	42.7	39.7	0.00.E+00	8.2	90.7	4.99.E-04	2.37E+19
156.58	3.50.E-02	41.4	39.4	3.76.E-04	8.1	89.0	3.94.E-04	1.87E+19
157.16	3.65.E-02	42.9	40.0	7.17.E-04	8.3	91.2	4.00.E-04	1.90E+19
157.73	3.16.E-02	44.9	41.0	5.89.E-04	8.6	94.5	3.35.E-04	1.59E+19
158.30	2.85.E-02	43.9	40.0	7.57.E-04	8.4	92.3	3.09.E-04	1.47E+19
158.88	2.81.E-02	44.7	40.0	0.00.E+00	8.5	93.1	3.02.E-04	1.43E+19
159.45	2.67.E-02	46.4	41.2	0.00.E+00	8.8	96.4	2.77.E-04	1.32E+19
160.02	1.88.E-02	47.4	41.1	0.00.E+00	8.8	97.3	1.94.E-04	9.20E+18
160.60	2.36.E-02	45.4	40.5	8.86.E-04	8.6	94.5	2.50.E-04	1.19E+19
161.17	1.58.E-02	45.5	41.0	6.25.E-04	8.6	95.2	1.66.E-04	7.90E+18
161.75	1.87.E-02	44.9	40.4	0.00.E+00	8.5	93.8	1.99.E-04	9.46E+18
162.32	1.32.E-02	46.9	41.7	0.00.E+00	8.8	97.4	1.36.E-04	6.45E+18
162.89	1.39.E-02	47.0	40.9	0.00.E+00	8.8	96.7	1.44.E-04	6.85E+18
163.47	1.76.E-02	46.2	41.0	0.00.E+00	8.7	95.9	1.84.E-04	8.73E+18
164.04	7.92.E-03	44.0	39.7	6.39.E-04	8.4	92.1	8.61.E-05	4.09E+18
164.61	1.52.E-02	45.8	41.0	0.00.E+00	8.7	95.5	1.60.E-04	7.59E+18
165.19	1.13.E-02	48.2	41.2	8.46.E-04	8.9	98.3	1.15.E-04	5.45E+18
165.76	6.89.E-03	47.4	41.4	6.17.E-04	8.9	97.6	7.06.E-05	3.35E+18
166.33	5.63.E-03	45.0	40.2	0.00.E+00	8.5	93.7	6.01.E-05	2.86E+18
166.91	4.57.E-03	42.0	38.9	0.00.E+00	8.1	89.0	5.13.E-05	2.44E+18
167.48	3.94.E-03	40.6	38.6	5.32.E-05	7.9	87.1	4.52.E-05	2.15E+18
168.05	8.06.E-03	39.9	38.9	0.00.E+00	7.9	86.6	9.31.E-05	4.43E+18
168.63	8.35.E-03	40.9	39.0	6.47.E-04	8.0	87.9	9.51.E-05	4.52E+18
169.20	4.81.E-03	39.5	38.3	0.00.E+00	7.8	85.6	5.62.E-05	2.67E+18
169.78	2.21.E-03	38.5	37.0	1.40.E-03	7.5	83.0	2.66.E-05	1.26E+18
170.35	4.79.E-03	40.6	39.6	5.52.E-04	8.0	88.2	5.44.E-05	2.58E+18
170.92	3.24.E-03	44.5	40.8	0.00.E+00	8.5	93.8	3.45.E-05	1.64E+18
171.50	3.51.E-03	44.2	39.6	0.00.E+00	8.4	92.2	3.81.E-05	1.81E+18
172.07	1.42.E-03	43.0	39.5	0.00.E+00	8.2	90.8	1.57.E-05	7.44E+17
172.64	2.57.E-03	40.1	37.9	0.00.E+00	7.8	85.8	3.00.E-05	1.42E+18
173.22	2.56.E-03	39.5	38.6	0.00.E+00	7.8	85.9	2.98.E-05	1.42E+18
173.79	2.57.E-03	43.0	39.7	4.82.E-04	8.3	91.0	2.83.E-05	1.34E+18
174.36	3.07.E-03	44.2	40.7	0.00.E+00	8.5	93.3	3.29.E-05	1.56E+18
174.94	2.90.E-03	43.5	40.1	4.01.E-04	8.4	92.0	3.15.E-05	1.50E+18
175.51	9.53.E-04	42.0	38.9	5.18.E-04	8.1	89.0	1.07.E-05	5.09E+17
176.08	2.43.E-03	40.3	38.9	0.00.E+00	7.9	87.1	2.79.E-05	1.32E+18
176.66	5.16.E-04	38.6	38.2	0.00.E+00	7.7	84.5	6.10.E-06	2.90E+17
177.23	2.31.E-03	37.0	37.8	0.00.E+00	7.5	82.3	2.81.E-05	1.33E+18
177.81	4.74.E-04	35.9	37.7	7.79.E-04	7.4	80.9	5.85.E-06	2.78E+17
178.38	2.23.E-03	38.0	38.4	3.81.E-04	7.6	84.1	2.65.E-05	1.26E+18
178.95	1.08.E-03	42.3	39.3	0.00.E+00	8.2	89.8	1.20.E-05	5.71E+17
179.53	1.26.E-03	45.0	40.4	0.00.E+00	8.5	94.0	1.34.E-05	6.38E+17
180.10	4.62.E-04	44.5	40.0	0.00.E+00	8.4	92.9	4.98.E-06	2.37E+17

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
180.67	1.29.E-03	42.7	38.9	0.00.E+00	8.1	89.7	1.44.E-05	6.86E+17
181.25	1.35.E-03	41.5	39.4	8.01.E-04	8.1	88.9	1.52.E-05	7.20E+17
181.82	1.96.E-03	42.7	39.7	0.00.E+00	8.2	90.6	2.16.E-05	1.03E+18
182.39	0.00.E+00	42.8	39.8	5.38.E-04	8.2	90.8	0.00.E+00	0.00E+00
182.97	7.45.E-04	41.1	38.7	0.00.E+00	8.0	87.7	8.50.E-06	4.04E+17
183.54	8.35.E-04	42.9	39.1	9.16.E-04	8.2	90.2	9.25.E-06	4.40E+17
184.11	0.00.E+00	44.0	40.1	2.19.E-04	8.4	92.5	0.00.E+00	0.00E+00
184.69	3.33.E-04	45.8	40.9	0.00.E+00	8.7	95.4	3.50.E-06	1.66E+17
185.26	1.32.E-04	44.7	39.9	0.00.E+00	8.4	93.0	1.42.E-06	6.73E+16
185.84	1.33.E-03	41.9	39.7	0.00.E+00	8.2	89.8	1.48.E-05	7.04E+17
186.41	7.71.E-04	39.7	39.0	0.00.E+00	7.9	86.6	8.90.E-06	4.23E+17
186.98	5.60.E-04	40.3	38.2	2.02.E-04	7.8	86.3	6.49.E-06	3.09E+17
187.56	4.34.E-04	41.2	39.3	1.88.E-04	8.0	88.6	4.90.E-06	2.33E+17
188.13	0.00.E+00	40.8	38.9	7.59.E-04	8.0	87.7	0.00.E+00	0.00E+00
188.70	6.78.E-04	38.8	37.6	2.55.E-04	7.6	84.1	8.07.E-06	3.83E+17
189.28	3.05.E-04	37.4	37.6	4.34.E-04	7.5	82.4	3.71.E-06	1.76E+17
189.85	1.61.E-03	38.4	37.8	0.00.E+00	7.6	83.8	1.92.E-05	9.10E+17
190.42	5.49.E-04	39.5	38.1	0.00.E+00	7.8	85.4	6.43.E-06	3.05E+17
191.00	7.96.E-04	38.5	38.2	0.00.E+00	7.7	84.4	9.43.E-06	4.48E+17
191.57	3.22.E-04	37.6	38.3	0.00.E+00	7.6	83.5	3.86.E-06	1.83E+17
192.14	3.95.E-04	39.2	38.3	0.00.E+00	7.7	85.2	4.64.E-06	2.20E+17
192.72	2.83.E-04	43.3	40.1	0.00.E+00	8.3	91.8	3.08.E-06	1.46E+17
193.29	1.35.E-04	43.7	40.5	6.42.E-04	8.4	92.5	1.45.E-06	6.91E+16
193.87	0.00.E+00	42.0	39.5	1.07.E-03	8.1	89.6	0.00.E+00	0.00E+00
194.44	7.29.E-04	38.7	38.0	0.00.E+00	7.7	84.4	8.64.E-06	4.10E+17
195.01	6.61.E-04	37.1	37.5	0.00.E+00	7.5	82.1	8.05.E-06	3.83E+17
195.59	4.46.E-04	35.9	37.4	1.53.E-03	7.3	80.7	5.52.E-06	2.62E+17
196.16	0.00.E+00	38.9	38.1	0.00.E+00	7.7	84.7	0.00.E+00	0.00E+00
196.73	1.31.E-03	40.7	37.6	0.00.E+00	7.8	86.1	1.52.E-05	7.22E+17
197.31	0.00.E+00	39.9	38.4	4.54.E-04	7.8	86.1	0.00.E+00	0.00E+00
197.88	0.00.E+00	37.2	37.4	0.00.E+00	7.4	82.0	0.00.E+00	0.00E+00
198.45	3.28.E-04	36.3	36.8	4.57.E-04	7.3	80.3	4.08.E-06	1.94E+17
199.03	2.24.E-04	38.6	37.8	0.00.E+00	7.6	84.0	2.67.E-06	1.27E+17
199.60	8.52.E-04	38.3	37.7	0.00.E+00	7.6	83.6	1.02.E-05	4.84E+17
200.17	4.48.E-04	39.9	38.8	0.00.E+00	7.9	86.6	5.18.E-06	2.46E+17
200.75	0.00.E+00	40.8	38.8	5.04.E-04	8.0	87.5	0.00.E+00	0.00E+00
201.32	0.00.E+00	43.4	40.1	0.00.E+00	8.3	91.9	0.00.E+00	0.00E+00
201.89	2.49.E-04	43.3	39.2	1.23.E-04	8.2	90.7	2.75.E-06	1.31E+17
202.47	0.00.E+00	43.0	38.6	0.00.E+00	8.2	89.8	0.00.E+00	0.00E+00
203.04	1.63.E-04	42.5	38.6	9.53.E-04	8.1	89.2	1.82.E-06	8.66E+16
203.62	6.61.E-04	43.4	39.8	0.00.E+00	8.3	91.5	7.23.E-06	3.43E+17
204.19	0.00.E+00	42.3	38.9	4.79.E-04	8.1	89.3	0.00.E+00	0.00E+00
204.76	0.00.E+00	40.6	38.6	0.00.E+00	7.9	87.1	0.00.E+00	0.00E+00
205.34	0.00.E+00	39.5	38.4	0.00.E+00	7.8	85.7	0.00.E+00	0.00E+00
205.91	3.00.E-04	38.3	38.0	3.36.E-04	7.6	83.9	3.57.E-06	1.70E+17
206.48	8.77.E-04	42.7	38.4	0.00.E+00	8.1	89.2	9.83.E-06	4.67E+17
207.06	5.77.E-04	42.8	39.7	4.85.E-04	8.2	90.7	6.36.E-06	3.02E+17
207.63	8.80.E-04	41.6	38.8	0.00.E+00	8.0	88.5	9.95.E-06	4.73E+17
208.20	9.53.E-04	38.0	37.0	4.79.E-04	7.5	82.4	1.16.E-05	5.50E+17
208.78	7.96.E-04	41.1	38.4	2.61.E-03	7.9	87.4	9.10.E-06	4.33E+17
209.35	0.00.E+00	43.3	39.6	4.29.E-04	8.3	91.1	0.00.E+00	0.00E+00
209.92	1.28.E-03	42.7	39.1	0.00.E+00	8.2	90.0	1.42.E-05	6.75E+17
210.50	0.00.E+00	41.5	39.0	4.99.E-04	8.0	88.5	0.00.E+00	0.00E+00
211.07	0.00.E+00	42.2	39.2	0.00.E+00	8.1	89.5	0.00.E+00	0.00E+00
211.65	0.00.E+00	42.0	38.6	0.00.E+00	8.1	88.7	0.00.E+00	0.00E+00
212.22	1.36.E-03	42.1	39.4	0.00.E+00	8.1	89.6	1.51.E-05	7.20E+17
212.79	4.51.E-04	38.5	37.1	1.33.E-03	7.6	83.2	5.42.E-06	2.58E+17
213.37	4.20.E-04	38.2	38.0	0.00.E+00	7.6	83.8	5.02.E-06	2.38E+17
213.94	1.17.E-03	37.9	37.3	7.29.E-04	7.5	82.7	1.42.E-05	6.75E+17
214.51	7.54.E-04	38.7	37.6	6.84.E-04	7.6	84.0	8.98.E-06	4.27E+17
215.09	3.33.E-04	36.5	37.2	0.00.E+00	7.4	81.0	4.12.E-06	1.96E+17
215.66	0.00.E+00	36.2	37.1	3.53.E-04	7.3	80.6	0.00.E+00	0.00E+00
216.23	1.57.E-04	35.3	36.4	0.00.E+00	7.2	79.0	1.99.E-06	9.45E+16
216.81	0.00.E+00	34.4	36.3	7.68.E-04	7.1	77.7	0.00.E+00	0.00E+00

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
217.38	3.11.E-04	34.4	36.9	0.00.E+00	7.1	78.4	3.97.E-06	1.89E+17
217.95	1.13.E-03	37.8	37.3	0.00.E+00	7.5	82.6	1.37.E-05	6.53E+17
218.53	2.89.E-04	42.4	39.0	0.00.E+00	8.1	89.5	3.22.E-06	1.53E+17
219.10	6.33.E-04	44.2	39.8	0.00.E+00	8.4	92.4	6.85.E-06	3.26E+17
219.68	2.07.E-04	43.8	39.8	0.00.E+00	8.4	92.0	2.25.E-06	1.07E+17
220.25	0.00.E+00	41.8	38.9	0.00.E+00	8.1	88.7	0.00.E+00	0.00E+00
220.82	0.00.E+00	41.3	37.4	0.00.E+00	7.9	86.6	0.00.E+00	0.00E+00
221.40	6.05.E-04	44.0	40.3	0.00.E+00	8.4	92.7	6.53.E-06	3.10E+17
221.97	1.24.E-03	42.5	38.5	0.00.E+00	8.1	89.0	1.39.E-05	6.61E+17
222.54	9.19.E-04	40.8	38.4	1.02.E-03	7.9	87.2	1.05.E-05	5.01E+17
223.12	2.69.E-04	40.5	37.9	1.68.E-04	7.8	86.2	3.12.E-06	1.48E+17
223.69	2.94.E-04	40.4	38.6	0.00.E+00	7.9	86.8	3.39.E-06	1.61E+17
224.26	0.00.E+00	38.7	37.8	0.00.E+00	7.6	84.2	0.00.E+00	0.00E+00
224.84	0.00.E+00	39.0	38.0	1.50.E-03	7.7	84.7	0.00.E+00	0.00E+00
225.41	1.07.E-03	38.7	37.7	3.67.E-04	7.6	84.0	1.28.E-05	6.07E+17
225.98	3.67.E-04	37.8	37.6	0.00.E+00	7.5	83.0	4.43.E-06	2.10E+17
226.56	9.08.E-04	37.5	37.4	0.00.E+00	7.5	82.4	1.10.E-05	5.24E+17
227.13	6.33.E-04	41.1	38.5	0.00.E+00	7.9	87.5	7.24.E-06	3.44E+17
227.71	4.34.E-04	42.4	39.2	2.72.E-04	8.1	89.7	4.84.E-06	2.30E+17
228.28	4.12.E-04	41.7	38.9	4.29.E-04	8.0	88.6	4.65.E-06	2.21E+17
228.85	6.53.E-04	39.7	37.7	5.94.E-04	7.7	85.2	7.67.E-06	3.64E+17
229.43	9.05.E-04	41.5	39.2	0.00.E+00	8.1	88.7	1.02.E-05	4.85E+17
230.00	0.00.E+00	40.8	38.9	0.00.E+00	8.0	87.7	0.00.E+00	0.00E+00
230.57	2.86.E-04	41.1	38.6	0.00.E+00	8.0	87.6	3.26.E-06	1.55E+17
231.15	1.57.E-04	40.5	38.6	0.00.E+00	7.9	87.0	1.80.E-06	8.57E+16
231.72	6.61.E-04	40.7	39.2	6.39.E-04	8.0	87.9	7.53.E-06	3.58E+17
232.29	5.89.E-04	42.8	39.3	5.10.E-04	8.2	90.3	6.52.E-06	3.10E+17
232.87	2.02.E-04	42.3	38.6	4.46.E-04	8.1	88.9	2.27.E-06	1.08E+17
233.44	0.00.E+00	40.9	38.4	4.32.E-04	7.9	87.2	0.00.E+00	0.00E+00
234.01	4.34.E-04	40.3	38.8	0.00.E+00	7.9	87.0	4.99.E-06	2.37E+17
234.59	0.00.E+00	40.6	38.7	0.00.E+00	7.9	87.2	0.00.E+00	0.00E+00
235.16	5.24.E-04	39.0	37.8	0.00.E+00	7.7	84.5	6.20.E-06	2.95E+17
235.74	2.77.E-04	40.9	39.5	0.00.E+00	8.0	88.5	3.14.E-06	1.49E+17
236.31	7.57.E-04	42.1	39.4	5.80.E-04	8.1	89.6	8.45.E-06	4.01E+17
236.88	5.74.E-04	44.3	40.2	6.61.E-04	8.4	92.9	6.18.E-06	2.94E+17
237.46	1.79.E-04	44.8	39.9	0.00.E+00	8.5	93.1	1.93.E-06	9.16E+16
238.03	3.78.E-04	43.3	39.5	0.00.E+00	8.3	91.2	4.15.E-06	1.97E+17
238.60	6.75.E-04	41.1	38.2	0.00.E+00	7.9	87.1	7.75.E-06	3.68E+17
239.18	1.02.E-03	40.5	38.5	3.50.E-04	7.9	86.9	1.17.E-05	5.56E+17
239.75	0.00.E+00	38.0	37.8	0.00.E+00	7.6	83.4	0.00.E+00	0.00E+00
240.32	0.00.E+00	37.0	37.7	0.00.E+00	7.5	82.3	0.00.E+00	0.00E+00
240.90	1.07.E-03	37.7	37.8	0.00.E+00	7.5	83.1	1.29.E-05	6.14E+17
241.47	3.11.E-04	39.2	37.4	3.62.E-04	7.7	84.3	3.69.E-06	1.75E+17
242.04	3.42.E-04	39.2	38.5	0.00.E+00	7.8	85.4	4.00.E-06	1.90E+17
242.62	2.07.E-04	37.7	37.4	0.00.E+00	7.5	82.6	2.51.E-06	1.19E+17
243.19	7.87.E-04	38.2	38.1	3.92.E-04	7.6	83.9	9.38.E-06	4.46E+17
243.77	4.93.E-04	37.9	38.0	0.00.E+00	7.6	83.6	5.90.E-06	2.80E+17
244.34	2.72.E-04	35.7	36.7	2.49.E-04	7.2	79.6	3.42.E-06	1.62E+17
244.91	1.46.E-03	34.7	36.5	0.00.E+00	7.1	78.3	1.86.E-05	8.86E+17
245.49	0.00.E+00	37.5	37.6	5.07.E-04	7.5	82.6	0.00.E+00	0.00E+00
246.06	0.00.E+00	40.5	38.1	6.59.E-04	7.8	86.4	0.00.E+00	0.00E+00
246.63	7.12.E-04	39.5	37.9	0.00.E+00	7.7	85.2	8.36.E-06	3.97E+17
247.21	9.78.E-04	37.9	37.5	2.23.E-03	7.5	83.0	1.18.E-05	5.60E+17
247.78	9.75.E-04	38.6	37.9	0.00.E+00	7.6	84.1	1.16.E-05	5.51E+17
248.35	8.69.E-04	40.3	38.5	0.00.E+00	7.9	86.7	1.00.E-05	4.76E+17
248.93	0.00.E+00	40.6	38.3	0.00.E+00	7.9	86.7	0.00.E+00	0.00E+00
249.50	3.39.E-04	44.4	40.2	3.67.E-04	8.5	93.1	3.64.E-06	1.73E+17
250.07	8.52.E-04	45.1	40.1	0.00.E+00	8.5	93.8	9.09.E-06	4.32E+17
250.65	0.00.E+00	45.6	40.6	4.74.E-04	8.6	94.8	0.00.E+00	0.00E+00
251.22	8.16.E-04	44.8	40.2	1.68.E-04	8.5	93.5	8.73.E-06	4.15E+17
251.80	7.96.E-04	42.6	38.9	0.00.E+00	8.1	89.6	8.88.E-06	4.22E+17
252.37	1.74.E-04	40.2	38.3	0.00.E+00	7.8	86.4	2.01.E-06	9.55E+16
252.94	2.61.E-04	39.4	38.0	0.00.E+00	7.7	85.1	3.06.E-06	1.45E+17
253.52	5.77.E-04	41.3	38.6	3.84.E-04	8.0	87.9	6.57.E-06	3.12E+17

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
254.09	1.47.E-03	42.5	39.1	0.00.E+00	8.2	89.8	1.64.E-05	7.78E+17
254.66	0.00.E+00	41.2	38.8	0.00.E+00	8.0	88.0	0.00.E+00	0.00E+00
255.24	7.82.E-04	39.7	37.7	0.00.E+00	7.7	85.1	9.18.E-06	4.36E+17
255.81	1.85.E-04	37.6	37.0	9.58.E-04	7.5	82.1	2.25.E-06	1.07E+17
256.38	0.00.E+00	35.7	36.7	0.00.E+00	7.2	79.6	0.00.E+00	0.00E+00
256.96	2.35.E-04	36.3	37.5	0.00.E+00	7.4	81.2	2.90.E-06	1.38E+17
257.53	5.80.E-04	36.9	37.2	0.00.E+00	7.4	81.6	7.11.E-06	3.38E+17
258.10	1.22.E-03	39.6	38.0	0.00.E+00	7.7	85.3	1.44.E-05	6.82E+17
258.68	8.13.E-04	39.3	37.7	8.58.E-04	7.7	84.6	9.60.E-06	4.56E+17
259.25	2.83.E-04	37.3	36.8	1.82.E-04	7.4	81.4	3.48.E-06	1.65E+17
259.83	2.72.E-04	36.2	37.0	0.00.E+00	7.3	80.4	3.38.E-06	1.61E+17
260.40	1.11.E-03	35.4	36.7	0.00.E+00	7.2	79.3	1.40.E-05	6.64E+17
260.97	8.18.E-04	42.0	38.7	0.00.E+00	8.1	88.7	9.22.E-06	4.38E+17
261.55	2.16.E-04	43.0	39.2	6.14.E-04	8.2	90.4	2.39.E-06	1.13E+17
262.12	5.13.E-04	43.9	39.3	1.35.E-04	8.3	91.4	5.61.E-06	2.67E+17
262.69	1.33.E-03	42.1	38.4	0.00.E+00	8.0	88.5	1.51.E-05	7.16E+17
263.27	1.91.E-04	40.7	37.9	0.00.E+00	7.9	86.5	2.20.E-06	1.05E+17
263.84	9.95.E-04	39.0	37.1	6.05.E-04	7.6	83.8	1.19.E-05	5.64E+17
264.41	0.00.E+00	37.1	37.3	0.00.E+00	7.4	81.8	0.00.E+00	0.00E+00
264.99	2.55.E-04	34.6	36.2	0.00.E+00	7.1	78.0	3.27.E-06	1.55E+17
265.56	7.82.E-04	36.1	36.3	1.36.E-03	7.2	79.6	9.82.E-06	4.67E+17
266.13	6.81.E-04	38.2	37.2	0.00.E+00	7.5	82.9	8.21.E-06	3.90E+17
266.71	7.23.E-04	36.3	36.2	4.46.E-04	7.2	79.7	9.07.E-06	4.31E+17
267.28	3.45.E-04	35.1	36.1	0.00.E+00	7.1	78.3	4.40.E-06	2.09E+17
267.85	6.42.E-04	34.7	35.9	1.08.E-03	7.1	77.7	8.26.E-06	3.93E+17
268.43	0.00.E+00	36.8	36.5	4.06.E-04	7.3	80.5	0.00.E+00	0.00E+00
269.00	8.38.E-04	39.4	38.3	0.00.E+00	7.8	85.5	9.80.E-06	4.66E+17
269.58	0.00.E+00	38.8	37.3	0.00.E+00	7.6	83.7	0.00.E+00	0.00E+00
270.15	3.05.E-04	35.9	36.3	1.57.E-04	7.2	79.5	3.84.E-06	1.83E+17
270.72	1.33.E-03	37.3	37.3	0.00.E+00	7.5	82.1	1.63.E-05	7.72E+17
271.30	5.38.E-04	40.9	38.4	3.33.E-04	7.9	87.2	6.17.E-06	2.93E+17
271.87	5.83.E-04	42.5	39.2	0.00.E+00	8.2	89.9	6.49.E-06	3.08E+17
272.44	0.00.E+00	41.8	39.1	0.00.E+00	8.1	88.9	0.00.E+00	0.00E+00
273.02	0.00.E+00	40.1	37.8	5.21.E-04	7.8	85.7	0.00.E+00	0.00E+00
273.59	7.03.E-04	38.0	37.5	0.00.E+00	7.5	83.0	8.47.E-06	4.03E+17
274.16	0.00.E+00	36.9	37.0	0.00.E+00	7.4	81.3	0.00.E+00	0.00E+00
274.74	5.18.E-04	38.1	36.8	0.00.E+00	7.5	82.4	6.29.E-06	2.99E+17
275.31	7.76.E-04	38.8	37.2	0.00.E+00	7.6	83.7	9.28.E-06	4.41E+17
275.88	3.73.E-04	39.0	38.3	2.52.E-05	7.7	85.0	4.38.E-06	2.08E+17
276.46	3.90.E-04	38.3	37.5	8.69.E-04	7.6	83.4	4.67.E-06	2.22E+17
277.03	9.33.E-04	39.0	37.9	1.29.E-04	7.7	84.6	1.10.E-05	5.24E+17
277.61	2.94.E-04	40.2	38.3	5.60.E-04	7.8	86.4	3.41.E-06	1.62E+17
278.18	3.11.E-04	39.7	37.1	0.00.E+00	7.7	84.5	3.68.E-06	1.75E+17
278.75	1.74.E-04	38.3	37.4	0.00.E+00	7.6	83.2	2.09.E-06	9.92E+16
279.33	2.97.E-04	35.9	36.5	7.62.E-04	7.2	79.6	3.73.E-06	1.77E+17
279.90	4.18.E-04	36.8	37.0	0.00.E+00	7.4	81.2	5.14.E-06	2.44E+17
280.47	6.00.E-04	38.7	37.7	2.33.E-04	7.6	84.0	7.14.E-06	3.39E+17
281.05	0.00.E+00	38.8	37.8	3.28.E-04	7.7	84.3	0.00.E+00	0.00E+00
281.62	9.84.E-04	41.1	38.5	6.05.E-04	8.0	87.5	1.12.E-05	5.34E+17
282.19	7.96.E-04	41.0	38.4	0.00.E+00	7.9	87.3	9.11.E-06	4.33E+17
282.77	6.53.E-04	40.9	38.4	0.00.E+00	7.9	87.3	7.48.E-06	3.55E+17
283.34	7.48.E-04	40.1	37.6	0.00.E+00	7.8	85.5	8.75.E-06	4.16E+17
283.91	0.00.E+00	39.9	38.0	0.00.E+00	7.8	85.8	0.00.E+00	0.00E+00
284.49	0.00.E+00	38.7	38.0	4.06.E-04	7.7	84.4	0.00.E+00	0.00E+00
285.06	2.13.E-04	37.7	37.3	0.00.E+00	7.5	82.5	2.58.E-06	1.23E+17
285.64	0.00.E+00	35.4	35.6	5.80.E-04	7.1	78.2	0.00.E+00	0.00E+00
286.21	2.10.E-04	37.7	37.4	3.28.E-04	7.5	82.6	2.54.E-06	1.21E+17
286.78	6.47.E-04	40.4	38.5	3.11.E-04	7.9	86.8	7.46.E-06	3.54E+17
287.36	1.33.E-03	39.6	37.6	6.42.E-04	7.7	84.9	1.56.E-05	7.44E+17
287.93	1.13.E-03	38.4	37.1	0.00.E+00	7.5	83.1	1.36.E-05	6.44E+17
288.50	0.00.E+00	37.3	36.8	4.60.E-04	7.4	81.5	0.00.E+00	0.00E+00
289.08	7.65.E-04	39.3	36.9	2.19.E-04	7.6	83.8	9.13.E-06	4.34E+17
289.65	0.00.E+00	42.3	39.4	2.75.E-04	8.2	89.9	0.00.E+00	0.00E+00
290.22	1.02.E-03	43.7	39.8	5.74.E-04	8.3	91.8	1.11.E-05	5.28E+17

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C [*] (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
290.80	1.87.E-03	43.7	39.8	0.00.E+00	8.3	91.9	2.04.E-05	9.70E+17
291.37	5.13.E-04	42.0	38.8	5.02.E-04	8.1	88.9	5.77.E-06	2.74E+17
291.94	4.74.E-04	40.9	38.7	0.00.E+00	8.0	87.6	5.41.E-06	2.57E+17
292.52	1.52.E-03	40.2	38.5	0.00.E+00	7.9	86.6	1.75.E-05	8.33E+17
293.09	6.89.E-04	41.3	38.3	5.86.E-04	7.9	87.5	7.88.E-06	3.74E+17
293.67	6.22.E-04	42.5	38.3	0.00.E+00	8.1	89.0	6.99.E-06	3.32E+17
294.24	0.00.E+00	42.7	38.8	0.00.E+00	8.1	89.6	0.00.E+00	0.00E+00
294.81	6.31.E-04	40.3	37.5	6.56.E-04	7.8	85.6	7.37.E-06	3.50E+17
295.39	1.04.E-03	40.8	37.9	5.77.E-04	7.9	86.6	1.20.E-05	5.72E+17
295.96	1.08.E-03	38.3	37.6	0.00.E+00	7.6	83.6	1.29.E-05	6.12E+17
296.53	5.41.E-04	36.9	36.6	0.00.E+00	7.3	80.9	6.69.E-06	3.18E+17
297.11	1.05.E-03	37.5	37.5	3.08.E-05	7.5	82.5	1.27.E-05	6.05E+17
297.68	1.88.E-03	40.8	38.8	2.15.E-03	8.0	87.6	2.15.E-05	1.02E+18
298.25	9.30.E-04	41.4	38.1	0.00.E+00	7.9	87.4	1.06.E-05	5.06E+17
298.83	8.21.E-04	41.9	38.6	2.07.E-04	8.0	88.5	9.28.E-06	4.41E+17
299.40	3.50.E-04	40.1	37.5	3.45.E-04	7.7	85.3	4.11.E-06	1.95E+17
299.97	1.49.E-03	39.5	37.5	0.00.E+00	7.7	84.7	1.76.E-05	8.37E+17
300.55	5.18.E-04	37.1	36.8	1.46.E-04	7.4	81.3	6.38.E-06	3.03E+17
301.12	8.80.E-04	36.2	36.8	3.00.E-04	7.3	80.3	1.10.E-05	5.21E+17
301.70	1.30.E-03	35.3	35.7	8.18.E-04	7.1	78.1	1.67.E-05	7.91E+17
302.27	7.15.E-04	36.6	37.5	0.00.E+00	7.4	81.5	8.77.E-06	4.17E+17
302.84	0.00.E+00	36.8	36.8	4.79.E-04	7.4	81.0	0.00.E+00	0.00E+00
303.42	1.15.E-03	41.1	37.8	8.52.E-04	7.9	86.8	1.32.E-05	6.29E+17
303.99	2.15.E-03	42.5	39.0	4.85.E-04	8.1	89.7	2.40.E-05	1.14E+18
304.56	2.19.E-04	42.3	39.1	4.29.E-04	8.1	89.5	2.44.E-06	1.16E+17
305.14	0.00.E+00	39.8	37.4	0.00.E+00	7.7	84.9	0.00.E+00	0.00E+00
305.71	4.23.E-04	39.3	37.7	0.00.E+00	7.7	84.7	4.99.E-06	2.37E+17
306.28	9.89.E-04	39.2	37.5	1.62.E-03	7.7	84.4	1.17.E-05	5.57E+17
306.86	5.02.E-04	39.8	38.1	0.00.E+00	7.8	85.6	5.86.E-06	2.78E+17
307.43	7.99.E-04	40.0	37.6	0.00.E+00	7.8	85.4	9.36.E-06	4.45E+17
308.00	0.00.E+00	37.8	36.9	0.00.E+00	7.5	82.1	0.00.E+00	0.00E+00
308.58	1.13.E-03	36.7	36.9	0.00.E+00	7.3	80.9	1.40.E-05	6.67E+17
309.15	2.30.E-04	37.2	36.9	2.69.E-04	7.4	81.5	2.82.E-06	1.34E+17
309.73	7.34.E-04	39.6	37.9	0.00.E+00	7.7	85.2	8.62.E-06	4.10E+17
310.30	6.92.E-04	39.6	37.7	3.45.E-04	7.7	85.1	8.14.E-06	3.87E+17
310.87	4.60.E-04	37.8	37.2	0.00.E+00	7.5	82.5	5.57.E-06	2.65E+17
311.45	5.35.E-04	35.9	36.2	0.00.E+00	7.2	79.3	6.75.E-06	3.21E+17
312.02	1.40.E-04	36.3	36.6	3.62.E-04	7.3	80.1	1.75.E-06	8.31E+16
312.59	5.94.E-04	39.8	37.8	0.00.E+00	7.8	85.4	6.96.E-06	3.31E+17

¹²C³⁺ estimate^{*} was calculated by using C ratio without IG in API_1b He-DOS 1019 data for the estimation of total C ratio.

Appendix1_1b. Ion intensity (Cnt/MSc/Px) and the calculated ^4He concentrations of He-DOS
15keV without IG for calculation of C ion ratio.

Analysis day: 2016.10.19

Raster area: 30px

Analysis area: 5px

Depth (nm)	^4He (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)
313.17	5.07.E-04	39.0	37.7	7.7
313.74	1.47.E-03	40.1	39.3	7.4
314.31	1.10.E-03	37.8	37.9	6.8
314.89	2.05.E-03	36.3	37.3	7.7
315.46	6.00.E-04	33.7	36.0	7.8
316.03	1.47.E-03	31.7	35.3	6.6
316.61	1.28.E-03	29.0	33.7	7.4
317.18	1.59.E-03	28.1	34.1	6.4
317.76	7.48.E-04	26.9	34.3	5.1
318.33	4.48.E-04	28.0	34.4	5.3
318.90	2.09.E-03	29.9	34.8	6.4
319.48	2.01.E-03	31.5	34.8	7.6
320.05	2.40.E-03	32.1	35.9	6.7
320.62	5.32.E-04	28.9	34.0	6.2
321.20	1.28.E-03	30.9	35.5	6.5
321.77	1.46.E-03	35.0	37.9	5.4
322.34	2.40.E-03	37.8	38.1	7.5
322.92	2.16.E-03	37.9	38.5	7.2
323.49	1.08.E-03	37.1	37.4	7.7
324.06	9.61.E-04	35.8	37.4	6.8
324.64	1.36.E-03	34.5	36.4	7.8
325.21	1.87.E-03	34.5	35.8	7.9
325.79	1.66.E-03	35.8	37.4	6.3
326.36	1.13.E-03	36.9	37.6	7.5
326.93	2.23.E-03	37.2	38.0	7.4
327.51	2.23.E-03	37.7	37.8	7.7
328.08	1.29.E-03	38.5	37.7	8.0
328.65	1.00.E-03	38.5	38.1	7.3
329.23	2.31.E-03	38.5	37.6	8.5
329.80	8.88.E-04	37.0	37.2	8.6
Average		34.6	36.6	7.1
C ratio		0.44	0.47	0.09

Appendix1_2a. Ion intensity (Cnt/MSc/Px) and the calculated ⁴He concentrations of He-DOS 15keV (He standard) with Ion gate.

Analysis day: 2016.11.11		⁴ He Dose amount (/cm ²):		1.00E+16 (Bajo et al., 2015)				
Analysis sample: He-DOS 15keV		Σ(⁴ He/C):		0.721				
Raster area: 18px		Relative sensitivity factor:		1.39E+16				
Analysis area: 5px		Average of ⁴ He conc. Background (atoms/cm ³):		1.28E+18		Average of ⁴ He background (Cnt/MSc/Px):		4.4E-04
Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
0.33	1.46.E-02	99.4	114.0	4.26.E-02	40.5	253.9	5.76.E-05	2.43E+19
0.66	1.00.E-02	68.2	48.9	1.44.E-02	22.2	139.4	7.18.E-05	3.03E+19
0.99	1.01.E-02	69.3	45.7	1.25.E-02	21.8	136.8	7.39.E-05	3.11E+19
1.32	1.20.E-02	68.3	44.1	1.44.E-02	21.4	133.8	8.96.E-05	3.78E+19
1.64	1.43.E-02	71.0	44.7	1.22.E-02	22.0	137.7	1.04.E-04	4.36E+19
1.97	1.41.E-02	72.1	45.3	1.26.E-02	22.3	139.8	1.01.E-04	4.26E+19
2.30	1.64.E-02	74.1	45.4	1.53.E-02	22.7	142.2	1.15.E-04	4.86E+19
2.63	1.30.E-02	73.3	44.4	8.32.E-03	22.4	140.1	9.26.E-05	3.90E+19
2.96	1.56.E-02	74.2	45.7	6.83.E-03	22.8	142.7	1.09.E-04	4.61E+19
3.29	1.26.E-02	76.0	44.4	1.64.E-02	22.9	143.2	8.81.E-05	3.71E+19
3.62	1.29.E-02	75.0	44.9	3.97.E-03	22.8	142.7	9.02.E-05	3.80E+19
3.95	1.47.E-02	75.9	45.2	1.13.E-02	23.0	144.0	1.02.E-04	4.30E+19
4.28	1.61.E-02	72.6	43.8	8.22.E-03	22.1	138.6	1.16.E-04	4.90E+19
4.61	1.41.E-02	75.4	44.8	1.07.E-02	22.8	142.9	9.90.E-05	4.17E+19
4.93	1.57.E-02	78.4	45.9	1.12.E-02	23.6	147.9	1.06.E-04	4.47E+19
5.26	1.74.E-02	76.8	45.8	1.03.E-02	23.3	145.9	1.19.E-04	5.03E+19
5.59	1.53.E-02	75.5	45.2	9.51.E-03	22.9	143.6	1.06.E-04	4.48E+19
5.92	1.40.E-02	78.1	46.2	1.41.E-02	23.6	147.9	9.47.E-05	3.99E+19
6.25	1.60.E-02	75.9	45.1	1.29.E-02	23.0	143.9	1.11.E-04	4.68E+19
6.58	1.37.E-02	76.5	44.8	8.19.E-03	23.0	144.4	9.46.E-05	3.99E+19
6.91	1.53.E-02	76.7	45.0	8.76.E-03	23.1	144.8	1.06.E-04	4.47E+19
7.24	1.50.E-02	76.7	45.6	9.03.E-03	23.2	145.6	1.03.E-04	4.35E+19
7.57	1.26.E-02	78.2	46.0	1.22.E-02	23.6	147.8	8.51.E-05	3.59E+19
7.89	1.54.E-02	75.5	44.3	1.29.E-02	22.7	142.5	1.08.E-04	4.55E+19
8.22	1.83.E-02	78.9	46.4	1.11.E-02	23.8	149.1	1.23.E-04	5.17E+19
8.55	1.94.E-02	80.3	46.9	9.95.E-03	24.2	151.4	1.28.E-04	5.40E+19
8.88	1.60.E-02	80.3	47.5	5.64.E-03	24.3	152.1	1.05.E-04	4.43E+19
9.21	1.84.E-02	83.0	48.0	1.41.E-02	24.9	155.9	1.18.E-04	4.96E+19
9.54	1.97.E-02	78.9	46.7	1.04.E-02	23.9	149.5	1.32.E-04	5.54E+19
9.87	1.77.E-02	80.6	47.0	1.67.E-02	24.3	151.9	1.17.E-04	4.92E+19
10.20	1.19.E-02	78.7	46.4	1.34.E-02	23.8	148.9	7.98.E-05	3.36E+19
10.53	2.04.E-02	79.9	46.7	1.61.E-02	24.0	150.5	1.35.E-04	5.70E+19
10.86	1.98.E-02	81.5	47.8	1.04.E-02	24.6	153.9	1.29.E-04	5.43E+19
11.18	1.73.E-02	78.4	46.6	1.76.E-02	23.7	148.7	1.16.E-04	4.91E+19
11.51	1.89.E-02	82.8	48.7	8.66.E-03	25.0	156.5	1.21.E-04	5.10E+19
11.84	2.19.E-02	81.7	47.5	8.96.E-03	24.5	153.8	1.43.E-04	6.01E+19
12.17	2.30.E-02	82.9	48.5	7.95.E-03	25.0	156.3	1.47.E-04	6.22E+19
12.50	2.41.E-02	84.0	49.9	9.60.E-03	25.4	159.3	1.51.E-04	6.36E+19
12.83	1.94.E-02	83.7	48.0	1.39.E-02	25.0	156.8	1.24.E-04	5.22E+19
13.16	2.27.E-02	81.6	47.4	1.74.E-02	24.5	153.5	1.48.E-04	6.22E+19
13.49	2.80.E-02	84.0	48.3	9.10.E-03	25.1	157.4	1.78.E-04	7.51E+19
13.82	1.96.E-02	80.9	48.1	1.40.E-02	24.5	153.5	1.28.E-04	5.37E+19
14.14	3.15.E-02	80.8	47.2	1.20.E-02	24.3	152.3	2.07.E-04	8.71E+19
14.47	2.65.E-02	83.4	48.5	7.14.E-03	25.0	156.9	1.69.E-04	7.11E+19
14.80	2.42.E-02	82.2	48.5	1.06.E-02	24.8	155.5	1.56.E-04	6.56E+19
15.13	3.01.E-02	84.5	48.7	1.40.E-02	25.3	158.4	1.90.E-04	8.01E+19
15.46	2.04.E-02	80.1	46.6	1.46.E-02	24.1	150.7	1.36.E-04	5.72E+19
15.79	3.09.E-02	85.0	48.7	1.47.E-02	25.4	159.2	1.94.E-04	8.19E+19
16.12	3.23.E-02	81.3	47.3	4.82.E-03	24.4	153.0	2.11.E-04	8.88E+19
16.45	3.27.E-02	86.8	50.1	8.70.E-03	26.0	162.9	2.00.E-04	8.45E+19
16.78	2.89.E-02	83.2	48.6	1.09.E-02	25.0	156.7	1.84.E-04	7.76E+19
17.11	3.04.E-02	83.4	47.7	8.71.E-03	24.9	156.0	1.95.E-04	8.21E+19
17.43	3.48.E-02	83.1	48.3	1.40.E-02	25.0	156.4	2.23.E-04	9.38E+19
17.76	3.16.E-02	83.4	47.9	8.97.E-03	24.9	156.2	2.02.E-04	8.52E+19
18.09	4.49.E-02	81.2	47.4	1.55.E-02	24.4	153.0	2.93.E-04	1.24E+20
18.42	4.10.E-02	82.0	46.3	1.55.E-02	24.4	152.6	2.69.E-04	1.13E+20
18.75	4.36.E-02	84.7	47.4	1.40.E-02	25.1	157.1	2.77.E-04	1.17E+20
19.08	3.62.E-02	83.3	48.2	9.54.E-03	25.0	156.5	2.31.E-04	9.74E+19
19.41	4.16.E-02	83.1	47.7	1.06.E-02	24.9	155.7	2.67.E-04	1.13E+20
19.74	4.54.E-02	83.6	48.7	1.01.E-02	25.1	157.4	2.88.E-04	1.22E+20
20.07	3.95.E-02	85.1	49.4	1.17.E-02	25.5	160.0	2.47.E-04	1.04E+20
20.39	4.31.E-02	82.3	46.7	1.55.E-02	24.5	153.5	2.81.E-04	1.18E+20

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
20.72	4.70.E-02	81.9	47.4	1.29.E-02	24.6	153.9	3.05.E-04	1.29E+20
21.05	3.81.E-02	79.7	45.9	1.63.E-02	23.9	149.5	2.55.E-04	1.07E+20
21.38	4.44.E-02	79.2	47.3	1.58.E-02	24.0	150.6	2.95.E-04	1.24E+20
21.71	5.23.E-02	82.4	48.3	8.75.E-03	24.8	155.5	3.36.E-04	1.42E+20
22.04	5.46.E-02	81.5	47.8	1.74.E-02	24.6	153.9	3.55.E-04	1.50E+20
22.37	5.49.E-02	82.2	47.6	1.01.E-02	24.6	154.4	3.56.E-04	1.50E+20
22.70	4.69.E-02	83.6	48.8	1.57.E-02	25.1	157.5	2.97.E-04	1.25E+20
23.03	4.76.E-02	81.7	47.9	1.29.E-02	24.6	154.1	3.09.E-04	1.30E+20
23.36	5.00.E-02	83.3	49.1	8.86.E-03	25.2	157.6	3.17.E-04	1.34E+20
23.68	4.58.E-02	81.7	48.3	1.56.E-02	24.7	154.7	2.96.E-04	1.25E+20
24.01	6.45.E-02	82.1	47.9	1.52.E-02	24.7	154.7	4.17.E-04	1.76E+20
24.34	5.48.E-02	81.0	46.8	1.28.E-02	24.3	152.0	3.61.E-04	1.52E+20
24.67	6.00.E-02	79.7	47.9	1.44.E-02	24.2	151.9	3.95.E-04	1.67E+20
25.00	5.84.E-02	86.4	49.5	1.38.E-02	25.8	161.7	3.61.E-04	1.52E+20
25.33	6.90.E-02	82.6	47.2	7.31.E-03	24.7	154.5	4.47.E-04	1.88E+20
25.66	6.16.E-02	79.7	46.7	1.32.E-02	24.0	150.5	4.09.E-04	1.72E+20
25.99	5.59.E-02	78.3	45.1	1.30.E-02	23.4	146.8	3.81.E-04	1.60E+20
26.32	7.08.E-02	82.2	49.4	6.67.E-03	25.0	156.6	4.52.E-04	1.90E+20
26.64	7.08.E-02	83.0	47.9	1.38.E-02	24.9	155.7	4.55.E-04	1.92E+20
26.97	7.13.E-02	83.5	48.6	1.15.E-02	25.1	157.2	4.53.E-04	1.91E+20
27.30	8.30.E-02	82.0	48.2	1.10.E-02	24.7	154.9	5.36.E-04	2.26E+20
27.63	8.55.E-02	81.5	47.4	1.41.E-02	24.5	153.5	5.57.E-04	2.35E+20
27.96	7.52.E-02	81.4	48.2	1.44.E-02	24.6	154.2	4.87.E-04	2.05E+20
28.29	7.82.E-02	81.3	47.6	1.21.E-02	24.5	153.4	5.10.E-04	2.15E+20
28.62	7.56.E-02	82.6	47.4	1.15.E-02	24.7	154.6	4.89.E-04	2.06E+20
28.95	8.28.E-02	79.8	47.2	7.33.E-03	24.1	151.1	5.48.E-04	2.31E+20
29.28	8.38.E-02	81.0	47.6	1.11.E-02	24.4	153.1	5.47.E-04	2.31E+20
29.61	7.93.E-02	82.0	47.7	1.06.E-02	24.6	154.3	5.14.E-04	2.17E+20
29.93	8.00.E-02	81.5	47.3	1.25.E-02	24.5	153.3	5.22.E-04	2.20E+20
30.26	8.06.E-02	81.6	47.3	1.41.E-02	24.5	153.3	5.26.E-04	2.22E+20
30.59	9.53.E-02	82.0	47.2	1.61.E-02	24.5	153.7	6.20.E-04	2.61E+20
30.92	8.66.E-02	83.8	49.1	6.85.E-03	25.2	158.1	5.47.E-04	2.31E+20
31.25	8.34.E-02	80.1	46.7	1.30.E-02	24.1	150.9	5.53.E-04	2.33E+20
31.58	1.00.E-01	80.8	47.0	1.55.E-02	24.3	152.0	6.61.E-04	2.79E+20
31.91	9.43.E-02	81.7	47.6	1.54.E-02	24.6	153.9	6.13.E-04	2.58E+20
32.24	1.08.E-01	78.2	46.5	2.20.E-02	23.7	148.5	7.25.E-04	3.05E+20
32.57	9.70.E-02	83.9	46.5	1.06.E-02	24.8	155.2	6.25.E-04	2.63E+20
32.89	1.03.E-01	82.5	47.3	1.15.E-02	24.6	154.4	6.64.E-04	2.80E+20
33.22	1.07.E-01	82.0	47.4	5.73.E-03	24.6	153.9	6.98.E-04	2.94E+20
33.55	8.18.E-02	79.4	44.8	1.05.E-02	23.6	147.8	5.54.E-04	2.33E+20
33.88	1.11.E-01	80.3	47.4	8.23.E-03	24.3	152.0	7.28.E-04	3.07E+20
34.21	1.11.E-01	81.5	47.4	1.16.E-02	24.5	153.4	7.25.E-04	3.06E+20
34.54	1.14.E-01	82.0	47.2	1.06.E-02	24.5	153.7	7.42.E-04	3.13E+20
34.87	1.27.E-01	83.1	47.8	1.17.E-02	24.9	155.7	8.14.E-04	3.43E+20
35.20	1.20.E-01	78.8	45.9	1.74.E-02	23.7	148.4	8.10.E-04	3.41E+20
35.53	1.20.E-01	82.3	48.1	1.08.E-02	24.8	155.3	7.76.E-04	3.27E+20
35.86	1.23.E-01	80.3	45.6	2.58.E-02	23.9	149.7	8.20.E-04	3.46E+20
36.18	1.24.E-01	82.2	46.9	1.32.E-02	24.5	153.6	8.06.E-04	3.40E+20
36.51	1.47.E-01	79.1	45.9	1.67.E-02	23.7	148.7	9.91.E-04	4.18E+20
36.84	1.41.E-01	80.3	46.9	1.38.E-02	24.2	151.3	9.30.E-04	3.92E+20
37.17	1.42.E-01	79.0	45.9	1.43.E-02	23.7	148.7	9.56.E-04	4.03E+20
37.50	1.37.E-01	82.1	47.5	1.03.E-02	24.6	154.2	8.89.E-04	3.75E+20
37.83	1.47.E-01	82.3	48.3	1.47.E-02	24.8	155.4	9.48.E-04	4.00E+20
38.16	1.43.E-01	80.2	46.7	1.20.E-02	24.1	151.0	9.47.E-04	3.99E+20
38.49	1.47.E-01	83.4	47.6	7.58.E-03	24.9	155.9	9.41.E-04	3.97E+20
38.82	1.57.E-01	79.8	46.7	1.38.E-02	24.0	150.5	1.05.E-03	4.41E+20
39.14	1.50.E-01	78.5	46.9	1.13.E-02	23.8	149.3	1.00.E-03	4.23E+20
39.47	1.67.E-01	82.9	48.6	1.10.E-02	25.0	156.5	1.07.E-03	4.50E+20
39.80	1.75.E-01	82.2	47.5	1.40.E-02	24.6	154.3	1.13.E-03	4.78E+20
40.13	1.87.E-01	83.5	48.2	6.89.E-03	25.0	156.7	1.19.E-03	5.02E+20
40.46	1.69.E-01	81.6	48.0	9.62.E-03	24.6	154.2	1.10.E-03	4.63E+20
40.79	1.65.E-01	81.1	47.4	1.28.E-02	24.4	153.0	1.08.E-03	4.55E+20
41.12	1.84.E-01	81.1	47.6	1.23.E-02	24.4	153.1	1.20.E-03	5.07E+20
41.45	1.87.E-01	79.4	45.4	1.67.E-02	23.7	148.6	1.26.E-03	5.30E+20
41.78	1.78.E-01	80.2	46.7	9.22.E-03	24.1	151.1	1.18.E-03	4.95E+20
42.11	1.87.E-01	81.7	47.4	7.24.E-03	24.5	153.7	1.22.E-03	5.14E+20
42.43	1.83.E-01	79.9	46.6	1.64.E-02	24.0	150.5	1.22.E-03	5.13E+20
42.76	2.05.E-01	83.1	49.3	1.41.E-02	25.1	157.5	1.30.E-03	5.49E+20

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
43.09	2.26.E-01	83.6	48.5	1.71.E-02	25.1	157.2	1.44.E-03	6.06E+20
43.42	2.20.E-01	85.6	48.7	9.09.E-03	25.5	159.8	1.38.E-03	5.80E+20
43.75	2.38.E-01	84.7	50.1	1.00.E-02	25.6	160.3	1.48.E-03	6.26E+20
44.08	2.25.E-01	79.2	46.8	1.64.E-02	24.0	150.0	1.50.E-03	6.33E+20
44.41	2.64.E-01	82.8	49.7	1.29.E-02	25.2	157.7	1.68.E-03	7.06E+20
44.74	2.48.E-01	80.9	46.7	1.65.E-02	24.2	151.8	1.63.E-03	6.88E+20
45.07	2.38.E-01	81.9	47.5	1.51.E-02	24.6	154.0	1.54.E-03	6.51E+20
45.39	2.49.E-01	81.9	47.6	1.18.E-02	24.6	154.1	1.62.E-03	6.81E+20
45.72	2.39.E-01	82.7	48.9	1.08.E-02	25.0	156.6	1.53.E-03	6.44E+20
46.05	2.62.E-01	78.1	44.4	1.61.E-02	23.3	145.7	1.80.E-03	7.57E+20
46.38	2.56.E-01	83.8	47.8	1.43.E-02	25.0	156.6	1.63.E-03	6.89E+20
46.71	2.84.E-01	82.5	48.8	1.44.E-02	24.9	156.2	1.82.E-03	7.66E+20
47.04	2.88.E-01	85.6	48.9	1.09.E-02	25.5	159.9	1.80.E-03	7.59E+20
47.37	2.79.E-01	84.4	48.9	1.65.E-02	25.3	158.6	1.76.E-03	7.42E+20
47.70	3.13.E-01	81.5	48.2	1.57.E-02	24.6	154.3	2.03.E-03	8.56E+20
48.03	2.91.E-01	81.5	47.8	1.46.E-02	24.6	153.8	1.89.E-03	7.97E+20
48.36	2.95.E-01	81.2	47.7	1.42.E-02	24.5	153.5	1.92.E-03	8.10E+20
48.68	3.03.E-01	82.2	48.0	6.79.E-03	24.7	154.9	1.96.E-03	8.24E+20
49.01	3.24.E-01	83.7	48.5	1.89.E-02	25.1	157.3	2.06.E-03	8.69E+20
49.34	3.36.E-01	82.1	48.1	8.10.E-03	24.7	155.0	2.17.E-03	9.14E+20
49.67	3.14.E-01	82.7	48.8	9.77.E-03	25.0	156.5	2.01.E-03	8.46E+20
50.00	3.82.E-01	83.1	47.7	1.27.E-02	24.8	155.6	2.45.E-03	1.03E+21
50.33	3.18.E-01	81.4	47.8	1.57.E-02	24.5	153.7	2.07.E-03	8.72E+20
50.66	3.52.E-01	80.2	46.0	1.20.E-02	24.0	150.2	2.34.E-03	9.88E+20
50.99	3.83.E-01	80.8	47.7	1.42.E-02	24.4	152.9	2.50.E-03	1.06E+21
51.32	3.54.E-01	84.7	48.1	1.31.E-02	25.2	158.0	2.24.E-03	9.45E+20
51.64	3.89.E-01	82.3	48.0	1.57.E-02	24.8	155.1	2.51.E-03	1.06E+21
51.97	4.08.E-01	82.6	48.4	1.12.E-02	24.9	155.9	2.62.E-03	1.10E+21
52.30	4.03.E-01	80.6	48.2	2.00.E-02	24.5	153.4	2.63.E-03	1.11E+21
52.63	4.17.E-01	83.4	48.2	1.43.E-02	25.0	156.5	2.66.E-03	1.12E+21
52.96	4.37.E-01	84.8	48.3	8.46.E-03	25.3	158.4	2.76.E-03	1.16E+21
53.29	4.44.E-01	85.8	49.3	1.10.E-02	25.7	160.8	2.76.E-03	1.16E+21
53.62	4.37.E-01	84.5	48.3	1.42.E-02	25.2	158.0	2.77.E-03	1.17E+21
53.95	4.28.E-01	79.8	46.7	1.82.E-02	24.0	150.6	2.84.E-03	1.20E+21
54.28	4.42.E-01	81.6	48.4	1.77.E-02	24.7	154.7	2.86.E-03	1.20E+21
54.61	4.53.E-01	81.9	48.4	1.36.E-02	24.7	155.0	2.92.E-03	1.23E+21
54.93	4.60.E-01	80.7	47.3	1.39.E-02	24.3	152.3	3.02.E-03	1.27E+21
55.26	4.74.E-01	84.5	50.1	8.98.E-03	25.6	160.2	2.96.E-03	1.25E+21
55.59	4.47.E-01	82.1	48.1	1.57.E-02	24.7	155.0	2.89.E-03	1.22E+21
55.92	5.11.E-01	83.0	49.6	1.24.E-02	25.2	157.8	3.24.E-03	1.37E+21
56.25	5.52.E-01	86.4	50.2	9.01.E-03	25.9	162.5	3.40.E-03	1.43E+21
56.58	5.42.E-01	84.6	50.4	7.52.E-03	25.6	160.7	3.37.E-03	1.42E+21
56.91	5.41.E-01	82.7	48.2	1.17.E-02	24.9	155.7	3.47.E-03	1.46E+21
57.24	5.57.E-01	79.5	46.2	1.12.E-02	23.9	149.5	3.72.E-03	1.57E+21
57.57	5.49.E-01	80.0	48.0	1.29.E-02	24.3	152.4	3.60.E-03	1.52E+21
57.89	5.89.E-01	84.0	48.4	1.03.E-02	25.1	157.5	3.74.E-03	1.58E+21
58.22	6.05.E-01	85.1	49.6	1.15.E-02	25.6	160.2	3.77.E-03	1.59E+21
58.55	6.22.E-01	82.3	48.8	1.40.E-02	24.9	156.1	3.99.E-03	1.68E+21
58.88	6.19.E-01	82.1	48.2	1.41.E-02	24.7	155.0	3.99.E-03	1.68E+21
59.21	6.25.E-01	83.5	48.4	1.33.E-02	25.0	156.9	3.98.E-03	1.68E+21
59.54	6.57.E-01	82.0	49.0	1.52.E-02	24.9	156.0	4.21.E-03	1.77E+21
59.87	6.54.E-01	82.2	49.1	7.08.E-03	24.9	156.3	4.19.E-03	1.77E+21
60.20	6.83.E-01	81.1	49.1	9.32.E-03	24.7	155.0	4.41.E-03	1.86E+21
60.53	6.84.E-01	82.8	48.5	1.72.E-02	24.9	156.2	4.38.E-03	1.85E+21
60.86	6.82.E-01	84.3	48.1	1.24.E-02	25.2	157.6	4.33.E-03	1.82E+21
61.18	6.72.E-01	80.7	48.0	1.66.E-02	24.4	153.1	4.39.E-03	1.85E+21
61.51	7.33.E-01	81.7	48.9	8.90.E-03	24.8	155.3	4.72.E-03	1.99E+21
61.84	6.62.E-01	80.8	46.4	1.36.E-02	24.2	151.4	4.37.E-03	1.84E+21
62.17	7.09.E-01	78.4	45.2	2.29.E-02	23.5	147.1	4.82.E-03	2.03E+21
62.50	7.32.E-01	79.6	47.5	1.39.E-02	24.1	151.2	4.84.E-03	2.04E+21
62.83	7.61.E-01	82.9	48.3	8.38.E-03	24.9	156.1	4.87.E-03	2.05E+21
63.16	7.70.E-01	81.3	47.5	1.35.E-02	24.5	153.3	5.02.E-03	2.12E+21
63.49	7.54.E-01	80.7	46.2	1.48.E-02	24.1	151.0	5.00.E-03	2.11E+21
63.82	8.22.E-01	80.8	47.3	1.79.E-02	24.3	152.5	5.39.E-03	2.27E+21
64.14	8.24.E-01	82.1	48.4	1.36.E-02	24.8	155.3	5.30.E-03	2.24E+21
64.47	8.00.E-01	80.4	46.9	1.50.E-02	24.2	151.5	5.28.E-03	2.23E+21
64.80	8.56.E-01	83.8	49.2	1.49.E-02	25.3	158.2	5.41.E-03	2.28E+21
65.13	8.32.E-01	81.8	47.6	1.25.E-02	24.6	154.0	5.40.E-03	2.28E+21

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	Σ C (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
65.46	8.53.E-01	81.5	47.7	1.24.E-02	24.5	153.8	5.54.E-03	2.34E+21
65.79	8.70.E-01	80.3	47.3	1.08.E-02	24.2	151.8	5.73.E-03	2.42E+21
66.12	8.64.E-01	77.8	45.7	1.30.E-02	23.4	146.9	5.89.E-03	2.48E+21
66.45	8.78.E-01	81.7	48.3	1.09.E-02	24.7	154.8	5.67.E-03	2.39E+21
66.78	8.80.E-01	82.7	48.9	8.28.E-03	25.0	156.6	5.62.E-03	2.37E+21
67.11	9.11.E-01	82.0	49.6	1.03.E-02	25.0	156.7	5.82.E-03	2.45E+21
67.43	8.97.E-01	84.5	48.9	1.44.E-02	25.3	158.8	5.65.E-03	2.38E+21
67.76	8.76.E-01	81.8	48.2	1.68.E-02	24.7	154.7	5.66.E-03	2.39E+21
68.09	8.54.E-01	83.7	48.1	1.50.E-02	25.0	156.8	5.44.E-03	2.29E+21
68.42	9.45.E-01	82.3	48.6	1.84.E-02	24.9	155.7	6.07.E-03	2.56E+21
68.75	9.40.E-01	82.5	48.3	9.77.E-03	24.8	155.7	6.04.E-03	2.54E+21
69.08	9.70.E-01	80.7	48.4	1.20.E-02	24.5	153.7	6.32.E-03	2.66E+21
69.41	9.36.E-01	78.5	46.1	1.22.E-02	23.7	148.3	6.31.E-03	2.66E+21
69.74	1.02.E+00	84.9	49.1	9.25.E-03	25.5	159.5	6.39.E-03	2.69E+21
70.07	9.52.E-01	82.8	48.6	1.18.E-02	25.0	156.4	6.09.E-03	2.57E+21
70.39	9.60.E-01	79.4	46.9	1.78.E-02	24.0	150.2	6.39.E-03	2.69E+21
70.72	9.38.E-01	79.6	46.3	1.90.E-02	23.9	149.8	6.26.E-03	2.64E+21
71.05	1.00.E+00	81.3	48.3	1.16.E-02	24.6	154.1	6.52.E-03	2.75E+21
71.38	9.66.E-01	80.9	47.7	1.16.E-02	24.4	153.1	6.31.E-03	2.66E+21
71.71	9.85.E-01	80.2	45.9	1.12.E-02	24.0	150.1	6.57.E-03	2.77E+21
72.04	9.89.E-01	79.5	47.7	1.43.E-02	24.2	151.4	6.53.E-03	2.75E+21
72.37	1.03.E+00	80.4	47.7	1.68.E-02	24.3	152.4	6.74.E-03	2.84E+21
72.70	9.71.E-01	80.5	46.8	1.34.E-02	24.2	151.4	6.42.E-03	2.70E+21
73.03	9.50.E-01	81.2	47.8	1.34.E-02	24.5	153.5	6.19.E-03	2.61E+21
73.36	1.05.E+00	81.1	48.6	1.30.E-02	24.6	154.2	6.78.E-03	2.86E+21
73.68	1.01.E+00	79.6	47.3	1.34.E-02	24.1	151.1	6.69.E-03	2.82E+21
74.01	1.01.E+00	81.5	47.9	1.10.E-02	24.6	154.0	6.56.E-03	2.77E+21
74.34	1.01.E+00	80.9	47.5	1.15.E-02	24.4	152.7	6.61.E-03	2.79E+21
74.67	9.90.E-01	81.2	47.8	8.50.E-03	24.5	153.5	6.45.E-03	2.72E+21
75.00	9.98.E-01	79.0	46.9	1.84.E-02	23.9	149.8	6.66.E-03	2.81E+21
75.33	1.05.E+00	79.7	47.6	1.43.E-02	24.2	151.6	6.94.E-03	2.93E+21
75.66	1.00.E+00	78.9	47.1	8.77.E-03	23.9	150.0	6.68.E-03	2.82E+21
75.99	9.71.E-01	81.0	47.3	8.50.E-03	24.4	152.7	6.36.E-03	2.68E+21
76.32	9.76.E-01	81.8	46.8	1.39.E-02	24.4	153.1	6.38.E-03	2.69E+21
76.64	9.47.E-01	77.8	46.3	1.82.E-02	23.6	147.7	6.41.E-03	2.70E+21
76.97	9.58.E-01	81.5	48.9	6.40.E-03	24.8	155.2	6.17.E-03	2.60E+21
77.30	9.57.E-01	80.3	46.3	1.02.E-02	24.1	150.7	6.35.E-03	2.68E+21
77.63	9.35.E-01	79.9	47.0	1.78.E-02	24.1	151.0	6.19.E-03	2.61E+21
77.96	9.50.E-01	79.3	46.3	1.38.E-02	23.9	149.5	6.35.E-03	2.68E+21
78.29	9.74.E-01	80.9	47.4	9.08.E-03	24.4	152.6	6.38.E-03	2.69E+21
78.62	9.20.E-01	79.2	46.8	1.56.E-02	23.9	149.8	6.14.E-03	2.59E+21
78.95	8.87.E-01	81.9	47.9	1.23.E-02	24.7	154.5	5.74.E-03	2.42E+21
79.28	9.08.E-01	77.1	46.3	1.35.E-02	23.4	146.8	6.19.E-03	2.61E+21
79.61	8.89.E-01	77.7	45.4	1.66.E-02	23.4	146.5	6.06.E-03	2.56E+21
79.93	9.18.E-01	80.9	47.9	1.34.E-02	24.5	153.4	5.99.E-03	2.52E+21
80.26	8.84.E-01	81.5	48.3	1.39.E-02	24.7	154.5	5.72.E-03	2.41E+21
80.59	8.56.E-01	82.8	47.9	9.29.E-03	24.8	155.5	5.50.E-03	2.32E+21
80.92	8.66.E-01	80.4	47.6	1.41.E-02	24.3	152.4	5.68.E-03	2.39E+21
81.25	8.25.E-01	78.0	45.9	1.30.E-02	23.5	147.4	5.60.E-03	2.36E+21
81.58	8.86.E-01	78.9	46.4	1.36.E-02	23.8	149.1	5.94.E-03	2.50E+21
81.91	8.40.E-01	79.8	47.1	1.45.E-02	24.1	151.0	5.56.E-03	2.34E+21
82.24	8.24.E-01	81.9	48.4	1.62.E-02	24.8	155.0	5.32.E-03	2.24E+21
82.57	7.70.E-01	80.6	46.9	8.30.E-03	24.2	151.6	5.08.E-03	2.14E+21
82.89	7.72.E-01	80.8	46.7	1.30.E-02	24.2	151.7	5.09.E-03	2.15E+21
83.22	7.49.E-01	81.2	48.4	1.52.E-02	24.6	154.2	4.86.E-03	2.05E+21
83.55	7.44.E-01	78.8	46.5	1.59.E-02	23.8	149.0	5.00.E-03	2.11E+21
83.88	7.23.E-01	79.0	45.9	1.57.E-02	23.7	148.7	4.86.E-03	2.05E+21
84.21	6.91.E-01	78.2	45.8	1.66.E-02	23.6	147.6	4.68.E-03	1.97E+21
84.54	6.86.E-01	77.6	45.5	1.38.E-02	23.4	146.5	4.68.E-03	1.97E+21
84.87	6.77.E-01	79.3	46.5	9.43.E-03	23.9	149.7	4.52.E-03	1.91E+21
85.20	6.40.E-01	81.0	46.6	1.21.E-02	24.2	151.8	4.22.E-03	1.78E+21
85.53	6.20.E-01	79.6	46.4	1.11.E-02	23.9	149.9	4.14.E-03	1.74E+21
85.86	5.80.E-01	80.0	46.5	9.06.E-03	24.0	150.4	3.86.E-03	1.63E+21
86.18	5.72.E-01	81.6	47.1	1.02.E-02	24.4	153.0	3.74.E-03	1.58E+21
86.51	5.71.E-01	78.9	46.8	1.71.E-02	23.9	149.5	3.82.E-03	1.61E+21
86.84	5.30.E-01	80.0	47.6	1.34.E-02	24.2	151.7	3.49.E-03	1.47E+21
87.17	5.17.E-01	79.4	46.0	1.02.E-02	23.8	149.3	3.47.E-03	1.46E+21
87.50	5.10.E-01	78.7	46.2	1.43.E-02	23.7	148.7	3.43.E-03	1.45E+21

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
87.83	5.07.E-01	79.2	46.8	1.10.E-02	23.9	149.9	3.38.E-03	1.43E+21
88.16	4.64.E-01	80.1	46.1	1.34.E-02	24.0	150.2	3.09.E-03	1.30E+21
88.49	4.53.E-01	79.3	46.9	1.26.E-02	24.0	150.2	3.01.E-03	1.27E+21
88.82	4.08.E-01	78.4	46.3	1.66.E-02	23.7	148.4	2.75.E-03	1.16E+21
89.14	4.04.E-01	80.1	48.3	1.24.E-02	24.4	152.9	2.64.E-03	1.11E+21
89.47	3.96.E-01	78.4	46.8	1.16.E-02	23.8	149.0	2.66.E-03	1.12E+21
89.80	3.86.E-01	81.1	46.8	1.31.E-02	24.3	152.1	2.54.E-03	1.07E+21
90.13	3.60.E-01	82.4	47.3	1.18.E-02	24.6	154.4	2.33.E-03	9.83E+20
90.46	3.54.E-01	80.2	46.3	1.22.E-02	24.0	150.5	2.35.E-03	9.92E+20
90.79	3.49.E-01	78.5	46.2	1.98.E-02	23.7	148.4	2.35.E-03	9.91E+20
91.12	3.11.E-01	79.2	44.9	1.91.E-02	23.6	147.7	2.11.E-03	8.89E+20
91.45	3.05.E-01	80.6	46.5	1.42.E-02	24.1	151.2	2.02.E-03	8.51E+20
91.78	2.98.E-01	77.2	46.0	1.13.E-02	23.4	146.6	2.03.E-03	8.56E+20
92.11	2.79.E-01	79.2	46.7	1.33.E-02	23.9	149.9	1.86.E-03	7.84E+20
92.43	2.48.E-01	81.5	46.1	1.04.E-02	24.2	151.8	1.64.E-03	6.90E+20
92.76	2.58.E-01	79.1	46.2	1.44.E-02	23.8	149.1	1.73.E-03	7.30E+20
93.09	2.29.E-01	77.5	45.7	1.33.E-02	23.4	146.5	1.56.E-03	6.59E+20
93.42	2.30.E-01	80.9	47.1	1.12.E-02	24.3	152.4	1.51.E-03	6.36E+20
93.75	2.27.E-01	80.0	47.0	1.11.E-02	24.1	151.2	1.50.E-03	6.32E+20
94.08	1.98.E-01	80.3	47.1	1.34.E-02	24.2	151.6	1.31.E-03	5.51E+20
94.41	1.96.E-01	82.2	49.2	1.45.E-02	25.0	156.5	1.25.E-03	5.28E+20
94.74	1.90.E-01	78.2	45.1	1.59.E-02	23.4	146.8	1.29.E-03	5.45E+20
95.07	1.89.E-01	78.7	45.7	1.63.E-02	23.6	148.0	1.28.E-03	5.39E+20
95.39	1.91.E-01	80.3	48.2	1.17.E-02	24.4	152.9	1.25.E-03	5.26E+20
95.72	1.68.E-01	80.0	48.2	1.41.E-02	24.4	152.6	1.10.E-03	4.63E+20
96.05	1.43.E-01	80.4	45.9	1.18.E-02	24.0	150.3	9.49.E-04	4.00E+20
96.38	1.43.E-01	78.9	47.0	1.44.E-02	23.9	149.7	9.54.E-04	4.02E+20
96.71	1.34.E-01	80.0	46.4	1.52.E-02	24.0	150.4	8.89.E-04	3.75E+20
97.04	1.21.E-01	80.6	47.3	8.74.E-03	24.3	152.3	7.93.E-04	3.34E+20
97.37	1.22.E-01	81.2	47.5	1.72.E-02	24.4	153.1	8.00.E-04	3.37E+20
97.70	1.13.E-01	78.4	46.4	1.48.E-02	23.7	148.5	7.62.E-04	3.21E+20
98.03	1.08.E-01	78.6	45.7	1.53.E-02	23.6	148.0	7.28.E-04	3.07E+20
98.36	9.30.E-02	79.0	46.4	1.61.E-02	23.8	149.3	6.23.E-04	2.63E+20
98.68	9.14.E-02	83.5	48.0	8.81.E-03	25.0	156.4	5.84.E-04	2.46E+20
99.01	8.65.E-02	76.7	44.5	1.32.E-02	23.0	144.2	6.00.E-04	2.53E+20
99.34	7.83.E-02	81.4	46.9	1.08.E-02	24.4	152.7	5.13.E-04	2.16E+20
99.67	8.14.E-02	79.5	46.4	1.21.E-02	23.9	149.8	5.43.E-04	2.29E+20
100.00	6.72.E-02	81.2	46.1	1.28.E-02	24.2	151.5	4.44.E-04	1.87E+20
100.33	5.63.E-02	77.2	46.0	1.49.E-02	23.4	146.6	3.84.E-04	1.62E+20
100.66	5.58.E-02	80.6	47.1	1.74.E-02	24.2	151.9	3.68.E-04	1.55E+20
100.99	4.75.E-02	79.5	46.0	1.03.E-02	23.8	149.4	3.18.E-04	1.34E+20
101.32	5.06.E-02	80.4	46.8	1.23.E-02	24.2	151.4	3.34.E-04	1.41E+20
101.64	4.65.E-02	79.1	47.0	1.17.E-02	24.0	150.1	3.10.E-04	1.31E+20
101.97	4.64.E-02	75.0	44.5	1.41.E-02	22.7	142.2	3.26.E-04	1.37E+20
102.30	4.31.E-02	80.3	47.0	1.03.E-02	24.2	151.4	2.85.E-04	1.20E+20
102.63	2.80.E-02	79.2	47.7	8.25.E-03	24.1	151.1	1.85.E-04	7.81E+19
102.96	3.93.E-02	78.4	46.5	1.17.E-02	23.7	148.7	2.64.E-04	1.11E+20
103.29	3.55.E-02	80.3	47.0	1.01.E-02	24.2	151.5	2.35.E-04	9.89E+19
103.62	2.85.E-02	81.2	46.6	1.96.E-02	24.3	152.1	1.88.E-04	7.91E+19
103.95	2.73.E-02	79.2	47.3	1.29.E-02	24.0	150.5	1.81.E-04	7.64E+19
104.28	2.42.E-02	80.9	47.6	1.39.E-02	24.4	152.9	1.58.E-04	6.67E+19
104.61	2.72.E-02	80.1	47.4	1.06.E-02	24.2	151.7	1.79.E-04	7.55E+19
104.93	1.99.E-02	79.6	46.6	1.57.E-02	24.0	150.2	1.32.E-04	5.57E+19
105.26	2.11.E-02	77.7	46.4	1.12.E-02	23.6	147.7	1.43.E-04	6.04E+19
105.59	1.54.E-02	78.8	46.9	1.56.E-02	23.9	149.6	1.03.E-04	4.35E+19
105.92	2.11.E-02	79.8	45.4	1.63.E-02	23.8	149.0	1.41.E-04	5.96E+19
106.25	1.58.E-02	76.5	45.5	1.65.E-02	23.2	145.1	1.09.E-04	4.58E+19
106.58	1.90.E-02	79.3	46.5	1.31.E-02	23.9	149.7	1.27.E-04	5.36E+19
106.91	1.50.E-02	79.0	46.3	1.70.E-02	23.8	149.1	1.01.E-04	4.24E+19
107.24	1.57.E-02	78.7	46.2	1.41.E-02	23.7	148.6	1.06.E-04	4.45E+19
107.57	1.60.E-02	79.6	46.5	1.01.E-02	23.9	150.0	1.07.E-04	4.50E+19
107.89	1.32.E-02	81.6	46.3	8.72.E-03	24.3	152.3	8.65.E-05	3.65E+19
108.22	1.90.E-02	81.7	47.2	1.54.E-02	24.5	153.4	1.24.E-04	5.22E+19
108.55	1.00.E-02	78.4	45.3	1.78.E-02	23.5	147.3	6.79.E-05	2.86E+19
108.88	1.16.E-02	81.1	47.3	1.51.E-02	24.4	152.9	7.56.E-05	3.19E+19
109.21	1.14.E-02	79.1	46.7	1.24.E-02	23.9	149.7	7.59.E-05	3.20E+19
109.54	9.31.E-03	82.0	47.9	1.44.E-02	24.7	154.6	6.02.E-05	2.54E+19
109.87	8.62.E-03	77.8	46.3	1.67.E-02	23.6	147.7	5.84.E-05	2.46E+19

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
110.20	6.72.E-03	81.2	48.3	1.25.E-02	24.6	154.1	4.36.E-05	1.84E+19
110.53	4.87.E-03	80.1	47.7	1.44.E-02	24.3	152.1	3.20.E-05	1.35E+19
110.86	7.92.E-03	79.3	47.1	1.47.E-02	24.0	150.5	5.26.E-05	2.22E+19
111.18	4.88.E-03	78.6	47.2	1.46.E-02	23.9	149.7	3.26.E-05	1.37E+19
111.51	6.31.E-03	79.7	47.0	1.23.E-02	24.1	150.8	4.18.E-05	1.76E+19
111.84	4.91.E-03	82.4	49.2	1.42.E-02	25.0	156.6	3.14.E-05	1.32E+19
112.17	5.74.E-03	77.9	46.0	1.36.E-02	23.5	147.4	3.89.E-05	1.64E+19
112.50	4.21.E-03	77.8	45.9	1.28.E-02	23.5	147.2	2.86.E-05	1.21E+19
112.83	4.37.E-03	79.4	45.9	1.25.E-02	23.8	149.0	2.93.E-05	1.24E+19
113.16	4.31.E-03	78.9	46.4	1.32.E-02	23.8	149.1	2.89.E-05	1.22E+19
113.49	2.42.E-03	80.5	45.8	9.17.E-03	24.0	150.2	1.61.E-05	6.80E+18
113.82	2.35.E-03	77.8	46.2	1.48.E-02	23.5	147.5	1.59.E-05	6.70E+18
114.14	3.76.E-03	79.1	47.8	1.18.E-02	24.1	151.0	2.49.E-05	1.05E+19
114.47	6.41.E-03	78.1	46.8	1.50.E-02	23.7	148.5	4.32.E-05	1.82E+19
114.80	5.10.E-03	78.2	45.4	1.35.E-02	23.5	147.0	3.47.E-05	1.46E+19
115.13	1.46.E-03	76.8	44.7	1.18.E-02	23.1	144.6	1.01.E-05	4.25E+18
115.46	3.18.E-03	75.5	44.5	1.34.E-02	22.8	142.8	2.23.E-05	9.40E+18
115.79	1.74.E-03	80.0	47.4	9.32.E-03	24.2	151.5	1.15.E-05	4.84E+18
116.12	1.05.E-03	79.8	47.0	1.52.E-02	24.1	150.8	6.96.E-06	2.93E+18
116.45	2.43.E-03	79.8	47.6	7.19.E-03	24.2	151.7	1.60.E-05	6.76E+18
116.78	1.59.E-03	79.2	47.9	9.13.E-03	24.1	151.3	1.05.E-05	4.44E+18
117.11	2.18.E-03	78.1	45.4	1.35.E-02	23.5	147.0	1.49.E-05	6.26E+18
117.43	1.65.E-03	79.5	46.3	1.67.E-02	23.9	149.8	1.10.E-05	4.64E+18
117.76	1.24.E-03	79.5	46.4	1.27.E-02	23.9	149.8	8.28.E-06	3.49E+18
118.09	3.56.E-03	78.1	46.7	1.79.E-02	23.7	148.4	2.40.E-05	1.01E+19
118.42	1.11.E-03	80.3	46.8	1.61.E-02	24.1	151.2	7.36.E-06	3.10E+18
118.75	1.61.E-03	79.4	46.1	1.33.E-02	23.8	149.4	1.08.E-05	4.55E+18
119.08	2.26.E-03	78.2	46.5	1.24.E-02	23.7	148.3	1.53.E-05	6.43E+18
119.41	1.73.E-03	76.5	45.1	1.48.E-02	23.1	144.7	1.19.E-05	5.03E+18
119.74	7.96.E-04	75.2	43.3	1.68.E-02	22.5	141.0	5.65.E-06	2.38E+18
120.07	1.30.E-03	79.1	47.6	1.06.E-02	24.1	150.7	8.65.E-06	3.65E+18
120.39	1.55.E-04	80.9	47.5	7.99.E-03	24.4	152.8	1.01.E-06	4.28E+17
120.72	1.28.E-03	77.6	44.5	2.11.E-02	23.2	145.4	8.82.E-06	3.72E+18
121.05	8.60.E-04	77.5	45.8	1.22.E-02	23.4	146.8	5.86.E-06	2.47E+18
121.38	1.17.E-03	76.9	44.5	1.67.E-02	23.1	144.4	8.10.E-06	3.41E+18
121.71	4.51.E-04	76.8	45.4	1.30.E-02	23.2	145.4	3.10.E-06	1.31E+18
122.04	3.10.E-04	79.3	46.9	1.07.E-02	24.0	150.2	2.06.E-06	8.70E+17
122.37	1.40.E-03	77.1	44.3	1.26.E-02	23.1	144.5	9.71.E-06	4.09E+18
122.70	1.46.E-03	78.0	45.9	1.59.E-02	23.5	147.4	9.90.E-06	4.17E+18
123.03	1.78.E-03	78.2	46.0	1.08.E-02	23.6	147.7	1.20.E-05	5.07E+18
123.36	7.54.E-04	79.9	46.6	1.68.E-02	24.0	150.5	5.01.E-06	2.11E+18
123.68	5.71.E-04	79.7	46.6	1.19.E-02	24.0	150.2	3.80.E-06	1.60E+18
124.01	1.11.E-03	76.5	44.7	1.20.E-02	23.0	144.2	7.67.E-06	3.23E+18
124.34	0.00.E+00	78.8	47.2	1.17.E-02	23.9	150.0	0.00.E+00	0.00E+00
124.67	0.00.E+00	78.0	46.7	1.46.E-02	23.7	148.3	0.00.E+00	0.00E+00
125.00	1.02.E-03	78.2	46.9	7.00.E-03	23.8	148.9	6.86.E-06	2.89E+18
125.33	0.00.E+00	80.2	48.0	9.79.E-03	24.4	152.6	0.00.E+00	0.00E+00
125.66	8.67.E-04	80.6	48.0	8.36.E-03	24.4	152.9	5.67.E-06	2.39E+18
125.99	2.92.E-03	77.9	46.4	1.59.E-02	23.6	147.9	1.97.E-05	8.32E+18
126.32	1.74.E-03	77.1	45.9	8.82.E-03	23.4	146.4	1.19.E-05	5.01E+18
126.64	0.00.E+00	78.5	45.6	1.22.E-02	23.6	147.7	0.00.E+00	0.00E+00
126.97	5.64.E-04	73.6	43.8	1.58.E-02	22.3	139.7	4.03.E-06	1.70E+18
127.30	1.09.E-03	79.9	46.7	1.39.E-02	24.0	150.6	7.20.E-06	3.04E+18
127.63	2.54.E-04	76.3	44.6	1.76.E-02	23.0	143.9	1.76.E-06	7.43E+17
127.96	3.24.E-04	75.3	43.7	1.32.E-02	22.6	141.7	2.29.E-06	9.64E+17
128.29	1.51.E-03	78.7	44.8	1.94.E-02	23.5	147.0	1.03.E-05	4.33E+18
128.62	0.00.E+00	79.4	46.1	1.37.E-02	23.8	149.2	0.00.E+00	0.00E+00
128.95	2.33.E-04	78.7	46.3	1.91.E-02	23.7	148.8	1.56.E-06	6.59E+17
129.28	0.00.E+00	78.8	46.6	9.52.E-03	23.8	149.2	0.00.E+00	0.00E+00
129.61	8.81.E-04	74.1	44.9	1.55.E-02	22.6	141.6	6.22.E-06	2.62E+18
129.93	6.41.E-04	77.7	45.6	1.47.E-02	23.4	146.8	4.37.E-06	1.84E+18
130.26	2.96.E-04	76.9	45.2	1.57.E-02	23.2	145.3	2.04.E-06	8.59E+17
130.59	0.00.E+00	75.3	45.0	1.31.E-02	22.9	143.2	0.00.E+00	0.00E+00
130.92	0.00.E+00	79.6	47.2	2.20.E-02	24.1	150.8	0.00.E+00	0.00E+00
131.25	3.10.E-04	77.1	46.2	1.08.E-02	23.4	146.7	2.11.E-06	8.91E+17
131.58	4.51.E-04	79.1	47.0	1.67.E-02	23.9	150.0	3.01.E-06	1.27E+18
131.91	7.68.E-04	77.7	46.1	1.10.E-02	23.5	147.4	5.21.E-06	2.20E+18
132.24	0.00.E+00	79.7	48.0	1.31.E-02	24.3	152.0	0.00.E+00	0.00E+00

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*]	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
132.57	5.85.E-04	79.9	46.6	1.36.E-02	24.0	150.6	3.88.E-06	1.64E+18
132.89	0.00.E+00	77.4	46.8	1.89.E-02	23.6	147.8	0.00.E+00	0.00E+00
133.22	0.00.E+00	78.8	47.3	1.33.E-02	24.0	150.0	0.00.E+00	0.00E+00
133.55	2.82.E-04	78.0	46.3	1.28.E-02	23.6	147.9	1.91.E-06	8.03E+17
133.88	1.47.E-03	75.6	44.9	9.09.E-03	22.9	143.4	1.02.E-05	4.31E+18
134.21	0.00.E+00	74.2	44.3	1.83.E-02	22.5	141.0	0.00.E+00	0.00E+00
134.54	3.38.E-04	79.6	46.7	1.40.E-02	24.0	150.3	2.25.E-06	9.49E+17
134.87	3.10.E-04	80.0	47.4	8.15.E-03	24.2	151.5	2.05.E-06	8.63E+17
135.20	2.68.E-04	78.7	45.5	1.61.E-02	23.6	147.8	1.81.E-06	7.63E+17
135.53	0.00.E+00	75.5	45.1	1.39.E-02	22.9	143.5	0.00.E+00	0.00E+00
135.86	0.00.E+00	78.5	46.4	1.75.E-02	23.7	148.6	0.00.E+00	0.00E+00
136.18	3.59.E-04	78.2	46.6	1.47.E-02	23.7	148.4	2.42.E-06	1.02E+18
136.51	0.00.E+00	78.7	46.9	1.12.E-02	23.9	149.5	0.00.E+00	0.00E+00
136.84	1.22.E-03	76.7	44.8	2.09.E-02	23.1	144.5	8.43.E-06	3.56E+18
137.17	0.00.E+00	78.3	46.1	1.10.E-02	23.6	148.0	0.00.E+00	0.00E+00
137.50	2.89.E-04	78.4	46.4	1.78.E-02	23.7	148.4	1.95.E-06	8.20E+17
137.83	0.00.E+00	77.3	45.7	1.29.E-02	23.4	146.4	0.00.E+00	0.00E+00
138.16	0.00.E+00	78.3	46.1	1.10.E-02	23.6	148.1	0.00.E+00	0.00E+00
138.49	5.07.E-04	77.9	45.7	7.33.E-03	23.5	147.1	3.45.E-06	1.45E+18
138.82	0.00.E+00	77.4	45.2	1.31.E-02	23.3	145.8	0.00.E+00	0.00E+00
139.14	1.29.E-03	76.4	44.7	1.27.E-02	23.0	144.1	8.95.E-06	3.77E+18
139.47	8.81.E-04	74.7	44.6	9.61.E-03	22.7	142.0	6.20.E-06	2.62E+18
139.80	3.80.E-04	77.6	45.7	1.27.E-02	23.4	146.8	2.59.E-06	1.09E+18
140.13	5.21.E-04	77.2	46.7	1.63.E-02	23.5	147.4	3.54.E-06	1.49E+18
140.46	4.44.E-04	79.5	46.9	8.31.E-03	24.0	150.4	2.95.E-06	1.24E+18
140.79	0.00.E+00	77.1	44.3	1.96.E-02	23.1	144.4	0.00.E+00	0.00E+00
141.12	0.00.E+00	76.4	45.0	1.84.E-02	23.1	144.5	0.00.E+00	0.00E+00
141.45	0.00.E+00	78.8	45.9	1.22.E-02	23.7	148.4	0.00.E+00	0.00E+00
141.78	2.18.E-04	75.6	44.7	1.24.E-02	22.9	143.2	1.53.E-06	6.43E+17
142.11	9.51.E-04	76.8	45.4	1.63.E-02	23.2	145.4	6.54.E-06	2.76E+18
142.43	0.00.E+00	77.9	46.4	9.34.E-03	23.6	147.9	0.00.E+00	0.00E+00
142.76	2.68.E-04	78.7	46.1	1.36.E-02	23.7	148.5	1.80.E-06	7.60E+17
143.09	8.39.E-04	75.4	43.7	1.62.E-02	22.6	141.7	5.92.E-06	2.49E+18
143.42	1.05.E-03	75.2	44.1	1.10.E-02	22.7	142.0	7.39.E-06	3.12E+18
143.75	5.92.E-04	77.5	45.5	1.22.E-02	23.4	146.3	4.05.E-06	1.71E+18
144.08	3.52.E-04	77.9	44.9	9.71.E-03	23.3	146.1	2.41.E-06	1.02E+18
144.41	5.36.E-04	77.8	45.4	1.16.E-02	23.4	146.6	3.65.E-06	1.54E+18
144.74	0.00.E+00	76.4	43.8	1.60.E-02	22.8	143.1	0.00.E+00	0.00E+00

¹²C³⁺ estimate** was calculated by using C ratio without IG in AP1_2b He-DOS1111 data for the estimation of total C ratio.

*without IG data in He-DOS 15keV for calculation of C ion ratio

Appendix1_2b. Ion intensity (Cnt/MSc/Px) and the calculated ^4He concentrations of He-DOS 15keV without IG for calculation of C ion ratio.

Analysis day: 2016.11.11

Raster area: 18px

Analysis area: 5px

Depth (nm)	^4He (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)
145.07	3.58.E-03	76.8	45.8	22.1
145.39	9.34.E-03	73.8	44.1	22.6
145.72	7.69.E-03	75.1	44.3	22.9
146.05	1.01.E-02	76.6	45.2	22.8
146.38	1.13.E-02	76.7	45.3	23.1
146.71	9.51.E-03	73.7	43.4	23.0
147.04	7.64.E-03	76.0	44.1	22.8
147.37	9.90.E-03	75.0	44.6	22.6
147.70	8.88.E-03	74.8	43.0	22.9
148.03	1.25.E-02	75.3	44.8	22.8
average		75.4	44.4	22.8
C ratio		0.53	0.31	0.16

Appendix2_a. Ion intensity (Cnt/MSc/Px) and the calculated ⁴He concentrations of Blank-DOS (without He implantation) with Ion gate.

Analysis day: 2016.10.19

Analysis sample: Blank-DOS Relative sensitivity factor (He-DOS 15keV): 2.73E+15

Raster area: 18px Average of ⁴He conc. Background (atoms/cm³) 2.75E+16 Average of ⁴He background (Cnt/MSc/Px): 5.3E-05

Analysis area: 5px

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
0.52	4.00.E-04	50.7	41.2	0.00.E+00	9.1	101.0	3.96.E-06	2.09E+17
1.03	0.00.E+00	51.5	40.5	9.81.E-04	9.1	101.0	0.00.E+00	0.00E+00
1.55	4.00.E-04	51.1	40.1	6.60.E-04	9.0	100.3	3.99.E-06	2.11E+17
2.06	0.00.E+00	51.7	40.4	4.72.E-05	9.1	101.2	0.00.E+00	0.00E+00
2.58	0.00.E+00	51.5	39.7	1.05.E-03	9.0	100.2	0.00.E+00	0.00E+00
3.10	0.00.E+00	52.0	39.9	9.87.E-04	9.1	101.0	0.00.E+00	0.00E+00
3.61	0.00.E+00	51.8	39.9	0.00.E+00	9.1	100.7	0.00.E+00	0.00E+00
4.13	0.00.E+00	51.9	39.4	9.06.E-04	9.0	100.4	0.00.E+00	0.00E+00
4.64	0.00.E+00	52.1	40.2	7.08.E-04	9.1	101.4	0.00.E+00	0.00E+00
5.16	0.00.E+00	52.2	40.2	0.00.E+00	9.2	101.6	0.00.E+00	0.00E+00
5.68	0.00.E+00	52.0	40.1	3.27.E-04	9.1	101.2	0.00.E+00	0.00E+00
6.19	0.00.E+00	52.2	40.4	9.12.E-04	9.2	101.8	0.00.E+00	0.00E+00
6.71	0.00.E+00	53.2	40.2	2.14.E-04	9.2	102.6	0.00.E+00	0.00E+00
7.22	0.00.E+00	53.5	40.8	3.24.E-04	9.3	103.6	0.00.E+00	0.00E+00
7.74	0.00.E+00	52.6	40.2	0.00.E+00	9.2	102.1	0.00.E+00	0.00E+00
8.25	0.00.E+00	54.3	41.1	4.69.E-04	9.4	104.9	0.00.E+00	0.00E+00
8.77	4.00.E-04	53.0	40.1	1.74.E-03	9.2	102.3	3.91.E-06	2.07E+17
9.29	0.00.E+00	54.1	41.2	0.00.E+00	9.4	104.7	0.00.E+00	0.00E+00
9.80	0.00.E+00	53.1	40.0	3.49.E-04	9.2	102.2	0.00.E+00	0.00E+00
10.32	0.00.E+00	53.0	40.6	2.31.E-03	9.3	102.8	0.00.E+00	0.00E+00
10.83	0.00.E+00	54.6	40.3	2.36.E-04	9.4	104.4	0.00.E+00	0.00E+00
11.35	0.00.E+00	54.5	41.0	1.42.E-03	9.5	105.0	0.00.E+00	0.00E+00
11.87	4.00.E-04	53.1	40.0	8.27.E-04	9.2	102.3	3.91.E-06	2.06E+17
12.38	0.00.E+00	54.7	41.2	4.81.E-04	9.5	105.4	0.00.E+00	0.00E+00
12.90	0.00.E+00	54.6	41.4	3.33.E-04	9.5	105.5	0.00.E+00	0.00E+00
13.41	0.00.E+00	55.4	42.0	8.99.E-04	9.6	107.0	0.00.E+00	0.00E+00
13.93	0.00.E+00	55.4	42.3	2.01.E-04	9.7	107.4	0.00.E+00	0.00E+00
14.45	0.00.E+00	55.2	42.0	0.00.E+00	9.6	106.9	0.00.E+00	0.00E+00
14.96	0.00.E+00	54.7	41.8	4.62.E-04	9.6	106.1	0.00.E+00	0.00E+00
15.48	0.00.E+00	54.0	41.0	4.81.E-04	9.4	104.5	0.00.E+00	0.00E+00
15.99	4.00.E-04	53.9	40.4	6.64.E-04	9.3	103.7	3.86.E-06	2.04E+17
16.51	0.00.E+00	55.1	41.9	7.96.E-04	9.6	106.6	0.00.E+00	0.00E+00
17.03	0.00.E+00	54.6	41.0	1.27.E-03	9.5	105.0	0.00.E+00	0.00E+00
17.54	0.00.E+00	55.3	41.7	1.50.E-03	9.6	106.6	0.00.E+00	0.00E+00
18.06	0.00.E+00	54.4	41.0	7.99.E-04	9.4	104.8	0.00.E+00	0.00E+00
18.57	4.00.E-04	54.7	41.6	0.00.E+00	9.5	105.9	3.78.E-06	1.99E+17
19.09	0.00.E+00	54.3	41.2	1.62.E-03	9.5	104.9	0.00.E+00	0.00E+00
19.61	0.00.E+00	53.9	40.9	7.58.E-04	9.4	104.2	0.00.E+00	0.00E+00
20.12	0.00.E+00	54.4	41.4	0.00.E+00	9.5	105.3	0.00.E+00	0.00E+00
20.64	0.00.E+00	53.3	40.0	9.47.E-04	9.2	102.5	0.00.E+00	0.00E+00
21.15	0.00.E+00	54.2	41.1	5.75.E-04	9.4	104.7	0.00.E+00	0.00E+00
21.67	0.00.E+00	53.7	41.2	5.00.E-04	9.4	104.4	0.00.E+00	0.00E+00
22.19	0.00.E+00	53.8	40.7	1.47.E-03	9.4	103.9	0.00.E+00	0.00E+00
22.70	0.00.E+00	53.5	40.9	0.00.E+00	9.3	103.8	0.00.E+00	0.00E+00
23.22	0.00.E+00	52.4	39.9	1.24.E-03	9.1	101.5	0.00.E+00	0.00E+00

¹²C³⁺ estimate* was calculated by using C ratio without IG in AP2_b BLK-DOS 1019 data for the estimation of total C ratio.

Appendix2_b. Ion intensity (Cnt/MSc/Px) and the calculated ^4He concentrations of Blank-DOS (without He implantation) without IG for calculation of C ion ratio.

Analysis day: 2016.10.19

Raster area: 18px

Analysis area: 5px

Depth (nm)	^4He (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)
23.73	1.60.E-03	51.7	40.3	10.5
24.25	8.00.E-04	51.9	40.4	9.1
24.76	2.00.E-03	51.2	40.5	8.9
25.28	1.20.E-03	51.6	41.0	8.3
25.80	2.40.E-03	51.2	40.3	9.5
26.31	2.00.E-03	51.4	40.3	9.0
26.83	1.60.E-03	50.1	40.0	9.7
27.34	8.00.E-04	50.5	40.3	9.8
27.86	2.00.E-03	50.8	40.8	8.0
28.38	2.80.E-03	49.2	39.5	9.2
28.89	1.20.E-03	48.0	39.0	10.0
29.41	1.60.E-03	49.0	39.7	9.1
29.92	2.40.E-03	49.1	39.9	7.8
30.44	8.00.E-04	49.3	40.1	7.8
30.96	1.60.E-03	48.9	39.9	7.8
31.47	1.20.E-03	48.7	39.3	10.6
31.99	1.60.E-03	48.5	39.6	8.4
32.50	2.40.E-03	49.2	39.5	8.5
33.02	2.40.E-03	48.5	40.1	7.5
33.54	1.60.E-03	48.3	39.9	8.3
average		49.9	40.0	8.9
C ratio		0.50	0.41	0.09

Appendix3_a. Ion intensity (Cnt/MSc/Px) and the calculated ^{22}Ne concentrations of Ne-DOS 30keV (^{22}Ne standard) with Ion gate.

Analysis day: 2016.11.11. ^{22}Ne Dose amount (/cm²): 2.00E+15
 Analysis sample: Ne-DOS 30keV $\Sigma(^{22}\text{Ne}/\text{C})$: 0.664
 Raster area: 18px Relative sensitivity factor: 3.01E+15
 Analysis area: 5px Average of ^{22}Ne conc. Background (atoms/cm³): 4.94E+18 Average of He background (Cnt/MSc/Px): 6.01E-03

Depth (nm)	^{22}Ne (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	$^{22}\text{Ne}/^{12}\text{C}$	^{22}Ne conc. (cm ³)
0.36	1.68.E-02	49.9	41.5	9.63.E-03	19.7	111.1	1.51.E-04	1.25E+19
0.73	1.70.E-02	46.7	33.6	5.71.E-03	17.3	97.6	1.75.E-04	1.45E+19
1.09	1.99.E-02	46.4	32.9	8.55.E-03	17.1	96.4	2.07.E-04	1.71E+19
1.45	2.68.E-02	46.5	33.0	7.52.E-03	17.1	96.7	2.77.E-04	2.30E+19
1.82	3.72.E-02	46.1	32.6	7.79.E-03	16.9	95.7	3.89.E-04	3.22E+19
2.18	3.92.E-02	46.3	32.9	7.55.E-03	17.0	96.2	4.08.E-04	3.38E+19
2.55	4.06.E-02	46.5	32.6	8.22.E-03	17.0	96.1	4.23.E-04	3.50E+19
2.91	5.07.E-02	45.8	32.6	8.55.E-03	16.9	95.4	5.32.E-04	4.41E+19
3.27	6.05.E-02	46.7	33.4	7.72.E-03	17.2	97.4	6.22.E-04	5.15E+19
3.64	6.24.E-02	46.3	33.3	8.83.E-03	17.1	96.8	6.45.E-04	5.34E+19
4.00	7.72.E-02	47.9	34.0	7.53.E-03	17.6	99.6	7.75.E-04	6.42E+19
4.36	7.72.E-02	47.7	33.3	7.69.E-03	17.4	98.4	7.84.E-04	6.50E+19
4.73	8.69.E-02	48.9	34.3	6.87.E-03	17.9	101.0	8.61.E-04	7.13E+19
5.09	9.00.E-02	47.3	33.1	9.63.E-03	17.3	97.7	9.21.E-04	7.63E+19
5.45	1.04.E-01	49.9	34.9	6.99.E-03	18.3	103.1	1.01.E-03	8.36E+19
5.82	1.08.E-01	48.6	34.1	9.76.E-03	17.8	100.5	1.07.E-03	8.88E+19
6.18	1.09.E-01	48.6	34.2	9.76.E-03	17.8	100.6	1.08.E-03	8.98E+19
6.55	1.15.E-01	47.9	33.7	9.38.E-03	17.6	99.2	1.16.E-03	9.60E+19
6.91	1.26.E-01	50.2	34.8	8.48.E-03	18.3	103.3	1.22.E-03	1.01E+20
7.27	1.34.E-01	49.7	34.7	8.45.E-03	18.2	102.5	1.31.E-03	1.09E+20
7.64	1.37.E-01	49.9	34.5	7.76.E-03	18.2	102.6	1.34.E-03	1.11E+20
8.00	1.47.E-01	49.9	34.8	9.22.E-03	18.2	103.0	1.43.E-03	1.18E+20
8.36	1.56.E-01	50.2	35.0	7.55.E-03	18.3	103.5	1.51.E-03	1.25E+20
8.73	1.59.E-01	51.0	35.3	8.56.E-03	18.6	104.9	1.52.E-03	1.26E+20
9.09	1.61.E-01	50.7	35.4	8.64.E-03	18.5	104.6	1.54.E-03	1.27E+20
9.45	1.80.E-01	52.7	36.4	8.71.E-03	19.2	108.2	1.67.E-03	1.38E+20
9.82	1.76.E-01	51.6	35.6	7.54.E-03	18.8	106.0	1.66.E-03	1.38E+20
10.18	1.90.E-01	51.3	35.5	9.18.E-03	18.7	105.5	1.80.E-03	1.49E+20
10.55	2.05.E-01	52.0	35.9	8.55.E-03	18.9	106.8	1.92.E-03	1.59E+20
10.91	2.14.E-01	51.9	36.2	7.91.E-03	19.0	107.1	2.00.E-03	1.65E+20
11.27	2.23.E-01	53.1	36.6	8.62.E-03	19.3	108.9	2.05.E-03	1.69E+20
11.64	2.22.E-01	52.3	36.0	7.33.E-03	19.0	107.4	2.07.E-03	1.71E+20
12.00	2.29.E-01	52.0	35.9	8.72.E-03	18.9	106.8	2.14.E-03	1.78E+20
12.36	2.35.E-01	52.1	35.8	8.99.E-03	18.9	106.8	2.20.E-03	1.82E+20
12.73	2.51.E-01	52.9	36.1	8.16.E-03	19.2	108.2	2.32.E-03	1.92E+20
13.09	2.67.E-01	53.1	36.2	8.86.E-03	19.2	108.5	2.46.E-03	2.04E+20
13.45	2.84.E-01	53.3	36.5	7.74.E-03	19.3	109.1	2.60.E-03	2.16E+20
13.82	2.89.E-01	52.9	36.5	7.48.E-03	19.2	108.7	2.66.E-03	2.21E+20
14.18	2.91.E-01	53.3	36.2	8.10.E-03	19.3	108.9	2.68.E-03	2.22E+20
14.55	3.10.E-01	53.9	36.9	8.02.E-03	19.6	110.4	2.81.E-03	2.33E+20
14.91	3.32.E-01	54.3	37.5	7.74.E-03	19.8	111.6	2.97.E-03	2.46E+20
15.27	3.33.E-01	53.5	36.4	8.24.E-03	19.4	109.3	3.05.E-03	2.52E+20
15.64	3.47.E-01	52.9	36.4	1.06.E-02	19.2	108.6	3.19.E-03	2.64E+20
16.00	3.44.E-01	52.5	35.9	9.82.E-03	19.0	107.4	3.21.E-03	2.65E+20
16.36	3.78.E-01	52.8	36.5	9.62.E-03	19.2	108.5	3.49.E-03	2.89E+20
16.73	3.72.E-01	51.9	35.5	1.26.E-02	18.8	106.2	3.51.E-03	2.90E+20
17.09	4.08.E-01	53.6	36.8	1.09.E-02	19.5	109.9	3.72.E-03	3.08E+20
17.45	3.99.E-01	53.1	36.4	9.18.E-03	19.3	108.7	3.67.E-03	3.04E+20
17.82	4.18.E-01	53.4	36.6	9.07.E-03	19.4	109.4	3.82.E-03	3.17E+20
18.18	4.47.E-01	53.6	37.1	8.59.E-03	19.5	110.2	4.05.E-03	3.36E+20
18.55	4.59.E-01	53.4	36.8	9.80.E-03	19.4	109.6	4.19.E-03	3.47E+20
18.91	4.80.E-01	54.2	36.8	8.58.E-03	19.6	110.6	4.34.E-03	3.60E+20
19.27	4.95.E-01	54.0	36.8	8.85.E-03	19.6	110.4	4.49.E-03	3.72E+20
19.64	5.16.E-01	53.2	37.1	8.20.E-03	19.4	109.8	4.70.E-03	3.89E+20
20.00	5.34.E-01	54.6	37.3	9.17.E-03	19.8	111.7	4.78.E-03	3.96E+20
20.36	5.57.E-01	55.2	37.8	8.02.E-03	20.0	113.0	4.93.E-03	4.09E+20
20.73	5.42.E-01	52.6	36.0	1.08.E-02	19.1	107.7	5.03.E-03	4.16E+20
21.09	5.68.E-01	53.5	36.5	8.61.E-03	19.4	109.4	5.20.E-03	4.30E+20

Depth (nm)	²² Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	²² Ne/ ¹² C	²² Ne conc. (cm ³)
21.45	5.88.E-01	53.3	36.6	9.24.E-03	19.3	109.2	5.38.E-03	4.46E+20
21.82	5.88.E-01	52.8	36.1	9.03.E-03	19.1	108.0	5.44.E-03	4.50E+20
22.18	6.25.E-01	53.5	36.6	7.78.E-03	19.4	109.5	5.71.E-03	4.73E+20
22.55	6.24.E-01	52.6	35.7	9.21.E-03	19.0	107.4	5.81.E-03	4.81E+20
22.91	6.46.E-01	53.1	36.1	1.10.E-02	19.2	108.4	5.96.E-03	4.94E+20
23.27	6.68.E-01	53.4	36.4	7.54.E-03	19.3	109.1	6.12.E-03	5.07E+20
23.64	6.81.E-01	53.9	36.8	8.03.E-03	19.5	110.2	6.18.E-03	5.12E+20
24.00	7.10.E-01	54.2	37.2	7.87.E-03	19.7	111.1	6.40.E-03	5.30E+20
24.36	7.17.E-01	53.8	36.9	9.08.E-03	19.5	110.3	6.50.E-03	5.38E+20
24.73	7.16.E-01	53.6	37.0	7.77.E-03	19.5	110.1	6.51.E-03	5.39E+20
25.09	7.14.E-01	53.4	36.9	1.01.E-02	19.4	109.7	6.51.E-03	5.39E+20
25.45	7.13.E-01	52.7	36.6	9.92.E-03	19.2	108.5	6.57.E-03	5.44E+20
25.82	7.26.E-01	52.6	36.6	9.33.E-03	19.2	108.4	6.70.E-03	5.55E+20
26.18	7.43.E-01	53.0	36.9	8.31.E-03	19.4	109.2	6.80.E-03	5.63E+20
26.55	7.56.E-01	53.6	36.9	8.09.E-03	19.5	109.9	6.88.E-03	5.70E+20
26.91	7.78.E-01	52.2	36.4	8.72.E-03	19.1	107.6	7.23.E-03	5.99E+20
27.27	7.78.E-01	53.4	36.6	8.02.E-03	19.4	109.4	7.11.E-03	5.89E+20
27.64	7.82.E-01	52.0	35.9	9.38.E-03	18.9	106.8	7.33.E-03	6.07E+20
28.00	7.97.E-01	53.1	36.5	7.51.E-03	19.3	108.9	7.32.E-03	6.06E+20
28.36	8.06.E-01	53.5	36.5	1.07.E-02	19.4	109.5	7.36.E-03	6.10E+20
28.73	7.95.E-01	52.6	36.4	8.23.E-03	19.1	108.1	7.35.E-03	6.09E+20
29.09	8.21.E-01	52.7	36.8	7.55.E-03	19.3	108.8	7.54.E-03	6.25E+20
29.45	7.83.E-01	52.1	36.0	8.92.E-03	19.0	107.1	7.31.E-03	6.06E+20
29.82	8.06.E-01	52.4	36.2	9.92.E-03	19.1	107.6	7.49.E-03	6.20E+20
30.18	8.17.E-01	53.0	36.5	1.02.E-02	19.3	108.8	7.51.E-03	6.22E+20
30.55	8.33.E-01	53.8	37.0	7.55.E-03	19.6	110.4	7.55.E-03	6.25E+20
30.91	7.97.E-01	52.3	36.0	9.23.E-03	19.0	107.3	7.44.E-03	6.16E+20
31.27	8.20.E-01	52.8	36.4	9.31.E-03	19.2	108.4	7.56.E-03	6.26E+20
31.64	8.09.E-01	52.4	36.2	9.68.E-03	19.1	107.6	7.52.E-03	6.23E+20
32.00	8.11.E-01	52.6	36.4	9.13.E-03	19.2	108.2	7.50.E-03	6.21E+20
32.36	8.24.E-01	53.0	36.9	9.37.E-03	19.4	109.3	7.54.E-03	6.24E+20
32.73	8.21.E-01	52.9	36.8	8.34.E-03	19.3	109.0	7.54.E-03	6.24E+20
33.09	8.07.E-01	53.0	36.5	8.29.E-03	19.3	108.7	7.43.E-03	6.15E+20
33.45	7.89.E-01	52.1	36.3	9.10.E-03	19.0	107.3	7.35.E-03	6.09E+20
33.82	7.74.E-01	51.6	35.7	1.14.E-02	18.8	106.0	7.30.E-03	6.04E+20
34.18	7.83.E-01	52.8	36.5	9.34.E-03	19.2	108.5	7.22.E-03	5.98E+20
34.55	7.84.E-01	52.4	36.3	8.72.E-03	19.1	107.8	7.28.E-03	6.03E+20
34.91	7.82.E-01	52.7	36.4	8.96.E-03	19.2	108.3	7.22.E-03	5.98E+20
35.27	7.79.E-01	52.7	35.9	1.02.E-02	19.1	107.7	7.23.E-03	5.99E+20
35.64	7.45.E-01	50.9	35.0	1.19.E-02	18.5	104.4	7.13.E-03	5.91E+20
36.00	7.52.E-01	52.5	35.7	8.31.E-03	19.0	107.2	7.01.E-03	5.81E+20
36.36	7.47.E-01	52.7	36.1	9.23.E-03	19.1	108.0	6.92.E-03	5.73E+20
36.73	7.40.E-01	51.8	36.0	9.54.E-03	18.9	106.8	6.93.E-03	5.74E+20
37.09	7.37.E-01	51.5	35.8	7.30.E-03	18.8	106.0	6.95.E-03	5.76E+20
37.45	7.30.E-01	52.4	35.5	8.56.E-03	18.9	106.8	6.83.E-03	5.66E+20
37.82	7.13.E-01	51.9	35.6	9.15.E-03	18.8	106.3	6.70.E-03	5.55E+20
38.18	7.13.E-01	51.9	35.9	8.87.E-03	18.9	106.7	6.68.E-03	5.53E+20
38.55	7.06.E-01	52.9	36.1	8.19.E-03	19.2	108.1	6.53.E-03	5.41E+20
38.91	6.77.E-01	52.2	35.7	8.55.E-03	18.9	106.8	6.34.E-03	5.25E+20
39.27	6.58.E-01	51.4	35.1	8.82.E-03	18.6	105.1	6.27.E-03	5.19E+20
39.64	6.27.E-01	50.5	34.5	9.15.E-03	18.3	103.3	6.07.E-03	5.03E+20
40.00	6.42.E-01	51.5	35.3	9.34.E-03	18.7	105.5	6.09.E-03	5.04E+20
40.36	6.28.E-01	51.6	35.2	9.54.E-03	18.7	105.4	5.96.E-03	4.93E+20
40.73	6.14.E-01	51.1	35.3	8.73.E-03	18.6	104.9	5.85.E-03	4.85E+20
41.09	5.85.E-01	50.8	34.4	8.26.E-03	18.3	103.6	5.65.E-03	4.68E+20
41.45	5.83.E-01	50.9	34.8	9.91.E-03	18.5	104.2	5.59.E-03	4.63E+20
41.82	5.85.E-01	51.2	35.1	7.72.E-03	18.6	104.9	5.58.E-03	4.62E+20
42.18	5.46.E-01	50.4	34.5	1.04.E-02	18.3	103.2	5.29.E-03	4.38E+20
42.55	5.51.E-01	51.2	35.3	9.81.E-03	18.6	105.2	5.24.E-03	4.34E+20
42.91	5.28.E-01	51.1	35.0	1.02.E-02	18.6	104.7	5.04.E-03	4.17E+20
43.27	5.01.E-01	50.0	34.4	9.83.E-03	18.2	102.5	4.89.E-03	4.05E+20
43.64	5.13.E-01	52.3	35.7	8.15.E-03	18.9	106.9	4.80.E-03	3.98E+20
44.00	4.93.E-01	51.8	35.4	9.45.E-03	18.8	106.0	4.66.E-03	3.86E+20
44.36	4.76.E-01	51.4	35.3	8.65.E-03	18.7	105.3	4.52.E-03	3.74E+20

Depth (nm)	²² Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	²² Ne/ ¹² C	²² Ne conc. (cm ³)
44.73	4.54.E-01	51.2	34.8	8.25.E-03	18.5	104.6	4.34.E-03	3.60E+20
45.09	4.41.E-01	51.0	34.7	8.53.E-03	18.4	104.1	4.24.E-03	3.51E+20
45.45	4.35.E-01	52.1	35.7	9.01.E-03	18.9	106.6	4.08.E-03	3.38E+20
45.82	4.28.E-01	51.5	35.6	9.98.E-03	18.8	105.9	4.04.E-03	3.34E+20
46.18	4.17.E-01	51.7	35.4	1.00.E-02	18.7	105.8	3.95.E-03	3.27E+20
46.55	3.98.E-01	51.5	34.9	8.95.E-03	18.6	104.9	3.79.E-03	3.14E+20
46.91	3.78.E-01	51.5	35.5	9.67.E-03	18.7	105.7	3.58.E-03	2.96E+20
47.27	3.71.E-01	51.0	34.7	9.23.E-03	18.4	104.1	3.57.E-03	2.96E+20
47.64	3.57.E-01	50.8	34.7	9.10.E-03	18.4	103.9	3.43.E-03	2.84E+20
48.00	3.56.E-01	51.8	35.7	7.80.E-03	18.8	106.3	3.35.E-03	2.78E+20
48.36	3.32.E-01	50.6	34.8	9.07.E-03	18.4	103.7	3.20.E-03	2.65E+20
48.73	3.24.E-01	50.8	34.8	8.44.E-03	18.4	104.0	3.11.E-03	2.58E+20
49.09	3.08.E-01	51.2	34.7	7.84.E-03	18.5	104.4	2.95.E-03	2.45E+20
49.45	2.94.E-01	51.3	35.2	7.91.E-03	18.6	105.1	2.79.E-03	2.31E+20
49.82	2.86.E-01	51.7	35.0	8.79.E-03	18.7	105.3	2.72.E-03	2.25E+20
50.18	2.82.E-01	51.4	34.8	6.50.E-03	18.5	104.7	2.69.E-03	2.23E+20
50.55	2.62.E-01	50.9	34.4	9.79.E-03	18.4	103.6	2.53.E-03	2.09E+20
50.91	2.42.E-01	50.4	34.2	9.52.E-03	18.2	102.9	2.35.E-03	1.95E+20
51.27	2.44.E-01	51.7	35.5	9.18.E-03	18.8	106.0	2.30.E-03	1.90E+20
51.64	2.30.E-01	50.9	34.7	8.82.E-03	18.4	104.1	2.21.E-03	1.83E+20
52.00	2.27.E-01	51.9	35.5	7.66.E-03	18.8	106.2	2.13.E-03	1.77E+20
52.36	2.08.E-01	51.2	34.6	9.29.E-03	18.5	104.3	1.99.E-03	1.65E+20
52.73	2.10.E-01	51.2	34.9	9.98.E-03	18.5	104.6	2.01.E-03	1.66E+20
53.09	1.89.E-01	51.6	35.3	8.99.E-03	18.7	105.7	1.79.E-03	1.49E+20
53.45	1.88.E-01	52.2	35.3	8.42.E-03	18.8	106.4	1.77.E-03	1.46E+20
53.82	1.74.E-01	49.7	33.8	9.17.E-03	18.0	101.4	1.71.E-03	1.42E+20
54.18	1.70.E-01	50.9	35.3	8.72.E-03	18.6	104.7	1.62.E-03	1.34E+20
54.55	1.61.E-01	50.5	34.5	9.58.E-03	18.3	103.4	1.56.E-03	1.29E+20
54.91	1.59.E-01	50.4	35.2	8.28.E-03	18.4	104.1	1.52.E-03	1.26E+20
55.27	1.52.E-01	51.6	35.5	7.99.E-03	18.8	105.9	1.44.E-03	1.19E+20
55.64	1.42.E-01	50.1	34.8	8.46.E-03	18.3	103.2	1.38.E-03	1.14E+20
56.00	1.36.E-01	51.5	35.3	8.21.E-03	18.7	105.5	1.29.E-03	1.07E+20
56.36	1.25.E-01	49.1	34.2	8.76.E-03	17.9	101.2	1.23.E-03	1.02E+20
56.73	1.28.E-01	50.6	34.6	8.92.E-03	18.3	103.5	1.23.E-03	1.02E+20
57.09	1.23.E-01	52.3	36.2	7.41.E-03	19.1	107.6	1.15.E-03	9.50E+19
57.45	1.14.E-01	51.0	35.0	9.74.E-03	18.5	104.5	1.09.E-03	9.03E+19
57.82	1.07.E-01	50.6	35.0	8.52.E-03	18.4	104.0	1.03.E-03	8.50E+19
58.18	1.05.E-01	51.2	35.2	9.73.E-03	18.6	105.0	9.97.E-04	8.26E+19
58.55	1.00.E-01	50.5	34.9	7.24.E-03	18.4	103.8	9.63.E-04	7.98E+19
58.91	8.92.E-02	50.4	34.5	7.99.E-03	18.3	103.2	8.65.E-04	7.16E+19
59.27	8.46.E-02	50.2	34.7	1.08.E-02	18.3	103.2	8.20.E-04	6.79E+19
59.64	8.48.E-02	50.0	34.3	9.40.E-03	18.1	102.4	8.28.E-04	6.86E+19
60.00	7.86.E-02	49.7	34.5	1.01.E-02	18.1	102.4	7.68.E-04	6.36E+19
60.36	7.30.E-02	50.5	34.7	8.05.E-03	18.3	103.5	7.06.E-04	5.84E+19
60.73	6.96.E-02	50.4	34.5	9.51.E-03	18.3	103.3	6.74.E-04	5.58E+19
61.09	6.75.E-02	50.3	34.8	8.24.E-03	18.3	103.5	6.52.E-04	5.40E+19
61.45	6.77.E-02	50.5	35.0	8.96.E-03	18.4	103.9	6.52.E-04	5.40E+19
61.82	6.30.E-02	50.8	35.2	9.04.E-03	18.5	104.5	6.03.E-04	4.99E+19
62.18	5.91.E-02	50.2	34.8	8.80.E-03	18.3	103.3	5.73.E-04	4.74E+19
62.55	6.18.E-02	50.5	35.1	1.03.E-02	18.4	103.9	5.95.E-04	4.93E+19
62.91	5.24.E-02	49.7	34.1	1.09.E-02	18.0	101.9	5.14.E-04	4.26E+19
63.27	5.06.E-02	49.8	34.2	9.61.E-03	18.1	102.1	4.95.E-04	4.10E+19
63.64	5.07.E-02	49.6	34.6	1.05.E-02	18.1	102.4	4.95.E-04	4.10E+19
64.00	4.85.E-02	50.5	34.5	8.49.E-03	18.3	103.2	4.70.E-04	3.89E+19
64.36	4.80.E-02	50.0	34.8	9.31.E-03	18.3	103.1	4.66.E-04	3.86E+19
64.73	4.61.E-02	50.0	34.8	8.39.E-03	18.3	103.1	4.47.E-04	3.70E+19
65.09	4.38.E-02	50.3	34.5	7.34.E-03	18.3	103.1	4.25.E-04	3.52E+19
65.45	3.88.E-02	49.3	33.9	9.64.E-03	17.9	101.0	3.84.E-04	3.18E+19
65.82	4.03.E-02	51.1	35.1	9.20.E-03	18.6	104.7	3.85.E-04	3.19E+19
66.18	3.97.E-02	50.7	34.9	8.05.E-03	18.4	104.1	3.82.E-04	3.16E+19
66.55	3.84.E-02	50.4	34.6	8.78.E-03	18.3	103.3	3.72.E-04	3.08E+19
66.91	3.67.E-02	50.2	34.4	9.20.E-03	18.2	102.8	3.57.E-04	2.95E+19
67.27	3.37.E-02	49.3	34.1	8.85.E-03	18.0	101.4	3.33.E-04	2.76E+19
67.64	3.37.E-02	49.4	34.0	1.01.E-02	18.0	101.4	3.32.E-04	2.75E+19

Depth (nm)	²² Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	²² Ne/ ¹² C	²² Ne conc. (cm ³)
68.00	3.17.E-02	49.3	34.1	8.69.E-03	18.0	101.4	3.12.E-04	2.59E+19
68.36	3.13.E-02	48.8	33.7	1.03.E-02	17.8	100.3	3.12.E-04	2.58E+19
68.73	3.20.E-02	51.1	35.0	9.91.E-03	18.5	104.5	3.06.E-04	2.54E+19
69.09	3.04.E-02	51.1	34.8	8.84.E-03	18.5	104.4	2.92.E-04	2.41E+19
69.45	2.83.E-02	49.4	33.9	9.37.E-03	17.9	101.2	2.79.E-04	2.31E+19
69.82	2.52.E-02	49.7	34.2	8.86.E-03	18.1	101.9	2.48.E-04	2.05E+19
70.18	2.58.E-02	49.9	33.8	9.71.E-03	18.0	101.7	2.54.E-04	2.10E+19
70.55	2.52.E-02	50.3	34.6	8.76.E-03	18.3	103.2	2.44.E-04	2.02E+19
70.91	2.46.E-02	50.0	34.7	8.88.E-03	18.2	102.9	2.39.E-04	1.98E+19
71.27	2.66.E-02	51.1	35.5	8.13.E-03	18.6	105.2	2.53.E-04	2.09E+19
71.64	2.39.E-02	50.6	34.6	9.10.E-03	18.3	103.6	2.31.E-04	1.91E+19
72.00	2.50.E-02	50.4	34.4	8.77.E-03	18.2	103.0	2.43.E-04	2.01E+19
72.36	2.35.E-02	51.6	35.3	8.42.E-03	18.7	105.6	2.22.E-04	1.84E+19
72.73	2.25.E-02	50.1	34.3	9.08.E-03	18.2	102.7	2.19.E-04	1.81E+19
73.09	2.37.E-02	49.0	34.2	8.34.E-03	17.9	101.2	2.34.E-04	1.94E+19
73.45	1.99.E-02	50.2	34.1	1.03.E-02	18.1	102.4	1.94.E-04	1.61E+19
73.82	2.11.E-02	50.3	34.6	8.57.E-03	18.3	103.2	2.04.E-04	1.69E+19
74.18	2.08.E-02	50.4	34.9	8.55.E-03	18.4	103.7	2.01.E-04	1.66E+19
74.55	1.98.E-02	49.5	34.4	9.82.E-03	18.1	102.0	1.95.E-04	1.61E+19
74.91	1.84.E-02	50.0	34.6	8.73.E-03	18.2	102.9	1.78.E-04	1.48E+19
75.27	1.78.E-02	49.1	33.9	1.11.E-02	17.9	100.8	1.77.E-04	1.46E+19
75.64	1.62.E-02	50.0	34.6	8.96.E-03	18.2	102.8	1.57.E-04	1.30E+19
76.00	1.58.E-02	48.9	34.0	8.84.E-03	17.8	100.7	1.57.E-04	1.30E+19
76.36	1.58.E-02	50.6	34.7	8.89.E-03	18.4	103.6	1.52.E-04	1.26E+19
76.73	1.54.E-02	50.1	34.6	9.63.E-03	18.2	103.0	1.49.E-04	1.24E+19
77.09	1.50.E-02	50.0	34.9	9.40.E-03	18.3	103.3	1.45.E-04	1.20E+19
77.45	1.50.E-02	49.7	34.4	1.03.E-02	18.1	102.3	1.46.E-04	1.21E+19
77.82	1.45.E-02	50.2	35.1	7.93.E-03	18.3	103.6	1.40.E-04	1.16E+19
78.18	1.34.E-02	50.1	35.0	1.03.E-02	18.3	103.4	1.29.E-04	1.07E+19
78.55	1.24.E-02	50.2	34.5	9.90.E-03	18.2	102.9	1.20.E-04	9.98E+18
78.91	1.32.E-02	49.0	34.2	9.13.E-03	17.9	101.1	1.31.E-04	1.09E+19
79.27	1.28.E-02	49.6	34.3	1.09.E-02	18.1	101.9	1.26.E-04	1.04E+19
79.64	1.14.E-02	49.6	34.4	9.44.E-03	18.1	102.1	1.12.E-04	9.25E+18
80.00	1.21.E-02	49.1	34.0	1.07.E-02	17.9	100.9	1.20.E-04	9.92E+18
80.36	1.30.E-02	49.6	34.1	9.59.E-03	18.0	101.8	1.28.E-04	1.06E+19
80.73	1.22.E-02	49.7	34.2	7.10.E-03	18.1	101.9	1.20.E-04	9.95E+18
81.09	1.24.E-02	49.7	34.0	1.01.E-02	18.0	101.7	1.22.E-04	1.01E+19
81.45	1.05.E-02	49.7	34.1	8.20.E-03	18.0	101.8	1.03.E-04	8.53E+18
81.82	1.18.E-02	49.8	34.6	8.64.E-03	18.2	102.6	1.15.E-04	9.51E+18
82.18	9.83.E-03	49.5	33.8	7.31.E-03	17.9	101.2	9.71.E-05	8.04E+18
82.55	1.12.E-02	49.4	34.0	8.61.E-03	18.0	101.4	1.11.E-04	9.17E+18
82.91	1.08.E-02	49.7	34.1	8.62.E-03	18.0	101.8	1.06.E-04	8.77E+18
83.27	9.10.E-03	49.8	34.6	7.06.E-03	18.2	102.5	8.88.E-05	7.35E+18
83.64	1.04.E-02	49.3	34.1	8.07.E-03	18.0	101.4	1.02.E-04	8.47E+18
84.00	1.03.E-02	49.7	34.2	8.20.E-03	18.1	101.9	1.01.E-04	8.40E+18
84.36	9.92.E-03	49.3	34.0	9.61.E-03	17.9	101.2	9.80.E-05	8.12E+18
84.73	1.08.E-02	50.0	34.4	7.26.E-03	18.2	102.6	1.06.E-04	8.75E+18
85.09	9.00.E-03	49.7	34.0	9.33.E-03	18.0	101.7	8.85.E-05	7.33E+18
85.45	8.98.E-03	50.2	34.8	8.12.E-03	18.3	103.3	8.70.E-05	7.20E+18
85.82	1.06.E-02	49.2	34.3	8.39.E-03	18.0	101.5	1.04.E-04	8.64E+18
86.18	7.14.E-03	49.0	34.2	9.58.E-03	17.9	101.1	7.06.E-05	5.85E+18
86.55	8.19.E-03	49.6	34.4	8.95.E-03	18.1	102.1	8.02.E-05	6.65E+18
86.91	8.33.E-03	49.7	34.8	7.12.E-03	18.2	102.7	8.12.E-05	6.72E+18
87.27	9.16.E-03	49.6	34.6	9.05.E-03	18.1	102.4	8.95.E-05	7.42E+18
87.64	8.39.E-03	49.9	34.9	7.03.E-03	18.3	103.1	8.14.E-05	6.75E+18
88.00	8.50.E-03	49.3	33.9	9.47.E-03	17.9	101.1	8.41.E-05	6.97E+18
88.36	7.91.E-03	49.3	33.9	8.13.E-03	17.9	101.0	7.83.E-05	6.49E+18
88.73	7.71.E-03	48.5	33.5	1.06.E-02	17.7	99.7	7.73.E-05	6.40E+18
89.09	6.72.E-03	48.8	33.7	9.47.E-03	17.8	100.3	6.70.E-05	5.55E+18
89.45	7.48.E-03	49.1	33.9	9.25.E-03	17.9	100.9	7.41.E-05	6.14E+18
89.82	6.80.E-03	49.3	33.7	9.87.E-03	17.9	100.8	6.74.E-05	5.58E+18
90.18	7.19.E-03	48.9	33.2	1.00.E-02	17.7	99.8	7.21.E-05	5.97E+18
90.55	7.56.E-03	49.6	34.2	7.63.E-03	18.0	101.8	7.42.E-05	6.15E+18
90.91	7.58.E-03	48.8	33.5	9.17.E-03	17.7	100.0	7.58.E-05	6.28E+18

Depth (nm)	²² Ne (Cnt/MSc/Px)	¹² C* (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	²² Ne/ ¹² C	²² Ne conc. (cm ³)
91.27	5.86.E-03	48.8	33.7	9.46.E-03	17.8	100.2	5.84.E-05	4.84E+18
91.64	6.53.E-03	49.7	34.1	1.00.E-02	18.0	101.9	6.41.E-05	5.31E+18
92.00	6.25.E-03	49.4	33.7	9.53.E-03	17.9	101.0	6.18.E-05	5.12E+18
92.36	5.08.E-03	48.8	33.8	9.33.E-03	17.8	100.4	5.06.E-05	4.19E+18
92.73	6.23.E-03	49.5	34.2	9.98.E-03	18.0	101.7	6.12.E-05	5.07E+18
93.09	6.41.E-03	49.0	33.4	8.06.E-03	17.7	100.1	6.40.E-05	5.30E+18
93.45	5.46.E-03	48.9	33.5	1.03.E-02	17.7	100.1	5.45.E-05	4.52E+18
93.82	4.86.E-03	48.7	33.4	1.10.E-02	17.7	99.7	4.87.E-05	4.03E+18
94.18	6.03.E-03	49.4	33.5	8.77.E-03	17.8	100.7	5.99.E-05	4.96E+18
94.55	5.43.E-03	49.1	33.8	7.94.E-03	17.8	100.8	5.39.E-05	4.47E+18
94.91	4.95.E-03	48.9	33.4	8.93.E-03	17.7	100.0	4.95.E-05	4.10E+18
95.27	4.68.E-03	49.8	34.4	8.92.E-03	18.1	102.3	4.57.E-05	3.79E+18
95.64	5.44.E-03	49.2	33.9	8.54.E-03	17.9	101.0	5.39.E-05	4.47E+18
96.00	5.49.E-03	48.1	33.5	8.97.E-03	17.6	99.2	5.54.E-05	4.59E+18
96.36	4.91.E-03	49.4	34.6	9.08.E-03	18.1	102.1	4.81.E-05	3.99E+18

¹²C³⁺ estimate** was calculated by using C ratio without IG in AP3_b Ne-DOS 1111 data for the estimation of total C ratio.

Appendix3_b. Ion intensity (Cnt/MSc/Px) and the calculated ^{22}Ne concentrations of Ne-DOS 30keV (^{22}Ne standard) without IG for calculation of C ion ratio.

Analysis day: 2016.11.11.

Raster area: 18px

Analysis area: 5px

Depth (nm)	^{22}Ne (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)
96.73	4.89.E-03	47.8	32.3	17.4
97.09	5.33.E-03	49.3	34.3	17.6
97.45	4.15.E-03	48.3	33.5	17.8
97.82	4.99.E-03	48.6	33.9	17.6
98.18	5.25.E-03	48.2	33.3	17.8
98.55	4.24.E-03	49.0	33.7	18.0
98.91	5.69.E-03	49.3	34.1	17.7
99.27	4.45.E-03	47.7	33.5	17.8
99.64	4.68.E-03	48.9	33.7	17.8
100.00	4.26.E-03	49.4	34.2	17.8
average		48.7	33.8	17.7
C ratio		0.49	0.34	0.18

Appendix4_1a. Ion intensity (Cnt/MSc/Px) and the calculated ⁴He concentrations of Genesis-DOS60939 with Ion gate.

Analysis day: 2016.10.19 ⁴He Dose amount (/cm²): 8.20E+14 (Heber et al., 2009)
 Analysis sample: Genesis-DOS60939 Σ(⁴He/C): 0.124
 Raster area: 30px Relative sensitivity factor (He-DOS 15keV): 2.73E+15
 Analysis area: 14px Average of ⁴He conc. Background (atoms/cm³) 8.10E+16 Average of ⁴He background (Cnt/MSc/Px): 1.17E-04
 ⁴He fluence 3.37.E+14

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
0.52	1.25.E-01	67.6	68.7	1.21.E-03	13.0	149.3	8.35.E-04	4.41E+19	
1.03	1.15.E-01	54.8	47.5	1.18.E-04	9.8	112.0	1.03.E-03	5.43E+19	
1.55	1.38.E-01	55.7	47.5	4.14.E-04	9.9	113.1	1.22.E-03	6.46E+19	6.02E+19
2.06	1.46.E-01	56.3	47.5	4.81.E-05	9.9	113.7	1.29.E-03	6.79E+19	
2.58	1.51.E-01	56.4	47.5	1.67.E-04	9.9	113.8	1.33.E-03	7.01E+19	
3.10	1.53.E-01	57.3	47.8	3.53.E-04	10.1	115.2	1.33.E-03	7.01E+19	
3.61	1.53.E-01	57.3	47.8	9.89.E-05	10.0	115.1	1.33.E-03	7.02E+19	
4.13	1.54.E-01	57.8	48.2	1.72.E-04	10.1	116.2	1.33.E-03	7.01E+19	6.93E+19
4.64	1.54.E-01	58.2	48.5	5.30.E-04	10.2	116.9	1.32.E-03	6.96E+19	
5.16	1.48.E-01	58.4	48.3	1.85.E-04	10.2	117.0	1.26.E-03	6.67E+19	
5.68	1.49.E-01	58.7	49.0	3.11.E-04	10.3	118.0	1.26.E-03	6.65E+19	
6.19	1.45.E-01	58.9	48.1	1.76.E-04	10.2	117.2	1.23.E-03	6.51E+19	
6.71	1.44.E-01	59.3	49.5	2.37.E-04	10.4	119.2	1.21.E-03	6.40E+19	6.40E+19
7.22	1.44.E-01	59.9	50.2	9.17.E-05	10.5	120.6	1.19.E-03	6.29E+19	
7.74	1.41.E-01	60.5	50.4	5.09.E-04	10.6	121.4	1.16.E-03	6.14E+19	
8.25	1.34.E-01	61.0	50.6	2.56.E-04	10.7	122.3	1.10.E-03	5.79E+19	
8.77	1.31.E-01	60.5	49.7	3.55.E-04	10.5	120.8	1.08.E-03	5.72E+19	
9.29	1.29.E-01	61.3	50.5	2.99.E-04	10.7	122.4	1.05.E-03	5.56E+19	5.66E+19
9.80	1.30.E-01	61.0	49.8	8.04.E-05	10.6	121.4	1.07.E-03	5.65E+19	
10.32	1.29.E-01	61.6	50.1	2.00.E-04	10.7	122.5	1.06.E-03	5.58E+19	
10.83	1.24.E-01	61.4	49.9	3.86.E-04	10.6	121.9	1.02.E-03	5.37E+19	
11.35	1.27.E-01	62.1	50.5	1.19.E-04	10.8	123.4	1.03.E-03	5.42E+19	
11.87	1.33.E-01	61.5	50.1	3.55.E-05	10.7	122.3	1.08.E-03	5.72E+19	5.54E+19
12.38	1.32.E-01	62.7	51.1	1.54.E-04	10.9	124.6	1.06.E-03	5.61E+19	
12.90	1.32.E-01	62.8	51.6	2.97.E-04	10.9	125.3	1.06.E-03	5.58E+19	
13.41	1.31.E-01	62.4	51.1	1.25.E-04	10.9	124.3	1.06.E-03	5.57E+19	
13.93	1.33.E-01	62.4	51.1	1.51.E-04	10.8	124.3	1.07.E-03	5.64E+19	
14.45	1.38.E-01	62.2	51.2	1.83.E-04	10.8	124.2	1.11.E-03	5.87E+19	5.81E+19
14.96	1.42.E-01	62.8	51.2	7.23.E-05	10.9	124.8	1.14.E-03	6.01E+19	
15.48	1.41.E-01	62.5	51.5	2.44.E-04	10.9	124.9	1.13.E-03	5.98E+19	
15.99	1.41.E-01	62.5	50.5	2.91.E-04	10.8	123.9	1.14.E-03	6.02E+19	
16.51	1.45.E-01	62.7	51.4	1.25.E-04	10.9	125.0	1.16.E-03	6.14E+19	
17.03	1.49.E-01	62.6	51.2	1.47.E-04	10.9	124.6	1.20.E-03	6.32E+19	6.30E+19
17.54	1.50.E-01	62.6	51.4	1.16.E-04	10.9	124.8	1.21.E-03	6.37E+19	
18.06	1.57.E-01	62.6	51.3	1.32.E-04	10.9	124.7	1.26.E-03	6.66E+19	
18.57	1.58.E-01	62.0	50.8	5.75.E-04	10.8	123.5	1.28.E-03	6.77E+19	
19.09	1.62.E-01	62.6	51.6	1.55.E-04	10.9	125.1	1.29.E-03	6.83E+19	
19.61	1.57.E-01	62.4	51.0	3.87.E-04	10.8	124.2	1.27.E-03	6.68E+19	6.75E+19
20.12	1.58.E-01	62.2	51.2	1.01.E-04	10.8	124.2	1.27.E-03	6.74E+19	
20.64	1.57.E-01	62.0	50.7	3.05.E-04	10.8	123.5	1.27.E-03	6.71E+19	
21.15	1.62.E-01	62.9	52.0	1.20.E-04	11.0	125.8	1.29.E-03	6.79E+19	
21.67	1.65.E-01	62.4	51.0	2.87.E-04	10.8	124.2	1.33.E-03	7.03E+19	
22.19	1.61.E-01	61.9	50.3	2.20.E-04	10.7	123.0	1.31.E-03	6.90E+19	6.91E+19
22.70	1.61.E-01	62.2	50.2	3.31.E-04	10.7	123.1	1.31.E-03	6.92E+19	
23.22	1.62.E-01	62.3	50.7	1.96.E-04	10.8	123.7	1.31.E-03	6.93E+19	
23.73	1.52.E-01	62.5	51.3	1.24.E-04	10.9	124.7	1.22.E-03	6.44E+19	
24.25	1.54.E-01	61.7	50.0	3.67.E-04	10.7	122.5	1.26.E-03	6.66E+19	
24.76	1.55.E-01	61.4	50.3	1.40.E-04	10.7	122.4	1.27.E-03	6.69E+19	6.41E+19
25.28	1.42.E-01	62.2	50.6	3.24.E-04	10.8	123.6	1.15.E-03	6.05E+19	
25.80	1.45.E-01	61.7	50.9	1.81.E-04	10.8	123.3	1.18.E-03	6.22E+19	
26.31	1.50.E-01	62.2	51.4	9.41.E-05	10.9	124.5	1.21.E-03	6.38E+19	
26.83	1.46.E-01	62.1	51.0	1.57.E-04	10.8	123.8	1.18.E-03	6.25E+19	
27.34	1.41.E-01	62.0	50.9	4.03.E-04	10.8	123.7	1.14.E-03	6.03E+19	6.07E+19

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
27.86	1.40.E-01	61.8	51.2	2.12.E-04	10.8	123.9	1.13.E-03	5.98E+19	5.60E+19
28.38	1.36.E-01	62.4	52.0	2.06.E-04	10.9	125.4	1.09.E-03	5.73E+19	
28.89	1.31.E-01	61.9	51.3	3.04.E-04	10.8	124.0	1.06.E-03	5.57E+19	
29.41	1.31.E-01	62.0	51.3	2.56.E-04	10.8	124.1	1.06.E-03	5.59E+19	
29.92	1.30.E-01	61.6	50.7	2.55.E-04	10.7	123.0	1.06.E-03	5.58E+19	
30.44	1.31.E-01	61.7	50.3	1.53.E-04	10.7	122.7	1.07.E-03	5.65E+19	5.38E+19
30.96	1.31.E-01	61.7	51.0	2.48.E-04	10.8	123.4	1.06.E-03	5.63E+19	
31.47	1.26.E-01	62.2	51.7	4.01.E-04	10.9	124.8	1.01.E-03	5.33E+19	
31.99	1.26.E-01	61.4	50.7	1.23.E-04	10.7	122.8	1.02.E-03	5.41E+19	
32.50	1.24.E-01	61.3	50.7	1.14.E-04	10.7	122.8	1.01.E-03	5.35E+19	
33.02	1.22.E-01	60.6	49.6	1.85.E-04	10.5	120.8	1.01.E-03	5.34E+19	5.06E+19
33.54	1.25.E-01	60.7	49.9	4.38.E-04	10.6	121.2	1.03.E-03	5.46E+19	
34.05	1.26.E-01	61.1	50.6	1.49.E-04	10.7	122.3	1.03.E-03	5.44E+19	
34.57	1.20.E-01	60.7	50.1	4.09.E-04	10.6	121.3	9.90.E-04	5.23E+19	
35.08	1.10.E-01	60.6	50.2	3.00.E-04	10.6	121.4	9.08.E-04	4.80E+19	
35.60	1.10.E-01	60.2	49.0	1.28.E-04	10.4	119.7	9.15.E-04	4.84E+19	4.41E+19
36.12	1.14.E-01	60.7	50.1	3.54.E-04	10.6	121.4	9.43.E-04	4.98E+19	
36.63	1.07.E-01	60.4	49.6	3.72.E-04	10.5	120.6	8.84.E-04	4.67E+19	
37.15	1.04.E-01	61.2	51.4	3.15.E-04	10.8	123.3	8.47.E-04	4.47E+19	
37.66	1.03.E-01	61.2	50.9	2.95.E-05	10.7	122.7	8.40.E-04	4.44E+19	
38.18	1.02.E-01	61.5	51.4	6.46.E-05	10.8	123.6	8.27.E-04	4.37E+19	3.98E+19
38.70	9.53.E-02	61.2	50.6	2.72.E-04	10.7	122.4	7.78.E-04	4.11E+19	
39.21	9.78.E-02	61.1	50.8	2.86.E-04	10.7	122.6	7.98.E-04	4.21E+19	
39.73	9.44.E-02	60.7	50.4	0.00.E+00	10.6	121.7	7.76.E-04	4.10E+19	
40.24	9.02.E-02	60.9	51.0	2.98.E-04	10.7	122.6	7.36.E-04	3.89E+19	
40.76	8.68.E-02	61.1	51.5	4.45.E-04	10.8	123.3	7.04.E-04	3.72E+19	3.57E+19
41.27	9.40.E-02	61.7	52.5	1.01.E-04	10.9	125.1	7.51.E-04	3.97E+19	
41.79	8.58.E-02	61.2	51.9	2.15.E-04	10.8	124.0	6.92.E-04	3.66E+19	
42.31	8.67.E-02	61.5	51.4	2.76.E-04	10.8	123.6	7.02.E-04	3.71E+19	
42.82	8.42.E-02	61.1	51.0	1.13.E-04	10.7	122.8	6.86.E-04	3.62E+19	
43.34	8.16.E-02	61.2	51.4	2.29.E-04	10.8	123.4	6.61.E-04	3.49E+19	3.22E+19
43.85	7.84.E-02	61.4	51.4	3.36.E-04	10.8	123.6	6.35.E-04	3.35E+19	
44.37	7.89.E-02	61.3	51.7	1.47.E-04	10.8	123.9	6.37.E-04	3.37E+19	
44.89	7.86.E-02	61.1	51.4	1.13.E-04	10.8	123.3	6.38.E-04	3.37E+19	
45.40	7.42.E-02	61.5	51.6	3.37.E-04	10.8	123.9	5.99.E-04	3.17E+19	
45.92	7.45.E-02	61.1	50.9	4.10.E-04	10.7	122.7	6.07.E-04	3.21E+19	3.01E+19
46.43	7.08.E-02	61.6	51.6	2.25.E-04	10.8	124.1	5.71.E-04	3.02E+19	
46.95	6.93.E-02	61.2	51.5	4.25.E-04	10.8	123.5	5.61.E-04	2.97E+19	
47.47	7.28.E-02	61.3	51.6	2.73.E-04	10.8	123.7	5.88.E-04	3.11E+19	
47.98	7.01.E-02	61.1	51.3	1.49.E-04	10.7	123.1	5.69.E-04	3.01E+19	
48.50	7.07.E-02	60.9	51.7	2.49.E-04	10.8	123.3	5.73.E-04	3.03E+19	2.70E+19
49.01	6.85.E-02	60.8	51.0	1.62.E-04	10.7	122.5	5.59.E-04	2.95E+19	
49.53	6.57.E-02	61.4	51.7	3.64.E-04	10.8	123.9	5.30.E-04	2.80E+19	
50.05	6.29.E-02	60.8	50.5	3.93.E-04	10.6	121.9	5.16.E-04	2.73E+19	
50.56	6.36.E-02	60.9	50.7	2.55.E-04	10.7	122.3	5.20.E-04	2.75E+19	
51.08	6.12.E-02	60.8	50.7	2.99.E-04	10.7	122.2	5.01.E-04	2.65E+19	2.43E+19
51.59	6.03.E-02	61.0	50.8	6.78.E-04	10.7	122.4	4.93.E-04	2.60E+19	
52.11	6.01.E-02	60.8	50.6	2.60.E-04	10.6	122.0	4.93.E-04	2.60E+19	
52.63	5.76.E-02	61.1	51.4	2.85.E-04	10.8	123.3	4.67.E-04	2.47E+19	
53.14	5.59.E-02	61.0	51.2	2.57.E-04	10.7	123.0	4.54.E-04	2.40E+19	
53.66	5.39.E-02	60.9	51.3	1.63.E-04	10.7	122.9	4.39.E-04	2.32E+19	2.23E+19
54.17	5.49.E-02	61.0	51.5	1.37.E-04	10.8	123.3	4.46.E-04	2.35E+19	
54.69	5.39.E-02	60.9	51.5	1.47.E-04	10.7	123.2	4.37.E-04	2.31E+19	
55.20	5.20.E-02	60.7	51.2	9.41.E-05	10.7	122.6	4.24.E-04	2.24E+19	
55.72	5.26.E-02	60.6	51.1	4.87.E-04	10.7	122.4	4.29.E-04	2.27E+19	
56.24	5.03.E-02	60.7	51.6	2.02.E-04	10.7	123.0	4.09.E-04	2.16E+19	2.07E+19
56.75	4.98.E-02	60.5	50.3	2.00.E-04	10.6	121.4	4.11.E-04	2.17E+19	
57.27	5.17.E-02	60.6	50.6	2.67.E-04	10.6	121.9	4.24.E-04	2.24E+19	
57.78	4.76.E-02	59.9	50.1	3.25.E-04	10.5	120.5	3.95.E-04	2.09E+19	
58.30	4.74.E-02	60.1	50.3	2.35.E-04	10.6	121.0	3.92.E-04	2.07E+19	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
58.82	4.53.E-02	60.1	51.1	2.69.E-04	10.6	121.9	3.71.E-04	1.96E+19	1.78E+19
59.33	4.60.E-02	60.3	51.2	2.16.E-04	10.7	122.1	3.76.E-04	1.99E+19	
59.85	4.30.E-02	60.1	50.5	2.13.E-04	10.6	121.1	3.55.E-04	1.87E+19	
60.36	3.82.E-02	59.9	50.0	3.53.E-04	10.5	120.4	3.17.E-04	1.68E+19	
60.88	4.39.E-02	60.2	50.5	1.39.E-04	10.6	121.3	3.62.E-04	1.91E+19	
61.40	4.01.E-02	59.6	50.3	3.53.E-04	10.5	120.4	3.33.E-04	1.76E+19	1.64E+19
61.91	3.91.E-02	60.0	51.1	4.89.E-04	10.6	121.7	3.21.E-04	1.70E+19	
62.43	4.10.E-02	60.0	50.7	4.01.E-04	10.6	121.2	3.38.E-04	1.79E+19	
62.94	3.88.E-02	60.1	50.8	8.16.E-05	10.6	121.5	3.20.E-04	1.69E+19	
63.46	3.78.E-02	60.1	51.4	5.29.E-05	10.7	122.2	3.09.E-04	1.63E+19	
63.98	3.56.E-02	59.9	50.7	4.11.E-04	10.6	121.2	2.94.E-04	1.55E+19	1.51E+19
64.49	3.54.E-02	59.6	50.2	1.26.E-04	10.5	120.4	2.94.E-04	1.55E+19	
65.01	3.36.E-02	59.7	50.5	5.13.E-05	10.5	120.7	2.78.E-04	1.47E+19	
65.52	3.84.E-02	59.5	49.9	1.16.E-04	10.5	119.9	3.20.E-04	1.69E+19	
66.04	3.29.E-02	60.0	50.8	1.70.E-04	10.6	121.4	2.71.E-04	1.43E+19	
66.56	3.15.E-02	60.0	50.6	3.02.E-04	10.6	121.2	2.60.E-04	1.37E+19	1.30E+19
67.07	3.62.E-02	60.2	50.7	3.02.E-04	10.6	121.4	2.98.E-04	1.57E+19	
67.59	2.97.E-02	59.9	49.9	2.25.E-04	10.5	120.3	2.47.E-04	1.31E+19	
68.10	3.24.E-02	59.9	50.8	1.64.E-04	10.6	121.3	2.67.E-04	1.41E+19	
68.62	3.10.E-02	60.0	50.1	3.78.E-04	10.5	120.7	2.57.E-04	1.36E+19	
69.14	2.86.E-02	59.5	49.7	2.96.E-04	10.4	119.6	2.39.E-04	1.26E+19	1.11E+19
69.65	2.62.E-02	59.4	49.9	1.83.E-04	10.4	119.7	2.19.E-04	1.16E+19	
70.17	2.64.E-02	59.4	49.9	3.92.E-04	10.5	119.8	2.21.E-04	1.17E+19	
70.68	2.59.E-02	59.5	50.2	2.74.E-04	10.5	120.2	2.15.E-04	1.14E+19	
71.20	2.52.E-02	59.3	50.4	5.13.E-05	10.5	120.2	2.09.E-04	1.11E+19	
71.71	2.49.E-02	59.3	50.8	1.87.E-04	10.5	120.7	2.07.E-04	1.09E+19	1.03E+19
72.23	2.37.E-02	59.1	50.0	8.96.E-05	10.4	119.5	1.98.E-04	1.05E+19	
72.75	2.40.E-02	58.9	49.6	2.31.E-04	10.4	118.9	2.02.E-04	1.07E+19	
73.26	2.41.E-02	59.4	51.3	4.84.E-04	10.6	121.3	1.99.E-04	1.05E+19	
73.78	2.34.E-02	59.2	50.6	3.42.E-04	10.5	120.4	1.94.E-04	1.03E+19	
74.29	2.36.E-02	59.4	50.7	1.59.E-04	10.5	120.6	1.95.E-04	1.03E+19	9.04E+18
74.81	2.19.E-02	58.6	49.1	2.92.E-04	10.3	118.0	1.86.E-04	9.80E+18	
75.33	2.03.E-02	58.4	49.0	2.57.E-04	10.3	117.7	1.72.E-04	9.09E+18	
75.84	2.32.E-02	58.8	50.1	2.23.E-04	10.4	119.3	1.95.E-04	1.03E+19	
76.36	1.97.E-02	58.8	50.0	2.59.E-04	10.4	119.2	1.65.E-04	8.73E+18	
76.87	1.91.E-02	58.5	49.6	1.18.E-04	10.3	118.4	1.62.E-04	8.53E+18	7.96E+18
77.39	1.92.E-02	58.6	49.6	2.98.E-04	10.3	118.5	1.62.E-04	8.55E+18	
77.91	1.89.E-02	58.8	49.7	6.32.E-04	10.4	118.9	1.59.E-04	8.39E+18	
78.42	1.82.E-02	58.8	49.6	5.79.E-04	10.4	118.7	1.53.E-04	8.10E+18	
78.94	1.81.E-02	59.0	50.0	5.17.E-04	10.4	119.4	1.51.E-04	7.99E+18	
79.45	1.74.E-02	58.7	49.3	1.98.E-04	10.3	118.3	1.47.E-04	7.79E+18	6.62E+18
79.97	1.69.E-02	58.9	49.7	1.91.E-04	10.4	119.0	1.42.E-04	7.52E+18	
80.49	1.54.E-02	58.9	49.9	2.05.E-04	10.4	119.2	1.29.E-04	6.83E+18	
81.00	1.57.E-02	58.5	49.1	2.93.E-04	10.3	117.9	1.33.E-04	7.02E+18	
81.52	1.54.E-02	58.9	50.3	7.71.E-05	10.4	119.6	1.28.E-04	6.78E+18	
82.03	1.36.E-02	58.3	49.4	2.81.E-04	10.3	118.0	1.15.E-04	6.10E+18	5.76E+18
82.55	1.42.E-02	57.9	49.3	4.40.E-04	10.3	117.5	1.21.E-04	6.38E+18	
83.07	1.36.E-02	58.2	49.8	2.00.E-04	10.3	118.3	1.15.E-04	6.08E+18	
83.58	1.30.E-02	58.1	50.0	7.03.E-05	10.3	118.5	1.10.E-04	5.80E+18	
84.10	1.22.E-02	58.3	49.5	2.47.E-04	10.3	118.2	1.03.E-04	5.45E+18	
84.61	1.35.E-02	58.0	49.6	1.47.E-04	10.3	117.9	1.14.E-04	6.03E+18	4.90E+18
85.13	1.21.E-02	58.1	49.5	2.51.E-04	10.3	117.9	1.03.E-04	5.42E+18	
85.65	1.09.E-02	58.3	49.6	3.90.E-04	10.3	118.2	9.23.E-05	4.88E+18	
86.16	1.24.E-02	58.1	49.1	1.39.E-04	10.2	117.5	1.06.E-04	5.60E+18	
86.68	1.04.E-02	58.1	49.4	2.98.E-04	10.3	117.8	8.79.E-05	4.65E+18	
87.19	1.02.E-02	58.0	49.3	3.01.E-04	10.3	117.6	8.68.E-05	4.59E+18	4.60E+18
87.71	1.07.E-02	58.1	49.2	3.34.E-04	10.3	117.6	9.11.E-05	4.81E+18	
88.22	9.54.E-03	58.0	49.3	3.50.E-04	10.3	117.5	8.12.E-05	4.29E+18	
88.74	1.10.E-02	57.8	49.1	3.15.E-04	10.2	117.1	9.41.E-05	4.97E+18	
89.26	9.95.E-03	57.7	49.2	2.55.E-04	10.2	117.1	8.49.E-05	4.49E+18	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
89.77	1.10.E-02	58.0	49.2	2.39.E-04	10.3	117.5	9.34.E-05	4.93E+18	3.70E+18
90.29	9.59.E-03	57.8	48.9	4.91.E-04	10.2	117.0	8.20.E-05	4.33E+18	
90.80	8.93.E-03	57.8	48.8	3.32.E-04	10.2	116.8	7.64.E-05	4.04E+18	
91.32	8.78.E-03	57.5	48.7	1.36.E-04	10.2	116.4	7.54.E-05	3.98E+18	
91.84	7.65.E-03	57.7	48.6	3.22.E-04	10.2	116.5	6.57.E-05	3.47E+18	
92.35	7.55.E-03	58.1	49.9	2.52.E-04	10.3	118.4	6.38.E-05	3.37E+18	
92.87	8.01.E-03	57.4	49.1	5.21.E-04	10.2	116.7	6.87.E-05	3.63E+18	
93.38	6.12.E-03	57.6	49.0	2.41.E-04	10.2	116.7	5.25.E-05	2.77E+18	
93.90	7.70.E-03	58.0	50.2	1.91.E-04	10.3	118.5	6.50.E-05	3.43E+18	
94.42	7.24.E-03	57.6	49.5	3.88.E-04	10.2	117.3	6.18.E-05	3.26E+18	2.99E+18
94.93	6.38.E-03	57.8	50.1	3.64.E-04	10.3	118.3	5.39.E-05	2.85E+18	
95.45	5.82.E-03	57.4	48.9	1.52.E-04	10.2	116.5	4.99.E-05	2.64E+18	
95.96	8.01.E-03	57.4	48.9	2.17.E-04	10.2	116.5	6.88.E-05	3.63E+18	
96.48	6.63.E-03	57.4	49.5	3.13.E-04	10.2	117.1	5.66.E-05	2.99E+18	
97.00	5.66.E-03	57.8	49.7	4.11.E-04	10.3	117.8	4.81.E-05	2.54E+18	2.87E+18
97.51	5.05.E-03	57.7	49.2	1.56.E-04	10.2	117.1	4.31.E-05	2.28E+18	
98.03	6.43.E-03	57.8	49.2	8.72.E-05	10.2	117.3	5.48.E-05	2.90E+18	
98.54	5.92.E-03	56.9	48.2	2.54.E-04	10.1	115.2	5.14.E-05	2.71E+18	
99.06	5.31.E-03	57.2	49.0	1.78.E-04	10.2	116.4	4.56.E-05	2.41E+18	
99.58	5.41.E-03	56.6	48.6	1.18.E-04	10.1	115.3	4.69.E-05	2.48E+18	2.48E+18
100.09	5.20.E-03	56.8	49.1	2.54.E-04	10.1	116.1	4.48.E-05	2.37E+18	
100.61	5.31.E-03	57.1	49.1	2.89.E-04	10.1	116.3	4.56.E-05	2.41E+18	
101.12	4.59.E-03	56.3	48.4	1.14.E-04	10.0	114.8	4.00.E-05	2.11E+18	
101.64	4.13.E-03	56.3	48.7	2.41.E-04	10.0	115.1	3.59.E-05	1.90E+18	
102.15	4.39.E-03	56.8	49.1	1.34.E-04	10.1	116.0	3.78.E-05	2.00E+18	2.00E+18
102.67	4.34.E-03	56.2	47.8	2.81.E-04	9.9	113.9	3.81.E-05	2.01E+18	
103.19	4.29.E-03	56.4	48.2	1.24.E-04	10.0	114.6	3.74.E-05	1.97E+18	
103.70	3.42.E-03	56.6	48.4	1.60.E-04	10.0	115.0	2.97.E-05	1.57E+18	
104.22	4.64.E-03	56.2	48.1	2.52.E-04	10.0	114.3	4.06.E-05	2.15E+18	
104.73	3.83.E-03	56.5	48.3	3.11.E-04	10.0	114.8	3.33.E-05	1.76E+18	1.75E+18
105.25	3.27.E-03	57.0	49.0	2.79.E-04	10.1	116.1	2.81.E-05	1.49E+18	
105.77	3.93.E-03	56.9	49.2	2.08.E-04	10.1	116.2	3.38.E-05	1.79E+18	
106.28	2.81.E-03	56.3	48.1	4.45.E-04	10.0	114.4	2.45.E-05	1.30E+18	
106.80	3.78.E-03	56.6	48.9	1.09.E-04	10.1	115.5	3.27.E-05	1.73E+18	
107.31	3.42.E-03	56.3	48.3	1.62.E-04	10.0	114.7	2.98.E-05	1.58E+18	1.56E+18
107.83	3.93.E-03	57.0	48.9	1.66.E-04	10.1	115.9	3.39.E-05	1.79E+18	
108.35	3.06.E-03	56.5	48.2	5.65.E-04	10.0	114.7	2.67.E-05	1.41E+18	
108.86	2.81.E-03	56.8	48.5	2.14.E-04	10.1	115.3	2.43.E-05	1.29E+18	
109.38	3.57.E-03	56.9	48.7	4.27.E-04	10.1	115.7	3.09.E-05	1.63E+18	
109.89	2.55.E-03	56.3	48.0	2.08.E-04	10.0	114.2	2.23.E-05	1.18E+18	1.32E+18
110.41	2.86.E-03	56.5	48.8	1.60.E-04	10.1	115.4	2.48.E-05	1.31E+18	
110.93	2.65.E-03	56.6	48.8	3.92.E-04	10.1	115.5	2.30.E-05	1.21E+18	
111.44	3.52.E-03	57.0	48.9	8.60.E-05	10.1	116.0	3.04.E-05	1.60E+18	
111.96	4.13.E-03	56.2	47.8	6.16.E-04	9.9	114.0	3.63.E-05	1.92E+18	
112.47	2.70.E-03	56.2	48.4	3.81.E-04	10.0	114.6	2.36.E-05	1.25E+18	1.48E+18
112.99	2.55.E-03	56.5	48.8	4.32.E-05	10.1	115.4	2.21.E-05	1.17E+18	
113.51	3.11.E-03	55.7	47.9	1.15.E-04	9.9	113.5	2.74.E-05	1.45E+18	
114.02	3.37.E-03	55.9	48.0	1.48.E-04	9.9	113.8	2.96.E-05	1.56E+18	
114.54	3.21.E-03	56.0	47.7	5.12.E-04	9.9	113.6	2.83.E-05	1.49E+18	
115.05	2.30.E-03	55.9	47.8	2.67.E-04	9.9	113.6	2.02.E-05	1.07E+18	1.28E+18
115.57	2.50.E-03	55.6	47.9	3.48.E-04	9.9	113.5	2.20.E-05	1.16E+18	
116.09	2.40.E-03	56.3	49.0	4.05.E-04	10.1	115.4	2.08.E-05	1.10E+18	
116.60	2.60.E-03	56.0	48.8	1.77.E-04	10.0	114.8	2.27.E-05	1.20E+18	
117.12	2.50.E-03	56.0	48.6	1.79.E-04	10.0	114.7	2.18.E-05	1.15E+18	
117.63	2.14.E-03	55.5	48.1	2.85.E-04	9.9	113.5	1.89.E-05	9.98E+17	1.13E+18
118.15	2.45.E-03	55.7	48.3	3.40.E-04	9.9	114.0	2.15.E-05	1.14E+18	
118.66	2.55.E-03	55.4	48.3	4.97.E-05	9.9	113.6	2.25.E-05	1.19E+18	
119.18	2.45.E-03	55.5	47.7	3.84.E-04	9.9	113.0	2.17.E-05	1.14E+18	
119.70	2.81.E-03	55.4	47.8	4.45.E-04	9.9	113.1	2.48.E-05	1.31E+18	
120.21	2.40.E-03	54.9	46.9	2.35.E-04	9.7	111.6	2.15.E-05	1.14E+18	1.13E+18

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
120.73	1.94.E-03	55.3	47.6	3.14.E-04	9.8	112.7	1.72.E-05	9.09E+17	9.61E+17
121.24	2.50.E-03	55.8	48.2	1.22.E-04	9.9	114.0	2.19.E-05	1.16E+18	
121.76	1.43.E-03	55.1	47.6	3.63.E-04	9.8	112.5	1.27.E-05	6.71E+17	
122.28	2.14.E-03	55.2	47.9	1.15.E-04	9.9	112.9	1.90.E-05	1.00E+18	
122.79	1.94.E-03	55.3	47.9	4.25.E-04	9.9	113.0	1.72.E-05	9.06E+17	
123.31	2.19.E-03	55.1	48.0	2.29.E-04	9.9	112.9	1.94.E-05	1.03E+18	1.04E+18
123.82	2.55.E-03	55.1	47.7	1.90.E-04	9.8	112.6	2.27.E-05	1.20E+18	
124.34	3.06.E-03	54.9	48.1	1.41.E-04	9.8	112.9	2.71.E-05	1.43E+18	
124.86	2.45.E-03	54.8	47.2	3.42.E-04	9.8	111.7	2.19.E-05	1.16E+18	
125.37	1.79.E-03	54.9	47.7	2.47.E-04	9.8	112.4	1.59.E-05	8.39E+17	
125.89	1.84.E-03	55.0	48.0	1.43.E-04	9.8	112.9	1.63.E-05	8.60E+17	1.02E+18
126.40	1.94.E-03	54.5	47.2	6.43.E-04	9.7	111.4	1.74.E-05	9.20E+17	
126.92	1.68.E-03	54.6	47.5	4.08.E-04	9.8	111.8	1.51.E-05	7.95E+17	
127.44	2.19.E-03	55.1	48.2	1.62.E-04	9.9	113.2	1.94.E-05	1.02E+18	
127.95	2.19.E-03	54.9	48.0	2.78.E-04	9.8	112.6	1.95.E-05	1.03E+18	
128.47	2.96.E-03	55.4	48.5	3.59.E-04	9.9	113.8	2.60.E-05	1.37E+18	9.73E+17
128.98	1.89.E-03	55.0	48.2	1.79.E-04	9.9	113.0	1.67.E-05	8.83E+17	
129.50	2.40.E-03	55.2	48.5	2.59.E-04	9.9	113.6	2.11.E-05	1.12E+18	
130.02	2.96.E-03	56.0	49.2	2.34.E-04	10.1	115.3	2.57.E-05	1.36E+18	
130.53	1.99.E-03	56.5	49.9	2.60.E-04	10.2	116.6	1.71.E-05	9.02E+17	
131.05	2.04.E-03	56.6	49.5	4.24.E-05	10.1	116.3	1.76.E-05	9.27E+17	9.09E+17
131.56	1.22.E-03	55.8	48.8	3.12.E-04	10.0	114.6	1.07.E-05	5.64E+17	
132.08	1.99.E-03	55.6	48.5	2.14.E-04	10.0	114.0	1.74.E-05	9.22E+17	
132.60	2.35.E-03	55.6	48.7	5.60.E-04	10.0	114.3	2.05.E-05	1.08E+18	
133.11	1.79.E-03	55.0	47.9	1.22.E-04	9.8	112.7	1.58.E-05	8.37E+17	
133.63	2.04.E-03	54.7	47.9	2.83.E-04	9.8	112.4	1.82.E-05	9.60E+17	8.11E+17
134.14	1.58.E-03	55.1	47.6	2.83.E-04	9.8	112.6	1.41.E-05	7.42E+17	
134.66	1.99.E-03	54.6	47.2	5.97.E-04	9.7	111.6	1.78.E-05	9.42E+17	
135.17	1.68.E-03	54.9	48.2	2.11.E-04	9.9	113.0	1.49.E-05	7.87E+17	
135.69	1.79.E-03	55.0	48.7	2.40.E-04	9.9	113.6	1.57.E-05	8.30E+17	
136.21	1.22.E-03	55.6	49.3	1.22.E-04	10.0	114.9	1.07.E-05	5.63E+17	7.80E+17
136.72	1.99.E-03	54.9	48.1	4.68.E-04	9.9	112.9	1.76.E-05	9.31E+17	
137.24	1.89.E-03	54.9	48.5	1.65.E-04	9.9	113.4	1.67.E-05	8.80E+17	
137.75	1.53.E-03	54.9	48.5	2.75.E-04	9.9	113.3	1.35.E-05	7.13E+17	
138.27	1.79.E-03	54.9	48.2	1.05.E-04	9.9	113.0	1.58.E-05	8.35E+17	
138.79	1.53.E-03	55.1	47.9	2.90.E-04	9.8	112.9	1.36.E-05	7.17E+17	9.31E+17
139.30	1.63.E-03	55.4	48.7	3.31.E-04	10.0	114.1	1.43.E-05	7.56E+17	
139.82	1.94.E-03	55.3	48.9	2.29.E-04	10.0	114.1	1.70.E-05	8.97E+17	
140.33	1.89.E-03	55.2	48.5	5.75.E-04	9.9	113.6	1.66.E-05	8.78E+17	
140.85	2.19.E-03	55.0	47.7	6.66.E-04	9.8	112.5	1.95.E-05	1.03E+18	
141.37	1.79.E-03	54.7	47.3	5.55.E-04	9.8	111.7	1.60.E-05	8.44E+17	8.28E+17
141.88	2.14.E-03	54.8	47.7	1.70.E-04	9.8	112.3	1.91.E-05	1.01E+18	
142.40	1.89.E-03	54.9	47.9	4.28.E-04	9.8	112.7	1.68.E-05	8.85E+17	
142.91	2.19.E-03	54.5	47.3	3.56.E-04	9.7	111.5	1.97.E-05	1.04E+18	
143.43	1.48.E-03	54.4	47.6	2.19.E-04	9.8	111.7	1.32.E-05	6.99E+17	
143.95	1.73.E-03	54.4	47.5	3.01.E-04	9.7	111.7	1.55.E-05	8.21E+17	9.04E+17
144.46	1.48.E-03	54.8	48.2	2.86.E-04	9.8	112.8	1.31.E-05	6.93E+17	
144.98	1.99.E-03	53.9	47.3	2.97.E-04	9.7	110.9	1.79.E-05	9.47E+17	
145.49	1.94.E-03	54.2	47.3	2.89.E-04	9.7	111.3	1.74.E-05	9.20E+17	
146.01	2.09.E-03	54.2	47.6	2.23.E-04	9.7	111.6	1.87.E-05	9.90E+17	
146.53	1.89.E-03	54.3	47.8	4.07.E-04	9.8	111.9	1.69.E-05	8.91E+17	7.19E+17
147.04	1.63.E-03	54.5	47.6	7.03.E-05	9.8	111.9	1.46.E-05	7.71E+17	
147.56	1.53.E-03	54.5	48.1	2.67.E-04	9.8	112.4	1.36.E-05	7.19E+17	
148.07	1.12.E-03	54.3	47.3	1.56.E-04	9.7	111.4	1.01.E-05	5.32E+17	
148.59	1.79.E-03	53.8	47.7	3.80.E-04	9.7	111.3	1.61.E-05	8.48E+17	
149.10	1.58.E-03	53.5	47.0	4.04.E-05	9.6	110.2	1.44.E-05	7.59E+17	7.78E+17
149.62	1.53.E-03	53.4	46.7	3.22.E-04	9.6	109.6	1.40.E-05	7.38E+17	
150.14	1.43.E-03	53.8	47.6	5.44.E-04	9.7	111.2	1.28.E-05	6.79E+17	
150.65	1.58.E-03	54.0	47.8	3.66.E-04	9.7	111.5	1.42.E-05	7.49E+17	
151.17	1.33.E-03	54.0	48.3	2.37.E-04	9.8	112.1	1.18.E-05	6.25E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
151.68	1.99.E-03	53.6	47.2	3.59.E-04	9.6	110.4	1.80.E-05	9.52E+17	7.65E+17
152.20	1.84.E-03	53.5	46.8	4.78.E-04	9.6	109.8	1.67.E-05	8.83E+17	
152.72	1.84.E-03	53.3	46.9	3.28.E-04	9.6	109.8	1.67.E-05	8.84E+17	
153.23	1.48.E-03	53.5	47.2	3.37.E-04	9.6	110.4	1.34.E-05	7.08E+17	
153.75	1.22.E-03	53.6	47.3	1.86.E-04	9.7	110.6	1.11.E-05	5.85E+17	
154.26	1.68.E-03	53.1	46.9	1.57.E-04	9.6	109.6	1.54.E-05	8.11E+17	5.91E+17
154.78	1.73.E-03	52.9	46.8	2.29.E-04	9.5	109.3	1.59.E-05	8.39E+17	
155.30	1.07.E-03	53.2	47.1	3.23.E-04	9.6	109.9	9.75.E-06	5.15E+17	
155.81	1.12.E-03	53.0	46.5	4.81.E-04	9.5	109.0	1.03.E-05	5.44E+17	
156.33	1.33.E-03	53.3	47.2	1.84.E-04	9.6	110.2	1.20.E-05	6.36E+17	
156.84	1.22.E-03	53.0	47.2	3.19.E-04	9.6	109.8	1.12.E-05	5.89E+17	6.09E+17
157.36	1.38.E-03	52.7	46.1	3.04.E-04	9.4	108.3	1.27.E-05	6.72E+17	
157.88	1.17.E-03	52.7	46.5	8.40.E-05	9.5	108.7	1.08.E-05	5.71E+17	
158.39	9.69.E-04	52.7	47.0	5.57.E-04	9.5	109.3	8.87.E-06	4.69E+17	
158.91	1.53.E-03	52.5	46.4	9.33.E-05	9.5	108.4	1.41.E-05	7.46E+17	
159.42	1.63.E-03	52.7	46.9	2.36.E-04	9.5	109.1	1.50.E-05	7.91E+17	5.89E+17
159.94	9.69.E-04	52.9	46.9	2.10.E-04	9.5	109.3	8.87.E-06	4.69E+17	
160.46	1.17.E-03	52.5	46.4	6.63.E-04	9.5	108.3	1.08.E-05	5.72E+17	
160.97	1.48.E-03	52.9	46.7	2.68.E-04	9.5	109.1	1.36.E-05	7.17E+17	
161.49	1.63.E-03	52.6	46.9	4.11.E-04	9.5	109.0	1.50.E-05	7.91E+17	
162.00	8.16.E-04	52.4	46.4	4.12.E-04	9.5	108.3	7.54.E-06	3.98E+17	5.94E+17
162.52	9.69.E-04	53.1	47.1	5.28.E-04	9.6	109.7	8.84.E-06	4.67E+17	
163.04	1.63.E-03	52.7	46.9	4.05.E-04	9.5	109.1	1.50.E-05	7.91E+17	
163.55	1.07.E-03	52.7	46.4	2.79.E-04	9.5	108.6	9.87.E-06	5.21E+17	
164.07	1.12.E-03	51.9	45.8	2.08.E-04	9.3	107.1	1.05.E-05	5.54E+17	
164.58	8.16.E-04	52.3	46.2	3.36.E-04	9.4	107.9	7.56.E-06	4.00E+17	6.37E+17
165.10	1.43.E-03	52.1	45.8	3.77.E-04	9.4	107.2	1.33.E-05	7.04E+17	
165.61	1.48.E-03	52.1	46.3	2.14.E-04	9.4	107.9	1.37.E-05	7.25E+17	
166.13	1.33.E-03	52.3	46.7	2.26.E-04	9.5	108.5	1.22.E-05	6.46E+17	
166.65	1.33.E-03	52.2	46.1	4.56.E-04	9.4	107.6	1.23.E-05	6.51E+17	
167.16	1.28.E-03	52.1	46.1	3.48.E-04	9.4	107.6	1.19.E-05	6.26E+17	5.57E+17
167.68	1.07.E-03	51.6	45.1	3.18.E-04	9.2	105.9	1.01.E-05	5.35E+17	
168.19	1.22.E-03	52.0	46.1	2.80.E-04	9.4	107.5	1.14.E-05	6.02E+17	
168.71	1.17.E-03	52.2	46.5	2.84.E-04	9.4	108.2	1.08.E-05	5.73E+17	
169.23	7.65.E-04	52.2	46.5	3.80.E-04	9.4	108.1	7.08.E-06	3.74E+17	
169.74	1.17.E-03	51.6	45.5	6.42.E-04	9.3	106.5	1.10.E-05	5.82E+17	4.55E+17
170.26	1.33.E-03	52.2	45.9	4.75.E-04	9.4	107.5	1.23.E-05	6.52E+17	
170.77	8.16.E-04	51.9	45.8	2.98.E-04	9.3	107.0	7.63.E-06	4.03E+17	
171.29	7.65.E-04	52.0	45.9	4.41.E-04	9.4	107.4	7.13.E-06	3.77E+17	
171.81	9.18.E-04	51.9	46.3	2.56.E-04	9.4	107.6	8.53.E-06	4.51E+17	
172.32	8.67.E-04	51.8	45.7	1.62.E-04	9.3	106.8	8.12.E-06	4.29E+17	4.59E+17
172.84	1.22.E-03	51.1	44.8	7.83.E-04	9.2	105.1	1.17.E-05	6.16E+17	
173.35	7.65.E-04	51.4	45.5	3.97.E-04	9.3	106.2	7.21.E-06	3.81E+17	
173.87	1.07.E-03	51.9	45.4	2.76.E-04	9.3	106.6	1.00.E-05	5.31E+17	
174.39	8.16.E-04	52.7	46.6	6.66.E-04	9.5	108.8	7.50.E-06	3.96E+17	
174.90	8.16.E-04	52.8	46.6	5.16.E-04	9.5	108.9	7.50.E-06	3.96E+17	4.77E+17
175.42	1.22.E-03	52.9	46.9	1.18.E-04	9.5	109.4	1.12.E-05	5.91E+17	
175.93	1.12.E-03	52.4	46.3	2.99.E-04	9.4	108.1	1.04.E-05	5.48E+17	
176.45	1.02.E-03	52.0	45.9	2.81.E-04	9.4	107.3	9.51.E-06	5.02E+17	
176.97	7.65.E-04	52.0	46.1	4.19.E-04	9.4	107.5	7.12.E-06	3.76E+17	
177.48	9.18.E-04	51.2	45.6	3.76.E-05	9.3	106.1	8.66.E-06	4.57E+17	3.90E+17
178.00	1.02.E-03	52.0	46.2	6.46.E-04	9.4	107.6	9.48.E-06	5.01E+17	
178.51	7.65.E-04	51.6	46.0	2.86.E-04	9.3	106.9	7.16.E-06	3.78E+17	
179.03	5.61.E-04	51.9	46.1	3.73.E-04	9.4	107.4	5.23.E-06	2.76E+17	
179.55	8.67.E-04	51.6	46.2	2.55.E-04	9.4	107.2	8.09.E-06	4.28E+17	
180.06	9.18.E-04	51.2	45.3	5.00.E-04	9.2	105.8	8.68.E-06	4.59E+17	3.90E+17
180.58	8.16.E-04	50.9	44.7	6.48.E-04	9.1	104.8	7.79.E-06	4.12E+17	
181.09	7.65.E-04	50.9	45.1	2.18.E-04	9.2	105.2	7.28.E-06	3.84E+17	
181.61	1.02.E-03	50.9	44.8	5.76.E-04	9.1	104.8	9.74.E-06	5.14E+17	
182.12	6.12.E-04	50.8	45.5	2.03.E-04	9.2	105.6	5.80.E-06	3.06E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
182.64	7.65.E-04	50.8	45.0	6.37.E-04	9.2	105.0	7.29.E-06	3.85E+17	5.07E+17
183.16	7.14.E-04	50.8	44.9	3.99.E-04	9.2	104.9	6.81.E-06	3.60E+17	
183.67	9.69.E-04	50.8	44.7	5.53.E-04	9.1	104.5	9.27.E-06	4.90E+17	
184.19	1.07.E-03	50.7	45.3	2.54.E-04	9.2	105.2	1.02.E-05	5.38E+17	
184.70	1.07.E-03	51.0	45.5	1.68.E-04	9.2	105.7	1.01.E-05	5.36E+17	
185.22	1.22.E-03	51.0	45.5	2.89.E-04	9.2	105.7	1.16.E-05	6.12E+17	3.77E+17
185.74	7.14.E-04	50.4	45.0	1.97.E-04	9.1	104.6	6.83.E-06	3.61E+17	
186.25	7.65.E-04	50.1	44.1	5.98.E-04	9.0	103.2	7.41.E-06	3.92E+17	
186.77	8.16.E-04	50.2	44.7	7.77.E-04	9.1	104.0	7.85.E-06	4.15E+17	
187.28	7.65.E-04	50.6	44.9	1.81.E-04	9.1	104.7	7.31.E-06	3.86E+17	
187.80	4.59.E-04	50.3	44.7	5.45.E-04	9.1	104.1	4.41.E-06	2.33E+17	3.41E+17
188.32	9.18.E-04	51.0	45.4	1.48.E-04	9.2	105.6	8.70.E-06	4.59E+17	
188.83	5.61.E-04	50.4	44.4	4.32.E-04	9.1	103.8	5.40.E-06	2.86E+17	
189.35	6.12.E-04	50.3	45.1	3.34.E-04	9.1	104.5	5.86.E-06	3.10E+17	
189.86	5.10.E-04	50.4	44.9	7.33.E-04	9.1	104.5	4.88.E-06	2.58E+17	
190.38	9.18.E-04	50.7	45.2	4.57.E-04	9.2	105.0	8.74.E-06	4.62E+17	4.29E+17
190.90	7.65.E-04	50.2	44.7	4.51.E-04	9.1	104.0	7.36.E-06	3.89E+17	
191.41	8.67.E-04	50.4	44.6	3.63.E-04	9.1	104.0	8.34.E-06	4.40E+17	
191.93	9.69.E-04	50.6	45.4	4.00.E-05	9.2	105.2	9.21.E-06	4.87E+17	
192.44	7.14.E-04	50.4	45.0	1.66.E-04	9.1	104.5	6.84.E-06	3.61E+17	
192.96	1.07.E-03	50.3	43.9	3.05.E-04	9.0	103.2	1.04.E-05	5.48E+17	4.04E+17
193.48	6.12.E-04	51.0	45.2	2.64.E-04	9.2	105.4	5.81.E-06	3.07E+17	
193.99	8.16.E-04	50.7	44.7	5.35.E-04	9.1	104.5	7.81.E-06	4.13E+17	
194.51	8.67.E-04	51.0	45.4	3.01.E-04	9.2	105.6	8.22.E-06	4.34E+17	
195.02	4.08.E-04	50.5	45.0	3.23.E-04	9.1	104.6	3.90.E-06	2.06E+17	
195.54	7.14.E-04	50.5	44.9	2.23.E-04	9.1	104.5	6.83.E-06	3.61E+17	3.47E+17
196.05	1.17.E-03	49.8	43.5	5.84.E-04	8.9	102.3	1.15.E-05	6.06E+17	
196.57	7.65.E-04	50.5	44.8	3.88.E-04	9.1	104.5	7.33.E-06	3.87E+17	
197.09	7.14.E-04	50.6	45.5	2.32.E-04	9.2	105.3	6.79.E-06	3.58E+17	
197.60	7.65.E-04	50.3	45.1	5.44.E-04	9.1	104.5	7.32.E-06	3.87E+17	
198.12	6.63.E-04	49.9	44.5	3.77.E-04	9.0	103.4	6.41.E-06	3.39E+17	3.22E+17
198.63	5.10.E-04	49.8	44.2	1.89.E-04	9.0	102.9	4.96.E-06	2.62E+17	
199.15	7.14.E-04	50.3	44.8	3.74.E-04	9.1	104.2	6.86.E-06	3.62E+17	
199.67	6.63.E-04	50.4	45.2	2.49.E-04	9.1	104.7	6.33.E-06	3.35E+17	
200.18	4.59.E-04	49.7	44.3	3.52.E-04	9.0	103.0	4.46.E-06	2.36E+17	
200.70	5.10.E-04	49.7	44.4	3.68.E-04	9.0	103.1	4.95.E-06	2.61E+17	3.29E+17
201.21	8.16.E-04	50.1	45.0	4.72.E-04	9.1	104.2	7.83.E-06	4.14E+17	
201.73	4.59.E-04	49.7	44.0	8.53.E-04	9.0	102.6	4.47.E-06	2.36E+17	
202.25	8.16.E-04	49.7	44.0	8.08.E-04	9.0	102.7	7.95.E-06	4.20E+17	
202.76	7.65.E-04	50.0	44.5	1.55.E-04	9.0	103.5	7.39.E-06	3.91E+17	
203.28	3.57.E-04	50.2	44.4	4.59.E-04	9.0	103.6	3.45.E-06	1.82E+17	4.11E+17
203.79	8.16.E-04	49.9	44.7	1.07.E-04	9.0	103.6	7.88.E-06	4.16E+17	
204.31	1.12.E-03	50.1	44.5	3.94.E-04	9.0	103.6	1.08.E-05	5.72E+17	
204.83	7.65.E-04	50.0	44.9	1.41.E-04	9.1	103.9	7.36.E-06	3.89E+17	
205.34	1.02.E-03	49.5	43.7	3.36.E-04	8.9	102.0	1.00.E-05	5.28E+17	
205.86	4.59.E-04	50.2	44.8	5.87.E-04	9.1	104.1	4.41.E-06	2.33E+17	3.38E+17
206.37	6.63.E-04	50.8	45.6	4.48.E-04	9.2	105.5	6.28.E-06	3.32E+17	
206.89	7.14.E-04	50.3	44.9	2.74.E-04	9.1	104.3	6.85.E-06	3.62E+17	
207.41	5.61.E-04	50.1	45.1	3.72.E-04	9.1	104.3	5.38.E-06	2.84E+17	
207.92	7.65.E-04	49.4	44.1	5.26.E-04	8.9	102.4	7.47.E-06	3.95E+17	
208.44	7.65.E-04	49.7	44.6	3.05.E-04	9.0	103.3	7.41.E-06	3.91E+17	3.15E+17
208.95	5.10.E-04	50.0	44.6	4.30.E-04	9.1	103.7	4.92.E-06	2.60E+17	
209.47	5.61.E-04	50.5	44.9	1.90.E-05	9.1	104.5	5.37.E-06	2.84E+17	
209.99	3.57.E-04	51.0	45.4	2.90.E-04	9.2	105.6	3.38.E-06	1.79E+17	
210.50	7.65.E-04	50.4	45.5	5.40.E-04	9.2	105.1	7.28.E-06	3.85E+17	
211.02	5.10.E-04	49.9	44.3	2.50.E-04	9.0	103.3	4.94.E-06	2.61E+17	3.20E+17
211.53	9.18.E-04	50.1	44.8	3.86.E-04	9.1	103.9	8.84.E-06	4.67E+17	
212.05	5.61.E-04	49.5	43.8	4.23.E-04	8.9	102.2	5.49.E-06	2.90E+17	
212.56	5.61.E-04	49.6	44.6	3.37.E-04	9.0	103.2	5.44.E-06	2.87E+17	
213.08	4.59.E-04	49.7	44.3	1.18.E-04	9.0	103.0	4.46.E-06	2.36E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
213.60	6.63.E-04	49.5	44.0	2.86.E-04	8.9	102.5	6.47.E-06	3.42E+17	3.51E+17
214.11	8.67.E-04	49.4	44.3	3.94.E-04	9.0	102.7	8.45.E-06	4.46E+17	
214.63	6.63.E-04	49.9	44.7	2.31.E-04	9.0	103.6	6.40.E-06	3.38E+17	
215.14	6.12.E-04	50.0	45.0	1.59.E-04	9.1	104.1	5.88.E-06	3.11E+17	
215.66	9.18.E-04	50.5	45.8	5.32.E-04	9.2	105.5	8.71.E-06	4.60E+17	
216.18	5.10.E-04	50.3	44.4	3.26.E-04	9.0	103.7	4.92.E-06	2.60E+17	3.23E+17
216.69	7.65.E-04	50.3	44.9	3.45.E-04	9.1	104.3	7.34.E-06	3.88E+17	
217.21	4.59.E-04	50.0	44.3	2.25.E-04	9.0	103.3	4.44.E-06	2.35E+17	
217.72	8.16.E-04	50.2	45.1	4.62.E-04	9.1	104.3	7.82.E-06	4.13E+17	
218.24	8.16.E-04	49.8	44.4	2.94.E-04	9.0	103.2	7.91.E-06	4.18E+17	
218.76	4.59.E-04	50.0	44.7	1.95.E-04	9.1	103.7	4.43.E-06	2.34E+17	2.93E+17
219.27	6.12.E-04	49.4	44.6	3.76.E-04	9.0	102.9	5.95.E-06	3.14E+17	
219.79	5.61.E-04	49.1	43.7	4.41.E-04	8.9	101.7	5.52.E-06	2.92E+17	
220.30	5.10.E-04	48.9	43.8	4.94.E-04	8.9	101.5	5.03.E-06	2.65E+17	
220.82	8.67.E-04	48.7	43.3	5.84.E-04	8.8	100.9	8.60.E-06	4.54E+17	
221.34	4.59.E-04	49.1	44.0	3.17.E-04	8.9	102.1	4.50.E-06	2.38E+17	2.66E+17
221.85	4.08.E-04	48.4	43.0	2.03.E-04	8.7	100.2	4.07.E-06	2.15E+17	
222.37	3.57.E-04	48.6	43.3	4.03.E-04	8.8	100.7	3.55.E-06	1.87E+17	
222.88	6.63.E-04	48.8	43.5	2.46.E-04	8.8	101.2	6.56.E-06	3.46E+17	
223.40	7.14.E-04	48.9	43.9	6.31.E-04	8.9	101.8	7.02.E-06	3.71E+17	
223.92	6.12.E-04	48.8	43.5	4.56.E-04	8.8	101.1	6.05.E-06	3.20E+17	2.43E+17
224.43	2.04.E-04	48.5	43.3	3.04.E-04	8.8	100.6	2.03.E-06	1.07E+17	
224.95	3.06.E-04	48.7	43.9	3.97.E-04	8.8	101.4	3.02.E-06	1.60E+17	
225.46	4.08.E-04	49.2	44.1	3.10.E-04	8.9	102.3	3.99.E-06	2.11E+17	
225.98	4.59.E-04	49.2	44.2	3.01.E-04	8.9	102.3	4.49.E-06	2.37E+17	
226.50	4.08.E-04	49.2	44.1	5.53.E-04	8.9	102.2	3.99.E-06	2.11E+17	2.78E+17
227.01	7.65.E-04	49.0	43.7	2.35.E-04	8.9	101.6	7.53.E-06	3.98E+17	
227.53	2.55.E-04	48.5	43.4	2.75.E-04	8.8	100.7	2.53.E-06	1.34E+17	
228.04	7.14.E-04	48.8	43.7	3.44.E-04	8.8	101.3	7.05.E-06	3.72E+17	
228.56	7.14.E-04	48.5	42.7	4.16.E-04	8.7	100.0	7.15.E-06	3.77E+17	
229.07	3.06.E-04	48.7	43.7	7.49.E-04	8.8	101.2	3.03.E-06	1.60E+17	3.06E+17
229.59	6.63.E-04	48.4	43.4	6.45.E-04	8.8	100.6	6.59.E-06	3.48E+17	
230.11	6.63.E-04	48.4	43.2	2.48.E-04	8.8	100.4	6.61.E-06	3.49E+17	
230.62	6.63.E-04	48.6	43.4	2.28.E-04	8.8	100.8	6.58.E-06	3.48E+17	
231.14	4.59.E-04	48.4	43.2	4.68.E-04	8.8	100.4	4.58.E-06	2.42E+17	
231.65	5.10.E-04	48.4	43.5	4.55.E-04	8.8	100.6	5.07.E-06	2.68E+17	2.06E+17
232.17	6.12.E-04	48.4	43.4	2.98.E-04	8.8	100.6	6.09.E-06	3.21E+17	
232.69	5.61.E-04	48.3	43.7	3.19.E-04	8.8	100.8	5.57.E-06	2.94E+17	
233.20	2.04.E-04	48.2	43.4	1.80.E-04	8.8	100.3	2.03.E-06	1.07E+17	
233.72	1.53.E-04	48.4	43.6	3.22.E-04	8.8	100.9	1.52.E-06	8.02E+16	
234.23	5.10.E-04	49.2	44.3	2.17.E-04	8.9	102.5	4.98.E-06	2.63E+17	2.09E+17
234.75	5.61.E-04	49.7	44.8	3.42.E-04	9.0	103.6	5.42.E-06	2.86E+17	
235.27	5.61.E-04	49.3	44.1	7.04.E-04	8.9	102.3	5.49.E-06	2.90E+17	
235.78	1.53.E-04	48.9	43.8	3.22.E-04	8.9	101.6	1.51.E-06	7.96E+16	
236.30	6.12.E-04	48.1	42.4	1.02.E-03	8.7	99.1	6.18.E-06	3.26E+17	
236.81	3.06.E-04	48.2	42.9	4.05.E-04	8.7	99.8	3.07.E-06	1.62E+17	1.93E+17
237.33	3.57.E-04	48.2	43.5	3.48.E-04	8.8	100.5	3.55.E-06	1.88E+17	
237.85	5.10.E-04	48.3	42.9	4.45.E-04	8.7	99.8	5.11.E-06	2.70E+17	
238.36	2.04.E-04	48.8	43.7	4.74.E-04	8.8	101.3	2.01.E-06	1.06E+17	
238.88	3.57.E-04	48.3	43.2	8.25.E-04	8.7	100.1	3.57.E-06	1.88E+17	
239.39	3.06.E-04	48.5	43.4	4.14.E-04	8.8	100.7	3.04.E-06	1.61E+17	2.50E+17
239.91	4.59.E-04	48.5	43.8	2.14.E-04	8.8	101.2	4.54.E-06	2.40E+17	
240.43	4.59.E-04	48.2	43.5	3.08.E-04	8.8	100.5	4.57.E-06	2.41E+17	
240.94	5.61.E-04	48.2	43.6	2.69.E-04	8.8	100.6	5.58.E-06	2.95E+17	
241.46	3.57.E-04	48.9	43.7	2.68.E-04	8.9	101.5	3.52.E-06	1.86E+17	
241.97	5.61.E-04	49.0	43.9	5.92.E-04	8.9	101.8	5.52.E-06	2.91E+17	1.50E+17
242.49	4.59.E-04	49.2	43.9	2.92.E-04	8.9	102.0	4.50.E-06	2.38E+17	
243.00	3.06.E-04	48.5	43.4	5.26.E-04	8.8	100.7	3.04.E-06	1.61E+17	
243.52	5.10.E-04	48.4	43.6	4.33.E-04	8.8	100.8	5.06.E-06	2.67E+17	
244.04	2.55.E-04	48.1	43.2	4.49.E-04	8.7	100.0	2.55.E-06	1.35E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate ^a (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
244.55	1.53.E-04	48.2	43.0	3.78.E-04	8.7	99.9	1.53.E-06	8.09E+16	1.18E+17
245.07	2.04.E-04	48.2	43.3	3.36.E-04	8.7	100.2	2.04.E-06	1.08E+17	
245.58	5.10.E-05	48.1	43.2	4.45.E-04	8.7	100.1	5.10.E-07	2.69E+16	
246.10	2.04.E-04	48.2	43.6	1.65.E-04	8.8	100.5	2.03.E-06	1.07E+17	
246.62	3.57.E-04	48.0	42.8	6.63.E-04	8.7	99.5	3.59.E-06	1.90E+17	
247.13	4.08.E-04	48.8	43.8	2.93.E-04	8.8	101.4	4.03.E-06	2.13E+17	1.45E+17
247.65	1.02.E-04	48.6	43.8	5.25.E-04	8.8	101.2	1.01.E-06	5.32E+16	
248.16	4.59.E-04	48.6	43.4	1.01.E-04	8.8	100.7	4.56.E-06	2.41E+17	
248.68	3.57.E-04	48.1	43.5	3.86.E-04	8.8	100.4	3.56.E-06	1.88E+17	
249.20	3.57.E-04	47.6	42.7	5.31.E-04	8.6	98.9	3.61.E-06	1.91E+17	
249.71	1.53.E-04	47.9	43.0	3.06.E-04	8.7	99.6	1.54.E-06	8.12E+16	2.11E+17
250.23	5.10.E-05	48.7	43.6	3.82.E-04	8.8	101.1	5.05.E-07	2.67E+16	
250.74	4.08.E-04	47.9	42.8	4.08.E-04	8.7	99.4	4.11.E-06	2.17E+17	
251.26	4.59.E-04	48.1	42.8	5.59.E-04	8.7	99.5	4.61.E-06	2.44E+17	
251.78	4.08.E-04	48.1	43.1	4.51.E-04	8.7	99.9	4.08.E-06	2.16E+17	
252.29	2.55.E-04	48.0	43.2	4.87.E-04	8.7	99.9	2.55.E-06	1.35E+17	1.83E+17
252.81	4.59.E-04	48.0	43.0	2.22.E-04	8.7	99.7	4.61.E-06	2.43E+17	
253.32	1.53.E-04	47.8	42.6	6.58.E-05	8.7	99.1	1.54.E-06	8.16E+16	
253.84	5.10.E-04	47.9	42.8	3.59.E-04	8.7	99.3	5.14.E-06	2.71E+17	
254.36	2.55.E-04	48.0	43.4	3.14.E-04	8.7	100.1	2.55.E-06	1.35E+17	
254.87	1.02.E-04	47.8	42.9	5.69.E-04	8.7	99.4	1.03.E-06	5.42E+16	1.99E+17
255.39	7.14.E-04	48.6	43.9	5.38.E-04	8.8	101.3	7.05.E-06	3.72E+17	
255.90	2.55.E-04	48.5	43.8	5.24.E-04	8.8	101.2	2.52.E-06	1.33E+17	
256.42	6.12.E-04	48.5	43.5	5.33.E-04	8.8	100.9	6.07.E-06	3.21E+17	
256.94	4.59.E-04	47.8	42.8	2.87.E-04	8.7	99.3	4.62.E-06	2.44E+17	
257.45	1.53.E-04	48.0	43.2	2.47.E-04	8.7	100.0	1.53.E-06	8.09E+16	2.12E+17
257.97	4.08.E-04	48.2	43.1	5.94.E-04	8.7	100.0	4.08.E-06	2.16E+17	
258.48	4.08.E-04	47.7	42.8	3.26.E-04	8.6	99.1	4.12.E-06	2.18E+17	
259.00	3.57.E-04	47.7	42.5	6.81.E-04	8.6	98.8	3.62.E-06	1.91E+17	
259.51	3.06.E-04	47.7	42.4	5.49.E-04	8.6	98.7	3.10.E-06	1.64E+17	
260.03	4.59.E-04	48.0	43.0	3.70.E-04	8.7	99.7	4.61.E-06	2.43E+17	1.58E+17
260.55	4.59.E-04	47.5	42.3	5.04.E-04	8.6	98.4	4.67.E-06	2.47E+17	
261.06	3.06.E-04	47.4	42.7	3.48.E-04	8.6	98.6	3.10.E-06	1.64E+17	
261.58	2.04.E-04	47.4	42.2	6.71.E-04	8.6	98.2	2.08.E-06	1.10E+17	
262.09	4.08.E-04	47.1	42.2	4.86.E-04	8.5	97.8	4.17.E-06	2.20E+17	
262.61	3.57.E-04	47.7	43.1	7.59.E-05	8.7	99.6	3.59.E-06	1.89E+17	1.87E+17
263.13	2.04.E-04	47.8	43.1	2.84.E-04	8.7	99.6	2.05.E-06	1.08E+17	
263.64	3.06.E-04	47.3	42.7	2.74.E-04	8.6	98.7	3.10.E-06	1.64E+17	
264.16	5.10.E-04	46.9	41.9	1.08.E-04	8.5	97.3	5.24.E-06	2.77E+17	
264.67	5.10.E-04	47.2	42.6	5.06.E-04	8.6	98.4	5.18.E-06	2.74E+17	
265.19	3.57.E-04	47.1	42.2	4.14.E-04	8.5	97.8	3.65.E-06	1.93E+17	2.14E+17
265.71	5.10.E-05	47.2	42.5	2.26.E-04	8.6	98.3	5.19.E-07	2.74E+16	
266.22	5.10.E-04	47.2	42.8	2.52.E-04	8.6	98.7	5.17.E-06	2.73E+17	
266.74	2.04.E-04	47.5	42.8	2.93.E-04	8.6	99.0	2.06.E-06	1.09E+17	
267.25	7.14.E-04	47.2	42.2	7.41.E-04	8.6	98.0	7.29.E-06	3.85E+17	
267.77	3.57.E-04	46.9	42.1	4.75.E-04	8.5	97.6	3.66.E-06	1.93E+17	1.71E+17
268.29	2.04.E-04	47.0	42.1	7.65.E-04	8.5	97.7	2.09.E-06	1.10E+17	
268.80	2.55.E-04	47.3	43.1	4.36.E-04	8.6	99.0	2.58.E-06	1.36E+17	
269.32	4.59.E-04	46.8	42.2	4.51.E-04	8.5	97.6	4.71.E-06	2.49E+17	
269.83	3.57.E-04	46.8	41.7	3.91.E-04	8.5	96.9	3.68.E-06	1.95E+17	
270.35	3.57.E-04	47.2	42.0	7.22.E-04	8.5	97.7	3.66.E-06	1.93E+17	1.30E+17
270.87	1.53.E-04	48.2	43.5	3.40.E-04	8.8	100.5	1.52.E-06	8.05E+16	
271.38	4.08.E-04	48.3	43.4	3.28.E-04	8.8	100.5	4.06.E-06	2.15E+17	
271.90	2.04.E-04	48.0	43.2	3.24.E-04	8.7	100.0	2.04.E-06	1.08E+17	
272.41	1.53.E-04	47.5	42.5	4.55.E-04	8.6	98.6	1.55.E-06	8.20E+16	
272.93	2.04.E-04	47.0	42.4	3.79.E-04	8.5	97.9	2.08.E-06	1.10E+17	1.93E+17
273.45	2.55.E-04	46.9	42.4	6.21.E-04	8.5	97.8	2.61.E-06	1.38E+17	
273.96	2.55.E-04	46.9	42.1	3.58.E-04	8.5	97.5	2.62.E-06	1.38E+17	
274.48	3.06.E-04	46.6	41.9	5.94.E-04	8.5	96.9	3.16.E-06	1.67E+17	
274.99	4.08.E-04	47.3	42.6	4.01.E-04	8.6	98.5	4.15.E-06	2.19E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
275.51	5.61.E-04	46.7	42.3	4.85.E-04	8.5	97.4	5.76.E-06	3.04E+17	1.70E+17
276.02	2.55.E-04	47.2	42.7	5.33.E-04	8.6	98.5	2.59.E-06	1.37E+17	
276.54	3.57.E-04	46.9	41.6	5.16.E-04	8.5	96.9	3.68.E-06	1.95E+17	
277.06	4.59.E-04	47.0	42.1	3.97.E-04	8.5	97.6	4.70.E-06	2.49E+17	
277.57	2.04.E-04	47.6	43.0	7.31.E-05	8.7	99.2	2.06.E-06	1.09E+17	
278.09	4.08.E-04	47.9	43.1	4.99.E-04	8.7	99.7	4.09.E-06	2.16E+17	1.38E+17
278.60	1.53.E-04	47.6	42.6	3.87.E-04	8.6	98.9	1.55.E-06	8.18E+16	
279.12	2.04.E-04	47.4	42.7	5.44.E-04	8.6	98.6	2.07.E-06	1.09E+17	
279.64	5.10.E-05	46.8	41.8	2.49.E-04	8.5	97.1	5.25.E-07	2.78E+16	
280.15	2.55.E-04	47.1	42.7	3.06.E-04	8.6	98.3	2.59.E-06	1.37E+17	
280.67	4.08.E-04	46.7	42.0	4.60.E-04	8.5	97.1	4.20.E-06	2.22E+17	1.28E+17
281.18	3.57.E-04	46.8	41.6	9.70.E-04	8.5	96.8	3.69.E-06	1.95E+17	
281.70	2.55.E-04	46.9	42.0	5.54.E-04	8.5	97.3	2.62.E-06	1.38E+17	
282.22	2.55.E-04	47.1	42.8	4.95.E-04	8.6	98.5	2.59.E-06	1.37E+17	
282.73	2.55.E-04	46.4	41.8	2.10.E-04	8.4	96.6	2.64.E-06	1.40E+17	
283.25	3.06.E-04	46.6	41.9	4.53.E-04	8.5	97.0	3.16.E-06	1.67E+17	1.45E+17
283.76	1.02.E-04	46.2	41.3	7.48.E-04	8.4	95.9	1.06.E-06	5.62E+16	
284.28	3.06.E-04	46.5	41.8	5.13.E-04	8.4	96.8	3.16.E-06	1.67E+17	
284.80	2.55.E-04	46.6	41.7	5.66.E-04	8.4	96.7	2.64.E-06	1.39E+17	
285.31	2.55.E-04	46.7	42.1	3.99.E-04	8.5	97.3	2.62.E-06	1.39E+17	
285.83	3.06.E-04	46.4	41.8	7.04.E-04	8.4	96.7	3.17.E-06	1.67E+17	1.34E+17
286.34	2.04.E-04	46.6	42.0	2.04.E-04	8.5	97.1	2.10.E-06	1.11E+17	
286.86	2.04.E-04	46.9	42.6	3.42.E-04	8.6	98.0	2.08.E-06	1.10E+17	
287.38	2.04.E-04	46.4	41.7	5.56.E-04	8.4	96.5	2.12.E-06	1.12E+17	
287.89	3.06.E-04	46.1	40.9	6.64.E-04	8.3	95.4	3.21.E-06	1.70E+17	
288.41	2.55.E-04	46.2	41.8	2.37.E-04	8.4	96.4	2.65.E-06	1.40E+17	1.23E+17
288.92	2.55.E-04	46.2	41.6	3.45.E-04	8.4	96.2	2.65.E-06	1.40E+17	
289.44	2.55.E-04	46.3	41.5	3.01.E-04	8.4	96.3	2.65.E-06	1.40E+17	
289.95	1.53.E-04	46.7	42.5	5.13.E-04	8.5	97.7	1.57.E-06	8.28E+16	
290.47	1.53.E-04	46.6	42.1	3.97.E-04	8.5	97.1	1.58.E-06	8.33E+16	
290.99	3.57.E-04	46.2	41.9	1.34.E-04	8.4	96.6	3.70.E-06	1.95E+17	1.62E+17
291.50	2.04.E-04	45.9	41.3	3.37.E-04	8.3	95.6	2.14.E-06	1.13E+17	
292.02	3.06.E-04	46.1	41.4	2.16.E-04	8.4	95.8	3.20.E-06	1.69E+17	
292.53	3.57.E-04	46.3	41.0	4.71.E-04	8.3	95.7	3.73.E-06	1.97E+17	
293.05	4.59.E-04	46.5	41.9	3.17.E-04	8.5	96.9	4.74.E-06	2.50E+17	
293.57	2.04.E-04	46.5	42.7	1.93.E-04	8.5	97.7	2.09.E-06	1.10E+17	1.39E+17
294.08	1.53.E-04	46.7	42.8	3.76.E-04	8.6	98.1	1.56.E-06	8.24E+16	
294.60	2.55.E-04	46.8	42.2	6.40.E-04	8.5	97.5	2.62.E-06	1.38E+17	
295.11	2.04.E-04	46.3	42.4	2.70.E-04	8.5	97.2	2.10.E-06	1.11E+17	
295.63	1.02.E-04	46.6	42.8	2.73.E-04	8.5	97.9	1.04.E-06	5.51E+16	
296.15	4.59.E-04	46.2	42.1	2.24.E-04	8.4	96.7	4.75.E-06	2.51E+17	1.25E+17
296.66	2.55.E-04	46.0	41.5	6.89.E-04	8.4	95.8	2.66.E-06	1.41E+17	
297.18	3.06.E-04	46.0	41.8	5.64.E-04	8.4	96.2	3.18.E-06	1.68E+17	
297.69	2.04.E-04	45.5	40.7	7.47.E-04	8.2	94.5	2.16.E-06	1.14E+17	
298.21	1.53.E-04	45.6	40.3	4.35.E-04	8.2	94.2	1.63.E-06	8.59E+16	
298.73	2.55.E-04	45.6	41.2	6.53.E-04	8.3	95.1	2.68.E-06	1.42E+17	1.64E+17
299.24	2.04.E-04	45.7	41.1	4.58.E-04	8.3	95.1	2.15.E-06	1.13E+17	
299.76	4.59.E-04	45.8	41.4	1.57.E-04	8.3	95.6	4.80.E-06	2.54E+17	
300.27	2.55.E-04	45.6	41.4	3.49.E-04	8.3	95.3	2.68.E-06	1.41E+17	
300.79	3.57.E-04	45.7	41.5	4.44.E-04	8.3	95.5	3.74.E-06	1.98E+17	
301.31	2.04.E-04	45.5	41.1	6.22.E-04	8.3	95.0	2.15.E-06	1.14E+17	1.08E+17
301.82	2.04.E-04	45.7	41.3	5.06.E-04	8.3	95.4	2.14.E-06	1.13E+17	
302.34	1.53.E-04	45.4	41.1	4.18.E-04	8.3	94.7	1.62.E-06	8.53E+16	
302.85	4.08.E-04	45.5	41.3	4.46.E-04	8.3	95.1	4.29.E-06	2.27E+17	
303.37	1.02.E-04	45.7	41.4	3.25.E-04	8.3	95.5	1.07.E-06	5.65E+16	
303.89	2.04.E-04	45.5	40.8	3.69.E-04	8.2	94.5	2.16.E-06	1.14E+17	1.31E+17
304.40	1.02.E-04	45.4	41.3	8.84.E-04	8.3	95.0	1.07.E-06	5.68E+16	
304.92	2.04.E-04	45.3	40.8	2.95.E-04	8.2	94.3	2.16.E-06	1.14E+17	
305.43	2.55.E-04	45.2	40.8	6.18.E-04	8.2	94.2	2.71.E-06	1.43E+17	
305.95	2.04.E-04	45.5	41.4	3.02.E-04	8.3	95.3	2.14.E-06	1.13E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
306.46	2.04.E-04	45.6	41.3	4.21.E-04	8.3	95.2	2.14.E-06	1.13E+17	9.00E+16
306.98	3.06.E-04	45.2	40.6	2.54.E-04	8.2	94.1	3.25.E-06	1.72E+17	
307.50	3.06.E-04	45.8	42.0	6.03.E-04	8.4	96.3	3.18.E-06	1.68E+17	
308.01	2.55.E-04	45.9	42.0	5.86.E-04	8.4	96.3	2.65.E-06	1.40E+17	
308.53	5.10.E-05	45.7	41.2	4.53.E-04	8.3	95.2	5.36.E-07	2.83E+16	
309.04	5.10.E-05	45.4	41.0	4.37.E-04	8.3	94.6	5.39.E-07	2.85E+16	1.65E+17
309.56	1.53.E-04	45.4	41.2	1.97.E-04	8.3	94.9	1.61.E-06	8.52E+16	
310.08	5.61.E-04	45.4	41.2	4.14.E-04	8.3	94.9	5.91.E-06	3.12E+17	
310.59	1.02.E-04	45.6	41.1	5.02.E-04	8.3	95.0	1.07.E-06	5.68E+16	
311.11	3.57.E-04	45.1	41.1	6.21.E-04	8.2	94.5	3.78.E-06	2.00E+17	
311.62	2.55.E-04	45.3	41.3	1.42.E-04	8.3	94.9	2.69.E-06	1.42E+17	1.31E+17
312.14	2.04.E-04	45.6	41.5	6.17.E-04	8.3	95.4	2.14.E-06	1.13E+17	
312.66	3.06.E-04	45.3	41.1	2.60.E-04	8.3	94.6	3.23.E-06	1.71E+17	
313.17	2.04.E-04	45.4	41.2	3.06.E-04	8.3	94.9	2.15.E-06	1.14E+17	
313.69	3.06.E-04	45.6	40.8	3.88.E-04	8.3	94.7	3.23.E-06	1.71E+17	
314.20	0.00.E+00	45.3	41.3	5.10.E-04	8.3	94.8	0.00.E+00	0.00E+00	1.61E+17
314.72	3.57.E-04	45.0	40.5	4.98.E-04	8.2	93.8	3.81.E-06	2.01E+17	
315.24	1.53.E-04	45.2	41.1	4.16.E-04	8.2	94.5	1.62.E-06	8.55E+16	
315.75	2.04.E-04	45.0	40.9	1.39.E-04	8.2	94.1	2.17.E-06	1.15E+17	
316.27	4.59.E-04	45.1	40.6	5.41.E-04	8.2	93.9	4.89.E-06	2.58E+17	
316.78	1.53.E-04	45.0	40.7	6.11.E-04	8.2	93.9	1.63.E-06	8.61E+16	9.16E+16
317.30	4.59.E-04	44.7	40.2	6.10.E-04	8.1	93.1	4.93.E-06	2.61E+17	
317.82	2.55.E-04	45.4	41.3	3.29.E-04	8.3	95.0	2.68.E-06	1.42E+17	
318.33	1.02.E-04	45.0	41.2	4.62.E-04	8.2	94.5	1.08.E-06	5.71E+16	
318.85	0.00.E+00	44.8	41.0	2.80.E-04	8.2	94.1	0.00.E+00	0.00E+00	
319.36	2.55.E-04	44.5	40.1	7.00.E-04	8.1	92.8	2.75.E-06	1.45E+17	1.20E+17
319.88	2.04.E-04	45.2	41.2	5.06.E-04	8.3	94.7	2.16.E-06	1.14E+17	
320.40	3.57.E-04	45.4	41.0	3.31.E-04	8.3	94.7	3.77.E-06	1.99E+17	
320.91	1.53.E-04	45.1	40.8	4.41.E-04	8.2	94.0	1.63.E-06	8.60E+16	
321.43	2.04.E-04	44.9	40.7	3.97.E-04	8.2	93.7	2.18.E-06	1.15E+17	
321.94	2.55.E-04	44.5	40.6	3.51.E-04	8.1	93.3	2.73.E-06	1.44E+17	1.32E+17
322.46	1.02.E-04	44.8	40.8	7.23.E-04	8.2	93.8	1.09.E-06	5.75E+16	
322.97	3.06.E-04	44.5	40.3	4.79.E-04	8.1	92.9	3.29.E-06	1.74E+17	
323.49	2.55.E-04	45.0	40.9	3.74.E-04	8.2	94.2	2.71.E-06	1.43E+17	
324.01	1.53.E-04	44.9	40.4	4.54.E-04	8.2	93.4	1.64.E-06	8.66E+16	
324.52	2.55.E-04	45.2	41.8	4.29.E-04	8.3	95.3	2.68.E-06	1.41E+17	1.45E+17
325.04	2.04.E-04	44.7	40.4	2.83.E-04	8.1	93.3	2.19.E-06	1.16E+17	
325.55	1.02.E-04	44.6	40.4	3.49.E-04	8.1	93.1	1.10.E-06	5.79E+16	
326.07	2.04.E-04	44.8	40.7	4.73.E-04	8.2	93.7	2.18.E-06	1.15E+17	
326.59	2.55.E-04	44.6	40.3	8.03.E-04	8.1	93.0	2.74.E-06	1.45E+17	
327.10	3.06.E-04	44.5	40.5	2.59.E-04	8.1	93.1	3.29.E-06	1.74E+17	1.39E+17
327.62	4.08.E-04	44.5	40.6	5.57.E-04	8.1	93.2	4.38.E-06	2.31E+17	
328.13	1.02.E-04	44.6	40.4	5.24.E-04	8.1	93.1	1.10.E-06	5.79E+16	
328.65	4.08.E-04	44.1	40.0	5.53.E-04	8.0	92.2	4.43.E-06	2.34E+17	
329.17	1.53.E-04	44.1	40.0	1.12.E-03	8.0	92.1	1.66.E-06	8.78E+16	
329.68	1.02.E-04	44.4	40.2	4.48.E-04	8.1	92.7	1.10.E-06	5.82E+16	1.11E+17
330.20	4.59.E-04	44.9	41.0	4.53.E-04	8.2	94.1	4.88.E-06	2.58E+17	
330.71	5.10.E-05	44.4	40.9	4.23.E-04	8.2	93.5	5.46.E-07	2.88E+16	
331.23	3.57.E-04	44.1	40.2	3.59.E-04	8.1	92.4	3.87.E-06	2.04E+17	
331.75	1.53.E-04	44.1	39.8	6.66.E-04	8.0	91.9	1.67.E-06	8.80E+16	
332.26	2.04.E-04	44.3	40.4	2.70.E-04	8.1	92.8	2.20.E-06	1.16E+17	1.29E+17
332.78	2.04.E-04	44.3	40.2	5.39.E-04	8.1	92.6	2.20.E-06	1.16E+17	
333.29	2.55.E-04	44.4	40.4	5.08.E-04	8.1	92.8	2.75.E-06	1.45E+17	
333.81	3.06.E-04	43.7	39.4	4.10.E-04	7.9	91.1	3.36.E-06	1.78E+17	
334.33	1.53.E-04	44.0	39.9	2.98.E-04	8.0	92.0	1.66.E-06	8.79E+16	
334.84	1.02.E-04	44.1	40.0	1.35.E-04	8.0	92.1	1.11.E-06	5.85E+16	1.37E+17
335.36	3.06.E-04	44.0	40.0	6.36.E-04	8.0	92.0	3.33.E-06	1.76E+17	
335.87	3.57.E-04	43.7	39.2	8.42.E-04	7.9	90.8	3.93.E-06	2.08E+17	
336.39	1.53.E-04	43.8	39.9	5.86.E-04	8.0	91.7	1.67.E-06	8.82E+16	
336.90	1.53.E-04	43.8	39.4	4.05.E-04	8.0	91.1	1.68.E-06	8.87E+16	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
337.42	3.06.E-04	43.3	39.0	6.03.E-04	7.9	90.1	3.40.E-06	1.79E+17	1.23E+17
337.94	2.04.E-04	43.5	39.3	5.00.E-04	7.9	90.7	2.25.E-06	1.19E+17	
338.45	2.04.E-04	43.9	40.3	1.29.E-04	8.0	92.2	2.21.E-06	1.17E+17	
338.97	5.10.E-05	43.9	39.8	4.07.E-04	8.0	91.8	5.56.E-07	2.94E+16	
339.48	2.04.E-04	43.6	39.7	5.29.E-04	8.0	91.2	2.24.E-06	1.18E+17	
340.00	2.55.E-04	43.9	40.0	3.22.E-04	8.0	91.9	2.78.E-06	1.47E+17	1.72E+17
340.52	3.57.E-04	44.1	40.3	4.97.E-04	8.1	92.5	3.86.E-06	2.04E+17	
341.03	4.08.E-04	43.7	39.7	8.70.E-04	8.0	91.3	4.47.E-06	2.36E+17	
341.55	3.06.E-04	43.4	39.5	5.26.E-04	7.9	90.8	3.37.E-06	1.78E+17	
342.06	3.06.E-04	43.1	39.2	3.62.E-04	7.9	90.1	3.40.E-06	1.80E+17	
342.58	1.53.E-04	43.3	39.3	7.32.E-04	7.9	90.5	1.69.E-06	8.94E+16	1.19E+17
343.10	3.06.E-04	43.5	40.0	3.65.E-04	8.0	91.5	3.35.E-06	1.77E+17	
343.61	1.02.E-04	43.1	39.3	4.03.E-04	7.9	90.4	1.13.E-06	5.97E+16	
344.13	1.53.E-04	43.1	39.2	3.40.E-04	7.9	90.1	1.70.E-06	8.97E+16	
344.64	3.06.E-04	43.4	39.6	4.10.E-04	7.9	90.9	3.37.E-06	1.78E+17	
345.16	3.06.E-04	43.5	39.6	2.89.E-04	7.9	91.0	3.36.E-06	1.78E+17	1.24E+17
345.68	1.53.E-04	43.5	39.2	7.16.E-04	7.9	90.6	1.69.E-06	8.93E+16	
346.19	1.02.E-04	43.9	40.6	4.09.E-04	8.1	92.6	1.10.E-06	5.82E+16	
346.71	4.08.E-04	43.5	40.1	2.69.E-04	8.0	91.6	4.46.E-06	2.35E+17	
347.22	5.10.E-05	43.4	40.0	7.88.E-04	8.0	91.4	5.58.E-07	2.95E+16	
347.74	3.06.E-04	43.1	39.3	7.36.E-04	7.9	90.3	3.39.E-06	1.79E+17	1.19E+17
348.26	2.04.E-04	43.0	39.1	4.69.E-04	7.8	89.9	2.27.E-06	1.20E+17	
348.77	3.06.E-04	43.2	39.6	6.56.E-04	7.9	90.7	3.38.E-06	1.78E+17	
349.29	2.04.E-04	43.0	39.6	2.35.E-04	7.9	90.5	2.26.E-06	1.19E+17	
349.80	1.02.E-04	42.9	39.0	6.55.E-04	7.8	89.7	1.14.E-06	6.01E+16	
350.32	2.04.E-04	42.8	39.0	2.32.E-04	7.8	89.6	2.28.E-06	1.20E+17	1.61E+17
350.84	2.04.E-04	43.3	40.0	2.38.E-04	8.0	91.2	2.24.E-06	1.18E+17	
351.35	2.55.E-04	43.5	40.0	3.42.E-04	8.0	91.5	2.79.E-06	1.47E+17	
351.87	1.53.E-04	43.4	40.0	6.00.E-04	8.0	91.3	1.68.E-06	8.86E+16	
352.38	3.06.E-04	42.9	38.9	7.58.E-04	7.8	89.6	3.42.E-06	1.80E+17	
352.90	4.08.E-04	42.8	39.0	2.66.E-04	7.8	89.6	4.55.E-06	2.41E+17	1.46E+17
353.41	2.55.E-04	42.6	39.2	2.51.E-04	7.8	89.6	2.85.E-06	1.50E+17	
353.93	3.06.E-04	42.4	38.4	7.36.E-04	7.7	88.5	3.46.E-06	1.83E+17	
354.45	2.04.E-04	42.4	39.0	3.80.E-04	7.8	89.2	2.29.E-06	1.21E+17	
354.96	2.04.E-04	42.3	38.6	3.82.E-04	7.7	88.7	2.30.E-06	1.22E+17	
355.48	1.02.E-04	42.1	38.7	1.54.E-04	7.7	88.6	1.15.E-06	6.09E+16	1.59E+17
355.99	4.08.E-04	42.1	38.2	3.26.E-04	7.7	88.1	4.64.E-06	2.45E+17	
356.51	2.04.E-04	41.8	38.2	5.28.E-04	7.6	87.7	2.33.E-06	1.23E+17	
357.03	1.53.E-04	41.6	38.0	6.67.E-04	7.6	87.3	1.75.E-06	9.27E+16	
357.54	4.59.E-04	42.3	38.6	6.65.E-04	7.7	88.6	5.18.E-06	2.74E+17	
358.06	1.53.E-04	41.8	37.6	3.06.E-04	7.6	86.9	1.76.E-06	9.30E+16	1.05E+17
358.57	3.57.E-04	42.2	38.3	6.74.E-04	7.7	88.2	4.05.E-06	2.14E+17	
359.09	2.55.E-04	42.2	38.7	5.19.E-04	7.7	88.6	2.88.E-06	1.52E+17	
359.61	2.55.E-04	41.9	38.0	3.78.E-04	7.6	87.5	2.92.E-06	1.54E+17	
360.12	1.53.E-04	41.5	37.4	5.55.E-04	7.5	86.5	1.77.E-06	9.35E+16	
360.64	1.02.E-04	41.8	37.9	5.77.E-04	7.6	87.4	1.17.E-06	6.17E+16	1.56E+17
361.15	1.02.E-04	41.5	37.6	3.32.E-04	7.6	86.8	1.18.E-06	6.21E+16	
361.67	2.55.E-04	41.4	37.5	1.89.E-04	7.5	86.5	2.95.E-06	1.56E+17	
362.19	1.02.E-04	41.5	38.1	6.23.E-04	7.6	87.3	1.17.E-06	6.18E+16	
362.70	2.55.E-04	41.1	37.3	4.87.E-04	7.5	85.9	2.97.E-06	1.57E+17	
363.22	5.10.E-04	41.5	37.8	5.79.E-04	7.6	86.9	5.87.E-06	3.10E+17	1.06E+17
363.73	1.53.E-04	41.4	37.5	6.83.E-04	7.5	86.5	1.77.E-06	9.35E+16	
364.25	1.53.E-04	41.3	37.3	2.60.E-04	7.5	86.2	1.78.E-06	9.38E+16	
364.77	2.04.E-04	41.1	37.0	2.91.E-04	7.5	85.5	2.39.E-06	1.26E+17	
365.28	1.02.E-04	41.5	37.6	4.59.E-04	7.6	86.6	1.18.E-06	6.22E+16	
365.80	1.02.E-04	41.7	37.7	5.64.E-04	7.6	86.9	1.17.E-06	6.20E+16	1.35E+17
366.31	3.06.E-04	41.8	38.2	5.65.E-04	7.6	87.6	3.49.E-06	1.85E+17	
366.83	4.08.E-04	42.3	38.5	3.85.E-04	7.7	88.5	4.61.E-06	2.44E+17	
367.35	1.53.E-04	41.9	38.1	6.28.E-04	7.7	87.7	1.75.E-06	9.22E+16	
367.86	2.04.E-04	41.9	37.6	2.15.E-04	7.6	87.1	2.34.E-06	1.24E+17	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
368.38	3.06.E-04	41.7	37.7	2.92.E-04	7.6	87.1	3.52.E-06	1.86E+17	9.42E+16
368.89	5.10.E-05	41.7	38.0	5.37.E-04	7.6	87.3	5.85.E-07	3.09E+16	
369.41	2.04.E-04	41.2	37.0	2.93.E-04	7.5	85.6	2.38.E-06	1.26E+17	
369.92	2.55.E-04	41.3	37.3	4.92.E-04	7.5	86.1	2.96.E-06	1.57E+17	
370.44	1.02.E-04	40.8	36.9	5.60.E-04	7.4	85.2	1.20.E-06	6.33E+16	
370.96	1.02.E-04	41.0	37.3	2.73.E-04	7.5	85.8	1.19.E-06	6.28E+16	1.26E+17
371.47	1.02.E-04	41.1	37.6	2.14.E-04	7.5	86.1	1.18.E-06	6.26E+16	
371.99	1.53.E-04	40.7	36.8	3.34.E-04	7.4	84.9	1.80.E-06	9.53E+16	
372.50	2.55.E-04	40.9	37.2	3.76.E-04	7.5	85.6	2.98.E-06	1.58E+17	
373.02	1.53.E-04	41.2	37.4	6.16.E-04	7.5	86.1	1.78.E-06	9.39E+16	
373.54	2.55.E-04	41.0	37.1	3.59.E-04	7.5	85.6	2.98.E-06	1.57E+17	1.82E+17
374.05	2.04.E-04	41.4	37.8	6.42.E-04	7.6	86.8	2.35.E-06	1.24E+17	
374.57	2.04.E-04	41.2	37.5	3.56.E-04	7.5	86.3	2.36.E-06	1.25E+17	
375.08	2.55.E-04	41.3	38.0	5.13.E-04	7.6	86.9	2.94.E-06	1.55E+17	
375.60	3.57.E-04	40.9	37.7	5.52.E-04	7.5	86.0	4.15.E-06	2.19E+17	
376.12	2.55.E-04	40.5	37.9	4.09.E-04	7.5	85.9	2.97.E-06	1.57E+17	1.41E+17
376.63	4.08.E-04	40.2	37.1	2.53.E-04	7.4	84.7	4.82.E-06	2.55E+17	
377.15	1.53.E-04	40.0	36.5	3.30.E-04	7.3	83.8	1.83.E-06	9.65E+16	
377.66	2.04.E-04	39.9	36.6	2.50.E-04	7.3	83.9	2.43.E-06	1.29E+17	
378.18	1.53.E-04	40.2	37.1	4.37.E-04	7.4	84.7	1.81.E-06	9.55E+16	
378.70	3.57.E-04	40.1	37.0	3.16.E-04	7.4	84.5	4.23.E-06	2.23E+17	1.46E+17
379.21	2.55.E-04	40.3	37.2	5.01.E-04	7.4	85.0	3.00.E-06	1.59E+17	
379.73	3.06.E-04	40.5	37.4	5.36.E-04	7.4	85.4	3.59.E-06	1.89E+17	
380.24	3.06.E-04	40.3	36.8	5.34.E-04	7.4	84.4	3.63.E-06	1.92E+17	
380.76	2.04.E-04	40.3	36.8	5.45.E-04	7.4	84.5	2.42.E-06	1.28E+17	
381.28	2.55.E-04	40.4	36.8	5.02.E-04	7.4	84.5	3.02.E-06	1.59E+17	1.37E+17
381.79	1.02.E-04	40.3	36.9	2.65.E-04	7.4	84.6	1.21.E-06	6.37E+16	
382.31	3.06.E-04	39.7	36.2	6.27.E-04	7.3	83.2	3.68.E-06	1.94E+17	
382.82	2.04.E-04	39.8	36.8	3.53.E-04	7.3	84.0	2.43.E-06	1.28E+17	
383.34	1.02.E-04	39.5	37.0	3.61.E-04	7.3	83.8	1.22.E-06	6.43E+16	
383.85	1.53.E-04	39.3	36.3	4.31.E-04	7.2	82.8	1.85.E-06	9.76E+16	7.96E+16
384.37	3.06.E-04	38.6	35.5	4.37.E-04	7.1	81.2	3.77.E-06	1.99E+17	
384.89	3.06.E-04	38.5	35.7	3.03.E-04	7.1	81.4	3.76.E-06	1.99E+17	
385.40	1.02.E-04	38.6	36.0	5.00.E-04	7.1	81.7	1.25.E-06	6.60E+16	
385.92	1.02.E-04	38.4	35.5	5.49.E-04	7.1	80.9	1.26.E-06	6.66E+16	
386.43	5.10.E-05	38.5	35.9	3.67.E-04	7.1	81.6	6.25.E-07	3.30E+16	1.19E+17
386.95	5.10.E-05	38.4	35.2	6.20.E-04	7.0	80.7	6.32.E-07	3.34E+16	
387.47	5.10.E-05	38.5	35.5	3.40.E-04	7.1	81.2	6.29.E-07	3.32E+16	
387.98	3.06.E-04	38.6	36.3	3.85.E-04	7.2	82.1	3.73.E-06	1.97E+17	
388.50	2.04.E-04	38.7	36.0	2.47.E-04	7.1	81.9	2.49.E-06	1.32E+17	
389.01	2.04.E-04	38.5	35.5	6.18.E-04	7.1	81.1	2.52.E-06	1.33E+17	7.30E+16
389.53	1.53.E-04	38.8	36.7	2.98.E-04	7.2	82.7	1.85.E-06	9.78E+16	
390.05	1.02.E-04	38.3	35.7	4.23.E-04	7.1	81.1	1.26.E-06	6.65E+16	
390.56	1.53.E-04	38.4	35.9	1.96.E-04	7.1	81.4	1.88.E-06	9.93E+16	
391.08	1.02.E-04	38.6	36.1	4.26.E-04	7.1	81.8	1.25.E-06	6.59E+16	
391.59	5.10.E-05	38.2	35.1	3.20.E-04	7.0	80.3	6.35.E-07	3.36E+16	1.14E+17
392.11	1.53.E-04	38.4	35.5	3.56.E-04	7.1	80.9	1.89.E-06	9.99E+16	
392.63	1.02.E-04	38.2	35.2	2.73.E-04	7.0	80.5	1.27.E-06	6.70E+16	
393.14	3.57.E-04	38.1	35.0	2.89.E-04	7.0	80.1	4.46.E-06	2.36E+17	
393.66	5.10.E-05	38.1	35.5	3.98.E-04	7.0	80.7	6.32.E-07	3.34E+16	
394.17	2.04.E-04	38.1	35.5	5.34.E-04	7.0	80.7	2.53.E-06	1.34E+17	1.13E+17
394.69	1.53.E-04	38.3	36.1	2.94.E-04	7.1	81.5	1.88.E-06	9.92E+16	
395.21	1.53.E-04	38.1	35.6	4.66.E-04	7.0	80.7	1.90.E-06	1.00E+17	
395.72	0.00.E+00	38.4	36.4	6.52.E-04	7.2	82.0	0.00.E+00	0.00E+00	
396.24	3.06.E-04	38.1	35.8	3.49.E-04	7.1	80.9	3.78.E-06	2.00E+17	
396.75	2.55.E-04	38.3	36.1	4.98.E-04	7.1	81.6	3.13.E-06	1.65E+17	1.07E+17
397.27	1.53.E-04	38.4	36.1	3.42.E-04	7.1	81.7	1.87.E-06	9.90E+16	
397.79	1.02.E-04	38.3	35.8	4.06.E-04	7.1	81.2	1.26.E-06	6.64E+16	
398.30	1.53.E-04	37.9	35.7	5.15.E-04	7.0	80.6	1.90.E-06	1.00E+17	
398.82	1.02.E-04	38.2	36.2	3.90.E-04	7.1	81.5	1.25.E-06	6.62E+16	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate [*] (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
399.33	2.04.E-04	37.7	34.9	8.10.E-04	6.9	79.6	2.56.E-06	1.35E+17	8.68E+16
399.85	2.55.E-04	38.0	35.9	3.41.E-04	7.1	80.9	3.15.E-06	1.66E+17	
400.36	1.53.E-04	37.9	35.4	4.83.E-04	7.0	80.4	1.90.E-06	1.01E+17	
400.88	0.00.E+00	37.7	35.0	2.92.E-04	6.9	79.6	0.00.E+00	0.00E+00	
401.40	2.04.E-04	37.9	36.2	2.76.E-04	7.1	81.2	2.51.E-06	1.33E+17	
401.91	1.02.E-04	38.1	36.2	2.13.E-04	7.1	81.4	1.25.E-06	6.62E+16	9.47E+16
402.43	2.04.E-04	37.9	35.3	4.74.E-04	7.0	80.2	2.54.E-06	1.34E+17	
402.94	1.53.E-04	37.8	35.2	5.18.E-04	7.0	80.0	1.91.E-06	1.01E+17	
403.46	1.02.E-04	38.1	35.3	3.80.E-05	7.0	80.4	1.27.E-06	6.71E+16	
403.98	1.02.E-04	37.6	35.2	5.02.E-04	7.0	79.8	1.28.E-06	6.76E+16	
404.49	1.02.E-04	37.4	34.3	4.07.E-04	6.9	78.5	1.30.E-06	6.86E+16	1.22E+17
405.01	2.55.E-04	37.7	35.0	1.59.E-04	7.0	79.7	3.20.E-06	1.69E+17	
405.52	1.53.E-04	37.6	35.0	4.64.E-04	6.9	79.5	1.93.E-06	1.02E+17	
406.04	1.53.E-04	37.7	35.6	9.53.E-05	7.0	80.3	1.91.E-06	1.01E+17	
406.56	2.55.E-04	37.3	34.6	3.60.E-04	6.9	78.8	3.24.E-06	1.71E+17	
407.07	1.02.E-04	37.8	35.6	3.97.E-04	7.0	80.4	1.27.E-06	6.70E+16	9.45E+16
407.59	2.55.E-04	37.4	35.0	2.82.E-04	6.9	79.3	3.22.E-06	1.70E+17	
408.10	1.53.E-04	37.7	35.6	2.52.E-04	7.0	80.2	1.91.E-06	1.01E+17	
408.62	1.02.E-04	37.6	35.3	4.03.E-04	7.0	79.9	1.28.E-06	6.74E+16	
409.14	2.55.E-04	37.6	35.0	4.53.E-04	6.9	79.5	3.21.E-06	1.69E+17	
409.65	1.02.E-04	37.5	35.6	7.01.E-04	7.0	80.1	1.27.E-06	6.73E+16	1.16E+17
410.17	1.02.E-04	37.4	35.4	5.30.E-04	7.0	79.8	1.28.E-06	6.76E+16	
410.68	1.53.E-04	37.7	35.5	4.88.E-04	7.0	80.2	1.91.E-06	1.01E+17	
411.20	3.06.E-04	37.4	34.7	3.95.E-04	6.9	79.0	3.88.E-06	2.05E+17	
411.72	1.53.E-04	37.2	34.4	6.78.E-04	6.8	78.4	1.95.E-06	1.03E+17	
412.23	2.04.E-04	37.3	34.6	4.31.E-04	6.9	78.8	2.59.E-06	1.37E+17	8.17E+16
412.75	5.10.E-05	37.4	34.9	3.11.E-04	6.9	79.2	6.44.E-07	3.40E+16	
413.26	2.04.E-04	37.2	35.0	7.47.E-05	6.9	79.1	2.58.E-06	1.36E+17	
413.78	0.00.E+00	37.1	34.9	4.03.E-04	6.9	78.9	0.00.E+00	0.00E+00	
414.30	1.53.E-04	37.1	35.1	1.39.E-04	6.9	79.1	1.94.E-06	1.02E+17	
414.81	1.02.E-04	37.1	34.7	3.41.E-04	6.9	78.7	1.30.E-06	6.85E+16	9.56E+16
415.33	1.53.E-04	37.5	35.2	6.42.E-04	7.0	79.7	1.92.E-06	1.01E+17	
415.84	3.57.E-04	37.3	34.8	5.23.E-04	6.9	78.9	4.53.E-06	2.39E+17	
416.36	5.10.E-05	37.3	35.3	2.22.E-04	6.9	79.6	6.41.E-07	3.39E+16	
416.87	5.10.E-05	37.4	35.1	5.32.E-04	6.9	79.5	6.42.E-07	3.39E+16	
417.39	1.02.E-04	37.0	34.6	0.00.E+00	6.8	78.5	1.30.E-06	6.87E+16	1.16E+17
417.91	1.53.E-04	37.1	35.0	3.33.E-04	6.9	79.0	1.94.E-06	1.02E+17	
418.42	2.04.E-04	37.4	34.9	5.63.E-04	6.9	79.2	2.58.E-06	1.36E+17	
418.94	0.00.E+00	36.9	34.2	5.97.E-04	6.8	77.9	0.00.E+00	0.00E+00	
419.45	1.02.E-04	36.8	34.1	6.32.E-04	6.8	77.7	1.31.E-06	6.94E+16	
419.97	3.06.E-04	37.3	35.5	2.36.E-04	7.0	79.8	3.84.E-06	2.03E+17	1.09E+17
420.49	2.55.E-04	37.1	34.1	6.05.E-04	6.8	78.0	3.27.E-06	1.73E+17	
421.00	2.04.E-04	37.2	35.0	4.56.E-04	6.9	79.1	2.58.E-06	1.36E+17	
421.52	3.57.E-04	37.1	34.5	4.74.E-04	6.8	78.3	4.56.E-06	2.41E+17	
422.03	5.10.E-05	37.2	34.9	3.69.E-04	6.9	79.0	6.46.E-07	3.41E+16	
422.55	1.53.E-04	37.6	35.9	2.33.E-04	7.0	80.5	1.90.E-06	1.00E+17	1.23E+17
423.07	5.10.E-05	37.2	35.1	1.84.E-04	6.9	79.2	6.44.E-07	3.40E+16	
423.58	1.02.E-04	37.3	35.3	4.53.E-04	6.9	79.6	1.28.E-06	6.77E+16	
424.10	1.53.E-04	37.2	34.8	4.56.E-04	6.9	78.9	1.94.E-06	1.03E+17	
424.61	1.02.E-04	37.0	34.8	2.68.E-04	6.9	78.7	1.30.E-06	6.85E+16	
425.13	3.06.E-04	37.2	34.9	2.77.E-04	6.9	78.9	3.88.E-06	2.05E+17	7.47E+16
425.65	2.55.E-04	37.2	35.4	3.72.E-04	6.9	79.5	3.21.E-06	1.69E+17	
426.16	1.53.E-04	37.2	34.8	3.45.E-04	6.9	78.9	1.94.E-06	1.03E+17	
426.68	1.02.E-04	37.7	35.6	6.15.E-04	7.0	80.3	1.27.E-06	6.71E+16	
427.19	1.02.E-04	37.1	35.0	5.59.E-04	6.9	79.0	1.29.E-06	6.82E+16	
427.71	1.02.E-04	37.4	35.5	5.55.E-04	7.0	79.9	1.28.E-06	6.74E+16	6.16E+16
428.23	1.02.E-04	37.1	35.3	1.07.E-04	6.9	79.3	1.29.E-06	6.79E+16	
428.74	1.53.E-04	37.0	34.9	3.64.E-04	6.9	78.8	1.94.E-06	1.03E+17	
429.26	5.10.E-05	36.9	34.5	5.23.E-04	6.8	78.3	6.52.E-07	3.44E+16	
429.77	1.02.E-04	36.6	34.4	3.34.E-04	6.8	77.9	1.31.E-06	6.92E+16	

Depth (nm)	⁴ He (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹² C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ³⁺ estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)	⁴ He conc. 5 layers smoothing
430.29	1.53.E-04	37.2	35.3	7.07.E-05	6.9	79.4	1.93.E-06	1.02E+17	9.65E+16
430.80	0.00.E+00	37.2	35.6	4.26.E-04	7.0	79.7	0.00.E+00	0.00E+00	
431.32	5.10.E-05	36.9	34.4	5.02.E-04	6.8	78.1	6.53.E-07	3.45E+16	
431.84	2.04.E-04	36.8	34.6	3.78.E-04	6.8	78.2	2.61.E-06	1.38E+17	
432.35	1.53.E-04	36.9	34.6	5.55.E-04	6.8	78.3	1.95.E-06	1.03E+17	
432.87	5.10.E-05	36.9	34.4	2.12.E-04	6.8	78.1	6.53.E-07	3.45E+16	8.28E+16
433.38	2.55.E-04	36.9	34.5	5.32.E-04	6.8	78.2	3.26.E-06	1.72E+17	
433.90	5.10.E-05	36.5	34.3	5.16.E-04	6.8	77.6	6.57.E-07	3.47E+16	
434.42	1.02.E-04	36.5	34.1	4.60.E-04	6.7	77.3	1.32.E-06	6.97E+16	
434.93	1.02.E-04	36.9	34.9	1.45.E-04	6.9	78.7	1.30.E-06	6.85E+16	
435.45	1.02.E-04	36.6	33.7	4.22.E-04	6.7	77.0	1.32.E-06	7.00E+16	9.63E+16
435.96	2.55.E-04	36.9	34.9	4.80.E-04	6.9	78.7	3.24.E-06	1.71E+17	
436.48	2.04.E-04	37.0	35.6	3.35.E-05	6.9	79.6	2.56.E-06	1.35E+17	
437.00	5.10.E-05	36.7	35.2	3.21.E-04	6.9	78.8	6.48.E-07	3.42E+16	
437.51	1.53.E-04	36.5	34.5	4.46.E-04	6.8	77.9	1.97.E-06	1.04E+17	
438.03	2.04.E-04	36.4	34.3	6.00.E-04	6.8	77.5	2.63.E-06	1.39E+17	9.77E+16
438.54	1.02.E-04	36.6	34.7	3.74.E-04	6.8	78.1	1.31.E-06	6.90E+16	
439.06	2.04.E-04	36.3	34.1	4.36.E-04	6.7	77.1	2.65.E-06	1.40E+17	
439.58	1.02.E-04	36.2	33.9	3.39.E-04	6.7	76.8	1.33.E-06	7.02E+16	
440.09	1.02.E-04	36.2	34.4	4.90.E-04	6.7	77.3	1.32.E-06	6.97E+16	
440.61	5.10.E-05	36.1	33.7	3.70.E-04	6.7	76.5	6.67.E-07	3.52E+16	9.08E+16
441.12	2.55.E-04	36.4	34.4	5.41.E-04	6.8	77.6	3.29.E-06	1.74E+17	
441.64	2.04.E-04	36.4	34.4	5.42.E-04	6.8	77.5	2.63.E-06	1.39E+17	
442.16	1.02.E-04	36.3	34.4	1.78.E-04	6.8	77.4	1.32.E-06	6.96E+16	
442.67	1.53.E-04	36.3	33.9	6.33.E-04	6.7	76.9	1.99.E-06	1.05E+17	
443.19	5.10.E-05	36.2	34.4	1.31.E-04	6.8	77.4	6.59.E-07	3.48E+16	6.30E+16
443.70	1.53.E-04	36.0	33.9	3.09.E-04	6.7	76.7	2.00.E-06	1.05E+17	
444.22	0.00.E+00	35.8	33.1	5.18.E-04	6.6	75.5	0.00.E+00	0.00E+00	
444.74	1.02.E-04	36.3	34.3	3.02.E-04	6.8	77.4	1.32.E-06	6.97E+16	
445.25	1.02.E-04	36.5	34.9	4.89.E-04	6.8	78.3	1.30.E-06	6.89E+16	
445.77	1.53.E-04	36.2	33.6	2.76.E-04	6.7	76.5	2.00.E-06	1.06E+17	1.19E+17
446.28	1.02.E-04	35.9	33.8	3.68.E-04	6.7	76.4	1.34.E-06	7.06E+16	
446.80	5.10.E-05	36.2	34.6	2.74.E-04	6.8	77.5	6.58.E-07	3.48E+16	
447.31	5.10.E-05	36.1	34.0	3.28.E-04	6.7	76.8	6.64.E-07	3.51E+16	
447.83	1.53.E-04	36.3	34.2	3.89.E-04	6.7	77.1	1.98.E-06	1.05E+17	
448.35	2.04.E-04	36.1	34.3	4.98.E-04	6.7	77.1	2.65.E-06	1.40E+17	1.05E+17
448.86	4.08.E-04	36.2	34.5	3.09.E-04	6.8	77.4	5.27.E-06	2.78E+17	
449.38	1.02.E-04	35.9	33.7	4.76.E-04	6.7	76.2	1.34.E-06	7.07E+16	
449.89	1.02.E-04	36.2	34.3	5.51.E-04	6.7	77.2	1.32.E-06	6.98E+16	
450.41	1.02.E-04	36.1	34.0	2.59.E-04	6.7	76.8	1.33.E-06	7.02E+16	
450.93	2.04.E-04	36.1	34.4	3.02.E-04	6.7	77.2	2.64.E-06	1.40E+17	5.68E+16
451.44	2.55.E-04	36.1	34.3	2.70.E-04	6.7	77.1	3.31.E-06	1.75E+17	
451.96	1.02.E-04	35.7	33.8	2.23.E-04	6.6	76.2	1.34.E-06	7.08E+16	
452.47	5.10.E-05	36.0	34.4	3.27.E-04	6.7	77.1	6.62.E-07	3.50E+16	
452.99	1.53.E-04	35.5	33.4	2.37.E-04	6.6	75.5	2.03.E-06	1.07E+17	
453.51	5.10.E-05	35.9	33.8	6.17.E-04	6.7	76.3	6.69.E-07	3.53E+16	7.03E+16
454.02	5.10.E-05	35.7	33.5	5.27.E-04	6.6	75.7	6.74.E-07	3.56E+16	
454.54	1.53.E-04	35.6	33.5	3.11.E-04	6.6	75.7	2.02.E-06	1.07E+17	
455.05	1.02.E-04	35.8	33.9	5.98.E-04	6.7	76.3	1.34.E-06	7.06E+16	
455.57	1.02.E-04	36.0	34.6	0.00.E+00	6.8	77.4	1.32.E-06	6.97E+16	
456.09	1.02.E-04	36.1	34.8	1.81.E-04	6.8	77.6	1.31.E-06	6.94E+16	9.21E+16
456.60	5.10.E-05	36.0	34.5	2.75.E-04	6.7	77.3	6.60.E-07	3.49E+16	
457.12	2.55.E-04	35.8	33.6	4.65.E-04	6.6	76.0	3.36.E-06	1.77E+17	
457.63	1.02.E-04	35.9	33.8	3.74.E-04	6.7	76.3	1.34.E-06	7.07E+16	
458.15	1.53.E-04	35.7	33.4	3.42.E-04	6.6	75.8	2.02.E-06	1.07E+17	
458.67	1.02.E-04	36.0	33.8	4.36.E-04	6.7	76.5	1.33.E-06	7.05E+16	9.21E+16
459.18	5.10.E-05	35.9	33.7	2.90.E-04	6.7	76.3	6.69.E-07	3.53E+16	

¹²C³⁺ estimate was calculated by using C ratio without IG in AP4_1b Genesis-DOS 1019 data for the estimation of total C ratio.

Appendix4_1b. Ion intensity (Cnt/MSc/Px) and the calculated ^4He concentrations of Genesis-DOS6093 without IG for calculation of C ion ratio.

Analysis day: 2016.10.19

Raster area: 30px

Analysis area: 14px

Depth (nm)	^4He (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)
459.70	1.43.E-03	34.5	33.1	6.2
460.21	2.04.E-03	34.0	32.2	6.5
460.73	1.99.E-03	34.5	32.6	6.3
461.25	1.53.E-03	34.2	32.1	6.9
461.76	1.79.E-03	34.3	32.8	6.4
462.28	1.94.E-03	34.2	33.0	6.5
462.79	1.73.E-03	34.4	33.4	6.3
463.31	2.35.E-03	34.1	33.1	6.7
463.82	2.30.E-03	34.1	33.0	6.3
464.34	1.58.E-03	34.1	32.8	6.6
464.86	1.33.E-03	33.9	32.8	6.3
465.37	1.53.E-03	34.1	33.2	6.0
465.89	2.55.E-03	33.9	32.9	6.5
466.40	1.89.E-03	34.0	32.9	6.3
466.92	1.99.E-03	34.1	32.6	6.5
467.44	1.53.E-03	33.9	32.1	6.5
467.95	2.14.E-03	34.3	32.8	6.5
468.47	1.38.E-03	34.5	33.2	6.1
468.98	2.24.E-03	34.5	32.7	6.5
469.50	1.58.E-03	34.5	33.1	6.2
average		34.2	32.8	6.4
C ratio		0.47	0.45	0.09

Appendix4 2a. Ion intensity (Cnt/MSc/Px) and the calculated ⁴He and ²⁰Ne concentrations of Genesis-DOS 60939 with Ion gate.

Analysis day: 2016.11.11 ⁴He Dose amount (/cm²): 8.20E+14 (Heber et al., 2009)
²⁰Ne Dose amount (/cm²): 1.26E+12 (Heber et al., 2009)
Analysis sample: Genesis-DOS 60939 Σ(⁴He/C): 0.053
Raster area: 30px Σ(²⁰Ne/C): 0.00047
Analysis area: 14px Relative sensitivity factor (He-DOS 15keV): 1.39E+16
Relative sensitivity factor (Ne-DOS 30keV): 3.01E+15

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C* (Cnt/MSc/Px)	¹² C2* (Cnt/MSc/Px)	¹² C3* (Cnt/MSc/Px)	¹² C* estimate* (Cnt/MSc/Px)	¹² C3* estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
0.44	3.24.E-02	4.03.E-03	5.10.E-05	0.020	49.7	1.05.E-02	83.8	22.0	155.5	2.09.E-04	6.53E+19
0.89	3.53.E-02	3.57.E-04	1.02.E-04	0.024	26.3	4.46.E-03	44.4	11.7	82.3	4.28.E-04	1.34E+20
1.33	4.06.E-02	0.00.E+00	2.04.E-04	0.027	26.2	4.08.E-03	44.2	11.6	82.1	4.95.E-04	1.55E+20
1.77	4.29.E-02	1.53.E-04	5.10.E-05	0.027	25.7	4.64.E-03	43.3	11.4	80.4	5.34.E-04	1.67E+20
2.21	4.60.E-02	5.10.E-05	2.04.E-04	0.027	25.9	4.68.E-03	43.7	11.5	81.0	5.67.E-04	1.78E+20
2.66	4.63.E-02	5.10.E-05	2.04.E-04	0.027	25.5	3.69.E-03	43.0	11.3	79.9	5.79.E-04	1.81E+20
3.10	4.72.E-02	1.02.E-04	5.10.E-05	0.024	25.4	4.10.E-03	42.9	11.3	79.6	5.93.E-04	1.86E+20
3.54	4.83.E-02	0.00.E+00	2.04.E-04	0.027	25.9	3.57.E-03	43.7	11.5	81.1	5.96.E-04	1.87E+20
3.99	4.35.E-02	0.00.E+00	1.53.E-04	0.025	25.9	3.74.E-03	43.7	11.5	81.1	5.36.E-04	1.68E+20
4.43	4.53.E-02	0.00.E+00	3.06.E-04	0.027	26.3	3.66.E-03	44.3	11.7	82.3	5.51.E-04	1.72E+20
4.87	4.60.E-02	0.00.E+00	1.53.E-04	0.027	26.8	3.74.E-03	45.3	11.9	84.0	5.48.E-04	1.72E+20
5.31	4.53.E-02	5.10.E-05	1.53.E-04	0.027	27.3	4.26.E-03	46.1	12.1	85.5	5.29.E-04	1.66E+20
5.76	4.53.E-02	5.10.E-05	3.57.E-04	0.026	26.9	4.82.E-03	45.4	11.9	84.3	5.37.E-04	1.68E+20
6.20	4.26.E-02	0.00.E+00	3.57.E-04	0.023	26.4	4.98.E-03	44.6	11.7	82.7	5.15.E-04	1.61E+20
6.64	4.24.E-02	1.02.E-04	3.57.E-04	0.029	27.0	4.79.E-03	45.6	12.0	84.6	5.02.E-04	1.57E+20
7.08	4.33.E-02	0.00.E+00	3.57.E-04	0.025	27.4	6.05.E-03	46.2	12.1	85.7	5.05.E-04	1.58E+20
7.53	4.32.E-02	0.00.E+00	1.02.E-04	0.026	27.4	5.21.E-03	46.3	12.2	85.9	5.03.E-04	1.57E+20
7.97	4.15.E-02	0.00.E+00	1.02.E-04	0.028	27.6	5.64.E-03	46.5	12.2	86.4	4.80.E-04	1.50E+20
8.41	3.84.E-02	1.02.E-04	2.04.E-04	0.026	27.8	6.04.E-03	46.8	12.3	86.9	4.42.E-04	1.38E+20
8.86	3.90.E-02	0.00.E+00	4.08.E-04	0.025	27.6	5.56.E-03	46.6	12.2	86.4	4.52.E-04	1.41E+20
9.30	3.82.E-02	1.02.E-04	1.53.E-04	0.027	27.9	4.81.E-03	47.1	12.4	87.4	4.37.E-04	1.37E+20
9.74	3.55.E-02	0.00.E+00	2.55.E-04	0.026	27.8	5.36.E-03	46.9	12.3	87.1	4.07.E-04	1.28E+20
10.18	3.63.E-02	0.00.E+00	1.53.E-04	0.023	27.7	5.26.E-03	46.7	12.3	86.7	4.19.E-04	1.31E+20
10.63	3.64.E-02	0.00.E+00	1.53.E-04	0.025	28.2	3.38.E-03	47.6	12.5	88.4	4.12.E-04	1.29E+20
11.07	3.76.E-02	0.00.E+00	2.04.E-04	0.018	27.9	5.66.E-03	47.0	12.4	87.3	4.31.E-04	1.35E+20
11.51	3.62.E-02	0.00.E+00	3.06.E-04	0.023	28.5	5.08.E-03	48.0	12.6	89.1	4.07.E-04	1.27E+20
11.96	3.62.E-02	1.02.E-04	5.10.E-04	0.024	28.5	4.42.E-03	48.0	12.6	89.1	4.06.E-04	1.27E+20
12.40	3.87.E-02	0.00.E+00	3.06.E-04	0.022	28.0	4.93.E-03	47.3	12.4	87.7	4.42.E-04	1.38E+20
12.84	3.78.E-02	0.00.E+00	3.06.E-04	0.020	28.0	4.35.E-03	47.3	12.4	87.7	4.31.E-04	1.35E+20
13.28	3.73.E-02	0.00.E+00	4.08.E-04	0.019	28.2	5.23.E-03	47.5	12.5	88.2	4.23.E-04	1.33E+20
13.73	4.11.E-02	0.00.E+00	4.08.E-04	0.021	28.3	4.38.E-03	47.7	12.5	88.4	4.64.E-04	1.45E+20
14.17	3.97.E-02	1.02.E-04	1.53.E-04	0.022	28.3	5.54.E-03	47.7	12.5	88.4	4.49.E-04	1.41E+20
14.61	3.94.E-02	5.10.E-05	1.53.E-04	0.024	28.8	4.70.E-03	48.5	12.8	90.1	4.37.E-04	1.37E+20
15.05	4.22.E-02	0.00.E+00	5.10.E-05	0.024	28.9	5.27.E-03	48.8	12.8	90.5	4.67.E-04	1.46E+20
15.50	4.01.E-02	5.10.E-05	4.08.E-04	0.022	28.1	5.90.E-03	47.4	12.5	88.0	4.55.E-04	1.43E+20
15.94	4.29.E-02	5.10.E-05	2.04.E-04	0.023	28.5	5.08.E-03	48.0	12.6	89.2	4.81.E-04	1.51E+20
16.38	4.35.E-02	0.00.E+00	4.08.E-04	0.019	28.5	4.66.E-03	48.1	12.6	89.3	4.87.E-04	1.52E+20
16.83	4.24.E-02	0.00.E+00	3.06.E-04	0.022	28.1	5.49.E-03	47.4	12.4	87.9	4.83.E-04	1.51E+20
17.27	4.21.E-02	5.10.E-05	4.08.E-04	0.019	28.3	5.96.E-03	47.8	12.6	88.7	4.75.E-04	1.49E+20
17.71	4.29.E-02	0.00.E+00	4.08.E-04	0.019	28.1	6.65.E-03	47.4	12.5	88.0	4.87.E-04	1.53E+20
18.15	4.24.E-02	1.02.E-04	4.59.E-04	0.019	28.2	5.46.E-03	47.5	12.5	88.2	4.81.E-04	1.50E+20
18.60	4.44.E-02	0.00.E+00	3.57.E-04	0.018	28.8	5.12.E-03	48.6	12.8	90.1	4.92.E-04	1.54E+20
19.04	4.57.E-02	0.00.E+00	4.08.E-04	0.017	28.8	5.45.E-03	48.5	12.7	90.0	5.07.E-04	1.59E+20
19.48	4.39.E-02	0.00.E+00	3.57.E-04	0.021	28.4	6.40.E-03	47.9	12.6	88.9	4.94.E-04	1.55E+20
19.93	4.24.E-02	5.10.E-05	3.06.E-04	0.020	28.2	6.09.E-03	47.6	12.5	88.3	4.81.E-04	1.51E+20
20.37	4.13.E-02	0.00.E+00	1.53.E-04	0.015	28.2	5.55.E-03	47.6	12.5	88.3	4.67.E-04	1.46E+20
20.81	4.25.E-02	0.00.E+00	2.04.E-04	0.019	28.2	6.45.E-03	47.6	12.5	88.3	4.81.E-04	1.51E+20
21.25	4.21.E-02	5.10.E-05	1.02.E-04	0.018	28.3	6.87.E-03	47.8	12.6	88.7	4.75.E-04	1.49E+20
21.70	4.39.E-02	0.00.E+00	2.55.E-04	0.017	28.6	5.08.E-03	48.2	12.7	89.5	4.91.E-04	1.54E+20
22.14	4.35.E-02	5.10.E-05	3.06.E-04	0.017	27.6	5.73.E-03	46.5	12.2	86.3	5.03.E-04	1.58E+20
22.58	4.31.E-02	5.10.E-05	2.04.E-04	0.018	27.9	6.76.E-03	47.1	12.4	87.4	4.93.E-04	1.54E+20
23.02	4.31.E-02	5.10.E-05	3.57.E-04	0.018	28.9	6.28.E-03	48.8	12.8	90.6	4.76.E-04	1.49E+20
23.47	4.25.E-02	0.00.E+00	6.12.E-04	0.018	28.8	4.96.E-03	48.5	12.8	90.1	4.72.E-04	1.48E+20
23.91	4.43.E-02	0.00.E+00	2.04.E-04	0.016	28.2	4.75.E-03	47.5	12.5	88.2	5.02.E-04	1.57E+20
24.35	3.98.E-02	0.00.E+00	5.10.E-04	0.016	28.3	5.76.E-03	47.7	12.5	88.6	4.50.E-04	1.41E+20
24.80	3.95.E-02	0.00.E+00	2.04.E-04	0.016	27.7	4.34.E-03	46.7	12.3	86.7	4.55.E-04	1.43E+20

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
25.24	4.01.E-02	1.53.E-04	2.04.E-04	0.015	28.2	5.05.E-03	47.6	12.5	88.4	4.53.E-04	1.42E+20
25.68	3.71.E-02	0.00.E+00	1.53.E-04	0.017	27.8	4.68.E-03	46.9	12.3	87.1	4.26.E-04	1.34E+20
26.12	3.81.E-02	0.00.E+00	2.55.E-04	0.019	27.8	5.47.E-03	46.8	12.3	86.9	4.38.E-04	1.37E+20
26.57	3.77.E-02	0.00.E+00	7.14.E-04	0.017	28.5	5.45.E-03	48.1	12.6	89.2	4.23.E-04	1.32E+20
27.01	3.71.E-02	1.02.E-04	4.08.E-04	0.016	27.9	5.66.E-03	47.0	12.4	87.2	4.25.E-04	1.33E+20
27.45	3.62.E-02	5.10.E-05	2.04.E-04	0.015	27.8	6.58.E-03	47.0	12.3	87.1	4.16.E-04	1.30E+20
27.90	3.55.E-02	0.00.E+00	2.55.E-04	0.018	27.7	7.42.E-03	46.7	12.3	86.6	4.10.E-04	1.28E+20
28.34	3.48.E-02	5.10.E-05	2.04.E-04	0.018	28.6	5.49.E-03	48.3	12.7	89.5	3.89.E-04	1.22E+20
28.78	3.15.E-02	5.10.E-05	2.04.E-04	0.017	27.5	6.84.E-03	46.4	12.2	86.1	3.66.E-04	1.15E+20
29.22	3.58.E-02	5.10.E-05	4.59.E-04	0.015	27.6	7.05.E-03	46.5	12.2	86.3	4.15.E-04	1.30E+20
29.67	3.39.E-02	5.10.E-05	2.55.E-04	0.016	27.3	5.43.E-03	46.1	12.1	85.5	3.96.E-04	1.24E+20
30.11	3.46.E-02	5.10.E-05	3.06.E-04	0.016	27.6	4.57.E-03	46.6	12.2	86.4	4.01.E-04	1.26E+20
30.55	3.23.E-02	0.00.E+00	2.55.E-04	0.017	27.5	4.80.E-03	46.3	12.2	85.9	3.76.E-04	1.18E+20
31.00	3.44.E-02	0.00.E+00	1.53.E-04	0.016	27.7	4.64.E-03	46.8	12.3	86.8	3.97.E-04	1.24E+20
31.44	3.38.E-02	5.10.E-05	5.10.E-05	0.018	28.1	5.42.E-03	47.3	12.4	87.8	3.85.E-04	1.21E+20
31.88	3.18.E-02	0.00.E+00	2.04.E-04	0.015	29.0	4.23.E-03	48.9	12.9	90.8	3.51.E-04	1.10E+20
32.32	3.12.E-02	5.10.E-05	2.55.E-04	0.017	27.9	5.35.E-03	47.1	12.4	87.5	3.57.E-04	1.12E+20
32.77	2.94.E-02	5.10.E-05	3.57.E-04	0.017	27.8	5.05.E-03	46.9	12.3	87.1	3.37.E-04	1.06E+20
33.21	3.09.E-02	1.53.E-04	3.57.E-04	0.016	27.7	4.26.E-03	46.7	12.3	86.7	3.56.E-04	1.12E+20
33.65	3.00.E-02	1.02.E-04	1.53.E-04	0.015	27.3	6.28.E-03	46.1	12.1	85.5	3.51.E-04	1.10E+20
34.09	2.89.E-02	0.00.E+00	2.55.E-04	0.016	28.0	5.62.E-03	47.2	12.4	87.6	3.30.E-04	1.03E+20
34.54	2.79.E-02	5.10.E-05	2.04.E-04	0.016	27.1	4.55.E-03	45.8	12.0	84.9	3.29.E-04	1.03E+20
34.98	2.94.E-02	0.00.E+00	2.55.E-04	0.018	27.8	5.17.E-03	46.9	12.3	87.0	3.38.E-04	1.06E+20
35.42	2.62.E-02	5.10.E-05	3.06.E-04	0.018	27.3	7.26.E-03	46.0	12.1	85.4	3.06.E-04	9.59E+19
35.87	2.71.E-02	0.00.E+00	2.55.E-04	0.018	27.4	4.97.E-03	46.3	12.2	85.9	3.16.E-04	9.88E+19
36.31	2.48.E-02	0.00.E+00	3.06.E-04	0.015	27.5	5.73.E-03	46.3	12.2	86.0	2.88.E-04	9.03E+19
36.75	2.73.E-02	5.10.E-05	1.53.E-04	0.017	27.6	5.56.E-03	46.5	12.2	86.3	3.16.E-04	9.91E+19
37.19	2.55.E-02	0.00.E+00	2.55.E-04	0.016	27.4	7.24.E-03	46.2	12.1	85.7	2.97.E-04	9.30E+19
37.64	2.49.E-02	0.00.E+00	1.02.E-04	0.018	28.0	4.87.E-03	47.1	12.4	87.5	2.85.E-04	8.91E+19
38.08	2.46.E-02	0.00.E+00	2.04.E-04	0.016	27.3	5.50.E-03	46.1	12.1	85.6	2.88.E-04	9.02E+19
38.52	2.57.E-02	5.10.E-05	3.06.E-04	0.016	27.4	5.39.E-03	46.3	12.2	85.9	2.99.E-04	9.36E+19
38.97	2.31.E-02	0.00.E+00	5.10.E-05	0.017	28.0	4.88.E-03	47.2	12.4	87.5	2.63.E-04	8.25E+19
39.41	2.24.E-02	5.10.E-05	2.04.E-04	0.016	27.5	5.72.E-03	46.4	12.2	86.2	2.61.E-04	8.16E+19
39.85	2.26.E-02	5.10.E-05	1.02.E-04	0.017	27.3	6.52.E-03	46.0	12.1	85.4	2.65.E-04	8.29E+19
40.29	2.12.E-02	0.00.E+00	1.53.E-04	0.016	27.6	6.34.E-03	46.5	12.2	86.3	2.46.E-04	7.70E+19
40.74	2.28.E-02	0.00.E+00	1.02.E-04	0.017	27.6	5.44.E-03	46.6	12.2	86.4	2.63.E-04	8.24E+19
41.18	2.18.E-02	0.00.E+00	1.02.E-04	0.019	28.0	5.66.E-03	47.2	12.4	87.6	2.49.E-04	7.81E+19
41.62	2.12.E-02	0.00.E+00	2.55.E-04	0.016	27.4	5.70.E-03	46.2	12.1	85.7	2.47.E-04	7.74E+19
42.06	2.26.E-02	0.00.E+00	2.55.E-04	0.018	28.1	7.21.E-03	47.5	12.5	88.1	2.56.E-04	8.02E+19
42.51	1.98.E-02	0.00.E+00	5.10.E-05	0.016	27.3	6.20.E-03	46.0	12.1	85.4	2.32.E-04	7.26E+19
42.95	2.09.E-02	0.00.E+00	1.53.E-04	0.017	27.6	4.42.E-03	46.6	12.2	86.5	2.41.E-04	7.56E+19
43.39	1.94.E-02	0.00.E+00	2.04.E-04	0.015	27.2	6.64.E-03	45.8	12.0	85.0	2.28.E-04	7.14E+19
43.84	1.91.E-02	0.00.E+00	2.04.E-04	0.018	27.5	5.71.E-03	46.3	12.2	86.0	2.23.E-04	6.97E+19
44.28	1.95.E-02	0.00.E+00	1.02.E-04	0.014	26.9	6.32.E-03	45.3	11.9	84.1	2.32.E-04	7.27E+19
44.72	1.89.E-02	0.00.E+00	1.53.E-04	0.017	27.1	5.80.E-03	45.7	12.0	84.9	2.23.E-04	6.98E+19
45.16	1.95.E-02	0.00.E+00	1.02.E-04	0.014	26.9	5.57.E-03	45.4	11.9	84.3	2.32.E-04	7.26E+19
45.61	1.77.E-02	5.10.E-05	5.10.E-05	0.016	27.0	5.80.E-03	45.6	12.0	84.5	2.09.E-04	6.56E+19
46.05	1.93.E-02	0.00.E+00	1.02.E-04	0.015	27.1	6.73.E-03	45.6	12.0	84.7	2.28.E-04	7.13E+19
46.49	1.63.E-02	0.00.E+00	1.02.E-04	0.017	27.4	3.33.E-03	46.3	12.2	85.8	1.90.E-04	5.94E+19
46.94	1.78.E-02	0.00.E+00	5.10.E-05	0.014	27.5	6.03.E-03	46.4	12.2	86.1	2.06.E-04	6.46E+19
47.38	1.82.E-02	0.00.E+00	1.02.E-04	0.014	26.9	6.85.E-03	45.4	11.9	84.2	2.16.E-04	6.75E+19
47.82	1.91.E-02	0.00.E+00	5.10.E-05	0.017	27.6	5.44.E-03	46.5	12.2	86.3	2.22.E-04	6.94E+19
48.26	1.55.E-02	0.00.E+00	5.10.E-05	0.015	27.3	6.13.E-03	46.1	12.1	85.5	1.81.E-04	5.66E+19
48.71	1.69.E-02	0.00.E+00	2.04.E-04	0.014	27.2	4.97.E-03	45.9	12.1	85.2	1.98.E-04	6.20E+19
49.15	1.70.E-02	0.00.E+00	5.10.E-05	0.013	27.1	4.43.E-03	45.7	12.0	84.8	2.01.E-04	6.29E+19
49.59	1.46.E-02	0.00.E+00	1.02.E-04	0.014	26.9	4.75.E-03	45.3	11.9	84.1	1.74.E-04	5.45E+19
50.03	1.62.E-02	0.00.E+00	3.06.E-04	0.014	27.3	5.16.E-03	46.1	12.1	85.5	1.89.E-04	5.92E+19
50.48	1.45.E-02	0.00.E+00	1.02.E-04	0.015	27.4	4.07.E-03	46.3	12.2	85.8	1.69.E-04	5.30E+19
50.92	1.45.E-02	0.00.E+00	1.02.E-04	0.015	26.8	5.71.E-03	45.2	11.9	83.9	1.73.E-04	5.41E+19
51.36	1.42.E-02	0.00.E+00	1.02.E-04	0.016	27.4	4.90.E-03	46.2	12.2	85.8	1.65.E-04	5.18E+19
51.81	1.44.E-02	0.00.E+00	5.10.E-05	0.013	27.1	5.20.E-03	45.7	12.0	84.7	1.70.E-04	5.34E+19
52.25	1.40.E-02	0.00.E+00	1.53.E-04	0.014	26.8	5.67.E-03	45.2	11.9	83.9	1.67.E-04	5.23E+19
52.69	1.29.E-02	0.00.E+00	5.10.E-05	0.016	26.9	5.18.E-03	45.3	11.9	84.1	1.54.E-04	4.81E+19
53.13	1.42.E-02	1.02.E-04	3.06.E-04	0.017	26.4	4.67.E-03	44.6	11.7	82.7	1.71.E-04	5.37E+19

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
53.58	1.27.E-02	0.00.E+00	1.02.E-04	0.016	26.7	4.33.E-03	45.1	11.8	83.7	1.52.E-04	4.75E+19
54.02	1.41.E-02	5.10.E-05	5.10.E-05	0.015	27.1	5.64.E-03	45.6	12.0	84.7	1.66.E-04	5.21E+19
54.46	1.23.E-02	0.00.E+00	5.10.E-05	0.014	26.3	4.45.E-03	44.4	11.7	82.4	1.50.E-04	4.69E+19
54.91	1.32.E-02	0.00.E+00	1.02.E-04	0.013	26.5	4.30.E-03	44.8	11.8	83.1	1.59.E-04	4.98E+19
55.35	1.29.E-02	0.00.E+00	5.10.E-05	0.014	26.8	5.08.E-03	45.2	11.9	83.9	1.54.E-04	4.82E+19
55.79	1.23.E-02	0.00.E+00	1.53.E-04	0.014	26.6	5.43.E-03	44.9	11.8	83.3	1.48.E-04	4.64E+19
56.23	1.04.E-02	0.00.E+00	1.02.E-04	0.014	26.8	5.00.E-03	45.2	11.9	83.8	1.24.E-04	3.89E+19
56.68	1.21.E-02	0.00.E+00	0.00.E+00	0.014	27.4	4.59.E-03	46.1	12.1	85.6	1.42.E-04	4.44E+19
57.12	1.14.E-02	0.00.E+00	1.02.E-04	0.018	27.4	4.89.E-03	46.2	12.1	85.7	1.33.E-04	4.18E+19
57.56	1.03.E-02	0.00.E+00	5.10.E-05	0.014	27.4	5.44.E-03	46.2	12.1	85.8	1.20.E-04	3.76E+19
58.00	1.07.E-02	0.00.E+00	5.10.E-05	0.015	26.8	5.79.E-03	45.1	11.9	83.7	1.27.E-04	3.99E+19
58.45	1.13.E-02	5.10.E-05	5.10.E-05	0.014	26.4	4.75.E-03	44.6	11.7	82.7	1.37.E-04	4.29E+19
58.89	1.04.E-02	0.00.E+00	1.02.E-04	0.014	26.5	5.63.E-03	44.7	11.7	82.9	1.26.E-04	3.93E+19
59.33	1.01.E-02	0.00.E+00	5.10.E-05	0.013	26.6	5.72.E-03	44.9	11.8	83.4	1.21.E-04	3.77E+19
59.78	1.07.E-02	0.00.E+00	1.02.E-04	0.015	26.8	4.21.E-03	45.3	11.9	84.0	1.28.E-04	3.99E+19
60.22	8.11.E-03	5.10.E-05	2.04.E-04	0.014	26.4	6.14.E-03	44.6	11.7	82.7	9.81.E-05	3.07E+19
60.66	1.00.E-02	0.00.E+00	5.10.E-05	0.014	26.8	5.58.E-03	45.3	11.9	84.0	1.19.E-04	3.73E+19
61.10	9.34.E-03	0.00.E+00	1.02.E-04	0.014	26.6	6.18.E-03	44.9	11.8	83.3	1.12.E-04	3.51E+19
61.55	9.08.E-03	0.00.E+00	5.10.E-05	0.014	26.3	6.89.E-03	44.3	11.6	82.2	1.10.E-04	3.46E+19
61.99	9.08.E-03	0.00.E+00	5.10.E-05	0.014	26.8	5.51.E-03	45.2	11.9	83.9	1.08.E-04	3.39E+19
62.43	8.72.E-03	0.00.E+00	1.02.E-04	0.013	26.7	5.73.E-03	45.0	11.8	83.4	1.05.E-04	3.27E+19
62.88	9.69.E-03	0.00.E+00	1.02.E-04	0.016	27.0	6.61.E-03	45.5	11.9	84.4	1.15.E-04	3.60E+19
63.32	8.42.E-03	5.10.E-05	5.10.E-05	0.017	26.9	4.92.E-03	45.4	11.9	84.3	9.98.E-05	3.13E+19
63.76	9.13.E-03	0.00.E+00	5.10.E-05	0.013	26.9	6.27.E-03	45.4	11.9	84.3	1.08.E-04	3.39E+19
64.20	7.76.E-03	0.00.E+00	1.02.E-04	0.014	26.1	5.24.E-03	43.9	11.5	81.5	9.51.E-05	2.98E+19
64.65	7.81.E-03	0.00.E+00	1.02.E-04	0.017	26.6	5.22.E-03	44.9	11.8	83.2	9.38.E-05	2.94E+19
65.09	6.73.E-03	0.00.E+00	5.10.E-05	0.016	26.6	4.19.E-03	44.8	11.8	83.1	8.10.E-05	2.54E+19
65.53	7.14.E-03	0.00.E+00	1.53.E-04	0.014	26.4	4.87.E-03	44.6	11.7	82.8	8.63.E-05	2.70E+19
65.98	7.65.E-03	0.00.E+00	0.00.E+00	0.013	26.6	4.83.E-03	44.9	11.8	83.4	9.18.E-05	2.87E+19
66.42	6.79.E-03	0.00.E+00	0.00.E+00	0.015	26.3	4.16.E-03	44.3	11.6	82.2	8.26.E-05	2.59E+19
66.86	6.89.E-03	5.10.E-05	5.10.E-05	0.014	26.1	4.49.E-03	44.0	11.6	81.6	8.44.E-05	2.64E+19
67.30	6.63.E-03	0.00.E+00	5.10.E-05	0.013	26.7	4.13.E-03	45.0	11.8	83.4	7.95.E-05	2.49E+19
67.75	6.22.E-03	0.00.E+00	5.10.E-05	0.014	26.4	5.93.E-03	44.5	11.7	82.6	7.53.E-05	2.36E+19
68.19	5.82.E-03	0.00.E+00	5.10.E-05	0.015	26.5	6.41.E-03	44.7	11.8	83.0	7.01.E-05	2.19E+19
68.63	6.07.E-03	0.00.E+00	5.10.E-05	0.013	26.6	4.90.E-03	44.9	11.8	83.4	7.28.E-05	2.28E+19
69.07	6.33.E-03	0.00.E+00	1.02.E-04	0.013	26.5	3.45.E-03	44.7	11.8	83.0	7.62.E-05	2.39E+19
69.52	5.92.E-03	0.00.E+00	5.10.E-05	0.015	26.6	4.71.E-03	44.9	11.8	83.3	7.10.E-05	2.22E+19
69.96	5.61.E-03	0.00.E+00	0.00.E+00	0.014	25.9	5.39.E-03	43.7	11.5	81.1	6.92.E-05	2.17E+19
70.40	6.12.E-03	0.00.E+00	1.53.E-04	0.013	26.4	5.52.E-03	44.6	11.7	82.7	7.40.E-05	2.32E+19
70.85	6.84.E-03	0.00.E+00	0.00.E+00	0.014	26.4	4.11.E-03	44.5	11.7	82.6	8.27.E-05	2.59E+19
71.29	4.95.E-03	0.00.E+00	5.10.E-05	0.012	26.1	5.85.E-03	44.1	11.6	81.8	6.05.E-05	1.89E+19
71.73	5.05.E-03	0.00.E+00	1.02.E-04	0.012	25.9	5.43.E-03	43.7	11.5	81.2	6.22.E-05	1.95E+19
72.17	4.74.E-03	0.00.E+00	0.00.E+00	0.013	26.0	4.92.E-03	43.9	11.5	81.4	5.83.E-05	1.83E+19
72.62	4.95.E-03	0.00.E+00	5.10.E-05	0.015	26.0	5.54.E-03	43.9	11.5	81.5	6.07.E-05	1.90E+19
73.06	4.64.E-03	0.00.E+00	1.02.E-04	0.013	25.9	4.45.E-03	43.7	11.5	81.1	5.73.E-05	1.79E+19
73.50	4.95.E-03	5.10.E-05	5.10.E-05	0.013	25.7	5.39.E-03	43.3	11.4	80.4	6.15.E-05	1.93E+19
73.95	5.36.E-03	5.10.E-05	5.10.E-05	0.013	25.9	5.30.E-03	43.7	11.5	81.2	6.60.E-05	2.07E+19
74.39	4.64.E-03	0.00.E+00	1.02.E-04	0.013	26.2	4.67.E-03	44.2	11.6	82.1	5.66.E-05	1.77E+19
74.83	3.67.E-03	0.00.E+00	5.10.E-05	0.014	26.1	4.74.E-03	44.1	11.6	81.8	4.49.E-05	1.41E+19
75.27	4.34.E-03	5.10.E-05	5.10.E-05	0.012	25.3	5.92.E-03	42.6	11.2	79.1	5.49.E-05	1.72E+19
75.72	4.18.E-03	0.00.E+00	0.00.E+00	0.013	25.4	7.27.E-03	42.8	11.2	79.4	5.27.E-05	1.65E+19
76.16	4.08.E-03	0.00.E+00	0.00.E+00	0.013	26.2	3.95.E-03	44.2	11.6	82.0	4.98.E-05	1.56E+19
76.60	4.29.E-03	0.00.E+00	5.10.E-05	0.011	25.9	5.17.E-03	43.6	11.5	81.0	5.29.E-05	1.66E+19
77.04	4.23.E-03	0.00.E+00	5.10.E-05	0.012	26.2	4.12.E-03	44.1	11.6	81.9	5.17.E-05	1.62E+19
77.49	4.03.E-03	0.00.E+00	1.02.E-04	0.012	26.0	5.06.E-03	43.8	11.5	81.3	4.96.E-05	1.55E+19
77.93	3.62.E-03	0.00.E+00	5.10.E-05	0.014	26.0	3.38.E-03	43.9	11.5	81.5	4.44.E-05	1.39E+19
78.37	3.47.E-03	5.10.E-05	0.00.E+00	0.013	25.8	4.37.E-03	43.6	11.5	80.9	4.29.E-05	1.34E+19
78.82	3.72.E-03	0.00.E+00	0.00.E+00	0.014	26.1	5.93.E-03	44.0	11.6	81.6	4.57.E-05	1.43E+19
79.26	3.27.E-03	1.53.E-04	0.00.E+00	0.012	26.3	4.28.E-03	44.4	11.7	82.4	3.96.E-05	1.24E+19
79.70	3.01.E-03	0.00.E+00	5.10.E-05	0.011	26.7	5.02.E-03	45.0	11.8	83.5	3.61.E-05	1.13E+19
80.14	3.11.E-03	0.00.E+00	1.53.E-04	0.011	26.1	3.79.E-03	44.1	11.6	81.8	3.80.E-05	1.19E+19
80.59	3.27.E-03	0.00.E+00	0.00.E+00	0.013	26.0	4.76.E-03	43.9	11.5	81.4	4.01.E-05	1.26E+19
81.03	3.32.E-03	5.10.E-05	0.00.E+00	0.011	26.0	5.15.E-03	43.8	11.5	81.3	4.08.E-05	1.28E+19
81.47	2.65.E-03	0.00.E+00	5.10.E-05	0.012	25.8	4.14.E-03	43.6	11.5	80.9	3.28.E-05	1.03E+19

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
81.92	3.67.E-03	0.00.E+00	1.53.E-04	0.012	25.9	6.40.E-03	43.6	11.5	81.0	4.54.E-05	1.42E+19
82.36	3.16.E-03	0.00.E+00	1.53.E-04	0.011	25.7	5.84.E-03	43.3	11.4	80.3	3.94.E-05	1.23E+19
82.80	2.55.E-03	0.00.E+00	5.10.E-05	0.013	26.3	3.89.E-03	44.4	11.7	82.3	3.10.E-05	9.70E+18
83.24	3.11.E-03	0.00.E+00	5.10.E-05	0.012	25.9	4.91.E-03	43.7	11.5	81.0	3.84.E-05	1.20E+19
83.69	2.40.E-03	0.00.E+00	1.02.E-04	0.014	26.1	4.79.E-03	44.0	11.6	81.7	2.94.E-05	9.19E+18
84.13	2.81.E-03	5.10.E-05	1.02.E-04	0.013	25.7	4.76.E-03	43.3	11.4	80.3	3.50.E-05	1.09E+19
84.57	3.11.E-03	0.00.E+00	0.00.E+00	0.017	25.9	4.15.E-03	43.7	11.5	81.1	3.84.E-05	1.20E+19
85.01	2.24.E-03	0.00.E+00	5.10.E-05	0.013	26.0	4.82.E-03	43.8	11.5	81.2	2.76.E-05	8.65E+18
85.46	2.35.E-03	0.00.E+00	5.10.E-05	0.013	26.1	4.56.E-03	43.9	11.5	81.6	2.88.E-05	9.01E+18
85.90	1.99.E-03	0.00.E+00	5.10.E-05	0.012	25.7	4.69.E-03	43.3	11.4	80.3	2.48.E-05	7.76E+18
86.34	2.70.E-03	0.00.E+00	0.00.E+00	0.011	25.5	5.31.E-03	43.1	11.3	80.0	3.38.E-05	1.06E+19
86.79	1.94.E-03	0.00.E+00	5.10.E-05	0.011	25.7	4.35.E-03	43.3	11.4	80.3	2.41.E-05	7.56E+18
87.23	1.84.E-03	0.00.E+00	0.00.E+00	0.011	25.6	4.72.E-03	43.2	11.4	80.2	2.29.E-05	7.17E+18
87.67	1.43.E-03	0.00.E+00	1.02.E-04	0.012	25.4	5.64.E-03	42.8	11.3	79.5	1.80.E-05	5.63E+18
88.11	1.84.E-03	0.00.E+00	0.00.E+00	0.013	26.0	6.00.E-03	43.8	11.5	81.3	2.26.E-05	7.08E+18
88.56	1.58.E-03	0.00.E+00	5.10.E-05	0.011	25.4	4.88.E-03	42.8	11.3	79.4	1.99.E-05	6.23E+18
89.00	1.58.E-03	0.00.E+00	0.00.E+00	0.011	25.3	5.98.E-03	42.7	11.2	79.3	1.99.E-05	6.24E+18
89.44	1.53.E-03	0.00.E+00	0.00.E+00	0.011	25.9	3.63.E-03	43.7	11.5	81.2	1.89.E-05	5.91E+18
89.89	1.53.E-03	0.00.E+00	0.00.E+00	0.013	25.6	6.20.E-03	43.2	11.3	80.1	1.91.E-05	5.98E+18
90.33	1.89.E-03	0.00.E+00	0.00.E+00	0.010	25.3	4.98.E-03	42.7	11.2	79.2	2.38.E-05	7.46E+18
90.77	1.53.E-03	0.00.E+00	0.00.E+00	0.009	25.5	5.53.E-03	43.1	11.3	80.0	1.91.E-05	5.99E+18
91.21	1.79.E-03	0.00.E+00	1.02.E-04	0.012	25.6	3.85.E-03	43.1	11.3	80.0	2.23.E-05	6.99E+18
91.66	1.22.E-03	0.00.E+00	0.00.E+00	0.009	25.1	4.31.E-03	42.3	11.1	78.5	1.56.E-05	4.88E+18
92.10	1.58.E-03	0.00.E+00	0.00.E+00	0.012	25.6	4.84.E-03	43.3	11.4	80.3	1.97.E-05	6.17E+18
92.54	1.73.E-03	0.00.E+00	1.02.E-04	0.011	25.8	4.14.E-03	43.5	11.4	80.7	2.15.E-05	6.73E+18
92.99	1.58.E-03	0.00.E+00	5.10.E-05	0.012	25.4	3.86.E-03	42.8	11.3	79.5	1.99.E-05	6.23E+18
93.43	1.43.E-03	0.00.E+00	1.02.E-04	0.011	25.6	4.14.E-03	43.2	11.3	80.1	1.78.E-05	5.58E+18
93.87	1.68.E-03	0.00.E+00	1.02.E-04	0.009	25.5	5.79.E-03	43.1	11.3	79.9	2.11.E-05	6.60E+18
94.31	1.22.E-03	0.00.E+00	0.00.E+00	0.014	25.4	4.70.E-03	42.9	11.3	79.6	1.54.E-05	4.82E+18
94.76	1.33.E-03	0.00.E+00	5.10.E-05	0.012	25.6	4.45.E-03	43.2	11.4	80.2	1.65.E-05	5.18E+18
95.20	1.33.E-03	0.00.E+00	5.10.E-05	0.012	25.8	3.84.E-03	43.5	11.4	80.6	1.64.E-05	5.15E+18
95.64	7.65.E-04	0.00.E+00	0.00.E+00	0.013	25.5	5.30.E-03	43.0	11.3	79.7	9.60.E-06	3.01E+18
96.08	1.53.E-03	0.00.E+00	5.10.E-05	0.014	25.7	4.69.E-03	43.4	11.4	80.5	1.90.E-05	5.96E+18
96.53	1.02.E-03	0.00.E+00	1.02.E-04	0.012	25.5	3.67.E-03	43.0	11.3	79.8	1.28.E-05	4.00E+18
96.97	1.02.E-03	0.00.E+00	5.10.E-05	0.011	25.7	5.11.E-03	43.3	11.4	80.3	1.27.E-05	3.98E+18
97.41	1.07.E-03	0.00.E+00	0.00.E+00	0.012	25.8	4.79.E-03	43.5	11.4	80.8	1.33.E-05	4.15E+18
97.86	1.63.E-03	0.00.E+00	5.10.E-05	0.013	25.7	4.99.E-03	43.3	11.4	80.3	2.03.E-05	6.37E+18
98.30	7.65.E-04	5.10.E-05	1.02.E-04	0.008	24.4	6.07.E-03	41.1	10.8	76.3	1.00.E-05	3.14E+18
98.74	1.02.E-03	0.00.E+00	0.00.E+00	0.014	25.5	5.09.E-03	43.0	11.3	79.8	1.28.E-05	4.00E+18
99.18	1.33.E-03	0.00.E+00	5.10.E-05	0.011	25.1	4.58.E-03	42.4	11.1	78.7	1.69.E-05	5.28E+18
99.63	9.18.E-04	0.00.E+00	0.00.E+00	0.012	25.3	4.34.E-03	42.7	11.2	79.2	1.16.E-05	3.63E+18
100.07	1.12.E-03	0.00.E+00	5.10.E-05	0.012	25.7	5.21.E-03	43.3	11.4	80.4	1.40.E-05	4.37E+18
100.51	1.02.E-03	0.00.E+00	5.10.E-05	0.012	25.1	5.06.E-03	42.3	11.1	78.5	1.30.E-05	4.07E+18
100.96	9.69.E-04	0.00.E+00	0.00.E+00	0.010	25.0	4.33.E-03	42.2	11.1	78.3	1.24.E-05	3.88E+18
101.40	9.69.E-04	0.00.E+00	5.10.E-05	0.011	25.8	4.00.E-03	43.6	11.5	80.9	1.20.E-05	3.75E+18
101.84	8.67.E-04	0.00.E+00	1.02.E-04	0.012	25.5	3.91.E-03	43.0	11.3	79.9	1.09.E-05	3.40E+18
102.28	1.07.E-03	0.00.E+00	5.10.E-05	0.013	25.2	4.41.E-03	42.5	11.2	78.9	1.36.E-05	4.25E+18
102.73	5.61.E-04	5.10.E-05	0.00.E+00	0.015	25.5	5.72.E-03	43.1	11.3	79.9	7.02.E-06	2.20E+18
103.17	9.18.E-04	0.00.E+00	0.00.E+00	0.015	25.5	4.72.E-03	42.9	11.3	79.7	1.15.E-05	3.61E+18
103.61	6.63.E-04	0.00.E+00	5.10.E-05	0.014	25.3	4.83.E-03	42.6	11.2	79.1	8.38.E-06	2.62E+18
104.05	8.67.E-04	0.00.E+00	1.53.E-04	0.012	25.0	4.48.E-03	42.1	11.1	78.1	1.11.E-05	3.48E+18
104.50	5.10.E-04	5.10.E-05	1.02.E-04	0.011	26.0	4.78.E-03	43.8	11.5	81.2	6.28.E-06	1.97E+18
104.94	6.63.E-04	5.10.E-05	0.00.E+00	0.013	25.9	4.94.E-03	43.8	11.5	81.2	8.17.E-06	2.56E+18
105.38	6.63.E-04	0.00.E+00	0.00.E+00	0.012	25.8	4.14.E-03	43.5	11.4	80.8	8.21.E-06	2.57E+18
105.83	4.08.E-04	0.00.E+00	0.00.E+00	0.012	25.3	4.31.E-03	42.7	11.2	79.2	5.16.E-06	1.61E+18
106.27	1.12.E-03	0.00.E+00	0.00.E+00	0.011	25.4	5.26.E-03	42.9	11.3	79.6	1.41.E-05	4.42E+18
106.71	7.14.E-04	0.00.E+00	5.10.E-05	0.010	25.1	4.05.E-03	42.4	11.1	78.6	9.08.E-06	2.84E+18
107.15	6.63.E-04	0.00.E+00	0.00.E+00	0.011	25.0	3.54.E-03	42.2	11.1	78.3	8.47.E-06	2.65E+18
107.60	3.06.E-04	0.00.E+00	0.00.E+00	0.011	25.7	5.44.E-03	43.3	11.4	80.3	3.81.E-06	1.19E+18
108.04	6.12.E-04	0.00.E+00	5.10.E-05	0.011	25.0	5.68.E-03	42.2	11.1	78.3	7.82.E-06	2.45E+18
108.48	7.14.E-04	0.00.E+00	0.00.E+00	0.011	25.6	4.64.E-03	43.1	11.3	80.0	8.93.E-06	2.80E+18
108.93	5.61.E-04	0.00.E+00	0.00.E+00	0.010	25.2	4.48.E-03	42.6	11.2	79.0	7.10.E-06	2.22E+18
109.37	5.10.E-04	0.00.E+00	0.00.E+00	0.009	25.5	5.01.E-03	43.0	11.3	79.7	6.40.E-06	2.00E+18
109.81	4.59.E-04	0.00.E+00	5.10.E-05	0.012	24.8	5.55.E-03	41.8	11.0	77.6	5.92.E-06	1.85E+18

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	Σ C Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
110.25	5.61.E-04	0.00.E+00	5.10.E-05	0.012	25.5	6.20.E-03	43.0	11.3	79.7	7.04.E-06	2.20E+18
110.70	5.61.E-04	5.10.E-05	5.10.E-05	0.014	25.5	5.33.E-03	42.9	11.3	79.7	7.05.E-06	2.21E+18
111.14	7.14.E-04	0.00.E+00	0.00.E+00	0.012	25.5	4.36.E-03	43.1	11.3	80.0	8.93.E-06	2.80E+18
111.58	6.12.E-04	0.00.E+00	0.00.E+00	0.012	25.2	5.47.E-03	42.4	11.2	78.8	7.77.E-06	2.43E+18
112.02	2.55.E-04	0.00.E+00	0.00.E+00	0.012	25.3	5.10.E-03	42.7	11.2	79.2	3.22.E-06	1.01E+18
112.47	5.10.E-04	0.00.E+00	5.10.E-05	0.014	25.6	3.54.E-03	43.2	11.3	80.1	6.37.E-06	2.00E+18
112.91	9.18.E-04	0.00.E+00	0.00.E+00	0.011	24.9	4.71.E-03	42.1	11.1	78.1	1.18.E-05	3.68E+18
113.35	6.63.E-04	0.00.E+00	0.00.E+00	0.010	25.3	4.39.E-03	42.6	11.2	79.1	8.39.E-06	2.63E+18
113.80	7.14.E-04	0.00.E+00	5.10.E-05	0.011	25.1	4.16.E-03	42.3	11.1	78.6	9.09.E-06	2.85E+18
114.24	6.12.E-04	0.00.E+00	0.00.E+00	0.012	25.4	4.73.E-03	42.8	11.3	79.5	7.70.E-06	2.41E+18
114.68	5.61.E-04	0.00.E+00	5.10.E-05	0.013	25.4	3.08.E-03	42.8	11.3	79.5	7.06.E-06	2.21E+18
115.12	7.14.E-04	0.00.E+00	5.10.E-05	0.012	25.3	4.25.E-03	42.7	11.2	79.2	9.02.E-06	2.82E+18
115.57	3.06.E-04	0.00.E+00	0.00.E+00	0.010	25.4	4.21.E-03	42.8	11.2	79.4	3.85.E-06	1.21E+18
116.01	5.10.E-04	0.00.E+00	0.00.E+00	0.011	25.2	6.59.E-03	42.5	11.2	78.9	6.47.E-06	2.03E+18
116.45	4.59.E-04	0.00.E+00	5.10.E-05	0.011	25.2	5.04.E-03	42.5	11.2	78.9	5.82.E-06	1.82E+18
116.90	5.61.E-04	0.00.E+00	5.10.E-05	0.012	25.3	4.01.E-03	42.6	11.2	79.0	7.10.E-06	2.22E+18
117.34	6.12.E-04	0.00.E+00	0.00.E+00	0.012	25.4	3.26.E-03	42.8	11.2	79.3	7.72.E-06	2.42E+18
117.78	5.61.E-04	0.00.E+00	0.00.E+00	0.010	25.1	4.49.E-03	42.3	11.1	78.5	7.15.E-06	2.24E+18
118.22	6.63.E-04	0.00.E+00	0.00.E+00	0.011	25.1	3.84.E-03	42.4	11.1	78.6	8.44.E-06	2.64E+18
118.67	7.65.E-04	0.00.E+00	5.10.E-05	0.014	25.6	3.81.E-03	43.2	11.3	80.1	9.55.E-06	2.99E+18
119.11	4.08.E-04	5.10.E-05	0.00.E+00	0.013	25.4	4.21.E-03	42.8	11.3	79.5	5.14.E-06	1.61E+18
119.55	3.06.E-04	0.00.E+00	0.00.E+00	0.011	25.6	4.72.E-03	43.1	11.3	80.0	3.82.E-06	1.20E+18
120.00	4.59.E-04	0.00.E+00	5.10.E-05	0.012	25.1	4.27.E-03	42.4	11.1	78.6	5.84.E-06	1.83E+18
120.44	6.12.E-04	0.00.E+00	0.00.E+00	0.013	25.3	4.42.E-03	42.7	11.2	79.2	7.73.E-06	2.42E+18
120.88	6.63.E-04	0.00.E+00	5.10.E-05	0.014	25.2	5.04.E-03	42.5	11.2	78.8	8.41.E-06	2.63E+18
121.32	6.63.E-04	0.00.E+00	1.02.E-04	0.013	25.0	5.46.E-03	42.2	11.1	78.2	8.48.E-06	2.65E+18
121.77	5.10.E-04	0.00.E+00	0.00.E+00	0.012	25.2	3.37.E-03	42.4	11.2	78.7	6.48.E-06	2.03E+18
122.21	6.12.E-04	5.10.E-05	0.00.E+00	0.012	25.3	4.12.E-03	42.7	11.2	79.2	7.73.E-06	2.42E+18
122.65	6.12.E-04	0.00.E+00	5.10.E-05	0.012	25.3	3.83.E-03	42.7	11.2	79.2	7.73.E-06	2.42E+18
123.09	4.59.E-04	0.00.E+00	0.00.E+00	0.014	25.4	4.20.E-03	42.8	11.2	79.4	5.79.E-06	1.81E+18
123.54	7.14.E-04	5.10.E-05	0.00.E+00	0.011	25.2	6.32.E-03	42.6	11.2	79.0	9.04.E-06	2.83E+18
123.98	5.61.E-04	0.00.E+00	0.00.E+00	0.012	25.4	5.23.E-03	42.8	11.2	79.4	7.07.E-06	2.21E+18
124.42	6.63.E-04	0.00.E+00	0.00.E+00	0.012	25.0	5.62.E-03	42.1	11.1	78.2	8.48.E-06	2.66E+18
124.87	6.63.E-04	0.00.E+00	0.00.E+00	0.012	25.3	4.96.E-03	42.6	11.2	79.1	8.39.E-06	2.63E+18
125.31	2.55.E-04	0.00.E+00	0.00.E+00	0.011	24.7	4.14.E-03	41.6	10.9	77.3	3.30.E-06	1.03E+18
125.75	6.12.E-04	0.00.E+00	0.00.E+00	0.010	25.0	5.55.E-03	42.2	11.1	78.4	7.81.E-06	2.45E+18
126.19	6.12.E-04	0.00.E+00	0.00.E+00	0.011	25.5	4.17.E-03	43.0	11.3	79.8	7.67.E-06	2.40E+18
126.64	3.57.E-04	5.10.E-05	0.00.E+00	0.013	25.3	3.21.E-03	42.6	11.2	79.1	4.51.E-06	1.41E+18
127.08	7.14.E-04	0.00.E+00	0.00.E+00	0.014	25.5	3.58.E-03	42.9	11.3	79.7	8.96.E-06	2.81E+18
127.52	2.55.E-04	0.00.E+00	5.10.E-05	0.012	25.0	4.79.E-03	42.1	11.1	78.1	3.27.E-06	1.02E+18
127.97	5.10.E-04	0.00.E+00	0.00.E+00	0.012	25.3	5.17.E-03	42.6	11.2	79.1	6.45.E-06	2.02E+18
128.41	4.08.E-04	0.00.E+00	0.00.E+00	0.012	25.2	4.58.E-03	42.5	11.2	78.9	5.18.E-06	1.62E+18
128.85	3.57.E-04	0.00.E+00	5.10.E-05	0.011	25.1	5.28.E-03	42.4	11.1	78.6	4.54.E-06	1.42E+18
129.29	3.06.E-04	0.00.E+00	0.00.E+00	0.012	25.2	4.07.E-03	42.6	11.2	79.0	3.88.E-06	1.21E+18
129.74	3.57.E-04	0.00.E+00	0.00.E+00	0.011	25.4	3.56.E-03	42.8	11.3	79.5	4.49.E-06	1.41E+18
130.18	2.55.E-04	0.00.E+00	5.10.E-05	0.013	25.8	2.93.E-03	43.5	11.4	80.7	3.16.E-06	9.90E+17
130.62	3.06.E-04	0.00.E+00	0.00.E+00	0.012	24.9	5.19.E-03	42.0	11.0	78.0	3.92.E-06	1.23E+18
131.06	4.59.E-04	5.10.E-05	5.10.E-05	0.013	24.8	4.70.E-03	41.8	11.0	77.6	5.92.E-06	1.85E+18
131.51	4.59.E-04	0.00.E+00	0.00.E+00	0.013	25.0	5.90.E-03	42.2	11.1	78.3	5.87.E-06	1.84E+18
131.95	3.06.E-04	0.00.E+00	0.00.E+00	0.012	25.0	4.54.E-03	42.2	11.1	78.3	3.91.E-06	1.22E+18
132.39	5.10.E-04	0.00.E+00	0.00.E+00	0.011	25.0	4.66.E-03	42.2	11.1	78.3	6.52.E-06	2.04E+18
132.84	4.08.E-04	0.00.E+00	0.00.E+00	0.012	24.5	4.83.E-03	41.4	10.9	76.7	5.32.E-06	1.67E+18
133.28	6.12.E-04	0.00.E+00	0.00.E+00	0.013	25.0	3.19.E-03	42.2	11.1	78.3	7.82.E-06	2.45E+18
133.72	5.10.E-04	0.00.E+00	5.10.E-05	0.011	25.4	3.14.E-03	42.9	11.3	79.5	6.41.E-06	2.01E+18
134.16	5.10.E-04	0.00.E+00	0.00.E+00	0.011	25.1	4.78.E-03	42.4	11.1	78.6	6.49.E-06	2.03E+18
134.61	4.08.E-04	0.00.E+00	5.10.E-05	0.011	25.1	4.91.E-03	42.3	11.1	78.5	5.20.E-06	1.63E+18
135.05	4.08.E-04	0.00.E+00	0.00.E+00	0.011	24.7	4.65.E-03	41.7	11.0	77.4	5.27.E-06	1.65E+18
135.49	6.12.E-04	0.00.E+00	0.00.E+00	0.011	24.9	5.15.E-03	42.0	11.0	78.0	7.85.E-06	2.46E+18
135.94	2.55.E-04	0.00.E+00	5.10.E-05	0.012	25.0	4.61.E-03	42.1	11.1	78.1	3.26.E-06	1.02E+18
136.38	1.53.E-04	0.00.E+00	0.00.E+00	0.012	24.5	4.48.E-03	41.4	10.9	76.8	1.99.E-06	6.24E+17
136.82	1.02.E-04	0.00.E+00	0.00.E+00	0.013	24.9	4.84.E-03	42.1	11.1	78.1	1.31.E-06	4.09E+17
137.26	4.59.E-04	0.00.E+00	0.00.E+00	0.013	25.0	4.92.E-03	42.1	11.1	78.1	5.88.E-06	1.84E+18
137.71	3.06.E-04	0.00.E+00	5.10.E-05	0.011	24.6	4.17.E-03	41.5	10.9	76.9	3.98.E-06	1.25E+18
138.15	3.06.E-04	0.00.E+00	0.00.E+00	0.013	25.5	4.53.E-03	43.1	11.3	79.9	3.83.E-06	1.20E+18

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
138.59	4.08.E-04	0.00.E+00	0.00.E+00	0.012	25.7	4.62.E-03	43.3	11.4	80.4	5.08.E-06	1.59E+18
139.03	4.08.E-04	0.00.E+00	0.00.E+00	0.011	25.3	3.63.E-03	42.7	11.2	79.2	5.16.E-06	1.61E+18
139.48	3.57.E-04	0.00.E+00	0.00.E+00	0.012	24.8	3.64.E-03	41.8	11.0	77.6	4.60.E-06	1.44E+18
139.92	2.55.E-04	0.00.E+00	5.10.E-05	0.014	24.9	4.80.E-03	42.0	11.0	78.0	3.27.E-06	1.02E+18
140.36	4.08.E-04	0.00.E+00	5.10.E-05	0.013	25.1	5.86.E-03	42.3	11.1	78.4	5.21.E-06	1.63E+18
140.81	3.57.E-04	0.00.E+00	0.00.E+00	0.011	25.2	4.28.E-03	42.5	11.2	79.0	4.52.E-06	1.42E+18
141.25	3.06.E-04	0.00.E+00	0.00.E+00	0.013	25.0	4.16.E-03	42.1	11.1	78.2	3.92.E-06	1.23E+18
141.69	2.55.E-04	0.00.E+00	5.10.E-05	0.012	25.0	3.82.E-03	42.2	11.1	78.2	3.26.E-06	1.02E+18
142.13	5.61.E-04	0.00.E+00	0.00.E+00	0.013	25.0	4.84.E-03	42.2	11.1	78.2	7.17.E-06	2.25E+18
142.58	2.55.E-04	0.00.E+00	5.10.E-05	0.012	24.8	5.53.E-03	41.8	11.0	77.6	3.29.E-06	1.03E+18
143.02	8.67.E-04	0.00.E+00	0.00.E+00	0.012	24.9	3.79.E-03	41.9	11.0	77.8	1.11.E-05	3.49E+18
143.46	4.59.E-04	0.00.E+00	0.00.E+00	0.012	24.1	4.89.E-03	40.7	10.7	75.5	6.09.E-06	1.91E+18
143.91	4.59.E-04	5.10.E-05	0.00.E+00	0.010	24.6	4.05.E-03	41.5	10.9	77.0	5.96.E-06	1.87E+18
144.35	2.55.E-04	0.00.E+00	0.00.E+00	0.012	24.8	4.69.E-03	41.8	11.0	77.6	3.29.E-06	1.03E+18
144.79	1.53.E-04	0.00.E+00	0.00.E+00	0.011	24.9	4.42.E-03	42.0	11.0	77.9	1.96.E-06	6.15E+17
145.23	5.10.E-04	0.00.E+00	0.00.E+00	0.012	24.7	4.28.E-03	41.7	11.0	77.4	6.59.E-06	2.06E+18
145.68	2.55.E-04	0.00.E+00	5.10.E-05	0.011	24.7	6.08.E-03	41.7	11.0	77.4	3.30.E-06	1.03E+18
146.12	4.59.E-04	0.00.E+00	5.10.E-05	0.014	25.2	4.93.E-03	42.4	11.2	78.7	5.83.E-06	1.83E+18
146.56	3.57.E-04	0.00.E+00	5.10.E-05	0.012	24.9	5.57.E-03	42.1	11.1	78.1	4.58.E-06	1.43E+18
147.00	0.00.E+00	0.00.E+00	0.00.E+00	0.013	24.6	4.57.E-03	41.4	10.9	76.9	0.00.E+00	0.00E+00
147.45	5.10.E-05	0.00.E+00	0.00.E+00	0.011	24.3	3.80.E-03	41.0	10.8	76.1	6.70.E-07	2.10E+17
147.89	4.59.E-04	0.00.E+00	0.00.E+00	0.013	24.6	4.41.E-03	41.4	10.9	76.9	5.97.E-06	1.87E+18
148.33	3.06.E-04	0.00.E+00	5.10.E-05	0.013	24.7	4.51.E-03	41.6	10.9	77.3	3.96.E-06	1.24E+18
148.78	3.06.E-04	0.00.E+00	5.10.E-05	0.011	24.7	5.02.E-03	41.7	11.0	77.3	3.96.E-06	1.24E+18
149.22	2.55.E-04	0.00.E+00	5.10.E-05	0.010	24.6	4.48.E-03	41.4	10.9	76.9	3.32.E-06	1.04E+18
149.66	4.08.E-04	0.00.E+00	0.00.E+00	0.011	24.5	4.79.E-03	41.4	10.9	76.8	5.32.E-06	1.66E+18
150.10	2.04.E-04	0.00.E+00	0.00.E+00	0.012	24.5	5.68.E-03	41.3	10.8	76.6	2.67.E-06	8.35E+17
150.55	2.04.E-04	0.00.E+00	5.10.E-05	0.011	24.4	4.87.E-03	41.2	10.8	76.5	2.67.E-06	8.36E+17
150.99	3.06.E-04	0.00.E+00	0.00.E+00	0.013	24.7	4.72.E-03	41.7	11.0	77.5	3.95.E-06	1.24E+18
151.43	4.59.E-04	0.00.E+00	5.10.E-05	0.013	25.1	4.88.E-03	42.4	11.1	78.6	5.84.E-06	1.83E+18
151.88	1.53.E-04	0.00.E+00	0.00.E+00	0.011	25.4	4.17.E-03	42.8	11.2	79.4	1.93.E-06	6.04E+17
152.32	3.57.E-04	0.00.E+00	0.00.E+00	0.011	24.6	5.10.E-03	41.5	10.9	76.9	4.64.E-06	1.45E+18
152.76	2.04.E-04	0.00.E+00	0.00.E+00	0.011	24.8	4.58.E-03	41.8	11.0	77.5	2.63.E-06	8.25E+17
153.20	2.04.E-04	0.00.E+00	0.00.E+00	0.010	24.5	4.39.E-03	41.4	10.9	76.8	2.66.E-06	8.32E+17
153.65	3.06.E-04	0.00.E+00	0.00.E+00	0.011	24.1	5.17.E-03	40.7	10.7	75.5	4.06.E-06	1.27E+18
154.09	3.57.E-04	0.00.E+00	0.00.E+00	0.011	24.1	4.14.E-03	40.7	10.7	75.6	4.73.E-06	1.48E+18
154.53	2.04.E-04	5.10.E-05	0.00.E+00	0.010	24.6	3.57.E-03	41.5	10.9	77.1	2.65.E-06	8.29E+17
154.98	5.10.E-05	0.00.E+00	0.00.E+00	0.011	24.4	4.24.E-03	41.2	10.8	76.5	6.67.E-07	2.09E+17
155.42	1.53.E-04	0.00.E+00	5.10.E-05	0.011	24.4	4.40.E-03	41.2	10.8	76.4	2.00.E-06	6.27E+17
155.86	3.06.E-04	0.00.E+00	0.00.E+00	0.012	24.1	4.08.E-03	40.7	10.7	75.5	4.05.E-06	1.27E+18
156.30	3.57.E-04	0.00.E+00	0.00.E+00	0.009	24.2	4.07.E-03	40.8	10.7	75.6	4.72.E-06	1.48E+18
156.75	4.59.E-04	0.00.E+00	0.00.E+00	0.010	24.5	4.38.E-03	41.3	10.9	76.6	5.99.E-06	1.88E+18
157.19	3.06.E-04	0.00.E+00	5.10.E-05	0.010	25.0	4.55.E-03	42.1	11.1	78.1	3.92.E-06	1.23E+18
157.63	1.53.E-04	0.00.E+00	5.10.E-05	0.011	24.7	4.77.E-03	41.7	11.0	77.4	1.98.E-06	6.20E+17
158.07	1.02.E-04	0.00.E+00	1.02.E-04	0.011	24.3	4.68.E-03	41.0	10.8	76.0	1.34.E-06	4.20E+17
158.52	4.08.E-04	0.00.E+00	0.00.E+00	0.013	24.5	3.63.E-03	41.4	10.9	76.8	5.32.E-06	1.66E+18
158.96	2.55.E-04	0.00.E+00	0.00.E+00	0.014	24.4	3.32.E-03	41.1	10.8	76.4	3.34.E-06	1.05E+18
159.40	2.04.E-04	5.10.E-05	5.10.E-05	0.013	24.7	3.39.E-03	41.7	11.0	77.4	2.64.E-06	8.25E+17
159.85	2.55.E-04	0.00.E+00	5.10.E-05	0.012	24.6	5.45.E-03	41.5	10.9	77.1	3.31.E-06	1.04E+18
160.29	6.63.E-04	0.00.E+00	0.00.E+00	0.012	23.9	5.62.E-03	40.3	10.6	74.7	8.88.E-06	2.78E+18
160.73	1.53.E-04	0.00.E+00	0.00.E+00	0.013	24.6	3.71.E-03	41.5	10.9	77.1	1.99.E-06	6.22E+17
161.17	3.06.E-04	0.00.E+00	0.00.E+00	0.013	24.5	4.48.E-03	41.3	10.9	76.7	3.99.E-06	1.25E+18
161.62	3.57.E-04	0.00.E+00	0.00.E+00	0.012	25.3	4.06.E-03	42.6	11.2	79.1	4.52.E-06	1.41E+18
162.06	5.10.E-05	0.00.E+00	5.10.E-05	0.012	24.6	3.33.E-03	41.6	10.9	77.1	6.62.E-07	2.07E+17
162.50	2.55.E-04	0.00.E+00	5.10.E-05	0.013	24.4	3.76.E-03	41.1	10.8	76.2	3.35.E-06	1.05E+18
162.95	5.10.E-04	0.00.E+00	5.10.E-05	0.011	24.1	4.47.E-03	40.6	10.7	75.4	6.77.E-06	2.12E+18
163.39	2.55.E-04	0.00.E+00	5.10.E-05	0.013	24.2	3.62.E-03	40.8	10.7	75.7	3.37.E-06	1.06E+18
163.83	3.06.E-04	0.00.E+00	0.00.E+00	0.012	24.7	3.55.E-03	41.7	11.0	77.5	3.95.E-06	1.24E+18
164.27	2.55.E-04	0.00.E+00	1.02.E-04	0.011	24.4	3.97.E-03	41.2	10.8	76.5	3.33.E-06	1.04E+18
164.72	4.08.E-04	5.10.E-05	0.00.E+00	0.010	24.3	4.96.E-03	41.0	10.8	76.1	5.36.E-06	1.68E+18
165.16	3.06.E-04	0.00.E+00	0.00.E+00	0.014	24.6	5.69.E-03	41.4	10.9	76.9	3.98.E-06	1.25E+18
165.60	5.10.E-04	0.00.E+00	0.00.E+00	0.012	24.6	3.99.E-03	41.5	10.9	77.0	6.63.E-06	2.08E+18
166.04	3.57.E-04	5.10.E-05	5.10.E-05	0.012	24.7	5.02.E-03	41.7	11.0	77.4	4.62.E-06	1.45E+18
166.49	2.04.E-04	0.00.E+00	0.00.E+00	0.012	25.0	2.92.E-03	42.1	11.1	78.2	2.61.E-06	8.17E+17

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	Σ C ⁺ (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
166.93	2.04.E-04	5.10.E-05	0.00.E+00	0.012	25.2	3.25.E-03	42.5	11.2	78.8	2.59.E-06	8.11E+17
167.37	1.53.E-04	0.00.E+00	5.10.E-05	0.014	24.7	3.85.E-03	41.7	10.9	77.3	1.98.E-06	6.20E+17
167.82	2.55.E-04	0.00.E+00	0.00.E+00	0.011	24.6	4.63.E-03	41.4	10.9	76.8	3.32.E-06	1.04E+18
168.26	3.06.E-04	0.00.E+00	0.00.E+00	0.012	24.0	4.54.E-03	40.5	10.7	75.2	4.07.E-06	1.27E+18
168.70	1.53.E-04	5.10.E-05	0.00.E+00	0.013	24.6	5.74.E-03	41.4	10.9	76.9	1.99.E-06	6.24E+17
169.14	1.02.E-04	0.00.E+00	0.00.E+00	0.012	25.0	3.47.E-03	42.2	11.1	78.3	1.30.E-06	4.08E+17
169.59	2.55.E-04	5.10.E-05	0.00.E+00	0.011	24.4	4.00.E-03	41.2	10.8	76.5	3.34.E-06	1.04E+18
170.03	2.04.E-04	0.00.E+00	5.10.E-05	0.012	24.7	3.30.E-03	41.6	10.9	77.2	2.64.E-06	8.28E+17
170.47	1.53.E-04	0.00.E+00	0.00.E+00	0.011	24.1	4.03.E-03	40.7	10.7	75.5	2.03.E-06	6.35E+17
170.92	3.57.E-04	0.00.E+00	0.00.E+00	0.011	24.3	4.80.E-03	41.0	10.8	76.0	4.70.E-06	1.47E+18
171.36	5.10.E-05	0.00.E+00	0.00.E+00	0.012	25.0	3.97.E-03	42.1	11.1	78.2	6.52.E-07	2.04E+17
171.80	1.53.E-04	0.00.E+00	0.00.E+00	0.012	24.3	5.11.E-03	40.9	10.8	75.9	2.02.E-06	6.31E+17
172.24	3.57.E-04	0.00.E+00	0.00.E+00	0.013	24.2	4.96.E-03	40.9	10.7	75.8	4.71.E-06	1.48E+18
172.69	1.02.E-04	5.10.E-05	0.00.E+00	0.011	24.4	3.65.E-03	41.1	10.8	76.2	1.34.E-06	4.19E+17
173.13	2.55.E-04	0.00.E+00	5.10.E-05	0.011	24.2	4.52.E-03	40.8	10.7	75.7	3.37.E-06	1.05E+18
173.57	1.02.E-04	0.00.E+00	5.10.E-05	0.011	24.8	3.95.E-03	41.8	11.0	77.5	1.32.E-06	4.12E+17
174.01	5.10.E-05	0.00.E+00	5.10.E-05	0.011	23.7	5.08.E-03	39.9	10.5	74.1	6.88.E-07	2.16E+17
174.46	1.53.E-04	0.00.E+00	5.10.E-05	0.013	24.2	5.12.E-03	40.8	10.7	75.7	2.02.E-06	6.33E+17
174.90	1.53.E-04	0.00.E+00	5.10.E-05	0.011	24.4	4.48.E-03	41.1	10.8	76.3	2.01.E-06	6.28E+17
175.34	3.06.E-04	0.00.E+00	0.00.E+00	0.011	24.1	3.74.E-03	40.7	10.7	75.6	4.05.E-06	1.27E+18
175.79	1.02.E-04	0.00.E+00	0.00.E+00	0.011	24.4	4.01.E-03	41.2	10.8	76.4	1.34.E-06	4.18E+17
176.23	2.04.E-04	0.00.E+00	5.10.E-05	0.012	23.9	2.72.E-03	40.3	10.6	74.8	2.73.E-06	8.54E+17
176.67	1.02.E-04	0.00.E+00	0.00.E+00	0.010	24.2	3.65.E-03	40.9	10.7	75.8	1.35.E-06	4.21E+17
177.11	2.04.E-04	0.00.E+00	0.00.E+00	0.010	23.8	5.81.E-03	40.1	10.5	74.4	2.74.E-06	8.59E+17
177.56	3.06.E-04	0.00.E+00	0.00.E+00	0.011	23.7	5.38.E-03	40.0	10.5	74.1	4.13.E-06	1.29E+18
178.00	5.10.E-05	0.00.E+00	0.00.E+00	0.013	23.9	4.69.E-03	40.4	10.6	75.0	6.81.E-07	2.13E+17
178.44	2.04.E-04	0.00.E+00	0.00.E+00	0.011	23.7	3.64.E-03	40.0	10.5	74.3	2.75.E-06	8.60E+17
178.89	3.57.E-04	0.00.E+00	1.02.E-04	0.010	24.0	3.69.E-03	40.5	10.6	75.2	4.75.E-06	1.49E+18
179.33	2.04.E-04	0.00.E+00	0.00.E+00	0.011	23.8	4.17.E-03	40.2	10.6	74.6	2.73.E-06	8.56E+17
179.77	1.53.E-04	0.00.E+00	0.00.E+00	0.011	23.9	4.33.E-03	40.4	10.6	74.9	2.04.E-06	6.40E+17
180.21	1.53.E-04	0.00.E+00	0.00.E+00	0.013	23.6	3.99.E-03	39.9	10.5	74.0	2.07.E-06	6.48E+17
180.66	1.53.E-04	5.10.E-05	5.10.E-05	0.011	23.9	4.74.E-03	40.3	10.6	74.8	2.05.E-06	6.41E+17
181.10	2.04.E-04	0.00.E+00	0.00.E+00	0.011	23.8	4.14.E-03	40.2	10.6	74.6	2.74.E-06	8.57E+17
181.54	5.10.E-05	0.00.E+00	0.00.E+00	0.011	24.1	4.61.E-03	40.7	10.7	75.5	6.76.E-07	2.12E+17
181.99	1.53.E-04	0.00.E+00	0.00.E+00	0.013	24.0	4.37.E-03	40.4	10.6	75.0	2.04.E-06	6.39E+17
182.43	2.04.E-04	0.00.E+00	5.10.E-05	0.011	23.8	4.25.E-03	40.1	10.5	74.4	2.74.E-06	8.59E+17
182.87	1.02.E-04	0.00.E+00	5.10.E-05	0.013	24.1	4.14.E-03	40.7	10.7	75.5	1.35.E-06	4.23E+17
183.31	3.57.E-04	0.00.E+00	0.00.E+00	0.012	24.0	5.60.E-03	40.5	10.7	75.2	4.75.E-06	1.49E+18
183.76	5.10.E-05	0.00.E+00	0.00.E+00	0.012	24.2	3.98.E-03	40.7	10.7	75.6	6.75.E-07	2.11E+17
184.20	2.55.E-04	0.00.E+00	0.00.E+00	0.012	24.1	3.80.E-03	40.7	10.7	75.5	3.38.E-06	1.06E+18
184.64	2.55.E-04	0.00.E+00	0.00.E+00	0.010	23.9	4.81.E-03	40.4	10.6	74.9	3.40.E-06	1.07E+18
185.08	2.55.E-04	0.00.E+00	5.10.E-05	0.012	24.2	4.40.E-03	40.8	10.7	75.7	3.37.E-06	1.05E+18
185.53	2.55.E-04	0.00.E+00	0.00.E+00	0.013	23.6	5.19.E-03	39.8	10.5	73.9	3.45.E-06	1.08E+18
185.97	2.04.E-04	0.00.E+00	0.00.E+00	0.012	24.0	3.99.E-03	40.5	10.7	75.2	2.71.E-06	8.49E+17
186.41	3.06.E-04	0.00.E+00	0.00.E+00	0.013	24.1	3.94.E-03	40.7	10.7	75.4	4.06.E-06	1.27E+18
186.86	1.53.E-04	0.00.E+00	5.10.E-05	0.011	24.3	4.69.E-03	41.0	10.8	76.0	2.01.E-06	6.30E+17
187.30	1.02.E-04	0.00.E+00	0.00.E+00	0.011	23.8	4.69.E-03	40.1	10.5	74.5	1.37.E-06	4.29E+17
187.74	1.02.E-04	5.10.E-05	5.10.E-05	0.012	24.1	5.18.E-03	40.6	10.7	75.4	1.35.E-06	4.24E+17
188.18	3.06.E-04	0.00.E+00	5.10.E-05	0.011	24.4	4.87.E-03	41.2	10.8	76.4	4.01.E-06	1.25E+18
188.63	0.00.E+00	0.00.E+00	0.00.E+00	0.012	24.6	3.61.E-03	41.5	10.9	77.1	0.00.E+00	0.00E+00
189.07	1.02.E-04	0.00.E+00	5.10.E-05	0.013	24.3	4.31.E-03	41.0	10.8	76.1	1.34.E-06	4.20E+17
189.51	3.06.E-04	0.00.E+00	0.00.E+00	0.012	24.4	3.51.E-03	41.1	10.8	76.3	4.01.E-06	1.26E+18
189.96	2.55.E-04	0.00.E+00	5.10.E-05	0.012	24.2	3.42.E-03	40.8	10.7	75.8	3.37.E-06	1.05E+18
190.40	2.55.E-04	0.00.E+00	0.00.E+00	0.012	23.6	4.58.E-03	39.8	10.5	73.9	3.45.E-06	1.08E+18
190.84	2.04.E-04	0.00.E+00	0.00.E+00	0.013	24.4	3.79.E-03	41.1	10.8	76.3	2.67.E-06	8.37E+17
191.28	1.53.E-04	0.00.E+00	0.00.E+00	0.013	24.6	3.23.E-03	41.5	10.9	77.0	1.99.E-06	6.22E+17
191.73	2.55.E-04	0.00.E+00	5.10.E-05	0.013	23.9	4.42.E-03	40.3	10.6	74.8	3.41.E-06	1.07E+18
192.17	2.04.E-04	0.00.E+00	0.00.E+00	0.013	23.7	5.10.E-03	39.9	10.5	74.1	2.75.E-06	8.62E+17
192.61	2.55.E-04	0.00.E+00	0.00.E+00	0.011	23.9	5.24.E-03	40.3	10.6	74.7	3.41.E-06	1.07E+18
193.05	2.04.E-04	0.00.E+00	0.00.E+00	0.011	24.4	3.35.E-03	41.1	10.8	76.3	2.67.E-06	8.37E+17
193.50	5.10.E-05	0.00.E+00	0.00.E+00	0.012	24.2	3.69.E-03	40.9	10.7	75.9	6.72.E-07	2.11E+17
193.94	1.02.E-04	0.00.E+00	0.00.E+00	0.011	24.0	5.03.E-03	40.5	10.6	75.1	1.36.E-06	4.25E+17
194.38	5.10.E-05	0.00.E+00	0.00.E+00	0.012	23.6	4.76.E-03	39.8	10.5	73.9	6.90.E-07	2.16E+17
194.83	5.10.E-05	0.00.E+00	5.10.E-05	0.011	24.1	3.68.E-03	40.6	10.7	75.4	6.76.E-07	2.12E+17

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
195.27	1.02.E-04	0.00.E+00	0.00.E+00	0.012	23.5	4.69.E-03	39.6	10.4	73.5	1.39.E-06	4.35E+17
195.71	1.53.E-04	0.00.E+00	0.00.E+00	0.013	24.0	3.29.E-03	40.4	10.6	75.0	2.04.E-06	6.39E+17
196.15	5.10.E-05	0.00.E+00	0.00.E+00	0.013	24.2	3.45.E-03	40.9	10.7	75.9	6.72.E-07	2.11E+17
196.60	1.53.E-04	0.00.E+00	0.00.E+00	0.012	23.9	3.72.E-03	40.4	10.6	74.9	2.04.E-06	6.40E+17
197.04	1.02.E-04	0.00.E+00	0.00.E+00	0.012	23.9	4.86.E-03	40.3	10.6	74.8	1.36.E-06	4.27E+17
197.48	3.06.E-04	0.00.E+00	0.00.E+00	0.011	23.8	4.01.E-03	40.1	10.5	74.5	4.11.E-06	1.29E+18
197.93	1.02.E-04	0.00.E+00	0.00.E+00	0.013	23.3	4.26.E-03	39.3	10.3	73.0	1.40.E-06	4.38E+17
198.37	3.06.E-04	0.00.E+00	5.10.E-05	0.013	23.8	4.27.E-03	40.2	10.6	74.6	4.10.E-06	1.28E+18
198.81	1.53.E-04	0.00.E+00	0.00.E+00	0.010	23.4	4.12.E-03	39.5	10.4	73.4	2.09.E-06	6.53E+17
199.25	2.04.E-04	0.00.E+00	0.00.E+00	0.014	24.1	3.36.E-03	40.7	10.7	75.5	2.70.E-06	8.46E+17
199.70	1.53.E-04	0.00.E+00	5.10.E-05	0.011	23.4	5.24.E-03	39.5	10.4	73.4	2.09.E-06	6.53E+17
200.14	5.10.E-05	0.00.E+00	0.00.E+00	0.013	24.2	3.68.E-03	40.8	10.7	75.7	6.74.E-07	2.11E+17
200.58	1.02.E-04	0.00.E+00	0.00.E+00	0.012	24.1	3.17.E-03	40.7	10.7	75.5	1.35.E-06	4.23E+17
201.02	5.10.E-05	0.00.E+00	0.00.E+00	0.011	23.9	4.00.E-03	40.2	10.6	74.7	6.83.E-07	2.14E+17
201.47	1.53.E-04	0.00.E+00	0.00.E+00	0.012	23.2	4.79.E-03	39.1	10.3	72.5	2.11.E-06	6.61E+17
201.91	1.02.E-04	0.00.E+00	0.00.E+00	0.012	24.0	4.07.E-03	40.5	10.7	75.2	1.36.E-06	4.25E+17
202.35	1.53.E-04	0.00.E+00	0.00.E+00	0.013	23.7	3.74.E-03	40.0	10.5	74.2	2.06.E-06	6.46E+17
202.80	2.55.E-04	0.00.E+00	0.00.E+00	0.011	23.6	3.92.E-03	39.8	10.5	73.8	3.46.E-06	1.08E+18
203.24	2.55.E-04	0.00.E+00	5.10.E-05	0.012	23.5	4.19.E-03	39.6	10.4	73.5	3.47.E-06	1.09E+18
203.68	1.53.E-04	0.00.E+00	5.10.E-05	0.012	23.8	4.06.E-03	40.1	10.5	74.4	2.06.E-06	6.44E+17
204.12	1.02.E-04	0.00.E+00	0.00.E+00	0.011	24.7	3.44.E-03	41.7	11.0	77.4	1.32.E-06	4.13E+17
204.57	3.57.E-04	0.00.E+00	0.00.E+00	0.013	23.9	4.09.E-03	40.3	10.6	74.9	4.77.E-06	1.49E+18
205.01	2.55.E-04	0.00.E+00	1.02.E-04	0.012	24.0	3.24.E-03	40.4	10.6	75.0	3.40.E-06	1.07E+18
205.45	0.00.E+00	0.00.E+00	5.10.E-05	0.011	23.9	4.31.E-03	40.3	10.6	74.7	0.00.E+00	0.00E+00
205.90	1.53.E-04	0.00.E+00	0.00.E+00	0.011	23.6	4.27.E-03	39.8	10.5	73.9	2.07.E-06	6.48E+17
206.34	1.53.E-04	0.00.E+00	0.00.E+00	0.011	23.7	3.46.E-03	40.0	10.5	74.2	2.06.E-06	6.46E+17
206.78	2.04.E-04	0.00.E+00	0.00.E+00	0.010	23.5	3.70.E-03	39.6	10.4	73.6	2.77.E-06	8.69E+17
207.22	5.10.E-05	0.00.E+00	0.00.E+00	0.011	23.8	4.09.E-03	40.1	10.5	74.5	6.85.E-07	2.14E+17
207.67	1.02.E-04	0.00.E+00	0.00.E+00	0.010	23.8	3.42.E-03	40.1	10.5	74.4	1.37.E-06	4.30E+17
208.11	5.10.E-05	0.00.E+00	0.00.E+00	0.009	24.2	4.72.E-03	40.8	10.7	75.6	6.75.E-07	2.11E+17
208.55	2.55.E-04	0.00.E+00	0.00.E+00	0.009	24.6	3.82.E-03	41.6	10.9	77.1	3.31.E-06	1.04E+18
209.00	5.10.E-05	0.00.E+00	0.00.E+00	0.010	24.3	4.58.E-03	41.0	10.8	76.0	6.71.E-07	2.10E+17
209.44	1.53.E-04	0.00.E+00	0.00.E+00	0.010	24.3	3.45.E-03	41.0	10.8	76.2	2.01.E-06	6.29E+17
209.88	0.00.E+00	0.00.E+00	0.00.E+00	0.011	24.4	4.01.E-03	41.1	10.8	76.3	0.00.E+00	0.00E+00
210.32	1.53.E-04	0.00.E+00	0.00.E+00	0.010	24.6	4.04.E-03	41.5	10.9	77.1	1.99.E-06	6.22E+17
210.77	2.55.E-04	0.00.E+00	0.00.E+00	0.011	23.9	3.75.E-03	40.3	10.6	74.7	3.42.E-06	1.07E+18
211.21	1.53.E-04	0.00.E+00	0.00.E+00	0.011	23.7	4.32.E-03	40.0	10.5	74.3	2.06.E-06	6.45E+17
211.65	1.53.E-04	0.00.E+00	0.00.E+00	0.012	23.7	3.88.E-03	39.9	10.5	74.1	2.07.E-06	6.47E+17
212.09	1.53.E-04	0.00.E+00	5.10.E-05	0.011	23.5	3.47.E-03	39.7	10.4	73.7	2.08.E-06	6.51E+17
212.54	1.53.E-04	0.00.E+00	1.02.E-04	0.012	24.4	4.10.E-03	41.2	10.8	76.4	2.00.E-06	6.28E+17
212.98	1.02.E-04	0.00.E+00	0.00.E+00	0.012	24.9	2.68.E-03	42.0	11.0	78.0	1.31.E-06	4.10E+17
213.42	1.53.E-04	0.00.E+00	0.00.E+00	0.011	24.7	3.65.E-03	41.6	10.9	77.2	1.98.E-06	6.21E+17
213.87	0.00.E+00	0.00.E+00	5.10.E-05	0.012	24.7	3.25.E-03	41.7	11.0	77.4	0.00.E+00	0.00E+00
214.31	1.53.E-04	0.00.E+00	0.00.E+00	0.012	24.6	3.38.E-03	41.5	10.9	77.1	1.99.E-06	6.22E+17
214.75	2.04.E-04	0.00.E+00	0.00.E+00	0.011	24.6	3.71.E-03	41.4	10.9	76.9	2.65.E-06	8.31E+17
215.19	1.02.E-04	0.00.E+00	0.00.E+00	0.011	24.5	3.01.E-03	41.2	10.8	76.5	1.33.E-06	4.18E+17
215.64	1.02.E-04	0.00.E+00	0.00.E+00	0.011	24.7	2.90.E-03	41.6	10.9	77.3	1.32.E-06	4.14E+17
216.08	1.02.E-04	0.00.E+00	0.00.E+00	0.010	24.9	4.36.E-03	42.0	11.0	77.9	1.31.E-06	4.10E+17
216.52	0.00.E+00	0.00.E+00	0.00.E+00	0.010	25.0	3.70.E-03	42.1	11.1	78.2	0.00.E+00	0.00E+00
216.97	1.02.E-04	0.00.E+00	0.00.E+00	0.011	25.3	2.54.E-03	42.6	11.2	79.0	1.29.E-06	4.04E+17
217.41	5.10.E-05	0.00.E+00	0.00.E+00	0.013	25.0	3.13.E-03	42.1	11.1	78.1	6.53.E-07	2.05E+17
217.85	5.10.E-05	0.00.E+00	0.00.E+00	0.012	24.1	2.48.E-03	40.7	10.7	75.6	6.75.E-07	2.11E+17
218.29	1.02.E-04	0.00.E+00	0.00.E+00	0.010	24.3	3.08.E-03	41.0	10.8	76.2	1.34.E-06	4.20E+17
218.74	0.00.E+00	0.00.E+00	5.10.E-05	0.011	24.5	3.68.E-03	41.4	10.9	76.8	0.00.E+00	0.00E+00
219.18	5.10.E-05	0.00.E+00	5.10.E-05	0.011	24.4	3.28.E-03	41.1	10.8	76.3	6.69.E-07	2.09E+17
219.62	1.02.E-04	0.00.E+00	5.10.E-05	0.013	24.5	4.43.E-03	41.2	10.8	76.5	1.33.E-06	4.18E+17
220.06	0.00.E+00	0.00.E+00	0.00.E+00	0.012	24.9	3.29.E-03	42.0	11.0	77.9	0.00.E+00	0.00E+00
220.51	1.53.E-04	5.10.E-05	0.00.E+00	0.013	25.0	2.81.E-03	42.2	11.1	78.4	1.95.E-06	6.11E+17
220.95	0.00.E+00	0.00.E+00	0.00.E+00	0.012	24.5	3.09.E-03	41.3	10.9	76.7	0.00.E+00	0.00E+00
221.39	2.04.E-04	5.10.E-05	5.10.E-05	0.012	24.9	3.20.E-03	42.0	11.0	77.9	2.62.E-06	8.20E+17
221.84	1.02.E-04	0.00.E+00	0.00.E+00	0.012	24.9	3.61.E-03	41.9	11.0	77.8	1.31.E-06	4.11E+17
222.28	5.10.E-05	0.00.E+00	0.00.E+00	0.012	25.2	3.95.E-03	42.4	11.2	78.8	6.48.E-07	2.03E+17
222.72	1.02.E-04	0.00.E+00	0.00.E+00	0.012	24.6	3.85.E-03	41.5	10.9	77.1	1.32.E-06	4.15E+17
223.16	5.10.E-05	0.00.E+00	0.00.E+00	0.010	24.6	4.09.E-03	41.4	10.9	76.8	6.64.E-07	2.08E+17

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C ⁺ (Cnt/MSc/Px)	¹³ C ²⁺ (Cnt/MSc/Px)	¹² C ³⁺ (Cnt/MSc/Px)	¹² C ⁺ estimate ⁺ (Cnt/MSc/Px)	¹³ C ³⁺ estimate ⁺ (Cnt/MSc/Px)	ΣC Cnt/MSc/Px	⁴ He/ ¹² C	⁴ He conc. (cm ³)
223.61	0.00.E+00	0.00.E+00	0.00.E+00	0.014	24.7	3.75.E-03	41.7	11.0	77.4	0.00.E+00	0.00E+00
224.05	1.53.E-04	0.00.E+00	0.00.E+00	0.014	25.4	4.56.E-03	42.8	11.2	79.4	1.93.E-06	6.04E+17
224.49	1.53.E-04	0.00.E+00	0.00.E+00	0.013	24.0	4.12.E-03	40.5	10.6	75.2	2.04.E-06	6.38E+17
224.94	1.53.E-04	0.00.E+00	0.00.E+00	0.014	24.7	3.88.E-03	41.6	10.9	77.2	1.98.E-06	6.21E+17
225.38	1.02.E-04	0.00.E+00	5.10.E-05	0.013	24.6	2.98.E-03	41.4	10.9	76.9	1.33.E-06	4.15E+17
225.82	1.02.E-04	0.00.E+00	0.00.E+00	0.012	24.6	3.06.E-03	41.5	10.9	77.1	1.32.E-06	4.14E+17
226.26	5.10.E-05	5.10.E-05	0.00.E+00	0.013	24.9	3.05.E-03	42.0	11.0	78.0	6.54.E-07	2.05E+17
226.71	1.02.E-04	0.00.E+00	5.10.E-05	0.012	24.7	3.68.E-03	41.6	10.9	77.3	1.32.E-06	4.13E+17
227.15	2.04.E-04	0.00.E+00	0.00.E+00	0.012	24.4	4.01.E-03	41.2	10.8	76.4	2.67.E-06	8.36E+17
227.59	1.02.E-04	5.10.E-05	0.00.E+00	0.013	24.4	3.77.E-03	41.2	10.8	76.4	1.34.E-06	4.18E+17
228.03	5.10.E-05	0.00.E+00	0.00.E+00	0.014	24.6	2.75.E-03	41.4	10.9	76.9	6.64.E-07	2.08E+17
228.48	5.10.E-05	0.00.E+00	0.00.E+00	0.012	24.9	3.81.E-03	42.1	11.1	78.1	6.54.E-07	2.05E+17
228.92	0.00.E+00	0.00.E+00	5.10.E-05	0.016	25.0	3.65.E-03	42.2	11.1	78.4	0.00.E+00	0.00E+00
229.36	1.53.E-04	0.00.E+00	0.00.E+00	0.012	24.4	3.66.E-03	41.2	10.8	76.5	2.00.E-06	6.27E+17
229.81	0.00.E+00	0.00.E+00	0.00.E+00	0.014	24.8	2.84.E-03	41.8	11.0	77.7	0.00.E+00	0.00E+00
230.25	0.00.E+00	5.10.E-05	0.00.E+00	0.014	24.3	3.40.E-03	41.0	10.8	76.0	0.00.E+00	0.00E+00
230.69	5.10.E-05	0.00.E+00	0.00.E+00	0.012	24.3	4.03.E-03	40.9	10.8	75.9	6.72.E-07	2.10E+17
231.13	0.00.E+00	0.00.E+00	5.10.E-05	0.015	24.6	3.39.E-03	41.5	10.9	77.0	0.00.E+00	0.00E+00
231.58	1.53.E-04	0.00.E+00	0.00.E+00	0.015	24.1	4.74.E-03	40.6	10.7	75.4	2.03.E-06	6.36E+17
232.02	1.53.E-04	0.00.E+00	0.00.E+00	0.014	24.5	2.86.E-03	41.3	10.9	76.7	2.00.E-06	6.25E+17
232.46	0.00.E+00	0.00.E+00	0.00.E+00	0.016	24.6	3.75.E-03	41.5	10.9	77.0	0.00.E+00	0.00E+00
232.91	2.04.E-04	0.00.E+00	0.00.E+00	0.013	25.2	3.47.E-03	42.5	11.2	78.9	2.59.E-06	8.10E+17
233.35	5.10.E-05	0.00.E+00	0.00.E+00	0.014	24.4	3.56.E-03	41.1	10.8	76.2	6.69.E-07	2.10E+17
233.79	1.53.E-04	0.00.E+00	5.10.E-05	0.012	24.7	3.20.E-03	41.6	10.9	77.2	1.98.E-06	6.21E+17
234.23	0.00.E+00	5.10.E-05	0.00.E+00	0.013	24.2	3.55.E-03	40.8	10.7	75.6	0.00.E+00	0.00E+00
234.68	2.04.E-04	0.00.E+00	0.00.E+00	0.013	24.7	3.62.E-03	41.6	10.9	77.2	2.64.E-06	8.28E+17
235.12	1.53.E-04	0.00.E+00	5.10.E-05	0.014	24.7	4.46.E-03	41.6	10.9	77.2	1.98.E-06	6.21E+17
235.56	0.00.E+00	0.00.E+00	0.00.E+00	0.015	24.9	3.37.E-03	42.1	11.1	78.1	0.00.E+00	0.00E+00
236.00	1.02.E-04	0.00.E+00	0.00.E+00	0.015	24.4	3.14.E-03	41.2	10.8	76.4	1.34.E-06	4.18E+17
236.45	1.02.E-04	0.00.E+00	0.00.E+00	0.015	24.7	3.05.E-03	41.7	11.0	77.4	1.32.E-06	4.13E+17
236.89	5.10.E-05	0.00.E+00	0.00.E+00	0.015	24.9	3.33.E-03	42.0	11.0	77.9	6.55.E-07	2.05E+17
237.33	1.02.E-04	0.00.E+00	5.10.E-05	0.017	25.2	3.92.E-03	42.5	11.2	78.8	1.29.E-06	4.05E+17
237.78	1.53.E-04	0.00.E+00	0.00.E+00	0.015	25.8	2.94.E-03	43.5	11.4	80.7	1.90.E-06	5.94E+17
238.22	0.00.E+00	0.00.E+00	0.00.E+00	0.015	25.1	3.29.E-03	42.4	11.1	78.6	0.00.E+00	0.00E+00
238.66	5.10.E-05	0.00.E+00	0.00.E+00	0.015	25.0	4.40.E-03	42.2	11.1	78.3	6.52.E-07	2.04E+17
239.10	1.02.E-04	0.00.E+00	0.00.E+00	0.015	24.6	2.07.E-03	41.5	10.9	77.0	1.33.E-06	4.15E+17
239.55	5.10.E-05	0.00.E+00	0.00.E+00	0.013	24.6	4.57.E-03	41.6	10.9	77.1	6.62.E-07	2.07E+17
239.99	5.10.E-05	0.00.E+00	0.00.E+00	0.015	24.9	3.12.E-03	41.9	11.0	77.8	6.55.E-07	2.05E+17
240.43	0.00.E+00	0.00.E+00	0.00.E+00	0.015	24.6	3.01.E-03	41.4	10.9	76.9	0.00.E+00	0.00E+00
240.88	1.53.E-04	0.00.E+00	5.10.E-05	0.016	25.0	2.71.E-03	42.2	11.1	78.4	1.95.E-06	6.12E+17
241.32	5.10.E-05	0.00.E+00	5.10.E-05	0.013	24.5	3.98.E-03	41.4	10.9	76.7	6.65.E-07	2.08E+17
241.76	1.02.E-04	0.00.E+00	0.00.E+00	0.017	24.2	4.47.E-03	40.9	10.7	75.9	1.34.E-06	4.21E+17
242.20	5.10.E-05	0.00.E+00	0.00.E+00	0.013	24.4	4.59.E-03	41.1	10.8	76.3	6.69.E-07	2.09E+17
242.65	5.10.E-05	0.00.E+00	5.10.E-05	0.015	24.6	2.94.E-03	41.6	10.9	77.1	6.61.E-07	2.07E+17
243.09	5.10.E-05	0.00.E+00	0.00.E+00	0.015	25.0	3.46.E-03	42.2	11.1	78.3	6.51.E-07	2.04E+17
243.53	0.00.E+00	0.00.E+00	0.00.E+00	0.015	25.0	3.09.E-03	42.2	11.1	78.3	0.00.E+00	0.00E+00
243.98	0.00.E+00	0.00.E+00	0.00.E+00	0.014	24.9	4.06.E-03	42.1	11.1	78.1	0.00.E+00	0.00E+00
244.42	1.02.E-04	0.00.E+00	5.10.E-05	0.015	25.6	3.78.E-03	43.1	11.3	80.0	1.28.E-06	3.99E+17
244.86	5.10.E-05	0.00.E+00	0.00.E+00	0.015	25.0	4.84.E-03	42.1	11.1	78.2	6.53.E-07	2.04E+17
245.30	0.00.E+00	0.00.E+00	5.10.E-05	0.014	25.2	4.08.E-03	42.4	11.1	78.7	0.00.E+00	0.00E+00
245.75	1.02.E-04	0.00.E+00	0.00.E+00	0.015	25.4	2.39.E-03	42.9	11.3	79.7	1.28.E-06	4.01E+17
246.19	5.10.E-05	0.00.E+00	0.00.E+00	0.014	25.8	2.91.E-03	43.5	11.4	80.8	6.32.E-07	1.98E+17
246.63	0.00.E+00	0.00.E+00	0.00.E+00	0.014	25.5	2.93.E-03	42.9	11.3	79.7	0.00.E+00	0.00E+00
247.07	0.00.E+00	0.00.E+00	0.00.E+00	0.016	25.4	4.32.E-03	42.9	11.3	79.6	0.00.E+00	0.00E+00
247.52	0.00.E+00	0.00.E+00	1.02.E-04	0.015	25.4	4.11.E-03	42.8	11.2	79.4	0.00.E+00	0.00E+00
247.96	0.00.E+00	5.10.E-05	5.10.E-05	0.015	24.9	3.76.E-03	42.0	11.0	77.9	0.00.E+00	0.00E+00
248.40	5.10.E-05	0.00.E+00	5.10.E-05	0.015	25.2	3.18.E-03	42.5	11.2	78.9	6.47.E-07	2.03E+17
248.85	5.10.E-05	0.00.E+00	0.00.E+00	0.015	25.5	2.11.E-03	43.1	11.3	80.0	6.38.E-07	2.00E+17
249.29	1.53.E-04	0.00.E+00	0.00.E+00	0.015	25.1	3.20.E-03	42.4	11.1	78.6	1.95.E-06	6.10E+17
249.73	5.10.E-05	0.00.E+00	0.00.E+00	0.015	25.0	3.53.E-03	42.1	11.1	78.1	6.53.E-07	2.05E+17
250.17	5.10.E-05	0.00.E+00	0.00.E+00	0.015	25.4	4.33.E-03	42.9	11.3	79.5	6.41.E-07	2.01E+17
250.62	0.00.E+00	0.00.E+00	0.00.E+00	0.014	25.0	3.23.E-03	42.2	11.1	78.4	0.00.E+00	0.00E+00
251.06	5.10.E-05	0.00.E+00	5.10.E-05	0.014	24.5	3.33.E-03	41.3	10.8	76.6	6.66.E-07	2.09E+17
251.50	0.00.E+00	0.00.E+00	0.00.E+00	0.014	24.6	3.36.E-03	41.4	10.9	76.9	0.00.E+00	0.00E+00

Depth (nm)	⁴ He (Cnt/MSc/Px)	²² Ne (Cnt/MSc/Px)	²⁰ Ne (Cnt/MSc/Px)	¹² C* (Cnt/MSc/Px)	¹³ C2* (Cnt/MSc/Px)	¹³ C3* (Cnt/MSc/Px)	¹² C* estimate* (Cnt/MSc/Px)	¹³ C3* estimate* (Cnt/MSc/Px)	ΣC (Cnt/MSc/Px)	⁴ He/ ¹² C	⁴ He conc. (cm ³)
251.95	1.02.E-04	0.00.E+00	0.00.E+00	0.013	24.4	3.82.E-03	41.2	10.8	76.4	1.33.E-06	4.18E+17
252.39	1.02.E-04	0.00.E+00	0.00.E+00	0.015	24.4	2.98.E-03	41.2	10.8	76.4	1.34.E-06	4.18E+17
252.83	0.00.E+00	5.10.E-05	0.00.E+00	0.015	24.5	3.56.E-03	41.4	10.9	76.7	0.00.E+00	0.00E+00
253.27	0.00.E+00	0.00.E+00	0.00.E+00	0.015	24.6	3.51.E-03	41.6	10.9	77.1	0.00.E+00	0.00E+00
253.72	0.00.E+00	0.00.E+00	0.00.E+00	0.013	24.5	3.09.E-03	41.3	10.9	76.7	0.00.E+00	0.00E+00
254.16	0.00.E+00	5.10.E-05	0.00.E+00	0.016	24.6	4.31.E-03	41.6	10.9	77.1	0.00.E+00	0.00E+00
254.60	1.53.E-04	0.00.E+00	0.00.E+00	0.015	25.1	3.38.E-03	42.4	11.1	78.7	1.95.E-06	6.09E+17
255.04	0.00.E+00	0.00.E+00	0.00.E+00	0.015	24.5	5.26.E-03	41.3	10.8	76.6	0.00.E+00	0.00E+00
255.49	5.10.E-05	0.00.E+00	5.10.E-05	0.017	24.7	3.25.E-03	41.7	11.0	77.4	6.59.E-07	2.06E+17
255.93	1.02.E-04	0.00.E+00	0.00.E+00	0.017	24.3	2.99.E-03	40.9	10.8	76.0	1.34.E-06	4.21E+17
256.37	1.02.E-04	0.00.E+00	0.00.E+00	0.016	24.9	4.55.E-03	42.0	11.0	78.0	1.31.E-06	4.10E+17
256.82	5.10.E-05	0.00.E+00	0.00.E+00	0.016	25.0	3.05.E-03	42.2	11.1	78.3	6.52.E-07	2.04E+17
257.26	5.10.E-05	0.00.E+00	0.00.E+00	0.019	25.0	3.82.E-03	42.2	11.1	78.2	6.52.E-07	2.04E+17
257.70	2.04.E-04	0.00.E+00	5.10.E-05	0.016	24.8	3.28.E-03	41.9	11.0	77.7	2.63.E-06	8.22E+17
258.14	5.10.E-05	0.00.E+00	0.00.E+00	0.017	24.9	3.21.E-03	42.0	11.0	78.0	6.54.E-07	2.05E+17
258.59	2.55.E-04	0.00.E+00	1.53.E-04	0.015	24.5	3.91.E-03	41.3	10.8	76.6	3.33.E-06	1.04E+18
259.03	2.04.E-04	0.00.E+00	0.00.E+00	0.014	24.2	3.92.E-03	40.8	10.7	75.7	2.70.E-06	8.45E+17
259.47	1.02.E-04	0.00.E+00	1.53.E-04	0.015	24.5	3.23.E-03	41.3	10.8	76.6	1.33.E-06	4.17E+17
259.92	1.02.E-04	0.00.E+00	0.00.E+00	0.014	24.8	3.25.E-03	41.9	11.0	77.7	1.31.E-06	4.11E+17
260.36	0.00.E+00	0.00.E+00	1.02.E-04	0.015	24.5	4.11.E-03	41.4	10.9	76.8	0.00.E+00	0.00E+00
260.80	0.00.E+00	0.00.E+00	5.10.E-05	0.014	24.6	2.62.E-03	41.5	10.9	77.1	0.00.E+00	0.00E+00
261.24	1.02.E-04	0.00.E+00	5.10.E-05	0.016	24.4	3.70.E-03	41.2	10.8	76.4	1.34.E-06	4.18E+17
261.69	1.53.E-04	0.00.E+00	5.10.E-05	0.019	25.0	3.01.E-03	42.2	11.1	78.2	1.96.E-06	6.13E+17
262.13	0.00.E+00	0.00.E+00	0.00.E+00	0.018	24.4	2.50.E-03	41.2	10.8	76.4	0.00.E+00	0.00E+00
262.57	5.10.E-05	0.00.E+00	0.00.E+00	0.018	25.0	3.90.E-03	42.1	11.1	78.1	6.53.E-07	2.05E+17

¹²C* estimate* and ¹³C3* estimate* were calculated by using C ratio without IG in AP4_2b Genesis-DOS 1111 data for the estimation of total C ratio.

Average of ⁴ He conc. Background (atom:	3.52E+17	Average of ⁴ He background (Cnt/MSc/Px):	8.67E-05
Average of ²⁰ Ne conc. Background (atom:	2.93E+16	Average of ²⁰ Ne background (Cnt/MSc/Px):	3.32E-05
⁴ He/ ²⁰ Ne average (except for CME)	518.3		
⁴ He fluence	7.31.E+14		
²⁰ Ne fluence	1.41.E+12		

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹² C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹² C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
0.44		3.28.E-07	2.23E+16		2.59.E-05	2.59E+18		2.93E+03	
0.89		1.24.E-06	8.43E+16		4.34.E-06	4.33E+17		1.59E+03	
1.33	1.40E+20	2.49.E-06	1.69E+17	9.80E+16	0.00.E+00	0.00E+00	6.55E+17	9.16E+02	
1.77		6.35.E-07	4.32E+16		1.90.E-06	1.90E+17		3.87E+03	
2.21		2.52.E-06	1.71E+17		6.30.E-07	6.29E+16		1.04E+03	1.87E+03
2.66		2.55.E-06	1.74E+17		6.39.E-07	6.38E+16		1.04E+03	
3.10		6.41.E-07	4.36E+16		1.28.E-06	1.28E+17		4.26E+03	
3.54	1.79E+20	2.52.E-06	1.71E+17	1.54E+17	0.00.E+00	0.00E+00	3.84E+16	1.09E+03	
3.99		1.89.E-06	1.28E+17		0.00.E+00	0.00E+00		1.31E+03	
4.43		3.72.E-06	2.53E+17		0.00.E+00	0.00E+00		6.81E+02	
4.87		1.82.E-06	1.24E+17		0.00.E+00	0.00E+00		1.38E+03	
5.31		1.79.E-06	1.22E+17		5.97.E-07	5.96E+16		1.36E+03	
5.76	1.65E+20	4.24.E-06	2.88E+17	2.23E+17	6.05.E-07	6.05E+16	4.81E+16	5.84E+02	
6.20		4.32.E-06	2.94E+17		0.00.E+00	0.00E+00		5.49E+02	
6.64		4.22.E-06	2.87E+17		1.21.E-06	1.20E+17		5.47E+02	1.01E+03
7.08		4.17.E-06	2.84E+17		0.00.E+00	0.00E+00		5.58E+02	
7.53		1.19.E-06	8.08E+16		0.00.E+00	0.00E+00		1.95E+03	
7.97	1.49E+20	1.18.E-06	8.04E+16	1.85E+17	0.00.E+00	0.00E+00	2.35E+16	1.87E+03	
8.41		2.35.E-06	1.60E+17		1.17.E-06	1.17E+17		8.67E+02	
8.86		4.72.E-06	3.21E+17		0.00.E+00	0.00E+00		4.40E+02	
9.30		1.75.E-06	1.19E+17		1.17.E-06	1.17E+17		1.15E+03	
9.74		2.93.E-06	1.99E+17		0.00.E+00	0.00E+00		6.40E+02	
10.18	1.32E+20	1.77.E-06	1.20E+17	1.43E+17	0.00.E+00	0.00E+00	2.33E+16	1.09E+03	
10.63		1.73.E-06	1.18E+17		0.00.E+00	0.00E+00		1.09E+03	
11.07		2.34.E-06	1.59E+17		0.00.E+00	0.00E+00		8.48E+02	7.27E+02
11.51		3.44.E-06	2.34E+17		0.00.E+00	0.00E+00		5.45E+02	
11.96		5.73.E-06	3.90E+17		1.15.E-06	1.14E+17		3.26E+02	
12.40	1.32E+20	3.49.E-06	2.37E+17	2.83E+17	0.00.E+00	0.00E+00	2.29E+16	5.82E+02	
12.84		3.49.E-06	2.37E+17		0.00.E+00	0.00E+00		5.69E+02	
13.28		4.63.E-06	3.15E+17		0.00.E+00	0.00E+00		4.21E+02	
13.73		4.62.E-06	3.14E+17		0.00.E+00	0.00E+00		4.63E+02	
14.17		1.73.E-06	1.18E+17		1.15.E-06	1.15E+17		1.19E+03	
14.61	1.42E+20	1.70.E-06	1.16E+17	1.80E+17	5.66.E-07	5.66E+16	4.60E+16	1.18E+03	
15.05		5.64.E-07	3.83E+16		0.00.E+00	0.00E+00		3.81E+03	
15.50		4.64.E-06	3.15E+17		5.80.E-07	5.79E+16		4.52E+02	1.02E+03
15.94		2.29.E-06	1.56E+17		5.72.E-07	5.72E+16		9.67E+02	
16.38		4.57.E-06	3.11E+17		0.00.E+00	0.00E+00		4.90E+02	
16.83	1.51E+20	3.48.E-06	2.37E+17	2.66E+17	0.00.E+00	0.00E+00	2.29E+16	6.38E+02	
17.27		4.60.E-06	3.13E+17		5.76.E-07	5.75E+16		4.75E+02	
17.71		4.64.E-06	3.16E+17		0.00.E+00	0.00E+00		4.83E+02	
18.15		5.20.E-06	3.54E+17		1.16.E-06	1.16E+17		4.25E+02	
18.60		3.96.E-06	2.70E+17		0.00.E+00	0.00E+00		5.72E+02	
19.04	1.54E+20	4.53.E-06	3.08E+17	2.88E+17	0.00.E+00	0.00E+00	3.47E+16	5.15E+02	
19.48		4.02.E-06	2.73E+17		0.00.E+00	0.00E+00		5.66E+02	
19.93		3.47.E-06	2.36E+17		5.78.E-07	5.77E+16		6.38E+02	8.27E+02
20.37		1.73.E-06	1.18E+17		0.00.E+00	0.00E+00		1.24E+03	
20.81		2.31.E-06	1.57E+17		0.00.E+00	0.00E+00		9.59E+02	
21.25	1.51E+20	1.15.E-06	7.83E+16	1.58E+17	5.75.E-07	5.75E+16	2.33E+16	1.90E+03	
21.70		2.85.E-06	1.94E+17		0.00.E+00	0.00E+00		7.93E+02	
22.14		3.55.E-06	2.41E+17		5.91.E-07	5.90E+16		6.54E+02	
22.58		2.33.E-06	1.59E+17		5.84.E-07	5.83E+16		9.73E+02	
23.02		3.94.E-06	2.68E+17		5.63.E-07	5.63E+16		5.56E+02	
23.47	1.50E+20	6.80.E-06	4.62E+17	2.88E+17	0.00.E+00	0.00E+00	2.29E+16	3.20E+02	
23.91		2.31.E-06	1.57E+17		0.00.E+00	0.00E+00		1.00E+03	
24.35		5.76.E-06	3.92E+17		0.00.E+00	0.00E+00		3.60E+02	7.05E+02
24.80		2.35.E-06	1.60E+17		0.00.E+00	0.00E+00		8.91E+02	

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹³ C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹³ C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
25.24		2.31.E-06	1.57E+17		1.73.E-06	1.73E+17		9.04E+02	
25.68	1.37E+20	1.76.E-06	1.20E+17	2.36E+17	0.00.E+00	0.00E+00	3.46E+16	1.12E+03	
26.12		2.94.E-06	2.00E+17		0.00.E+00	0.00E+00		6.87E+02	
26.57		8.01.E-06	5.45E+17		0.00.E+00	0.00E+00		2.43E+02	
27.01		4.68.E-06	3.18E+17		1.17.E-06	1.17E+17		4.18E+02	
27.45		2.34.E-06	1.59E+17		5.86.E-07	5.85E+16		8.17E+02	
27.90	1.26E+20	2.95.E-06	2.00E+17	1.99E+17	0.00.E+00	0.00E+00	5.83E+16	6.41E+02	
28.34		2.28.E-06	1.55E+17		5.70.E-07	5.69E+16		7.86E+02	
28.78		2.37.E-06	1.61E+17		5.93.E-07	5.92E+16		7.11E+02	6.48E+02
29.22		5.32.E-06	3.62E+17		5.91.E-07	5.91E+16		3.59E+02	
29.67		2.98.E-06	2.03E+17		5.97.E-07	5.96E+16		6.11E+02	
30.11	1.24E+20	3.54.E-06	2.41E+17	2.26E+17	5.90.E-07	5.90E+16	3.55E+16	5.21E+02	
30.55		2.97.E-06	2.02E+17		0.00.E+00	0.00E+00		5.83E+02	
31.00		1.76.E-06	1.20E+17		0.00.E+00	0.00E+00		1.04E+03	
31.44		5.81.E-07	3.95E+16		5.81.E-07	5.80E+16		3.05E+03	
31.88		2.25.E-06	1.53E+17		0.00.E+00	0.00E+00		7.18E+02	
32.32	1.12E+20	2.92.E-06	1.98E+17	1.90E+17	5.83.E-07	5.83E+16	7.02E+16	5.64E+02	
32.77		4.10.E-06	2.79E+17		5.86.E-07	5.85E+16		3.79E+02	
33.21		4.12.E-06	2.80E+17		1.76.E-06	1.76E+17		3.99E+02	8.09E+02
33.65		1.79.E-06	1.22E+17		1.19.E-06	1.19E+17		9.02E+02	
34.09		2.91.E-06	1.98E+17		0.00.E+00	0.00E+00		5.22E+02	
34.54	1.04E+20	2.40.E-06	1.63E+17	1.85E+17	6.01.E-07	6.00E+16	4.78E+16	6.30E+02	
34.98		2.93.E-06	1.99E+17		0.00.E+00	0.00E+00		5.31E+02	
35.42		3.58.E-06	2.44E+17		5.97.E-07	5.97E+16		3.94E+02	
35.87		2.97.E-06	2.02E+17		0.00.E+00	0.00E+00		4.89E+02	
36.31		3.56.E-06	2.42E+17		0.00.E+00	0.00E+00		3.73E+02	
36.75	9.41E+19	1.77.E-06	1.21E+17	1.69E+17	5.91.E-07	5.91E+16	1.18E+16	8.21E+02	
37.19		2.98.E-06	2.02E+17		0.00.E+00	0.00E+00		4.59E+02	
37.64		1.17.E-06	7.93E+16		0.00.E+00	0.00E+00		1.12E+03	7.81E+02
38.08		2.38.E-06	1.62E+17		0.00.E+00	0.00E+00		5.56E+02	
38.52		3.57.E-06	2.42E+17		5.94.E-07	5.94E+16		3.86E+02	
38.97	8.61E+19	5.83.E-07	3.96E+16	1.37E+17	0.00.E+00	0.00E+00	3.57E+16	2.08E+03	
39.41		2.37.E-06	1.61E+17		5.92.E-07	5.92E+16		5.06E+02	
39.85		1.20.E-06	8.13E+16		5.98.E-07	5.97E+16		1.02E+03	
40.29		1.77.E-06	1.21E+17		0.00.E+00	0.00E+00		6.38E+02	
40.74		1.18.E-06	8.03E+16		0.00.E+00	0.00E+00		1.03E+03	
41.18	7.90E+19	1.17.E-06	7.92E+16	1.36E+17	0.00.E+00	0.00E+00	0.00E+00	9.85E+02	
41.62		2.98.E-06	2.03E+17		0.00.E+00	0.00E+00		3.82E+02	
42.06		2.90.E-06	1.97E+17		0.00.E+00	0.00E+00		4.07E+02	7.60E+02
42.51		5.97.E-07	4.06E+16		0.00.E+00	0.00E+00		1.79E+03	
42.95		1.77.E-06	1.20E+17		0.00.E+00	0.00E+00		6.28E+02	
43.39	7.24E+19	2.40.E-06	1.63E+17	1.14E+17	0.00.E+00	0.00E+00	0.00E+00	4.37E+02	
43.84		2.37.E-06	1.61E+17		0.00.E+00	0.00E+00		4.32E+02	
44.28		1.21.E-06	8.25E+16		0.00.E+00	0.00E+00		8.82E+02	
44.72		1.80.E-06	1.23E+17		0.00.E+00	0.00E+00		5.69E+02	
45.16		1.21.E-06	8.23E+16		0.00.E+00	0.00E+00		8.82E+02	
45.61	6.77E+19	6.04.E-07	4.10E+16	8.18E+16	6.04.E-07	6.03E+16	1.21E+16	1.60E+03	
46.05		1.20.E-06	8.19E+16		0.00.E+00	0.00E+00		8.70E+02	
46.49		1.19.E-06	8.09E+16		0.00.E+00	0.00E+00		7.34E+02	1.06E+03
46.94		5.92.E-07	4.03E+16		0.00.E+00	0.00E+00		1.60E+03	
47.38		1.21.E-06	8.24E+16		0.00.E+00	0.00E+00		8.19E+02	
47.82	6.40E+19	5.91.E-07	4.02E+16	7.33E+16	0.00.E+00	0.00E+00	0.00E+00	1.73E+03	
48.26		5.97.E-07	4.06E+16		0.00.E+00	0.00E+00		1.39E+03	
48.71		2.39.E-06	1.63E+17		0.00.E+00	0.00E+00		3.81E+02	
49.15		6.02.E-07	4.09E+16		0.00.E+00	0.00E+00		1.54E+03	
49.59		1.21.E-06	8.25E+16		0.00.E+00	0.00E+00		6.61E+02	
50.03	5.67E+19	3.58.E-06	2.43E+17	1.06E+17	0.00.E+00	0.00E+00	0.00E+00	2.43E+02	
50.48		1.19.E-06	8.09E+16		0.00.E+00	0.00E+00		6.56E+02	
50.92		1.22.E-06	8.27E+16		0.00.E+00	0.00E+00		6.54E+02	7.49E+02
51.36		1.19.E-06	8.09E+16		0.00.E+00	0.00E+00		6.40E+02	
51.81		6.02.E-07	4.10E+16		0.00.E+00	0.00E+00		1.30E+03	
52.25	5.18E+19	1.82.E-06	1.24E+17	1.08E+17	0.00.E+00	0.00E+00	2.46E+16	4.22E+02	
52.69		6.07.E-07	4.13E+16		0.00.E+00	0.00E+00		1.16E+03	
53.13		3.70.E-06	2.52E+17		1.23.E-06	1.23E+17		2.13E+02	

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹³ C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹³ C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
53.58		1.22.E-06	8.29E+16		0.00.E+00	0.00E+00		5.73E+02	
54.02		6.03.E-07	4.10E+16		6.03.E-07	6.02E+16		1.27E+03	
54.46	4.89E+19	6.19.E-07	4.21E+16	5.82E+16	0.00.E+00	0.00E+00	1.20E+16	1.11E+03	
54.91		1.23.E-06	8.36E+16		0.00.E+00	0.00E+00		5.96E+02	
55.35		6.08.E-07	4.14E+16		0.00.E+00	0.00E+00		1.16E+03	7.01E+02
55.79		1.84.E-06	1.25E+17		0.00.E+00	0.00E+00		3.71E+02	
56.23		1.22.E-06	8.28E+16		0.00.E+00	0.00E+00		4.70E+02	
56.68	4.18E+19	0.00.E+00	0.00E+00	6.59E+16	0.00.E+00	0.00E+00	0.00E+00		
57.12		1.19.E-06	8.10E+16		0.00.E+00	0.00E+00		5.16E+02	
57.56		5.95.E-07	4.05E+16		0.00.E+00	0.00E+00		9.30E+02	
58.00		6.09.E-07	4.14E+16		0.00.E+00	0.00E+00		9.62E+02	
58.45		6.17.E-07	4.20E+16		6.17.E-07	6.16E+16		1.02E+03	
58.89	4.00E+19	1.23.E-06	8.37E+16	5.83E+16	0.00.E+00	0.00E+00	1.23E+16	4.70E+02	
59.33		6.12.E-07	4.16E+16		0.00.E+00	0.00E+00		9.07E+02	
59.78		1.21.E-06	8.26E+16		0.00.E+00	0.00E+00		4.83E+02	6.99E+02
60.22		2.47.E-06	1.68E+17		6.17.E-07	6.17E+16		1.83E+02	
60.66		6.07.E-07	4.13E+16		0.00.E+00	0.00E+00		9.02E+02	
61.10	3.43E+19	1.22.E-06	8.33E+16	7.52E+16	0.00.E+00	0.00E+00	1.23E+16	4.21E+02	
61.55		6.21.E-07	4.22E+16		0.00.E+00	0.00E+00		8.19E+02	
61.99		6.08.E-07	4.14E+16		0.00.E+00	0.00E+00		8.19E+02	
62.43		1.22.E-06	8.32E+16		0.00.E+00	0.00E+00		3.94E+02	
62.88		1.21.E-06	8.23E+16		0.00.E+00	0.00E+00		4.37E+02	
63.32	3.27E+19	6.05.E-07	4.12E+16	6.66E+16	6.05.E-07	6.05E+16	1.21E+16	7.60E+02	
63.76		6.05.E-07	4.12E+16		0.00.E+00	0.00E+00		8.24E+02	
64.20		1.25.E-06	8.51E+16		0.00.E+00	0.00E+00		3.50E+02	3.94E+02
64.65		1.23.E-06	8.34E+16		0.00.E+00	0.00E+00		3.52E+02	
65.09		6.14.E-07	4.17E+16		0.00.E+00	0.00E+00		6.08E+02	
65.53	2.73E+19	1.85.E-06	1.26E+17	5.02E+16	0.00.E+00	0.00E+00	0.00E+00	2.15E+02	
65.98		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
66.42		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
66.86		6.25.E-07	4.25E+16		6.25.E-07	6.25E+16		6.22E+02	
67.30		6.12.E-07	4.16E+16		0.00.E+00	0.00E+00		5.99E+02	
67.75	2.39E+19	6.18.E-07	4.20E+16	4.19E+16	0.00.E+00	0.00E+00	1.25E+16	5.62E+02	
68.19		6.15.E-07	4.18E+16		0.00.E+00	0.00E+00		5.25E+02	
68.63		6.12.E-07	4.16E+16		0.00.E+00	0.00E+00		5.48E+02	3.86E+02
69.07		1.23.E-06	8.36E+16		0.00.E+00	0.00E+00		2.85E+02	
69.52		6.12.E-07	4.16E+16		0.00.E+00	0.00E+00		5.34E+02	
69.96	2.34E+19	0.00.E+00	0.00E+00	5.02E+16	0.00.E+00	0.00E+00	0.00E+00		
70.40		1.85.E-06	1.26E+17		0.00.E+00	0.00E+00		1.84E+02	
70.85		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
71.29		6.24.E-07	4.24E+16		0.00.E+00	0.00E+00		4.47E+02	
71.73		1.26.E-06	8.55E+16		0.00.E+00	0.00E+00		2.28E+02	
72.17	1.87E+19	0.00.E+00	0.00E+00	5.12E+16	0.00.E+00	0.00E+00	0.00E+00		
72.62		6.26.E-07	4.26E+16		0.00.E+00	0.00E+00		4.47E+02	
73.06		1.26.E-06	8.56E+16		0.00.E+00	0.00E+00		2.09E+02	3.19E+02
73.50		6.34.E-07	4.32E+16		6.34.E-07	6.34E+16		4.47E+02	
73.95		6.29.E-07	4.28E+16		6.29.E-07	6.28E+16		4.83E+02	
74.39	1.78E+19	1.24.E-06	8.46E+16	5.14E+16	0.00.E+00	0.00E+00	3.81E+16	2.09E+02	
74.83		6.24.E-07	4.24E+16		0.00.E+00	0.00E+00		3.31E+02	
75.27		6.45.E-07	4.39E+16		6.45.E-07	6.45E+16		3.91E+02	
75.72		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
76.16		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
76.60	1.61E+19	6.30.E-07	4.29E+16	3.41E+16	0.00.E+00	0.00E+00	0.00E+00	3.87E+02	
77.04		6.23.E-07	4.24E+16		0.00.E+00	0.00E+00		3.82E+02	
77.49		1.26.E-06	8.54E+16		0.00.E+00	0.00E+00		1.82E+02	1.55E+02
77.93		6.26.E-07	4.26E+16		0.00.E+00	0.00E+00		3.27E+02	
78.37		0.00.E+00	0.00E+00		6.31.E-07	6.30E+16			
78.82	1.31E+19	0.00.E+00	0.00E+00	1.68E+16	0.00.E+00	0.00E+00	4.97E+16		
79.26		0.00.E+00	0.00E+00		1.86.E-06	1.86E+17			
79.70		6.11.E-07	4.16E+16		0.00.E+00	0.00E+00		2.72E+02	
80.14		1.87.E-06	1.27E+17		0.00.E+00	0.00E+00		9.36E+01	
80.59		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
81.03	1.23E+19	0.00.E+00	0.00E+00	5.97E+16	6.28.E-07	6.28E+16	1.26E+16		
81.47		6.31.E-07	4.29E+16		0.00.E+00	0.00E+00		2.39E+02	

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹³ C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹³ C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
81.92		1.89.E-06	1.29E+17		0.00.E+00	0.00E+00		1.10E+02	1.28E+02
82.36		1.91.E-06	1.30E+17		0.00.E+00	0.00E+00		9.51E+01	
82.80		6.20.E-07	4.21E+16		0.00.E+00	0.00E+00		2.30E+02	
83.24	1.08E+19	6.30.E-07	4.28E+16	7.72E+16	0.00.E+00	0.00E+00	1.27E+16	2.81E+02	
83.69		1.25.E-06	8.50E+16		0.00.E+00	0.00E+00		1.08E+02	
84.13		1.27.E-06	8.64E+16		6.36.E-07	6.35E+16		1.27E+02	
84.57		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
85.01		6.28.E-07	4.27E+16		0.00.E+00	0.00E+00		2.03E+02	
85.46	9.61E+18	6.26.E-07	4.26E+16	2.57E+16	0.00.E+00	0.00E+00	0.00E+00	2.12E+02	
85.90		6.35.E-07	4.32E+16		0.00.E+00	0.00E+00		1.80E+02	
86.34		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			9.76E+01
86.79		6.35.E-07	4.32E+16		0.00.E+00	0.00E+00		1.75E+02	
87.23		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
87.67	6.73E+18	1.28.E-06	8.73E+16	3.48E+16	0.00.E+00	0.00E+00	0.00E+00	6.45E+01	
88.11		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
88.56		6.42.E-07	4.37E+16		0.00.E+00	0.00E+00		1.43E+02	
89.00		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
89.44		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
89.89	6.32E+18	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
90.33		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
90.77		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			3.02E+01
91.21		1.28.E-06	8.67E+16		0.00.E+00	0.00E+00		8.06E+01	
91.66		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
92.10	6.20E+18	0.00.E+00	0.00E+00	4.33E+16	0.00.E+00	0.00E+00	0.00E+00		
92.54		1.26.E-06	8.60E+16		0.00.E+00	0.00E+00		7.83E+01	
92.99		6.42.E-07	4.37E+16		0.00.E+00	0.00E+00		1.43E+02	
93.43		1.27.E-06	8.66E+16		0.00.E+00	0.00E+00		6.45E+01	
93.87		1.28.E-06	8.68E+16		0.00.E+00	0.00E+00		7.60E+01	
94.31	5.47E+18	0.00.E+00	0.00E+00	5.19E+16	0.00.E+00	0.00E+00	0.00E+00		
94.76		6.36.E-07	4.33E+16		0.00.E+00	0.00E+00		1.20E+02	
95.20		6.33.E-07	4.30E+16		0.00.E+00	0.00E+00		1.20E+02	6.56E+01
95.64		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
96.08		6.34.E-07	4.31E+16		0.00.E+00	0.00E+00		1.38E+02	
96.53	4.22E+18	1.28.E-06	8.69E+16	3.47E+16	0.00.E+00	0.00E+00	0.00E+00	4.60E+01	
96.97		6.35.E-07	4.32E+16		0.00.E+00	0.00E+00		9.21E+01	
97.41		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
97.86		6.35.E-07	4.32E+16		0.00.E+00	0.00E+00		1.47E+02	
98.30		1.34.E-06	9.10E+16		6.69.E-07	6.69E+16		3.45E+01	
98.74	4.48E+18	0.00.E+00	0.00E+00	3.57E+16	0.00.E+00	0.00E+00	1.34E+16		
99.18		6.49.E-07	4.41E+16		0.00.E+00	0.00E+00		1.20E+02	
99.63		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			6.22E+01
100.07		6.35.E-07	4.32E+16		0.00.E+00	0.00E+00		1.01E+02	
100.51		6.50.E-07	4.42E+16		0.00.E+00	0.00E+00		9.21E+01	
100.96	3.90E+18	0.00.E+00	0.00E+00	4.34E+16	0.00.E+00	0.00E+00	0.00E+00		
101.40		6.31.E-07	4.29E+16		0.00.E+00	0.00E+00		8.75E+01	
101.84		1.28.E-06	8.69E+16		0.00.E+00	0.00E+00		3.91E+01	
102.28		6.47.E-07	4.40E+16		0.00.E+00	0.00E+00		9.67E+01	
102.73		0.00.E+00	0.00E+00		6.38.E-07	6.38E+16			
103.17	3.23E+18	0.00.E+00	0.00E+00	4.42E+16	0.00.E+00	0.00E+00	1.28E+16		
103.61		6.45.E-07	4.39E+16		0.00.E+00	0.00E+00		5.99E+01	
104.05		1.96.E-06	1.33E+17		0.00.E+00	0.00E+00		2.61E+01	2.06E+01
104.50		1.26.E-06	8.54E+16		6.28.E-07	6.28E+16		2.30E+01	
104.94		0.00.E+00	0.00E+00		6.28.E-07	6.28E+16			
105.38	2.63E+18	0.00.E+00	0.00E+00	1.71E+16	0.00.E+00	0.00E+00	2.51E+16		
105.83		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
106.27		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
106.71		6.49.E-07	4.41E+16		0.00.E+00	0.00E+00		6.45E+01	
107.15		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
107.60	2.39E+18	0.00.E+00	0.00E+00	1.77E+16	0.00.E+00	0.00E+00	0.00E+00		
108.04		6.51.E-07	4.43E+16		0.00.E+00	0.00E+00		5.52E+01	
108.48		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.62E+01
108.93		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
109.37		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
109.81	2.10E+18	6.58.E-07	4.47E+16	2.64E+16	0.00.E+00	0.00E+00	1.28E+16	4.14E+01	

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹² C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹² C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
110.25		6.40.E-07	4.35E+16		0.00.E+00	0.00E+00		5.06E+01	
110.70		6.40.E-07	4.36E+16		6.40.E-07	6.40E+16		5.06E+01	
111.14		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
111.58		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
112.02	2.38E+18	0.00.E+00	0.00E+00	8.67E+15	0.00.E+00	0.00E+00	0.00E+00		
112.47		6.37.E-07	4.33E+16		0.00.E+00	0.00E+00		4.60E+01	
112.91		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.26E+01
113.35		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
113.80		6.49.E-07	4.42E+16		0.00.E+00	0.00E+00		6.45E+01	
114.24	2.58E+18	0.00.E+00	0.00E+00	2.63E+16	0.00.E+00	0.00E+00	0.00E+00		
114.68		6.42.E-07	4.37E+16		0.00.E+00	0.00E+00		5.06E+01	
115.12		6.44.E-07	4.38E+16		0.00.E+00	0.00E+00		6.45E+01	
115.57		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
116.01		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
116.45	1.94E+18	6.46.E-07	4.40E+16	1.76E+16	0.00.E+00	0.00E+00	0.00E+00	4.14E+01	
116.90		6.45.E-07	4.39E+16		0.00.E+00	0.00E+00		5.06E+01	
117.34		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.61E+01
117.78		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
118.22		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
118.67	2.14E+18	6.37.E-07	4.33E+16	8.66E+15	0.00.E+00	0.00E+00	1.28E+16	6.91E+01	
119.11		0.00.E+00	0.00E+00		6.42.E-07	6.42E+16			
119.55		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
120.00		6.49.E-07	4.41E+16		0.00.E+00	0.00E+00		4.14E+01	
120.44		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
120.88	2.31E+18	6.47.E-07	4.40E+16	3.54E+16	0.00.E+00	0.00E+00	0.00E+00	5.99E+01	
121.32		1.30.E-06	8.87E+16		0.00.E+00	0.00E+00		2.99E+01	
121.77		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.86E+01
122.21		0.00.E+00	0.00E+00		6.44.E-07	6.44E+16			
122.65		6.44.E-07	4.38E+16		0.00.E+00	0.00E+00		5.52E+01	
123.09	2.34E+18	0.00.E+00	0.00E+00	8.76E+15	0.00.E+00	0.00E+00	2.58E+16		
123.54		0.00.E+00	0.00E+00		6.46.E-07	6.45E+16			
123.98		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
124.42		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
124.87		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
125.31	2.23E+18	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
125.75		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
126.19		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.30E+00
126.64		0.00.E+00	0.00E+00		6.45.E-07	6.44E+16			
127.08		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
127.52	1.78E+18	6.53.E-07	4.44E+16	8.88E+15	0.00.E+00	0.00E+00	1.29E+16	2.30E+01	
127.97		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
128.41		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
128.85		6.49.E-07	4.42E+16		0.00.E+00	0.00E+00		3.22E+01	
129.29		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
129.74	1.25E+18	0.00.E+00	0.00E+00	1.74E+16	0.00.E+00	0.00E+00	0.00E+00		
130.18		6.32.E-07	4.30E+16		0.00.E+00	0.00E+00		2.30E+01	
130.62		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			9.67E+00
131.06		6.58.E-07	4.47E+16		6.58.E-07	6.57E+16		4.14E+01	
131.51		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
131.95	1.72E+18	0.00.E+00	0.00E+00	8.95E+15	0.00.E+00	0.00E+00	1.31E+16		
132.39		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
132.84		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
133.28		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
133.72		6.41.E-07	4.36E+16		0.00.E+00	0.00E+00		4.60E+01	
134.16	1.95E+18	0.00.E+00	0.00E+00	1.76E+16	0.00.E+00	0.00E+00	0.00E+00		
134.61		6.50.E-07	4.42E+16		0.00.E+00	0.00E+00		3.68E+01	
135.05		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.06E+01
135.49		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
135.94		6.53.E-07	4.44E+16		0.00.E+00	0.00E+00		2.30E+01	
136.38	1.27E+18	0.00.E+00	0.00E+00	8.88E+15	0.00.E+00	0.00E+00	0.00E+00		
136.82		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
137.26		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
137.71		6.63.E-07	4.51E+16		0.00.E+00	0.00E+00		2.76E+01	
138.15		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			

Depth (nm)	⁴ He conc.	²⁰ Ne/ ¹² C	²⁰ Ne conc.	²⁰ Ne conc.	²² Ne/ ¹² C	²² Ne conc.	²² Ne conc.	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne
	5 lay. Smoothing		(cm ³)	5 lay. Smoothing		10lay. Smoothing	5 lay. Smoothing		10lay. Smoothing
138.59	1.42E+18	0.00.E+00	0.00E+00	9.02E+15	0.00.E+00	0.00E+00	0.00E+00		
139.03		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
139.48		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.10E+01
139.92		6.54.E-07	4.45E+16		0.00.E+00	0.00E+00		2.30E+01	
140.36		6.51.E-07	4.43E+16		0.00.E+00	0.00E+00		3.68E+01	
140.81	1.26E+18	0.00.E+00	0.00E+00	2.66E+16	0.00.E+00	0.00E+00	0.00E+00		
141.25		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
141.69		6.52.E-07	4.44E+16		0.00.E+00	0.00E+00		2.30E+01	
142.13		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
142.58		6.58.E-07	4.47E+16		0.00.E+00	0.00E+00		2.30E+01	
143.02	2.11E+18	0.00.E+00	0.00E+00	8.95E+15	0.00.E+00	0.00E+00	1.32E+16		
143.46		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
143.91		0.00.E+00	0.00E+00		6.62.E-07	6.62E+16			8.75E+00
144.35		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
144.79		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
145.23	1.31E+18	0.00.E+00	0.00E+00	1.78E+16	0.00.E+00	0.00E+00	0.00E+00		
145.68		6.59.E-07	4.48E+16		0.00.E+00	0.00E+00		2.30E+01	
146.12		6.48.E-07	4.41E+16		0.00.E+00	0.00E+00		4.14E+01	
146.56		6.54.E-07	4.45E+16		0.00.E+00	0.00E+00		3.22E+01	
147.00		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
147.45	9.51E+17	0.00.E+00	0.00E+00	1.79E+16	0.00.E+00	0.00E+00	0.00E+00		
147.89		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
148.33		6.60.E-07	4.49E+16		0.00.E+00	0.00E+00		2.76E+01	1.29E+01
148.78		6.60.E-07	4.49E+16		0.00.E+00	0.00E+00		2.76E+01	
149.22		6.64.E-07	4.51E+16		0.00.E+00	0.00E+00		2.30E+01	
149.66	1.12E+18	0.00.E+00	0.00E+00	2.71E+16	0.00.E+00	0.00E+00	0.00E+00		
150.10		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
150.55		6.67.E-07	4.54E+16		0.00.E+00	0.00E+00		1.84E+01	
150.99		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
151.43		6.49.E-07	4.41E+16		0.00.E+00	0.00E+00		4.14E+01	
151.88	1.19E+18	0.00.E+00	0.00E+00	8.83E+15	0.00.E+00	0.00E+00	0.00E+00		
152.32		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
152.76		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			4.14E+00
153.20		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
153.65		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
154.09	9.24E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	1.32E+16		
154.53		0.00.E+00	0.00E+00		6.62.E-07	6.61E+16			
154.98		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
155.42		6.68.E-07	4.54E+16		0.00.E+00	0.00E+00		1.38E+01	
155.86		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
156.30	1.30E+18	0.00.E+00	0.00E+00	1.80E+16	0.00.E+00	0.00E+00	0.00E+00		
156.75		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
157.19		6.53.E-07	4.44E+16		0.00.E+00	0.00E+00		2.76E+01	7.83E+00
157.63		6.60.E-07	4.49E+16		0.00.E+00	0.00E+00		1.38E+01	
158.07		1.34.E-06	9.13E+16		0.00.E+00	0.00E+00		4.60E+00	
158.52	9.15E+17	0.00.E+00	0.00E+00	3.62E+16	0.00.E+00	0.00E+00	1.32E+16		
158.96		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
159.40		6.59.E-07	4.48E+16		6.59.E-07	6.58E+16		1.84E+01	
159.85		6.62.E-07	4.50E+16		0.00.E+00	0.00E+00		2.30E+01	
160.29		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
160.73	1.42E+18	0.00.E+00	0.00E+00	9.00E+15	0.00.E+00	0.00E+00	0.00E+00		
161.17		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
161.62		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.20E+01
162.06		6.62.E-07	4.50E+16		0.00.E+00	0.00E+00		4.60E+00	
162.50		6.69.E-07	4.55E+16		0.00.E+00	0.00E+00		2.30E+01	
162.95	1.13E+18	6.77.E-07	4.60E+16	3.65E+16	0.00.E+00	0.00E+00	0.00E+00	4.60E+01	
163.39		6.74.E-07	4.58E+16		0.00.E+00	0.00E+00		2.30E+01	
163.83		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
164.27		1.33.E-06	9.07E+16		0.00.E+00	0.00E+00		1.15E+01	
164.72		0.00.E+00	0.00E+00		6.70.E-07	6.70E+16			
165.16	1.50E+18	0.00.E+00	0.00E+00	2.71E+16	0.00.E+00	0.00E+00	2.66E+16		
165.60		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
166.04		6.59.E-07	4.49E+16		6.59.E-07	6.59E+16		3.22E+01	5.75E+00
166.49		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹³ C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹³ C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
166.93		0.00.E+00	0.00E+00		6.48.E-07	6.47E+16			
167.37	9.12E+17	6.60.E-07	4.49E+16	8.98E+15	0.00.E+00	0.00E+00	1.29E+16	1.38E+01	
167.82		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
168.26		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
168.70		0.00.E+00	0.00E+00		6.64.E-07	6.63E+16			
169.14		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
169.59	7.08E+17	0.00.E+00	0.00E+00	9.00E+15	6.67.E-07	6.67E+16	2.66E+16		
170.03		6.61.E-07	4.50E+16		0.00.E+00	0.00E+00		1.84E+01	
170.47		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.84E+00
170.92		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
171.36		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
171.80	8.40E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	1.34E+16		
172.24		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
172.69		0.00.E+00	0.00E+00		6.69.E-07	6.69E+16			
173.13		6.74.E-07	4.58E+16		0.00.E+00	0.00E+00		2.30E+01	
173.57		6.58.E-07	4.48E+16		0.00.E+00	0.00E+00		9.21E+00	
174.01	5.89E+17	6.88.E-07	4.68E+16	4.58E+16	0.00.E+00	0.00E+00	0.00E+00	4.60E+00	
174.46		6.74.E-07	4.59E+16		0.00.E+00	0.00E+00		1.38E+01	
174.90		6.69.E-07	4.55E+16		0.00.E+00	0.00E+00		1.38E+01	8.29E+00
175.34		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
175.79		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
176.23	7.64E+17	6.82.E-07	4.64E+16	9.28E+15	0.00.E+00	0.00E+00	0.00E+00	1.84E+01	
176.67		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
177.11		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
177.56		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
178.00		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
178.44	9.42E+17	0.00.E+00	0.00E+00	1.85E+16	0.00.E+00	0.00E+00	0.00E+00		
178.89		1.36.E-06	9.24E+16		0.00.E+00	0.00E+00		1.61E+01	
179.33		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.99E+00
179.77		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
180.21		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
180.66	5.99E+17	6.82.E-07	4.64E+16	9.27E+15	6.82.E-07	6.81E+16	1.36E+16	1.38E+01	
181.10		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
181.54		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
181.99		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
182.43		6.86.E-07	4.66E+16		0.00.E+00	0.00E+00		1.84E+01	
182.87	7.24E+17	6.76.E-07	4.60E+16	1.85E+16	0.00.E+00	0.00E+00	0.00E+00	9.21E+00	
183.31		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
183.76		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			5.06E+00
184.20		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
184.64		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
185.08	1.02E+18	6.74.E-07	4.58E+16	9.16E+15	0.00.E+00	0.00E+00	0.00E+00	2.30E+01	
185.53		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
185.97		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
186.41		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
186.86		6.71.E-07	4.56E+16		0.00.E+00	0.00E+00		1.38E+01	
187.30	8.02E+17	0.00.E+00	0.00E+00	2.74E+16	0.00.E+00	0.00E+00	1.35E+16		
187.74		6.77.E-07	4.60E+16		6.77.E-07	6.76E+16		9.21E+00	
188.18		6.68.E-07	4.54E+16		0.00.E+00	0.00E+00		2.76E+01	8.29E+00
188.63		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
189.07		6.70.E-07	4.56E+16		0.00.E+00	0.00E+00		9.21E+00	
189.51	7.62E+17	0.00.E+00	0.00E+00	1.83E+16	0.00.E+00	0.00E+00	0.00E+00		
189.96		6.73.E-07	4.58E+16		0.00.E+00	0.00E+00		2.30E+01	
190.40		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
190.84		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
191.28		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
191.73	8.92E+17	6.82.E-07	4.64E+16	9.28E+15	0.00.E+00	0.00E+00	0.00E+00	2.30E+01	
192.17		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
192.61		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.76E+00
193.05		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
193.50		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
193.94	3.80E+17	0.00.E+00	0.00E+00	9.20E+15	0.00.E+00	0.00E+00	0.00E+00		
194.38		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
194.83		6.76.E-07	4.60E+16		0.00.E+00	0.00E+00		4.60E+00	

Depth (nm)	⁴ He conc. 5 lay. Smoothing	²⁰ Ne/ ¹³ C	²⁰ Ne conc. (cm ³)	²⁰ Ne conc. 5 lay. Smoothing	²² Ne/ ¹³ C	²² Ne conc. 10lay. Smoothing	²² Ne conc. 5 lay. Smoothing	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne 10lay. Smoothing
195.27		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
195.71		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
196.15	4.70E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
196.60		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
197.04		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.76E+00
197.48		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
197.93		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
198.37	9.02E+17	6.84.E-07	4.65E+16	9.30E+15	0.00.E+00	0.00E+00	0.00E+00	2.76E+01	
198.81		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
199.25		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
199.70		6.95.E-07	4.73E+16		0.00.E+00	0.00E+00		1.38E+01	
200.14		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
200.58	4.33E+17	0.00.E+00	0.00E+00	9.46E+15	0.00.E+00	0.00E+00	0.00E+00		
201.02		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
201.47		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			5.06E+00
201.91		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
202.35		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
202.80	7.77E+17	0.00.E+00	0.00E+00	1.88E+16	0.00.E+00	0.00E+00	0.00E+00		
203.24		6.94.E-07	4.72E+16		0.00.E+00	0.00E+00		2.30E+01	
203.68		6.86.E-07	4.66E+16		0.00.E+00	0.00E+00		1.38E+01	
204.12		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
204.57		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
205.01	7.24E+17	1.36.E-06	9.26E+16	2.78E+16	0.00.E+00	0.00E+00	0.00E+00	1.15E+01	
205.45		6.83.E-07	4.64E+16		0.00.E+00	0.00E+00		0.00E+00	
205.90		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.15E+00
206.34		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
206.78		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
207.22	4.74E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
207.67		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
208.11		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
208.55		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
209.00		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
209.44	4.99E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
209.88		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
210.32		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.07E+00
210.77		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
211.21		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
211.65	7.28E+17	0.00.E+00	0.00E+00	2.76E+16	0.00.E+00	0.00E+00	0.00E+00		
212.09		6.93.E-07	4.71E+16		0.00.E+00	0.00E+00		1.38E+01	
212.54		1.34.E-06	9.09E+16		0.00.E+00	0.00E+00		6.91E+00	
212.98		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
213.42		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
213.87	4.97E+17	6.59.E-07	4.48E+16	8.96E+15	0.00.E+00	0.00E+00	0.00E+00	0.00E+00	
214.31		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
214.75		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			0.00E+00
215.19		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
215.64		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
216.08	3.29E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
216.52		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
216.97		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
217.41		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
217.85		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
218.29	2.09E+17	0.00.E+00	0.00E+00	1.81E+16	0.00.E+00	0.00E+00	0.00E+00		
218.74		6.64.E-07	4.52E+16		0.00.E+00	0.00E+00		0.00E+00	
219.18		6.69.E-07	4.55E+16		0.00.E+00	0.00E+00		4.60E+00	3.22E+00
219.62		6.67.E-07	4.53E+16		0.00.E+00	0.00E+00		9.21E+00	
220.06		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
220.51	3.70E+17	0.00.E+00	0.00E+00	1.80E+16	6.51.E-07	6.50E+16	2.61E+16		
220.95		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
221.39		6.55.E-07	4.45E+16		6.55.E-07	6.54E+16		1.84E+01	
221.84		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
222.28		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
222.72	2.47E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	0.00E+00		
223.16		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			

Depth (nm)	⁴ He conc.	²⁰ Ne/ ¹³ C	²⁰ Ne conc.	²⁰ Ne conc.	²² Ne/ ¹³ C	²² Ne conc.	²² Ne conc.	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne
	5 lay. Smoothing		(cm ³)	5 lay. Smoothing		10lay. Smoothing	5 lay. Smoothing		10lay. Smoothing
223.61		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			9.21E-01
224.05		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
224.49		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
224.94	5.39E+17	0.00.E+00	0.00E+00	9.02E+15	0.00.E+00	0.00E+00	0.00E+00		
225.38		6.63.E-07	4.51E+16		0.00.E+00	0.00E+00		9.21E+00	
225.82		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
226.26		0.00.E+00	0.00E+00		6.54.E-07	6.54E+16			
226.71		6.60.E-07	4.49E+16		0.00.E+00	0.00E+00		9.21E+00	
227.15	4.16E+17	0.00.E+00	0.00E+00	8.98E+15	0.00.E+00	0.00E+00	2.64E+16		
227.59		0.00.E+00	0.00E+00		6.68.E-07	6.67E+16			
228.03		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			9.21E-01
228.48		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
228.92		6.51.E-07	4.43E+16		0.00.E+00	0.00E+00		0.00E+00	
229.36	1.66E+17	0.00.E+00	0.00E+00	8.86E+15	0.00.E+00	0.00E+00	1.34E+16		
229.81		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
230.25		0.00.E+00	0.00E+00		6.71.E-07	6.70E+16			
230.69		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
231.13		6.63.E-07	4.51E+16		0.00.E+00	0.00E+00		0.00E+00	
231.58	2.94E+17	0.00.E+00	0.00E+00	9.02E+15	0.00.E+00	0.00E+00	0.00E+00		
232.02		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
232.46		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			1.38E+00
232.91		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
233.35		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
233.79	4.94E+17	6.61.E-07	4.50E+16	8.99E+15	0.00.E+00	0.00E+00	1.35E+16	1.38E+01	
234.23		0.00.E+00	0.00E+00		6.74.E-07	6.74E+16			
234.68		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
235.12		6.61.E-07	4.50E+16		0.00.E+00	0.00E+00		1.38E+01	
235.56		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
236.00	3.31E+17	0.00.E+00	0.00E+00	8.99E+15	0.00.E+00	0.00E+00	0.00E+00		
236.45		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
236.89		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			2.30E+00
237.33		6.47.E-07	4.40E+16		0.00.E+00	0.00E+00		9.21E+00	
237.78		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
238.22	3.24E+17	0.00.E+00	0.00E+00	8.80E+15	0.00.E+00	0.00E+00	0.00E+00		
238.66		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
239.10		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
239.55		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
239.99		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
240.43	2.46E+17	0.00.E+00	0.00E+00	1.79E+16	0.00.E+00	0.00E+00	0.00E+00		
240.88		6.51.E-07	4.43E+16		0.00.E+00	0.00E+00		1.38E+01	
241.32		6.65.E-07	4.52E+16		0.00.E+00	0.00E+00		4.60E+00	2.30E+00
241.76		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
242.20		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
242.65	2.08E+17	6.61.E-07	4.50E+16	9.00E+15	0.00.E+00	0.00E+00	0.00E+00	4.60E+00	
243.09		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
243.53		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
243.98		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
244.42		6.38.E-07	4.34E+16		0.00.E+00	0.00E+00		9.21E+00	
244.86	2.01E+17	0.00.E+00	0.00E+00	1.75E+16	0.00.E+00	0.00E+00	0.00E+00		
245.30		6.48.E-07	4.41E+16		0.00.E+00	0.00E+00		0.00E+00	
245.75		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			9.21E-01
246.19		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
246.63		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
247.07	3.96E+16	0.00.E+00	0.00E+00	2.64E+16	0.00.E+00	0.00E+00	1.31E+16		
247.52		1.29.E-06	8.74E+16		0.00.E+00	0.00E+00		0.00E+00	
247.96		6.55.E-07	4.45E+16		6.55.E-07	6.54E+16		0.00E+00	
248.40		6.47.E-07	4.40E+16		0.00.E+00	0.00E+00		4.60E+00	
248.85		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
249.29	2.84E+17	0.00.E+00	0.00E+00	8.80E+15	0.00.E+00	0.00E+00	0.00E+00		
249.73		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
250.17		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			9.21E-01
250.62		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
251.06		6.66.E-07	4.53E+16		0.00.E+00	0.00E+00		4.60E+00	
251.50	2.09E+17	0.00.E+00	0.00E+00	9.06E+15	0.00.E+00	0.00E+00	0.00E+00		

Depth (nm)	⁴ He conc.	²⁰ Ne/ ¹² C	²⁰ Ne conc.	²⁰ Ne conc.	²² Ne/ ¹² C	²² Ne conc.	²² Ne conc.	⁴ He/ ²⁰ Ne	⁴ He/ ²⁰ Ne
	5 lay. Smoothing		(cm ³)	5 lay. Smoothing		10lay. Smoothing	5 lay. Smoothing		10lay. Smoothing
251.95		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
252.39		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
252.83		0.00.E+00	0.00E+00		6.65.E-07	6.64E+16			
253.27		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
253.72	1.22E+17	0.00.E+00	0.00E+00	0.00E+00	0.00.E+00	0.00E+00	2.65E+16		
254.16		0.00.E+00	0.00E+00		6.62.E-07	6.61E+16			
254.60		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			4.60E-01
255.04		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
255.49		6.59.E-07	4.48E+16		0.00.E+00	0.00E+00		4.60E+00	
255.93	2.48E+17	0.00.E+00	0.00E+00	8.97E+15	0.00.E+00	0.00E+00	0.00E+00		
256.37		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
256.82		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
257.26		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
257.70		6.56.E-07	4.46E+16		0.00.E+00	0.00E+00		1.84E+01	
258.14	6.24E+17	0.00.E+00	0.00E+00	3.61E+16	0.00.E+00	0.00E+00	0.00E+00		
258.59		2.00.E-06	1.36E+17		0.00.E+00	0.00E+00		7.67E+00	
259.03		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			3.84E+00
259.47		2.00.E-06	1.36E+17		0.00.E+00	0.00E+00		3.07E+00	
259.92		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
260.36	2.49E+17	1.33.E-06	9.04E+16	6.34E+16	0.00.E+00	0.00E+00	0.00E+00	0.00E+00	
260.80		6.62.E-07	4.50E+16		0.00.E+00	0.00E+00		0.00E+00	
261.24		6.68.E-07	4.54E+16		0.00.E+00	0.00E+00		9.21E+00	
261.69		6.52.E-07	4.44E+16		0.00.E+00	0.00E+00		1.38E+01	
262.13		0.00.E+00	0.00E+00		0.00.E+00	0.00E+00			
262.57	1.63E+17	0.00.E+00	0.00E+00	8.87E+15	0.00.E+00	0.00E+00	0.00E+00		

Appendix4 2b. Ion intensity (Cnt/MSc/Px) and the calculated ^4He and ^{20}Ne concentrations of Genesis-DOS 60939 without IG for calculation of C ion ratio.

Analysis day: 2016.11.11

Raster area: 30px

Analysis area: 14px

Depth (nm)	^4He (Cnt/MSc/Px)	^{20}Ne (Cnt/MSc/Px)	^{22}Ne (Cnt/MSc/Px)	$^{12}\text{C}^+$ (Cnt/MSc/Px)	$^{12}\text{C}^{2+}$ (Cnt/MSc/Px)	$^{12}\text{C}^{3+}$ (Cnt/MSc/Px)
263.01	2.81.E-03	0.00.E+00	0.00.E+00	42.1	25.0	10.7
263.46	1.58.E-03	0.00.E+00	0.00.E+00	42.0	25.0	10.7
263.90	2.45.E-03	5.10.E-05	0.00.E+00	41.7	24.8	11.3
264.34	2.19.E-03	0.00.E+00	0.00.E+00	42.7	25.2	11.0
264.79	2.50.E-03	0.00.E+00	0.00.E+00	42.3	25.1	11.0
265.23	2.70.E-03	0.00.E+00	0.00.E+00	42.4	25.0	11.2
265.67	2.76.E-03	0.00.E+00	0.00.E+00	42.3	25.1	11.1
266.11	2.86.E-03	0.00.E+00	0.00.E+00	42.0	25.1	11.4
266.56	2.55.E-03	5.10.E-05	0.00.E+00	42.2	25.0	11.2
267.00	2.04.E-03	0.00.E+00	0.00.E+00	42.0	24.7	11.2
average				42.2	25.0	11.1
C ratio				0.54	0.32	0.14