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**MEASUREMENT OF THE ^{238}U
CAPTURE CROSS SECTION FOR
INCIDENT NEUTRON ENERGIES UP
TO 100 keV**

G. de Saussure

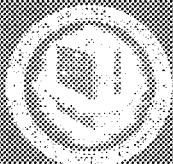
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NEUTRON ENERGIES UP TO 100 keV

G. de Saussure, E. G. Silver, R. B. Perez,
R. Ingle and H. Weaver

FEBRUARY 1973

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ABSTRACT

The neutron capture cross section of ^{238}U was measured for incident neutron energies between 5 eV and 100 keV using a pulsed electron linac neutron source and the time-of-flight technique. Capture gamma rays were detected by a large liquid scintillator located on a 40-m flight path. The incident neutron flux was monitored by a $^{10}\text{BF}_3$ ionization chamber. The cross section was normalized by the saturated resonance technique.

This memorandum contains a brief description of the experimental technique and a discussion of the results. A complete tabulation of one of the measurements is given in the appendix.

I. INTRODUCTION

The capture cross section of ^{238}U in the energy range from 1 to 100 keV is one of the most important nuclear parameters of the Liquid Metal Fast Breeder Reactor Program. Greebler *et al.*¹ have performed an extensive study of the effect of nuclear uncertainties on the design parameters of fast breeder reactors. From this study the sensitivity of typical reactor parameters to various nuclear cross sections can be obtained. The sensitivity of the breeding ratio to the six most important cross sections is given in Table I. As the table indicates, the breeding ratio is much more sensitive to $\bar{\nu}$ for ^{239}Pu and to the capture cross section of ^{238}U from 1 to 100 keV than to any other nuclear data. When the present uncertainties in the parameters are considered, it is clear that most of the uncertainty in the predicted breeding ratio is contributed by the uncertainty in the ^{238}U capture cross section. Greebler *et al.* indicated that a precision of 2% for this cross section would be required; the present uncertainty is of the order of 15%.

Since 1945 many measurements of the ^{238}U capture cross section have been performed.² These measurements have recently been reviewed by W. G. Davey,³ V. A. Konshin,⁴ L. P. Abagyan *et al.*,⁵ T. A. Pitterle *et al.*,⁶ and others.⁷ In spite of the many measurements, the uncertainty in this parameter is still very large; the discrepancies between the most recent measurements are typically of the order of 10 to 15%.

One reason for the persisting large uncertainty in the capture cross section of ^{238}U is the well-known great experimental difficulty in measuring capture cross sections of heavy elements in the keV region.⁸ A situation similar to that of ^{238}U exists with respect to the neutron capture cross section of gold, for instance.⁹ Another reason is that, in spite of the large number of

TABLE I. SENSITIVITY OF THE BREEDING RATIO OF A TYPICAL LIQUID METAL FAST BREEDER REACTOR TO SEVERAL CROSS SECTIONS(a)

Cross Section	Sensitivity $\frac{\delta BR}{BR} / \frac{\delta \sigma}{\sigma}$	Cross Section Uncertainty b) $\frac{\delta \sigma}{\sigma}$	Breeding Ratio Uncertainty c) $\frac{\delta BR}{\delta BR}$
^{239}Pu , $\bar{\nu}$ above 1 keV	1.54	.02	.040
^{238}U , $\sigma(n,\gamma)$ 1-100 keV	.46	.15	.090
^{238}U , $\bar{\nu}$ above 1 MeV	.13	.03	.005
^{238}U , $\sigma(n,f)$ above 1 MeV	.13	.06	.010
^{238}U , $\sigma(n,\gamma)$ above 100 keV	.12	.10	.015
^{239}Pu , $\sigma(n,f)$ 20-300 keV	.12	.10	.015

a) This table is derived from Table III of the paper of Greebler, Hutchins and Cowan.

b) The uncertainties assumed by Greebler *et al.* were used here except for ^{238}U $\sigma(n,\gamma)$, 1-100 keV, where the uncertainty was raised from 0.10 to 0.15, a more reliable estimate in view of the discrepancies discussed in this paper.

c) Based on an estimated Breeding Ratio of 1.3.

measurements performed, only since 1969 have good resolution time-of-flight measurements been done.^{10,11} In fact, other than the one described here, only two good resolution measurements over a large energy range have been carried out, the results for one of which are still preliminary.

In this report we describe a measurement of the capture cross section of ^{238}U in the range from 5 eV to 100 keV, using a large liquid-scintillator gamma-ray detector and the time-of-flight technique on a 40-m neutron flight path. The experimental conditions and data analysis are discussed, and the results are compared with the results of other measurements and with various evaluations.

II. DESCRIPTION OF THE EXPERIMENT

A. Principle of the Measurement

A pulsed beam of neutrons is collimated on a sample of ^{238}U . The neutron capture rate in the sample is measured, as a function of time of flight, by detecting the gamma rays from the $^{238}\text{U}(\text{n},\gamma)^{239}\text{U}$ reaction with a large gamma-ray detector surrounding the ^{238}U sample. The spectrum of the neutron flux incident upon the sample is obtained with a thin detector of known relative efficiency placed in front of the sample. At each energy, the probability of capture in the sample is proportional to the observed capture rate divided by the measured intensity of the incident neutron beam. This probability can be normalized on the peak of a low-energy "black" resonance where the transmission vanishes and where the probability of capture is almost unity. The cross section for the reaction $^{238}\text{U}(\text{n},\gamma)^{239}\text{U}$ can be derived from the measured probability of capture in a sample of finite thickness by applying appropriate corrections for multiple scattering and resonance self shielding.

B. Experimental Arrangement

The Oak Ridge Electron Linear Accelerator (ORELA)¹² was used to produce a pulsed source of neutrons. Pulses of approximately 140-MeV electrons of 12A peak intensity impinged on a water-cooled tantalum target where they produced fast neutrons by the (γ ,n) reaction. Some of these neutrons were slowed down to the energies of interest for the measurement by a 2.5-cm-thick, 15-cm-diameter water moderator surrounding the tantalum target. This water moderator was canned in a 2.4-mm-thick aluminum housing. The target-moderator assembly is sketched in Fig. 1. It has been described in some detail by R. L. Macklin.¹³

The capture gamma-ray detector was positioned in the 40-m station of flight path 6 of ORELA. This flight path is normal to the surface of the moderator. The ²³⁸U sample was placed at the center of the capture gamma-ray detector at a distance of 39.7 m from the neutron source. The incident neutron detector was located between the ²³⁸U sample and the neutron source at a distance of 37.9 m from the neutron source.

The neutron collimator system of flight path 6 has been described in detail by E. G. Silver *et al.*¹⁴ and is sketched in Fig. 2. The collimators are made of copper and lead to avoid the energy degradation caused by neutron scattering in lighter materials such as boron, lithium or paraffin. The beam is collimated to a 6.6-cm-diameter umbra at the sample position with a 8.3-cm-diameter penumbra. A shadow bar, rectangular in cross section, made of 61 cm of copper followed by 16 cm of lead located 2.5 m from the linac target shields the ²³⁸U sample from the gamma rays generated by the electrons impinging upon the tantalum of this target. This bar considerably reduces the "gamma flash" due to the gamma rays and unmoderated neutrons arriving at the detector a few microseconds after the electron burst.

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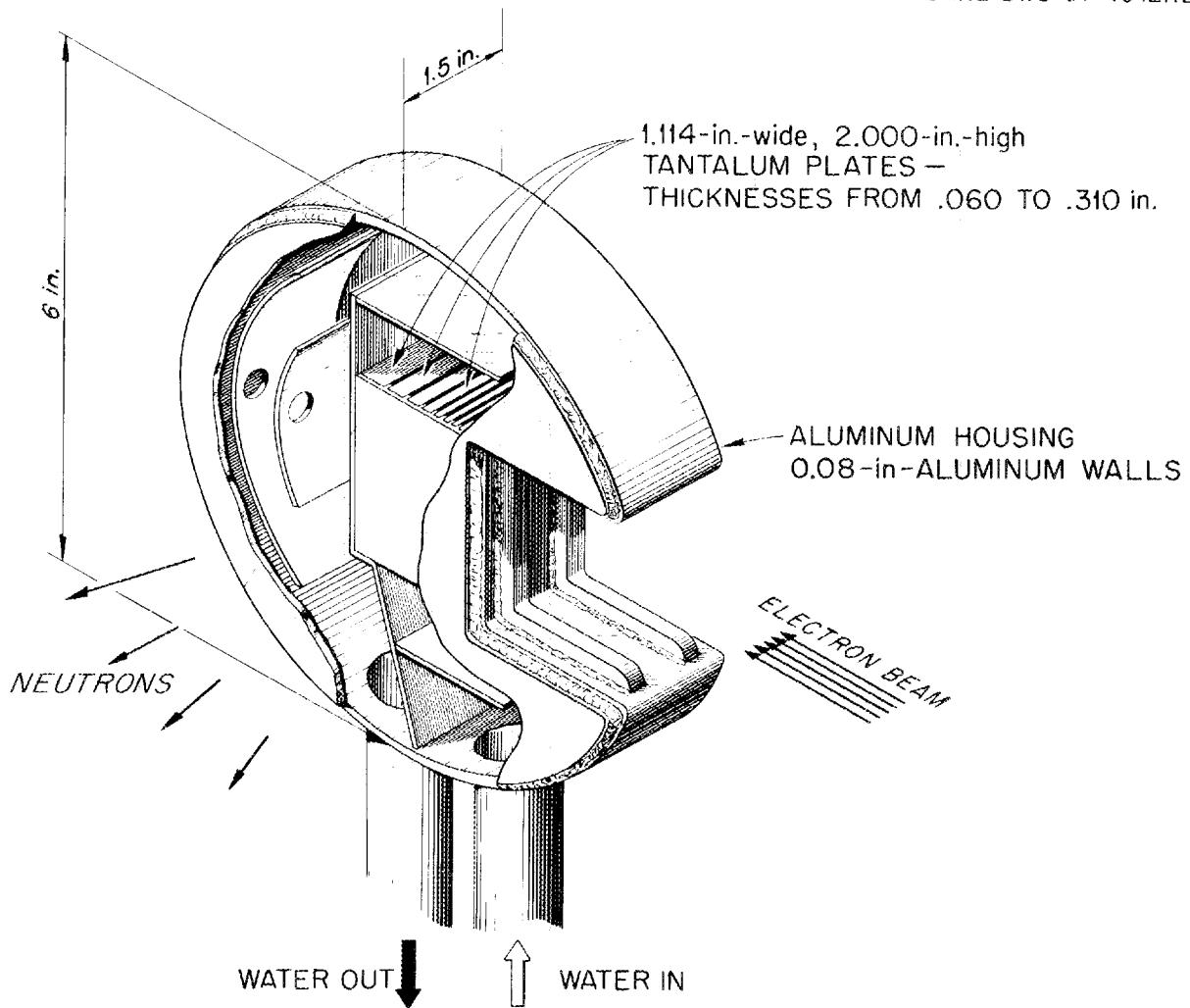


Fig. 1. The high power (50 kW) water-cooled tantalum neutron target and moderator assembly for ORELA. Note that all the neutrons which leave the assembly are filtered through the .08-in-thick aluminum housing.

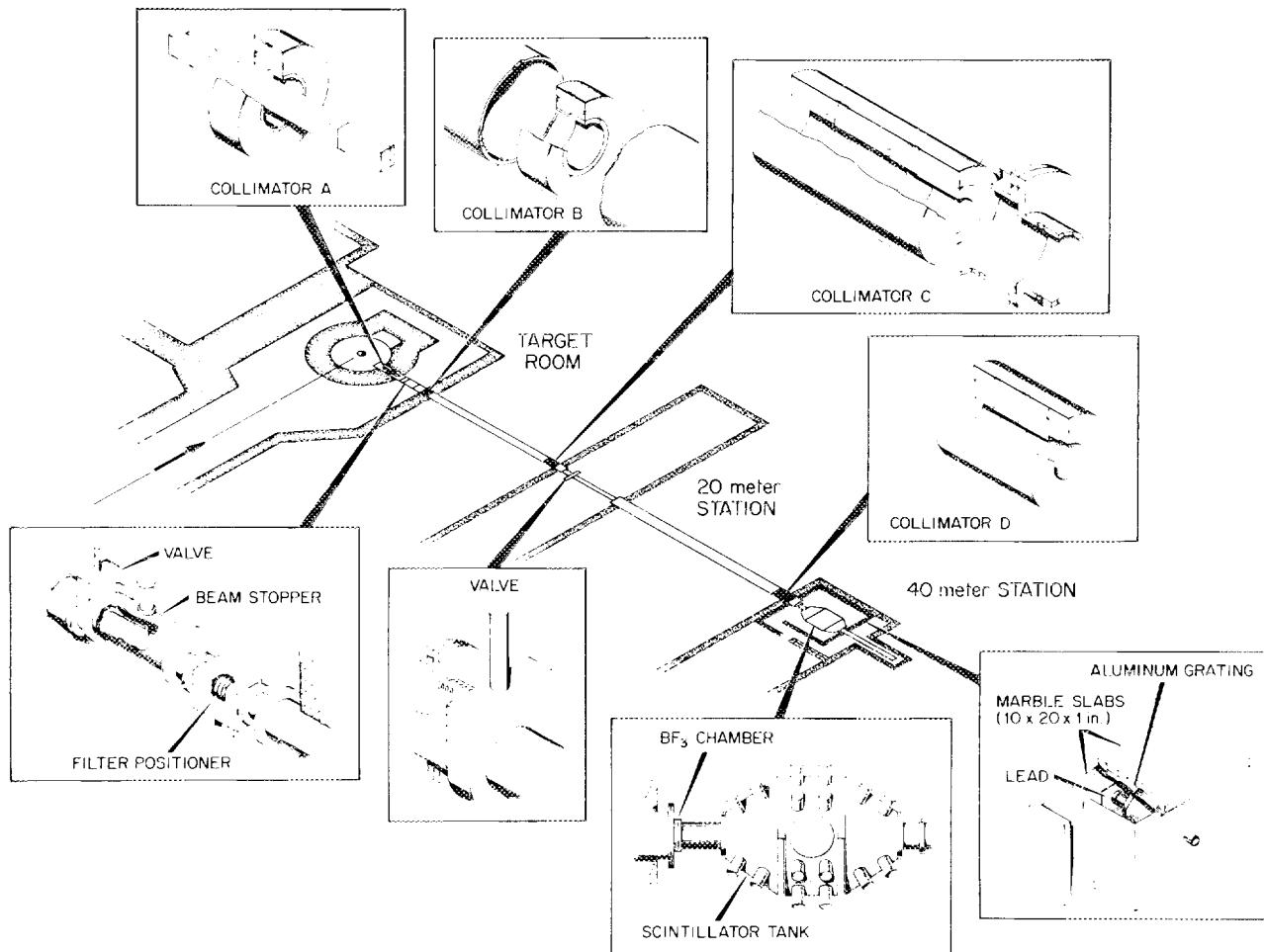


Fig. 2. The collimation system for the 40-m station of the flight path No. 6. The figure shows, in particular, the copper and lead shadow bar, the beam stopper, the filter positioner, and the the four copper and lead collimators.

C. The Detectors

The ORELAST capture gamma-ray detector used in this experiment has been described in detail by E. G. Silver *et al.*¹⁴ A sketch of this detector is shown in Fig. 3. Fig. 4 shows a picture of the detector at the 40-m station of flight path 6 before the installation of the 25-cm-thick marble shield which was placed around the ORELAST during the measurements. This shield reduced the background by a factor of about 12. The detector is filled with 3000 liters of three parts NE-224, a commercial liquid scintillator,¹⁵ and one part trimethylborate. The trimethylborate is added so that the scattered neutrons thermalized in the solution can be captured in boron rather than hydrogen; this reduces the background due to the 2.25-MeV capture gamma ray of hydrogen by a factor of 20. The liquid scintillator is viewed by thirty-two 5-in.-diam RCA-4522 photomultipliers whose gains are individually adjusted so as to optimize the overall pulse-height resolution of the detector. The ORELAST is traversed by an aluminum tube through which the neutron beam passes and in which the ^{238}U sample is placed. This "through tube" is of 17.8 cm internal diameter with 1-mm-thick walls. A 152.4-cm-long, 2.5-cm-thick liner of ^6LiH (12.5 cm ID) is inserted in this through tube. The purpose of this liner was to decrease the background in the scintillator due to neutrons scattered by the ^{238}U sample and to inhibit fast neutrons scattered by the scintillator from coming back to the ^{238}U sample.¹⁶

The liquid scintillator tank was separated optically into two equal halves by a 2-mil-thick aluminized-mylar barrier in the vertical plane containing the beam axis. This allowed requiring coincidences between the signals from the two halves. The signal-to-background ratio is approximately eight times higher for such coincidences than for the "singles" because

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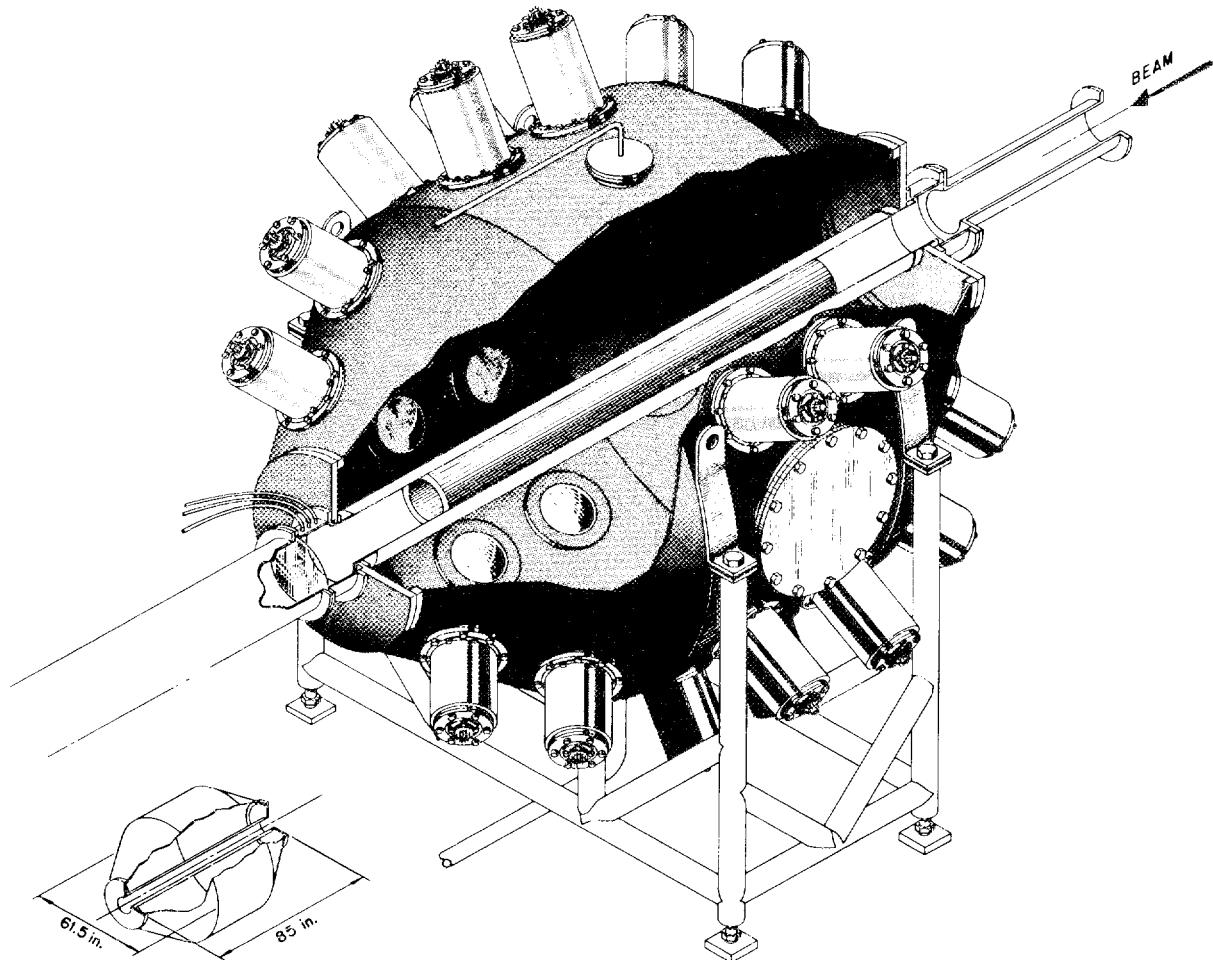


Fig. 3. Sketch of the ORELA liquid scintillator tank (ORELAST).
The tank is viewed by thirty-two 5-in.-diameter RCA 4522 photomultipliers;
it was separated into two equal halves with an aluminum reflector located in
the vertical plane containing the beam axis. This separation is not shown on
the figure.

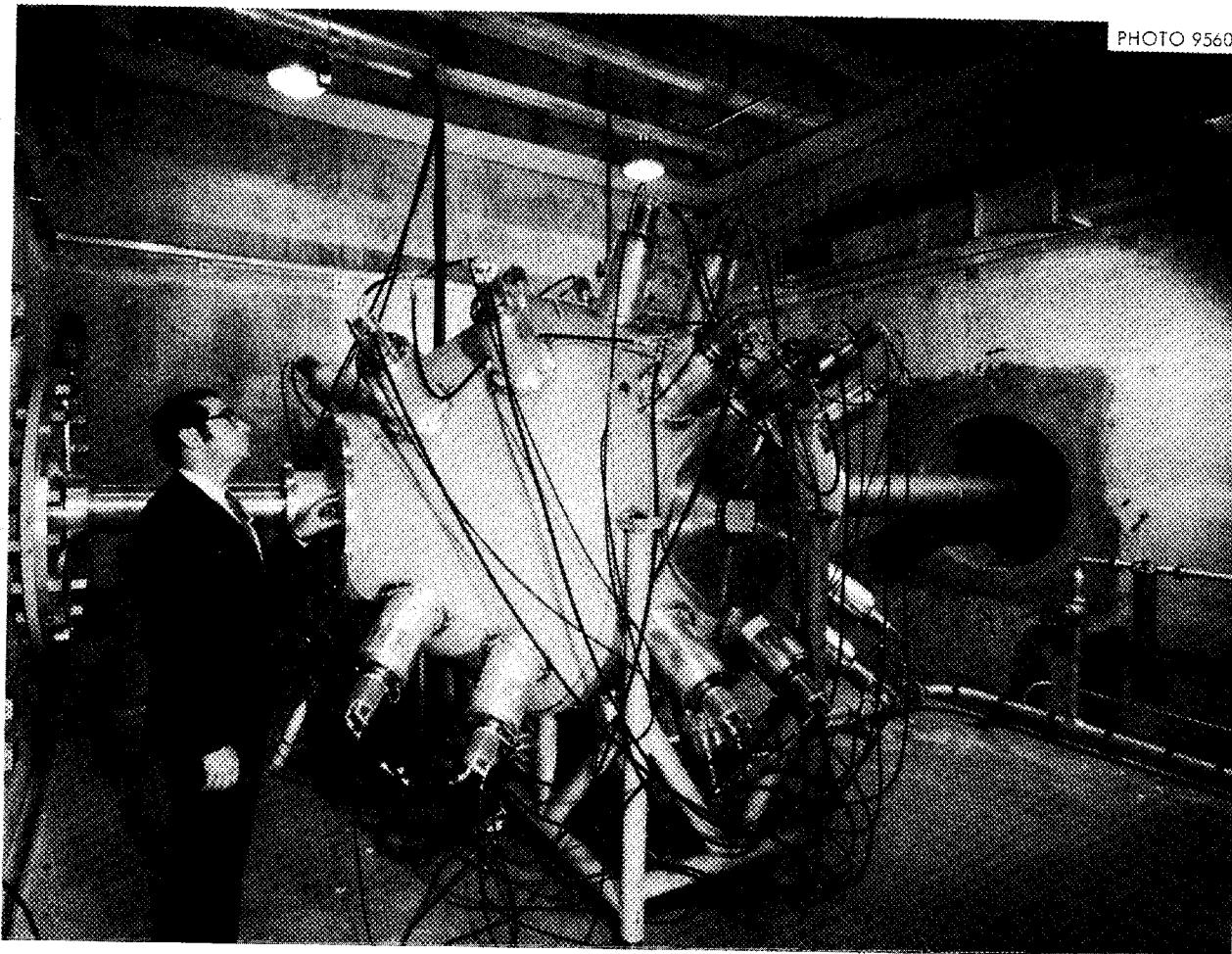


Fig. 4. Photograph of the large scintillation tank, ORELAST, in the 40-m-station of flight path 6 before installation of the marble shield. The neutron beam enters the tank through a collimator placed in the wall on the left of the photograph and exits through the beam dump partly shown on the right.

the gamma rays from capture in ^{238}U have a high multiplicity and hence a high probability per event to be seen in both halves of the scintillator; whereas much of the background is caused by single gamma rays, unlikely to be seen in both halves of the scintillator.

The neutron detector used to measure the incident neutron beam spectrum was a 12.5-cm-QD, 3-cm-thick parallel-plate ionization chamber filled with BF_3 (96% ^{10}B) to a pressure of 1 atm.¹⁷ The plates of this chamber were of 0.38-mm-thick beryllium. Beryllium was selected because it has no known neutron resonances below 100 keV.

The linac target cell and the entire collimation system up to the neutron detector were evacuated to reduce the energy degradation and loss of beam intensity associated with neutron scattering in air. The ORELAST through-tube and the beam dump (the neutron beam exit behind the ORELAST) were filled with helium because helium has a smaller scattering cross section than air.

The bare 7.6-cm-diam ^{238}U sample was held in position in the center of the capture-gamma-ray detector by a light lucite holder.

D. The Electronics

A simplified block diagram of the electronics associated with the experiment is shown in Fig. 5. The time of flight was measured with a Model 541 Eldorado digital time interval counter.¹⁸ This "clock" measured the time intervals between a start signal from a gamma-flash detector triggered by the arrival of the electron burst on the linac target and stop signals from either the capture gamma-ray detector or the neutron detector.¹⁹ The timing resolution of approximately 6 ns was determined by the fast signals from the photomultiplier anodes. The pulses from the capture gamma-ray detector were divided into two pulse-height groups corresponding to equivalent total gamma-ray energies between 2.8 and 4.5 and between 4.5 and 10 MeV respectively. Pulses below 2.8 MeV or above 10 MeV were rejected by a fast/slow coincidence circuit. In turn, each of these pulse-height groups was divided into two subgroups according to whether or not a coincidence occurred between the halves of the ORELAST. The resolving time of the coincidence circuit was 100 ns, the bias on each half of the scintillator was 300 keV equivalent gamma-ray energy. The four types of events from the capture gamma-ray detector were recorded separately in order to observe whether appreciable

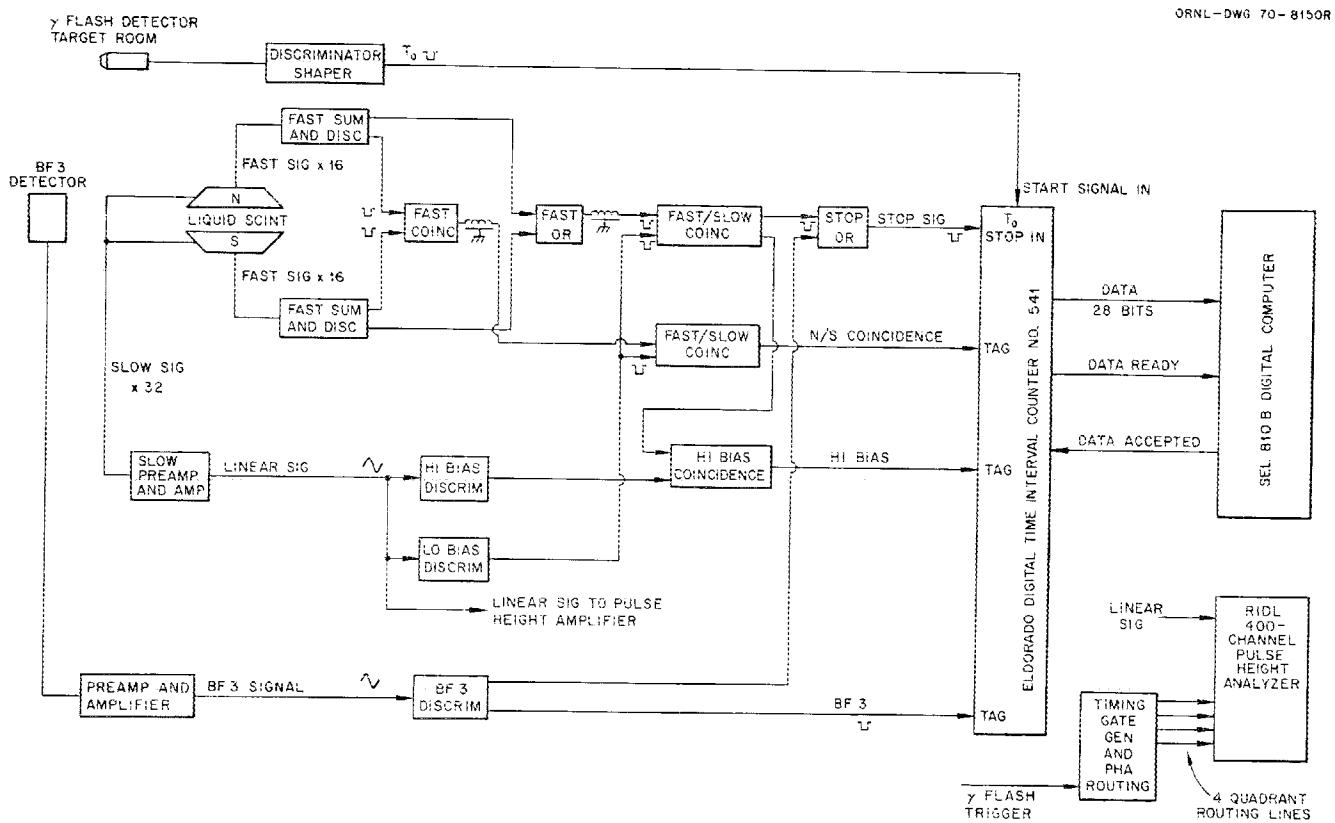


Fig. 5. Simplified block diagram of the electronic circuitry used in the measurements of the ^{238}U capture cross section. The time-of-flight spectra were accumulated on a fast random access disk tied to the SEL810B computer. They were later unloaded on magnetic tape and analyzed on an IBM/360 computer by batch process.

changes in pulse-height distribution or in multiplicity occurred as a function of time of flight. Such changes could be caused either by electronic bias shifts or by an energy dependence of the average properties of the cascade following neutron capture.

The liquid scintillator has a sufficiently large volume to absorb most of the gamma-ray energy originating at the sample position; after a capture in ^{238}U the gamma-ray energy released is equal to the sum of the binding energy (4.8 MeV) and the kinetic energy (<0.1 MeV) of the neutron. However, because of the poor pulse-height resolution of the detector and because some radiation is absorbed in the sample and structure, the actual pulse-height spectrum corresponding to a capture in ^{238}U extends from 0 to approximately 5.5 MeV and peaks near 4.5 MeV. A low bias was set at 2.8 MeV to discriminate against gamma rays from neutron inelastic scattering in ^{238}U and from neutron capture in hydrogen.

The five time-of-flight spectra (four from the gamma-ray capture detector and one from the neutron detector) were measured simultaneously, using the same digital time-interval counter and "tags" to identify the various types of events. The time-of-flight data were accumulated on a large capacity, rapid random-access magnetic disk storage device attached to an SEL-810B computer.²⁰ The stored data were later transferred via magnetic tape to be batch processed on an IBM-360/91.

Pulse-height spectra from the capture gamma-ray detector gated over four time-of-flight intervals were taken simultaneously with the time-of-flight spectra. These time-of-flight intervals were changed from run to run and the pulse-height spectra obtained were compared to determine whether significant changes of the pulse-height spectrum occurred with time of flight.

During accumulation the average count rates of the capture gamma-ray detector, of the neutron detector, and of a beam monitor were continuously recorded, and the data taking process was halted automatically whenever these count rates differed by more than 10% from the set level.

E. The Measurements

Measurements were carried out with samples of 1, 3 and 25 mils nominal thickness. The actual dimensions of these samples are given in Table II. The isotopic composition of the uranium is given in Table III.²¹

In the measurements with the thick samples, the signal-to-background ratio is better, particularly where the cross section is low. On the other hand, with the thin samples the self-shielding and multiple-scattering corrections required to derive the cross section from the measurements are relatively less important. Furthermore, a comparison of the data from the thick and thin samples can be made to verify the validity of the technique used in correcting for multiple-scattering and self-shielding effects. The data from the one-mil-thick sample had a very poor signal-to-background ratio and could not be fully reduced; these measurements with the one-mil sample will not be discussed in this paper.

For each sample thickness four sets of measurements were performed: measurements were done with and without a set of "resonance filters" in the beam. The resonance filters served to monitor the background at time-of-flight intervals corresponding to the location of black resonances in the filters. Measurements were also performed (both with and without the resonance filters) with an equivalent sample of lead in place of the ^{238}U sample. These measurements made it possible to interpolate the background

TABLE II. DIMENSIONS OF ^{238}U CAPTURE SAMPLES

Nominal Thickness	25 mil	3 mil	1 mil
Mean diameter, cm	$7.65 \pm .04$	$7.65 \pm .04$	$7.65 \pm .04$
Area, cm^2	$46.35 \pm .5$	$45.92 \pm .5$	$46.06 \pm .5$
Weight, grams	$51.842 \pm .01$	$7.183 \pm .01$	$2.549 \pm .01$
Areal density, g/cm^2	$1.118 \pm .01$	$.1564 \pm .002$	$.0553 \pm .0006$
Areal density, atoms/barn	$.00283 \pm .00003$	$.000396 \pm .000004$	$.000140 \pm .000001$
Inverse density, barns/atom	353 ± 4	2524 ± 25	7137 ± 72

TABLE III. ISOTOPIC COMPOSITION OF ^{238}U SAMPLES-(BATCH 169-C)

^{233}U	< 1 PPM
^{234}U	< 1 PPM
^{235}U	< 5 PPM
^{236}U	< 1 PPM
^{238}U	99.99%

The analysis was performed May 20, 1959 for H. Gwinn,
ORNL Isotopes Division.

between the resonance filter notches. Filters of ^{10}B were also used in each measurement to prevent overlap between neutrons from successive pulses of the linac. These overlap filters were made of pressed ^{10}B powder bound by 6% of epoxy resin. The total thickness of ^{10}B was adjusted as a function of the pulse repetition rate of the linac.

Most individual measurements lasted from 10 to 15 hours. For each sample thickness the complete set of four measurements was repeated at least twice to compensate for possible drifts in the electronics and in the beam spectrum, to obtain good statistics, and to permit consistency tests on the data.

In addition the entire set of measurements was repeated with different linac beam conditions, providing a verification that the final results were independent of such beam conditions as the repetition rate and the burst width (except for resolution effects). Table IV lists the experimental conditions common to all sets of measurements, Table V lists the beam conditions for five typical runs and Table VI lists the channel-width structure used for these measurements.

III. ANALYSIS OF THE DATA

The purpose of the analysis of the data is to obtain the probability of neutron absorption as a function of energy for each ^{238}U sample used. From this probability the cross section for the reaction $^{238}\text{U}(n,\gamma)^{239}\text{U}$ can be obtained by resonance analysis or by applying the appropriate corrections for resonance self-shielding and multiple-scattering effects. The successive steps to obtain the probability of absorption in a given sample are listed in Table VII and briefly discussed below.

TABLE IV. EXPERIMENTAL PARAMETERS FOR THE ORELA MEASUREMENT
OF CAPTURE IN ^{238}U AT 40 m

^{238}U sample flight path	$39.70 \pm .04$ m
Neutron detector flight path	$37.86 \pm .04$ m
Moderator composition	H_2O
Moderator thickness	$2.54 \pm .5$ cm
^{238}U sample composition	U-238 metal
Sample temperature	$297 \pm 5^\circ\text{K}$
Overlap filters	^{10}B powder pressed with 6 wt% epoxy
Background filters	1) Al 14 g/cm^2 2) NaF 1.41 g/cm^2 3) S 10 g/cm^2

TABLE V. EXPERIMENTAL PARAMETERS FOR FIVE SETS OF MEASUREMENTS

Run Number	R0033002	R0031901	R0101401	R0110101	R0110601
Linac Repetition Rate (Hz)	450	450	900	900	450
Electron burst width (ns)	5	5	5	5	40
^{10}B overlap filter (g/cm^2)	.187	.187	.550	.550	.550
^{238}U sample thickness (at/barn)	.0004	.0028	.0004	.0028	.0028

TABLE VI. TIME-OF-FLIGHT PROGRAM FOR MEASUREMENT OF σ_c FOR ^{238}U

Number of Channels	Channel Width	Time of Flight	Energy
16384	5 nsec	0-81.92 μsec	>1.3 keV
2048	10 nsec	81.92-102.4 μsec	1.3 keV-800 eV
2048	20 nsec	102.4-143.36 μsec	800-400 eV
1024	40 nsec	143.36-184.32 μsec	400-250 eV
1024	80 nsec	184.32-266.24 μsec	250-120 eV
512	160 nsec	266.24-348.16 μsec	120-70 eV
512	320 nsec	348.16-512 μsec	70-32 eV
512	640 nsec	512-840 μsec	32-12.5 eV
256	1.28 μsec	840 μsec -1.167 msec	12.5-8 eV
256	2.56 μsec	1.167-1.823 msec	8-2.5 eV

TABLE VII. SUCCESSIVE STEPS IN DATA REDUCTION

Nature of Correction	Magnitude of Correction Maximum	Magnitude of Correction Average	Uncertainty Associated With the Correction
Deadtime Correction	25%	2%	0.1%
Background Subtraction	$40 \text{ b.eV}^{1/2}$	$6 \text{ b.eV}^{1/2}$	$3 \text{ b.eV}^{1/2}$
Energy Dependence of Efficiency	No energy dependence observed		3%
Determination of Neutron Spectrum (Background Correction and Correction for non $\frac{1}{v}$ Dependence of ^{10}B Cross Section.)	6%	2%	4%
Normalization (Multiple Scattering Correction)	2%	2%	2%
Selfshielding and Multiple Scattering (above .5 keV)	40%	8%	4%

A. Deadtime Correction

As stated above, the five time-of-flight spectra were taken simultaneously using the same digital time-interval counter. A fixed deadtime of 10.24 μ s (larger than the dead-time of any of the electronic components) was artificially imposed on the equipment. This arrangement permitted a straight-forward calculation of the deadtime correction which was the same for all five spectra for any given time-of-flight channel. The correction was usually of the order of 2% and never exceeded 25%.

B. Background Subtraction

The background in each of the four time-of-flight spectra associated with the capture gamma-ray detector has a constant component and a time-of-flight-dependent component. The time-of-flight-dependent contribution is produced by the prompt gamma rays following the capture of a beam neutron or a scattered neutron in the detector or in any material around the detector except the ^{238}U sample; the time-of-flight-independent contribution is produced by cosmic rays and by long-lived radioactivities present in the detector and surrounding material, including the ^{238}U sample.

The spectrum of the time-of-flight-dependent part of the background was obtained from measurements for which the ^{238}U sample had been replaced by a lead sample of equivalent thickness. The magnitudes of both types of background were determined from the count rates at times of flight corresponding to the beam filters' black resonances. In order to improve the statistical accuracy of the background measurement and to interpolate under the few isolated resonances of lead, the spectra obtained with the lead sample were fitted with an appropriate polynomial function of the energy.

Fig. 6 shows an example of the raw data. The measurement was done with the 25-mil ^{238}U sample and with filters of S, Al, Na and ^{10}B in the beam.

The "notches" due to the black resonances of the filters are clearly seen.

Fig. 7 illustrates the determination and normalization of the background.

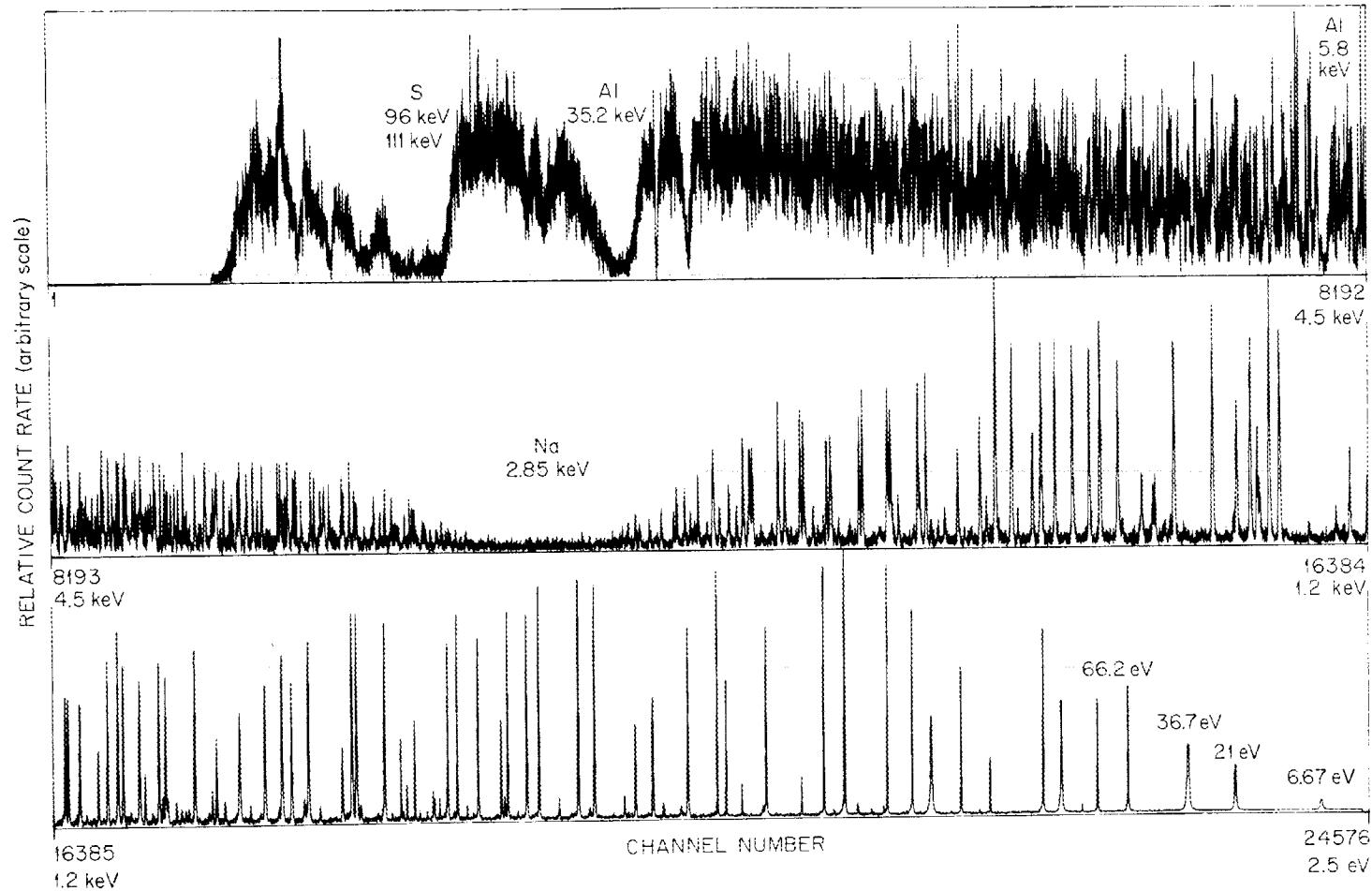
The lower curve on the figure shows the spectrum obtained with the ^{238}U sample replaced by an equivalent lead sample and the polynomial fit to the data; the upper curve shows a spectrum obtained with the "3-mil" ^{238}U sample and the background curve normalized at the black resonances.

The background associated with the neutron detector was of the order of 2% of the count rate. This background could be analyzed into a constant part and a time-of-flight-dependent part proportional to the foreground. Since only the relative count rate of the neutron detector was used in analyzing the data, the time-of-flight-dependent part of the background was not subtracted from the data. Fig. 8 shows the count rate of the neutron monitor as a function of incident neutron energy. The upper curve was obtained with no filter in the beam other than the ^{10}B "overlap filter". The lower curve was obtained by placing filters of Na, Al and S in the beam in addition to the ^{10}B overlap filter. The structure in the upper curve near 6 keV and above 20 keV is caused by the resonance structure of aluminum. (The neutrons leaving the linac target water moderator are filtered through the 2.4-mm-aluminum housing containing the moderator (see Fig. 1).)

C. Reduction of Data from the Capture Gamma-Ray Detector

As previously indicated four time-of-flight spectra were taken simultaneously with the capture gamma-ray detector. These corresponded to two pulse-height groups: between 2.8 and 4.5 MeV and between 4.5 and 10 MeV.

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Fig. 6. Count rate observed with a 25-mil ^{238}U sample in the ORELAST. Each of the three sections is individually normalized by an arbitrary scale factor. Resonance filters were located in the neutron beam, and some of the filter notches are identified.

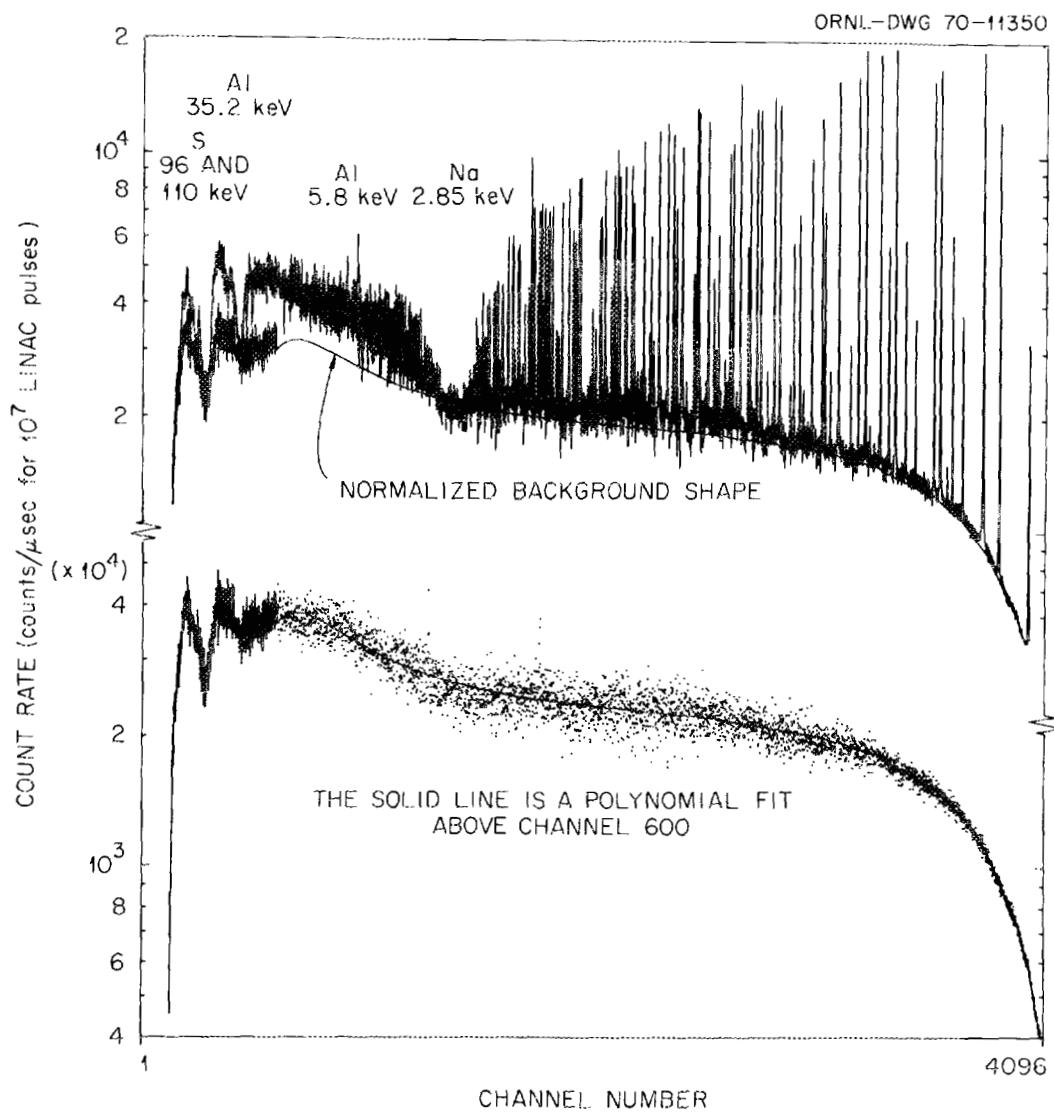


Fig. 7. Determination of the background in the ^{238}U capture cross-section measurement. The upper curve was obtained with a 3-mil sample of ^{238}U in the scintillation tank. The notches due to the resonance filter in the beam can be observed. The lower curve was obtained by replacing the 3-mil ^{238}U sample by a Pb sample of equivalent thickness. This lower curve defines the shape of the background. It is fitted by a polynomial to reduce the statistical fluctuations and eliminate the contribution of the few Pb resonances.

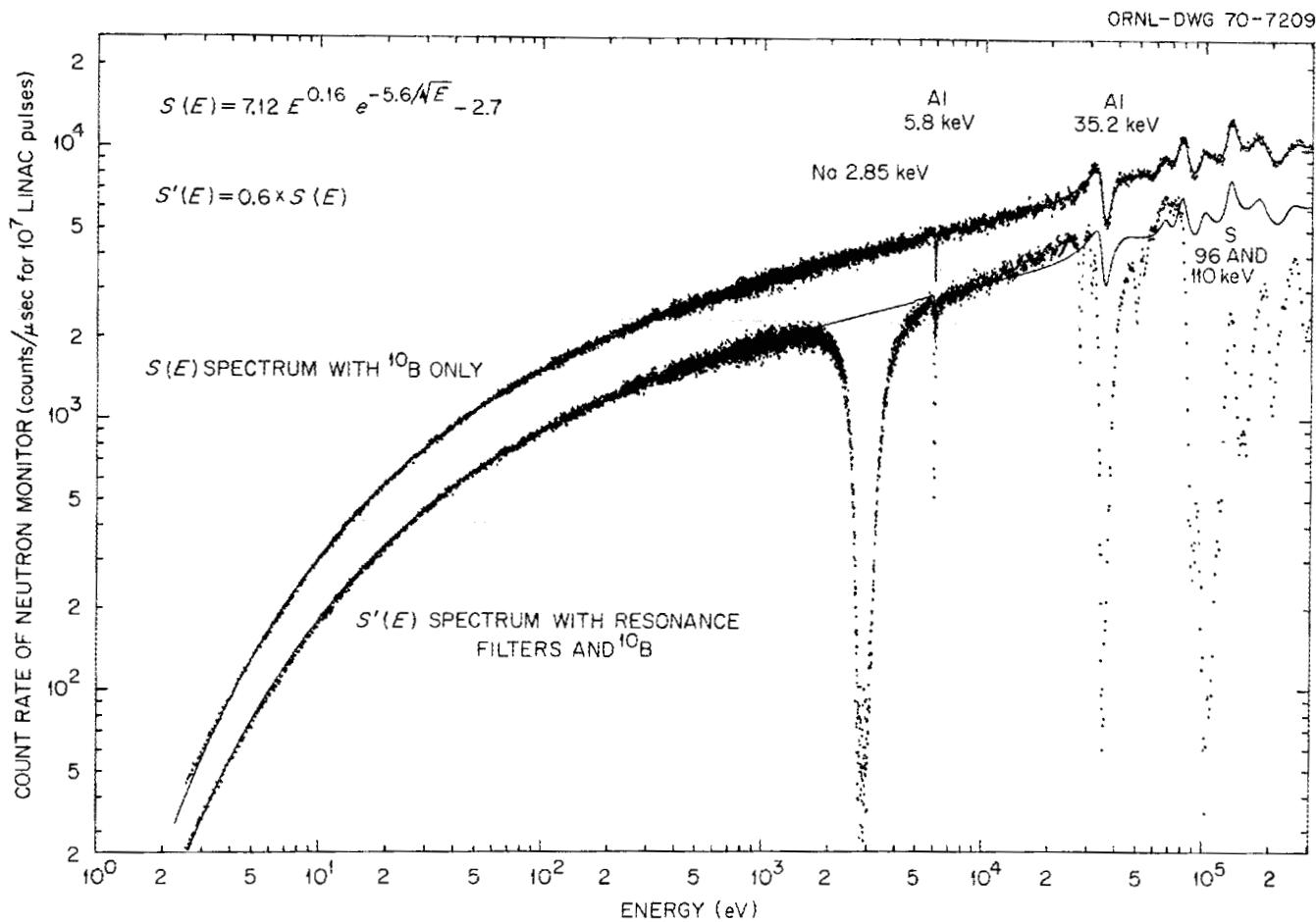


Fig. 8. Neutron count rates observed with a BF₃ ionization chamber with and without resonance filters. The solid lines represent an analytical fit to the data obtained without filters. The structure in the upper curve; near 6 keV and above 20 keV, is due to the filtering of the beam neutrons by the .08-in. aluminum housing of the ORELA target-moderator assembly (see Fig. 1).

Each pulse-height group was divided into two sections, the singles and the coincidences, depending on whether or not a coincidence had been detected between the two halves of the capture gamma-ray detector. The four time-of-flight spectra were compared to see if changes in the pulse-height spectra or in the coincidence probability could be observed, either as a function of energy or from resonance to resonance. No significant systematic changes were observed below 100 keV within the statistical accuracy of the measurements. This accuracy was about 5% for the ratio of singles to coincidences and 8% for the ratio of the high-pulse-height group to the low-pulse-height group when the data were averaged over decimal intervals (100 eV intervals up to 1 keV, 1 keV intervals up to 10 keV and 10 keV intervals up to 100 keV). The signal-to-background ratio was approximately eight times better for the coincidence data than for the singles; this is illustrated in Fig. 9 which shows the time-of-flight spectra of the singles (upper curve) and coincidences (lower curve) for a few low-energy resonances.

D. Determination of the Neutron Beam Spectrum

Since the neutron detector is very thin (its transmission is greater than 0.98 above 5 eV), the neutron beam transmitted through this detector and hence incident upon the ^{238}U sample, $\phi(E)$, may be related to the count rate of the detector, $S(E)$ at energy E by:

$$\phi(E) = K_1 \frac{S(E)}{\sigma(E)} = K_2 \frac{S(E)}{R(E)} \cdot E^{1/2} \quad (1)$$

where K_1 and K_2 are proportionality constants and $\sigma(E)$ is the ^{10}B absorption cross section. Below 100 keV the ^{10}B absorption cross section is nearly proportional to $E^{-1/2}$ so that the term $R(E)$ in the last expression is very

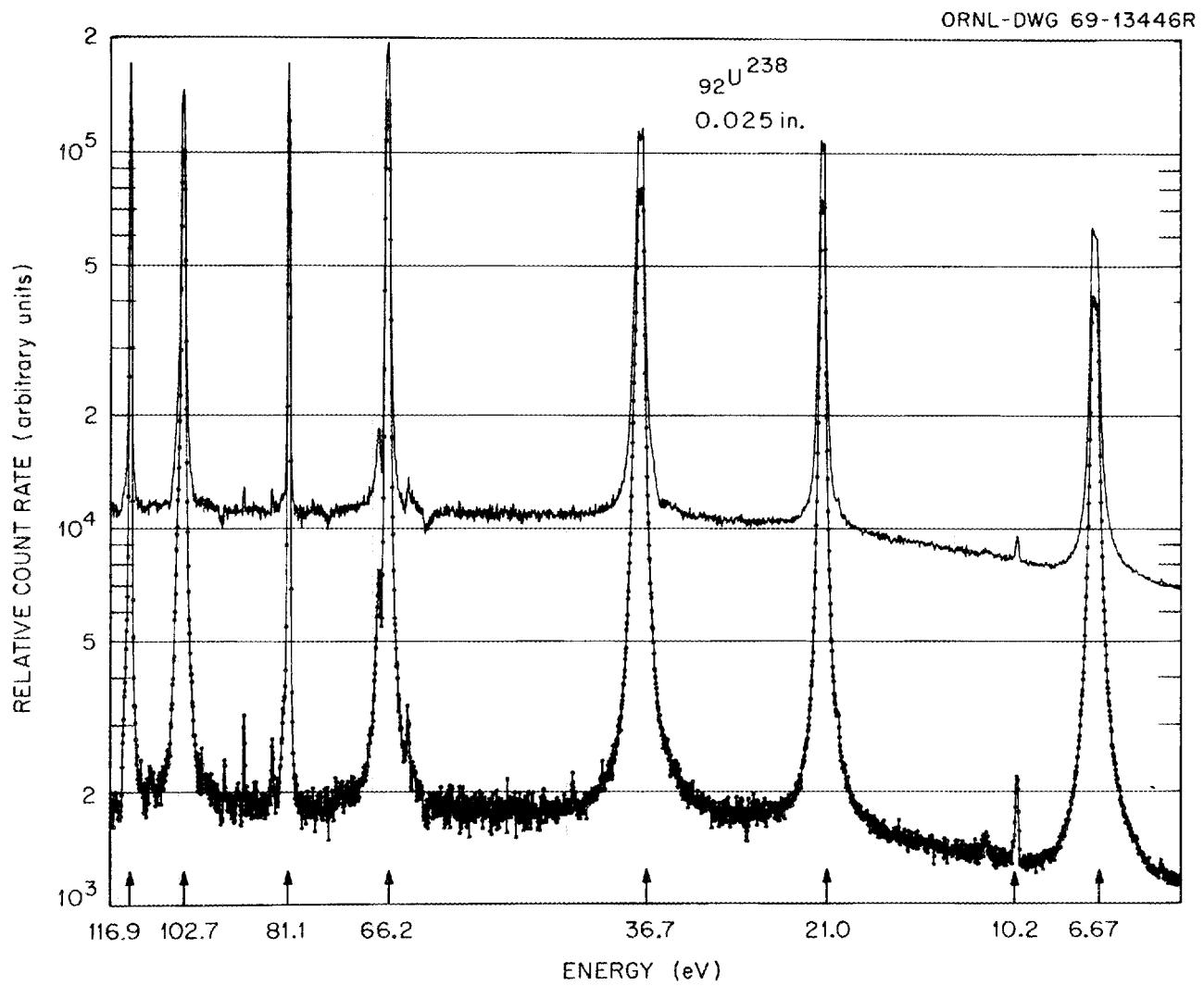


Fig. 9. Count rates observed with a 25-mil sample of ^{238}U in the ORELAST. The upper curve refers to those events which were observed in one-half of the ORELAST, but not the other. The lower curve refers to the coincidences between the two halves of the ORELAST. The signal to background ratio is approximately 8 times better in the coincidences (lower curve) than in the singles (upper curve).

close to unity. The evaluation of Sowerby et al.²² was used to compute $R(E)$.

Sowerby²³ has reported that the branching ratio of alpha particles going to the ground state to those going to the first excited state in ^7Li appears constant below 130 keV; consequently no correction to the efficiency of the neutron detector was made for changes in this branching ratio. The effect of the scattering of neutrons by the 0.38-mm-thick beryllium end-plates of the neutron detector was considered and found negligible.

The count rate $S(E)$ had to be interpolated because of the difference in flight paths pertaining to the neutron detector and the ^{238}U sample. For this interpolation, and in order to reduce errors associated with statistical fluctuations, the count rate was "fitted" by a smooth function, shown as the smooth line in Fig. 8. Below 5 keV the fit has the form:

$$S(E) = KE^\alpha e^{-\beta/\sqrt{E}} \quad (2)$$

where K is a constant, $\alpha = 0.16$ represents the "hardening" of the neutron flux due to the finite size of the neutron moderator (it corresponds to a flux $\phi(E)dE = E^{-0.84}dE$), and β is the macroscopic cross section of the ^{10}B overlap filter at 1 eV.

E. Normalization

The probability $P(E)$ of neutron capture in the ^{238}U sample is proportional to the net capture rate in the ^{238}U sample obtained with the capture gamma-ray detector, divided by the intensity of the incident neutron beam, obtained with the neutron detector. Since the absolute efficiencies of the capture gamma-ray detector and of the neutron detector are not accurately known, the

probability of capture $P(E)$ must be normalized at some energy where it can be computed. For this normalization the saturated-resonance technique¹⁸ was used. At the resonance energy 6.67 eV the 25-mil-thick ^{238}U sample is about 20 mean-free paths thick so that the transmission of this sample is effectively zero. Hence the probability of capture of a 6.67 eV neutron in the 25-mil ^{238}U sample is almost unity. (It is somewhat smaller because the neutron has a finite probability to be backscattered or to escape the sample by multiple scattering.) The multiple scattering and backscattering effects are a very small correction that can be computed by the Monte Carlo technique or by a transport calculation. Since the ratio of the neutron width to the capture width is small, for the 6.67 eV resonance, these corrections are quite insensitive to the uncertainties in the resonance parameters.

In Fig. 10 we compare the computed probability of capture for a 25-mil ^{238}U sample with the measurement, in the vicinity of the 6.67 eV resonance.

The quantity in the ordinate is $\frac{P(E)}{N} \sqrt{E}$ where $P(E)$ is the probability of neutron capture; N is the sample thickness in atoms/barn and E the incident neutron energy. The calculation was done by the Monte Carlo technique, using the ENDF/B-III parameters.^{25,6} It yielded for P a value of $.979 \pm .01$ at the resonance energy. The error on this value was obtained by assuming a 3% error in Γ_n and a 10% error in Γ_γ and repeating the calculation. The measurement was normalized to the value $P = .979$ at 6.67 eV. It is estimated that the total uncertainty associated with this normalization is 2%.

F. Self-Shielding and Multiple-Scattering Corrections

In order to derive the cross sections for the reaction $^{238}\text{U}(n,\gamma)^{239}\text{U}$ from the measured neutron capture probability in a sample of finite thickness

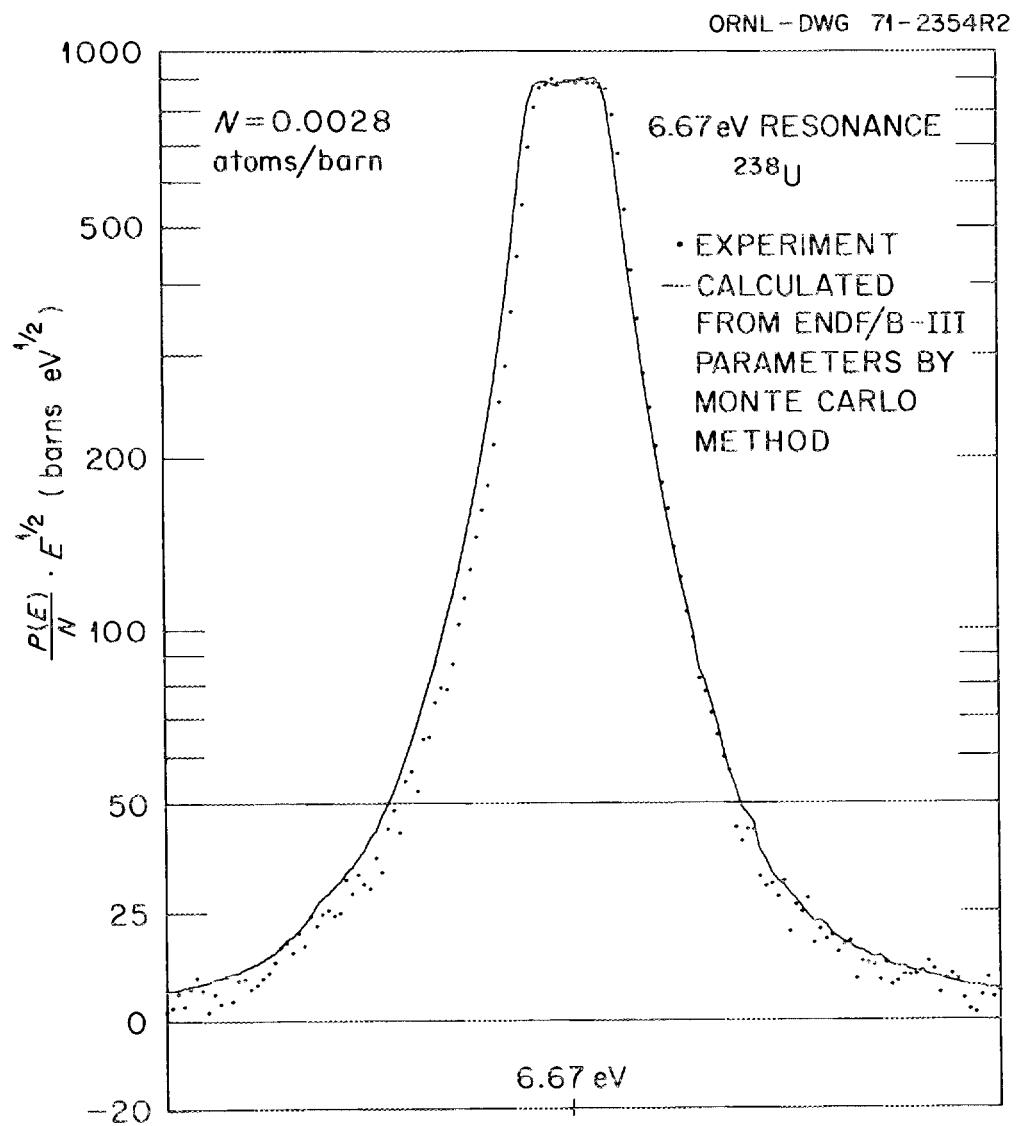


Fig. 10. Probability of capture in a 25-mil sample of ^{238}U at the 6.67 eV resonance. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -20 to +50 barn $\cdot\text{eV}^{1/2}$ and logarithmic above 50 barn $\cdot\text{eV}^{1/2}$.

it is necessary to correct the results of the measurement for the resonance self-shielding and multiple-scattering effects.

In the resolved resonance region (below 4 keV) the resonance parameters of ENDF/B-III were used to compute the capture probability in samples of 25 mil and 3 mil thickness. The result of the calculation was then compared directly with the measurement. The calculation was done by the Monte Carlo technique with the computer code MULTSCA developed for this purpose. Neutron histories were followed in the sample until a statistical accuracy of 0.1% was achieved.

Since the capture probability for a sample of finite thickness computed with the ENDF/B-III parameters agrees qualitatively with the measurements, the self-shielding and multiple-scattering correction can be computed using the ENDF/B-III resonance parameters. The average cross section is then given by the product of the measured average capture probability and the ratio of the average cross section to the average capture probability computed with the ENDF/B-III parameters. In the unresolved resonance region (above 4 keV) the resonance self-shielding and multiple-scattering corrections were computed with a statistical technique developed by L. Dresner²⁶ and coded by R. L. Macklin.²⁷ For this statistical calculation, the average resonance parameters listed in Table VIII were used. Table IX lists the

TABLE VIII. AVERAGE ^{238}U RESONANCE PARAMETERS USED IN COMPUTING
RESONANCE SELF-PROTECTION AND MULTIPLE SCATTERING
CORRECTIONS ABOVE 4 keV

$$\frac{\Gamma}{\gamma} = 24.8 \text{ mV},$$

$$\frac{\Gamma_n^o}{D} = \begin{array}{ll} 0.9 \times 10^{-4} & \text{for S-wave} \\ 2.5 \times 10^{-4} & \text{for P-Wave} \end{array}$$

TABLE IX. RESONANCE SELF-PROTECTION AND MULTIPLE-SCATTERING CORRECTION FACTORS FOR THE DECIMAL INTERVALS FROM .1 TO 100 keV*

$$\sigma(n, \gamma) = RSP * \frac{P(E)}{N} \text{ (see text)}$$

Energy Interval (keV)	.0028 atoms/barn RSP	.0004 atoms/barn RSP
.1-.2	2.886+.090	1.388+.080
.2-.3	1.698+.090	1.099+.050
.3-.4	1.581+.060	1.091+.040
.4-.5	1.081+.010	1.004+.005
.5-.6	1.360+.050	1.047+.008
.6-.7	1.257+.050	1.033+.002
.7-.8	1.021+.030	1.005+.006
.8-.9	1.159+.030	1.016+.006
.9-1	1.335+.040	1.050+.014
1-2	1.087+.035	1.005+.018
2-3	1.022+.020	1.000+.008
3-4	1.000+.010	1.000+.005
4-5	.992+.008	.998+.004
5-6	.984+.006	.997+.004
6-7	.979+.006	.997+.004
7-8	.976+.008	.996+.004
8-9	.973+.008	.996+.004
9-10	.971+.009	.995+.004
10-20	.966+.010	.995+.004
20-30	.962+.010	.995+.004
30-40	.962+.011	.994+.004
40-50	.962+.011	.994+.004
50-60	.961+.012	.994+.004
60-70	.961+.012	.994+.004
70-80	.961+.012	.994+.004
80-90	.961+.012	.994+.004
90-100	.960+.014	.994+.004

* Below 4 keV these correction factors were computed by the Monte Carlo technique using ENDF/B-III resonance parameters; above 4 keV the statistical method of L. W. Dresner was used.

multiple-scattering and self-shielding corrections for the 3-mil and 25-mil samples for the decimal intervals up to 100 keV.

G. Energy Calibration and Resolution

The neutron energy E can be obtained from the time-of-flight τ and the effective flight path L by the relation:

$$E = \mu^2 \frac{L^2}{(\tau - \tau_0)^2} \quad (3)$$

where $\mu = 72.3 \text{ eV}^{1/2} \mu\text{sec}/\text{m}$ and where τ_0 is the initial delay of the time-of-flight "clock" due to delays in the electronics chain. Rather than measure L and τ_0 , those two parameters were obtained by solving Eq. (3) for pairs of resonances whose time-of-flight could be measured accurately and whose energies were assumed known.

The principal factors affecting the resolution broadening were the Doppler broadening, the broadening associated with the moderation time and the finite thickness of the moderator, and the broadening due to the linac pulse width and time-of-flight channel widths. The resolution broadening may thus be approximated by a Gaussian convolution of width given by²⁸:

$$\Delta^*{}^2 = \frac{4kT}{A} E + \frac{2}{3} \frac{s^2 + \ell^2}{L^2} E^2 + \frac{2}{3} \frac{\tau_b^2 + \tau^2}{\mu^2 L^2} E^3 \quad (4)$$

where the first term, $\frac{4kT}{A} E$, represents the Doppler broadening. k is Boltzmann's constant, A the mass of the target nucleus, and T the "effective temperature"²⁹ of the sample, which in this case should be taken equal to the physical temperature of 300°K.³⁰ The second term represents the broadening effect of the moderator; L is the flight path length (3970.3 cm); ℓ is

the "equivalent length" corresponding to the slowing down time (2.5 cm)³¹; and S is the thickness of the moderator (2.5 cm). The third term represents the time resolution, μ is defined under Eq. (3), τ_b is the pulse width of the linac (it is listed for each set of measurements on Table V), and τ is the channel width which is given in Table VI as a function of energy.

H. Uncertainties in the Measurements

Two types of errors in the measurements must be considered: the statistical error which is uncorrelated from one time-of-flight channel to the next and the systematic error.

The statistical error can be approximated by the following parametrization:

$$\frac{\Delta P}{P} \approx \left[3 \cdot 10^5 \cdot \frac{t}{E^{3/2}} \cdot (\sigma E^{1/2} + 3) \right]^{-1/2} \quad (5)$$

where $\frac{\Delta P}{P}$ is the relative uncertainty in the capture probability for a 1 eV interval at energy E, in eV, for a sample thickness t in mils and σ is the capture cross section in barns at energy E. This relation based on the shapes of the foreground and background and of the neutron beam spectrum approximates the statistical uncertainty for each of the measurements listed in Table V.

The major systematic errors in the measurement are estimated to be 2% associated with the normalization and $3 \text{ b.eV}^{1/2}$ associated with the background subtraction. An additional uncertainty must be considered when the capture cross section is derived from the measured capture probability; this is the uncertainty in the resonance self-shielding and multiple-scattering corrections given in Table IX. However, the magnitude of the systematic errors is very difficult to estimate realistically, and the only decisive

test of precision of the data must come from a careful comparison with results obtained independently, and when possible, by other techniques.

IV. RESULTS AND COMPARISON WITH OTHER DATA

A tabulation of the results obtained from run R0031901, described in Table V, is given in the Appendix. For each time-of-flight channel, the tabulation lists the corresponding energy E , in eV, and the measured normalized capture probability $\frac{P(E)\sqrt{E}}{N}$, in barns \cdot eV $^{1/2}$, where N is the sample thickness in atoms/barn. A similar listing of the data from the other runs described in Table V may be obtained from the authors. The quantity $\frac{P(E)\sqrt{E}}{N}$ can be related to the cross sections by the expression:

$$\frac{P(E)\sqrt{E}}{N} = \sigma_{n\gamma} \sqrt{E} \left\{ \frac{1-e^{-N\sigma_t}}{N\sigma_t} \right\} \left\{ \frac{1}{1 - \frac{\sigma_{n\gamma}}{\sigma_t} P_c} \right\}$$

where $\sigma_{n\gamma}$ and σ_t are the capture and total cross sections, and P_c is the mean collision probability. For an infinitely thin sample ($N \rightarrow 0$) the expression reduces to $\sigma_{n\gamma} \sqrt{E}$.

In the resolved-resonance region, below 4 keV, the resonance parameters of ENDF/B-III were used to compute the capture probability in the two samples used. The result of this computation is compared with the data in Figs. 11 to 16. The figures show the capture probability $\frac{P(E)\sqrt{E}}{N}$, defined previously, as a function of energy. The solid line represents the results of the calculation; the points represent the data from the first and last measurements listed in Table IV. Figures 11 to 16 allow a visual qualitative comparison between the resonance capture as computed from the parameters of ENDF/B-III and as measured in this experiment. It is apparent that most of the levels clearly observed in the measurements are listed in ENDF/B-III, whereas some

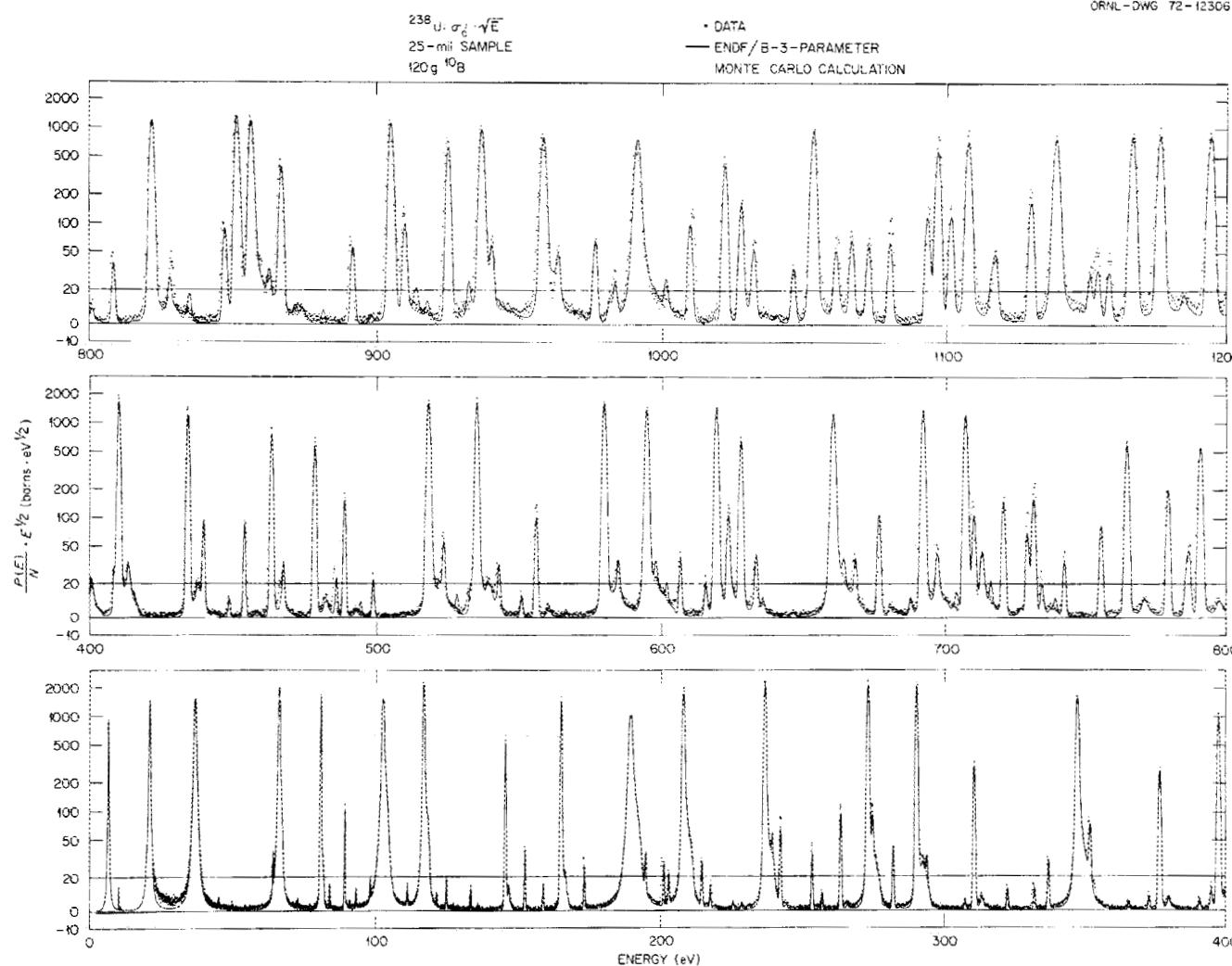
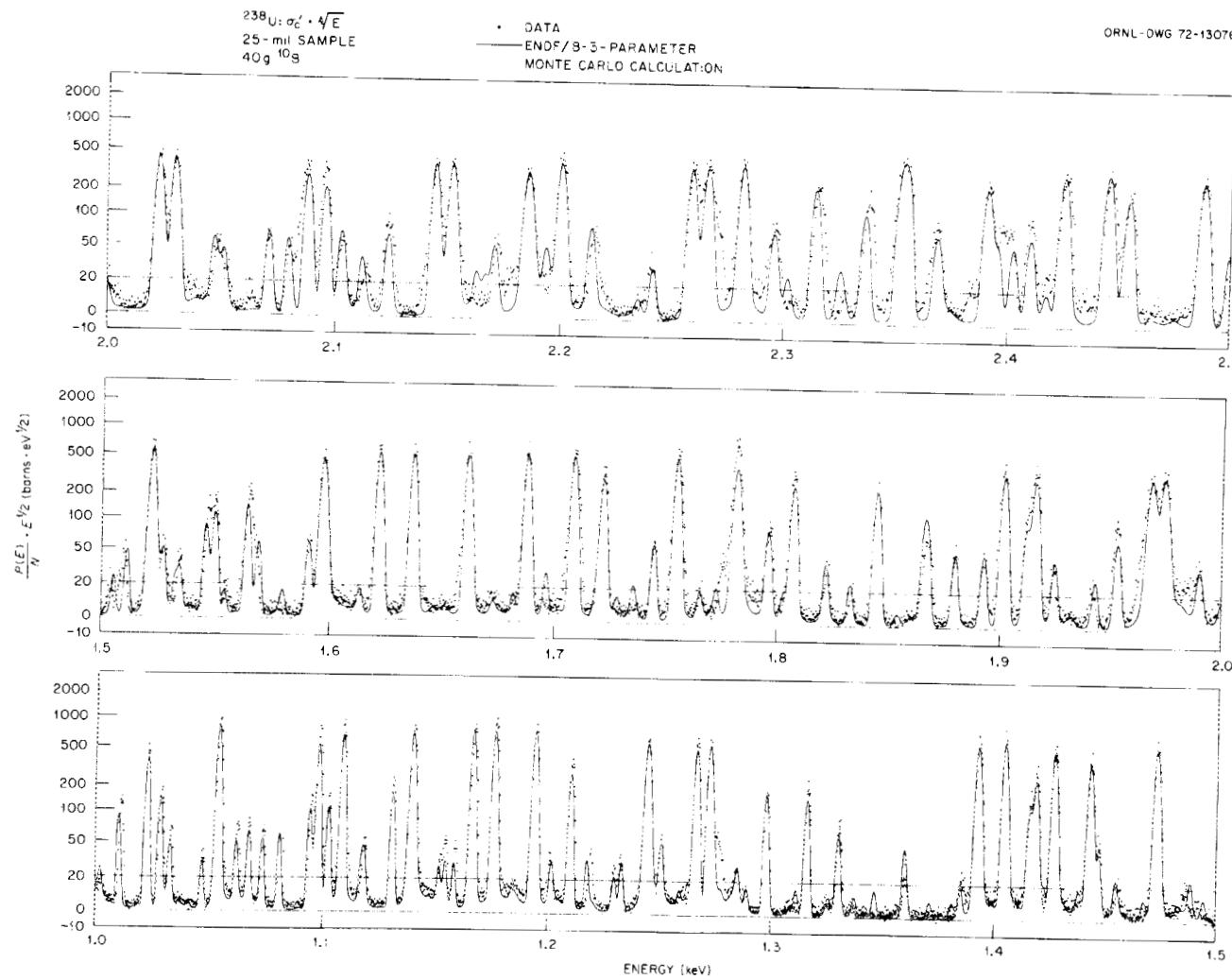


Fig. 11. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0028 atoms/barn and for incident neutron energies up to 1.2 keV. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -10 to +20 barn \cdot eV $^{1/2}$ and logarithmic above 20 barn \cdot eV $^{1/2}$.



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Fig. 12. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0028 atoms/barn and for incident neutron energies from 1 to 2.5 keV. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -10 to +20 barn.eV $^{1/2}$ and logarithmic above 20 barn.eV $^{1/2}$.

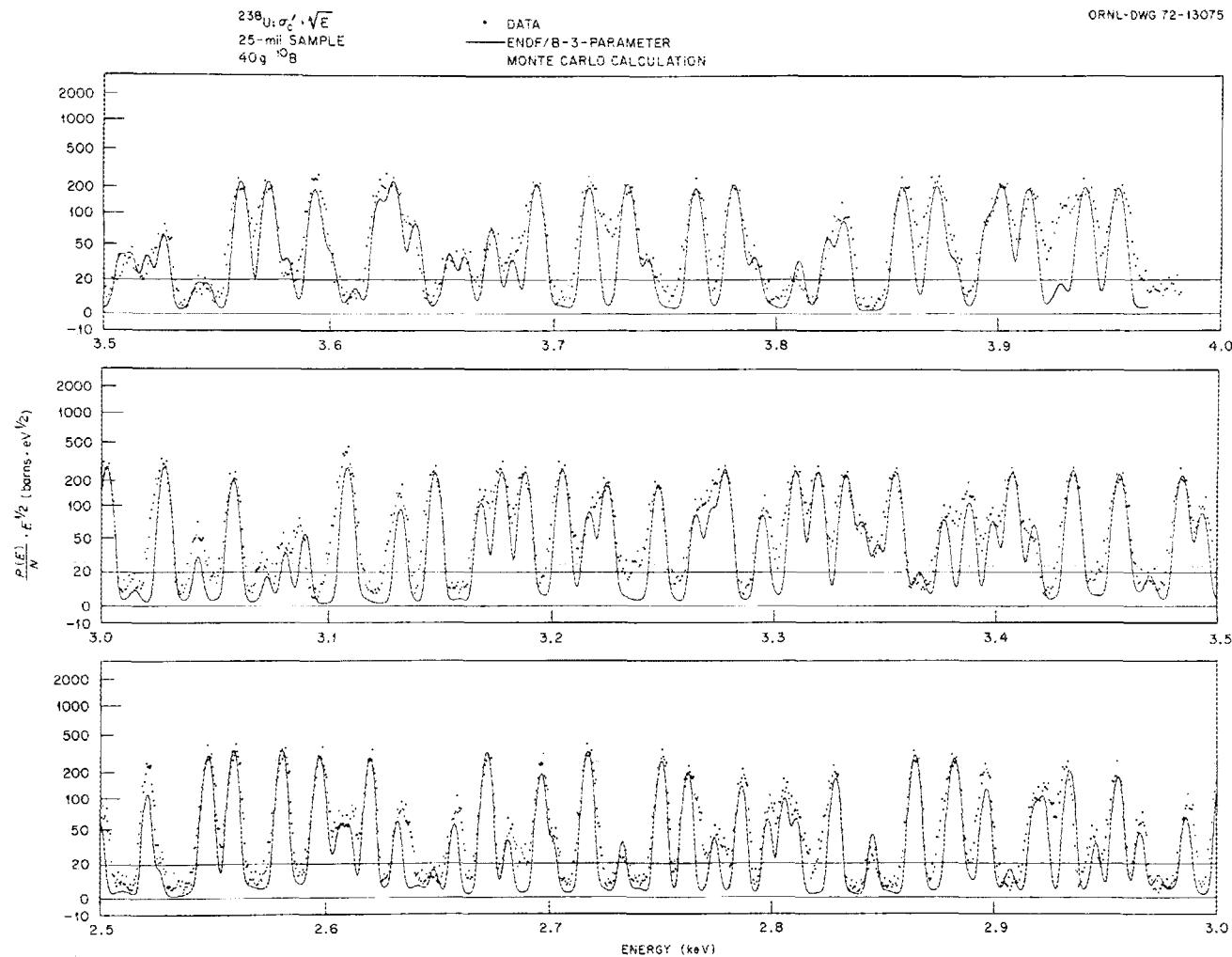


Fig. 13. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0028 atoms/barn and for incident neutron energies from 2.5 to 4 keV. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -10 to +20 barn·eV^{1/2} and logarithmic above 20 barn·eV^{1/2}.

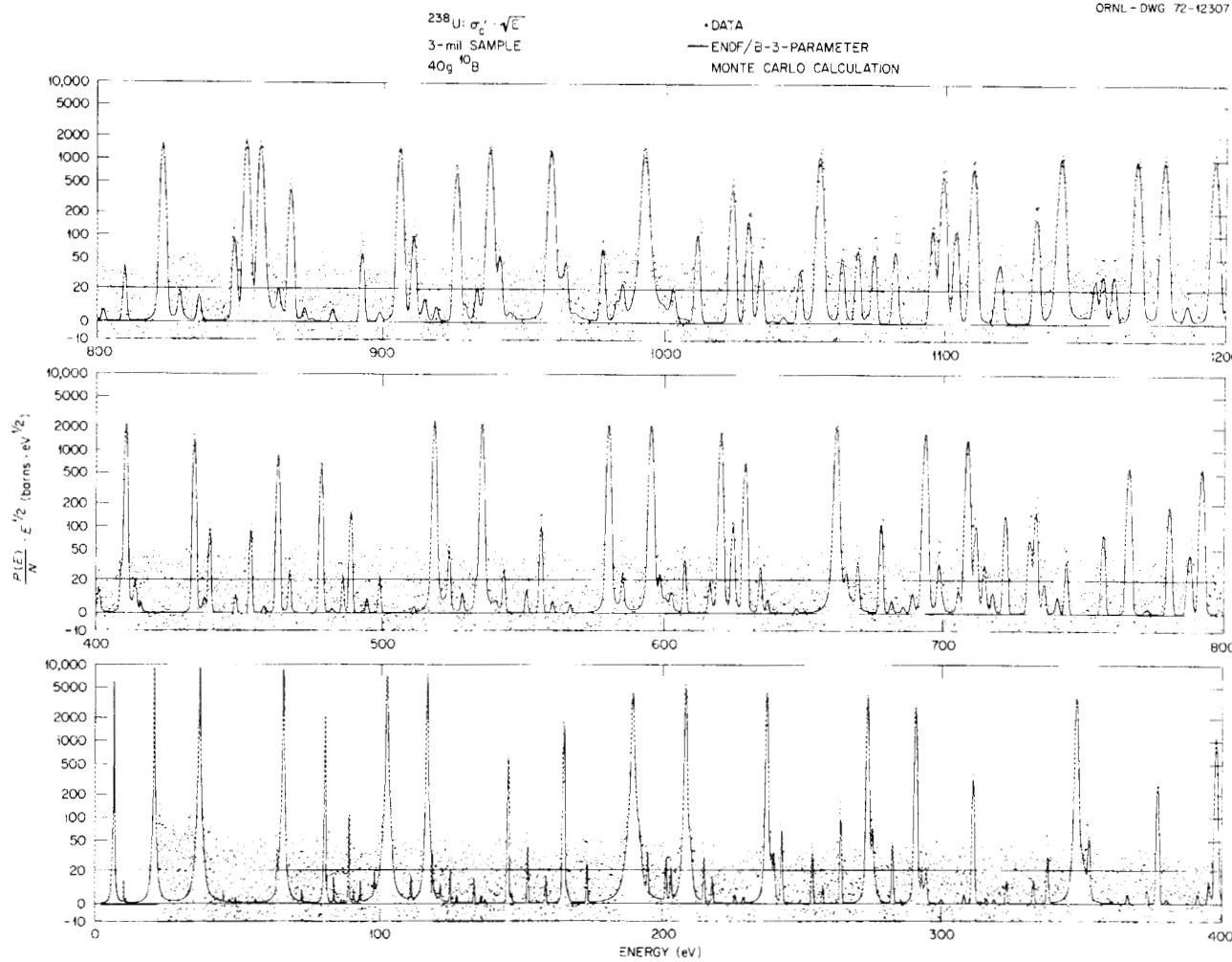


Fig. 14. Comparison of the measured and computed capture probability for a ^{238}U sample of .0004 atoms/barn and for incident neutron energies up to 1.2 keV. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -10 to +20 barn·eV $^{1/2}$ and logarithmic above 20 barn·eV $^{1/2}$.

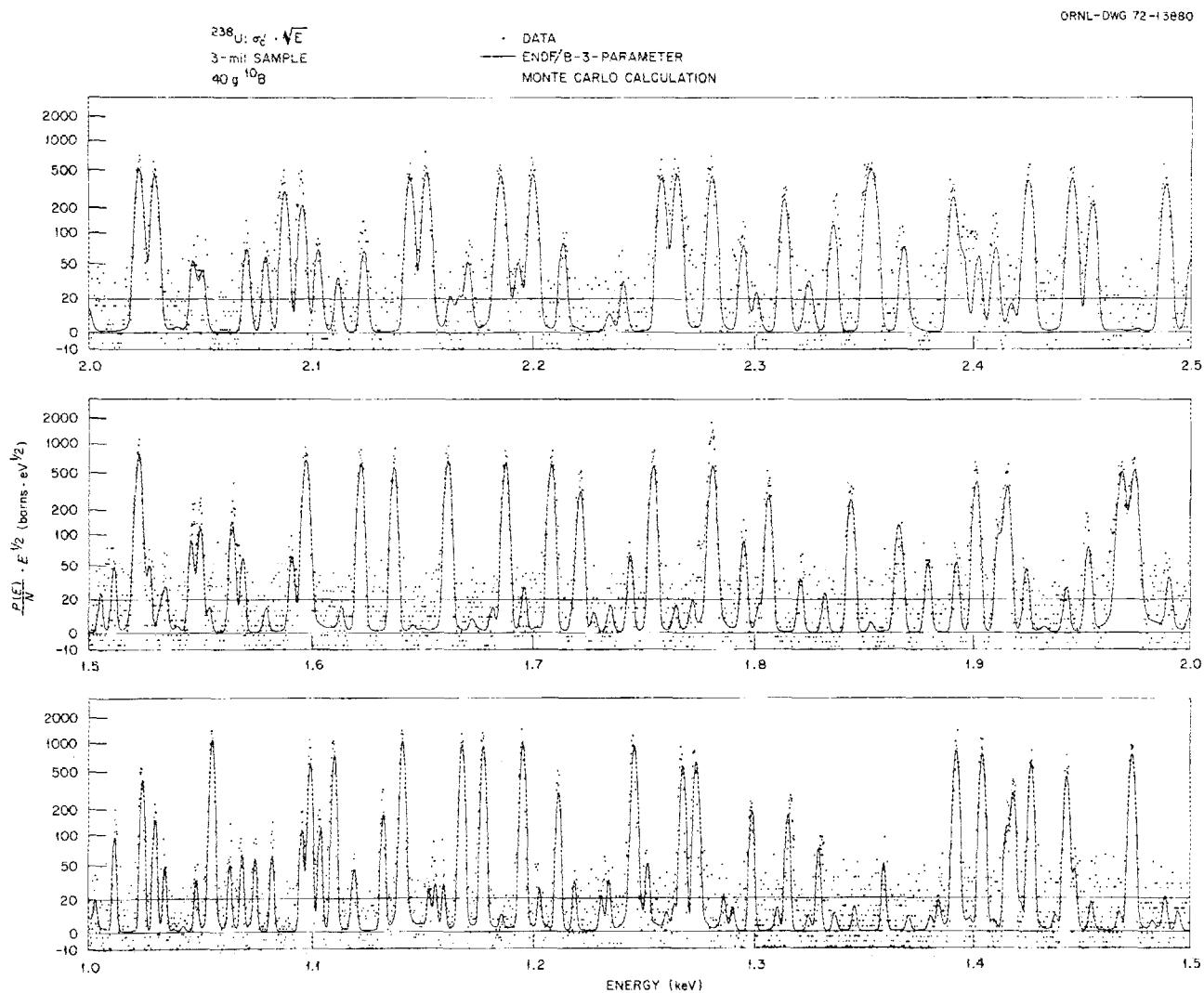


Fig. 15. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0004 atoms/barn and for incident neutron energies from 1 to 2.5 keV. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -10 to +20 barn \cdot eV $^{1/2}$ and logarithmic above 20 barn \cdot eV $^{1/2}$.

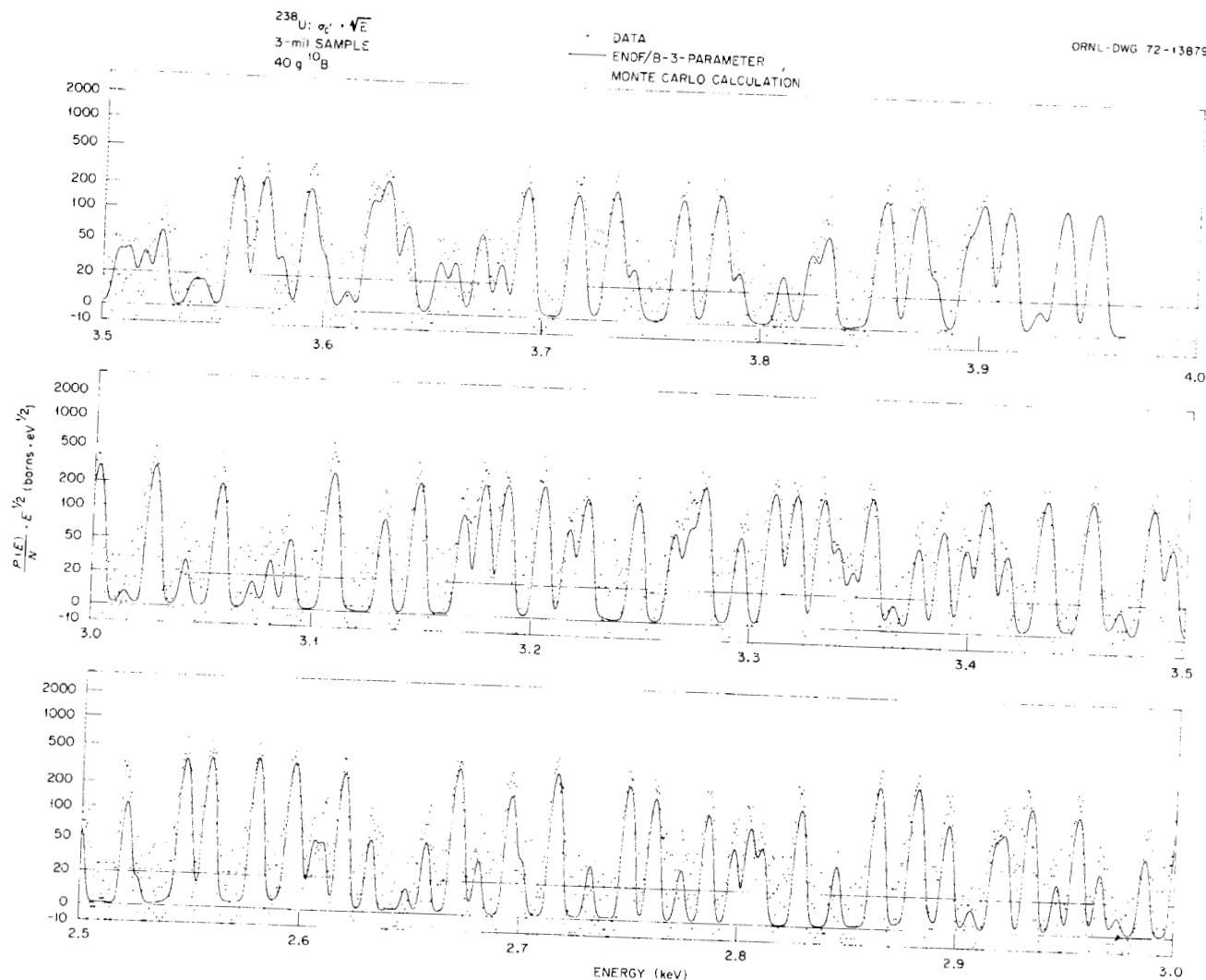


Fig. 16. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0004 atoms/barn and for incident neutron energies from 2.5 to 4 keV. The ordinate is the probability of capture multiplied by the square root of the energy and divided by the sample thickness in atoms/barn. The calculation was done with the Monte Carlo code MULTSCA using the resonance parameters of ENDF/B-III. Note that the ordinate is linear from -10 to +20 barn $\cdot\text{ev}^{1/2}$ and logarithmic above 20 barn $\cdot\text{ev}^{1/2}$.

levels listed in ENDF/B-III are not observed experimentally, for example, those at 494.6 eV, 528.2 eV, 598.2 eV and 602.2 eV. It is also apparent that there is good agreement between the computed and measured capture area for the large S-wave levels which are strongly self-shielded, whereas there are very systematic discrepancies for the smaller levels for which the measured capture area is always larger than the computed area.

One of the intervals over which the discrepancy between the measured capture area and the capture area computed with ENDF/B-III parameters is worst is in the interval from 500 eV to 600 eV. A more detailed investigation of the nature of the discrepancy was done over this interval. The data from the 3-mil and 25-mil sample measurements were "least squares fitted" simultaneously to obtain best values for the resonance parameters. For this fitting a program developed by M. Green et al.³² was used which computed multiple scattering effects by the transport code ANISN.³³ The result of the least squares fit to the data is compared in Table X with the parameters of ENDF/B-III and with the resonance parameters published by Rahn et al.³⁴ and Carraro et al.³⁵ In Figs. 17-19 the capture probabilities computed with the parameters derived from the fit to the data, as well as with the parameters of ENDF/B-III and of Rahn et al., are compared with the data from the measurement with the 25-mil sample. Inspection of Table X and of Figs. 17-19 indicate that some levels clearly shown in the data are not observed by Rahn et al. (as the levels at 532 eV and 551 eV). Two levels observed by Rahn et al., and listed in ENDF/B-III, at 527 eV and 592 eV are not seen or resolved in the present measurements. Finally, the neutron and radiation widths obtained from fitting the data are consistent with those

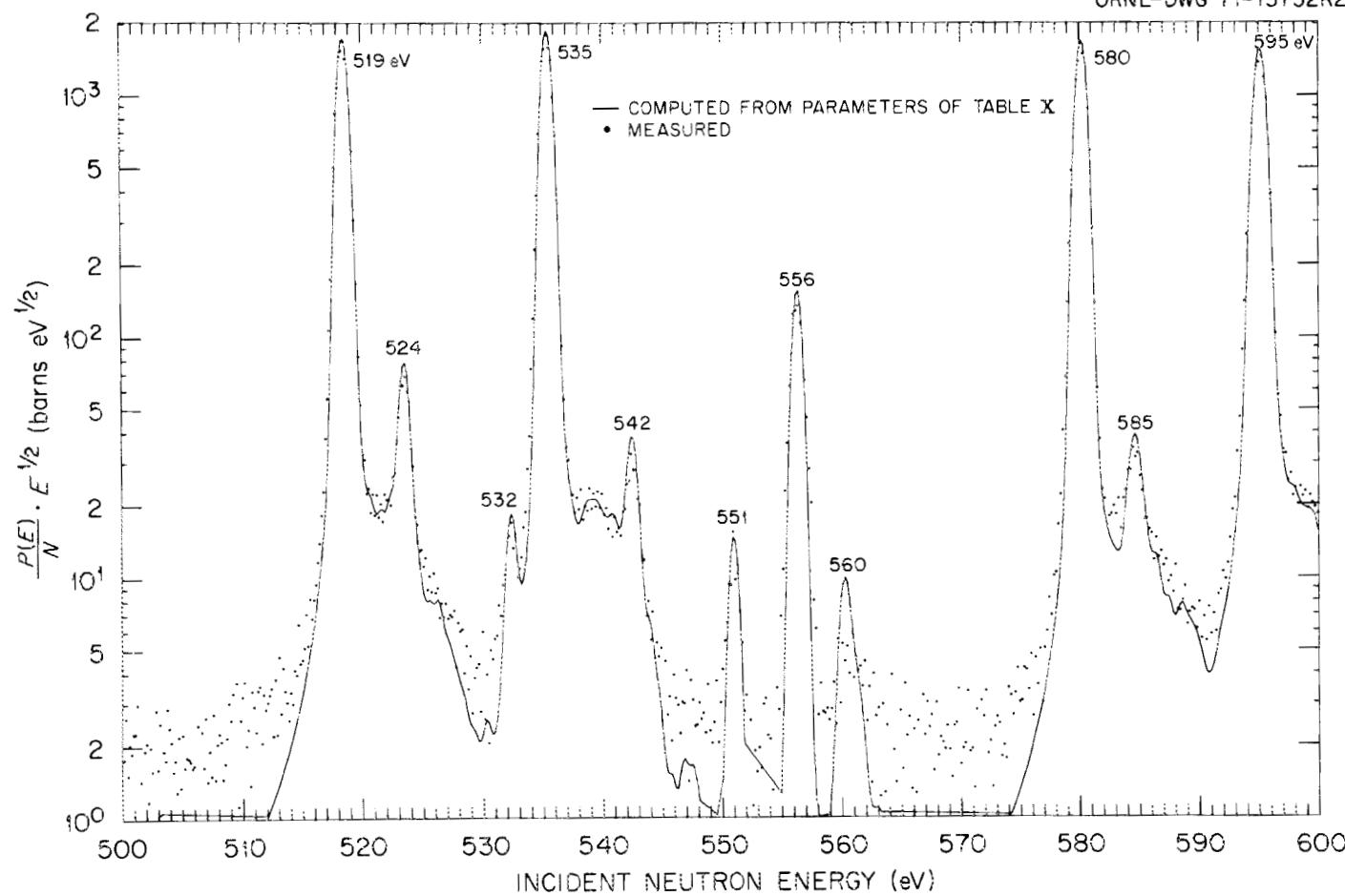
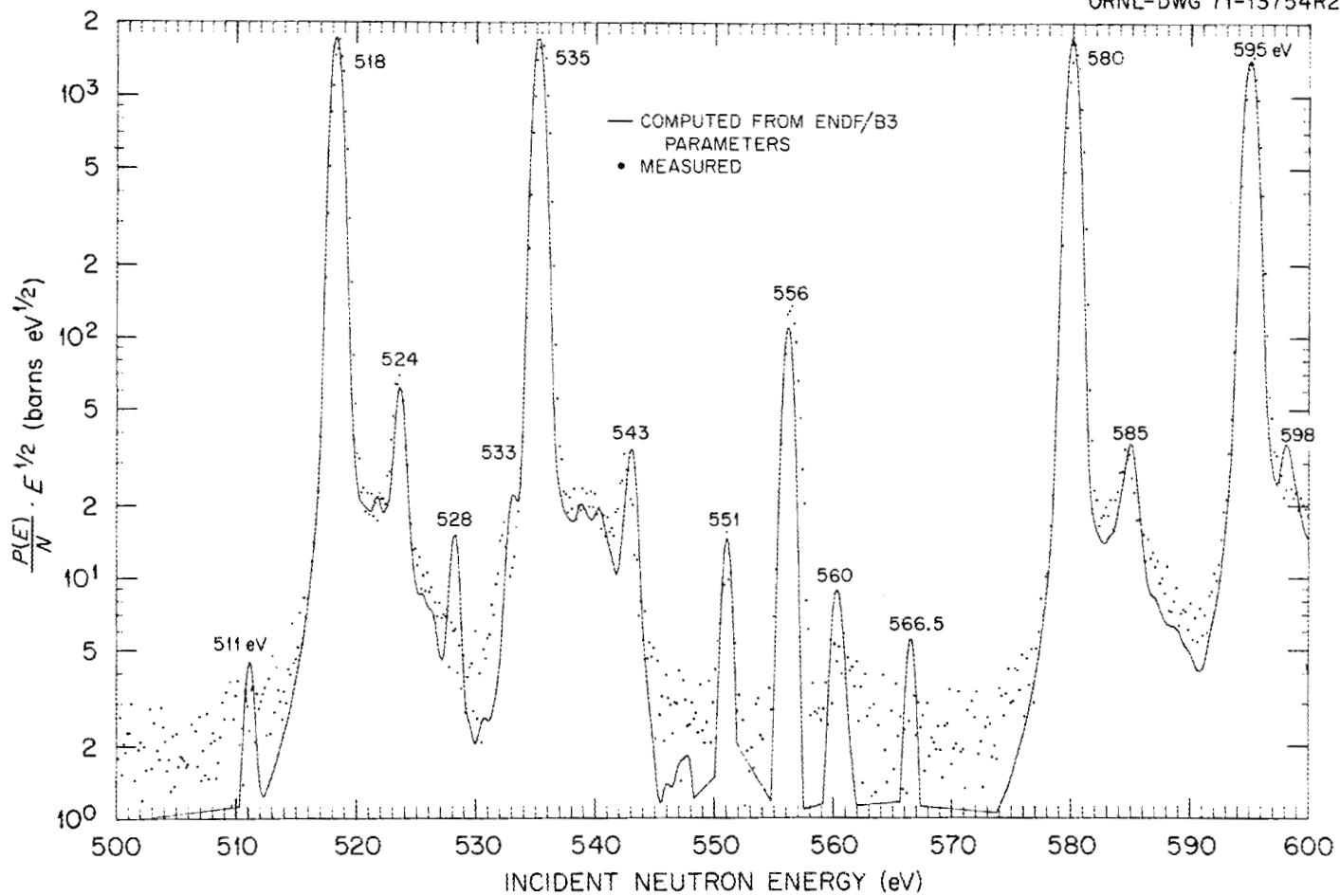


Fig. 17. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0028 atoms/barn and for incident neutron energies from 500 to 600 eV. The calculation was done with the ORELA resonance parameters of Table X. These parameters were obtained by a least-square-fit of the data shown in this figure and corresponding data obtained with a .0004 atoms/barn sample.

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Fig. 18. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0028 atoms/barn and for incident neutron energies from 500 to 600 eV. The calculation was done with the ENDF/B-III resonance parameters. Note that the levels at 528 eV, 566.5 eV and 598 eV are not observed in the data.

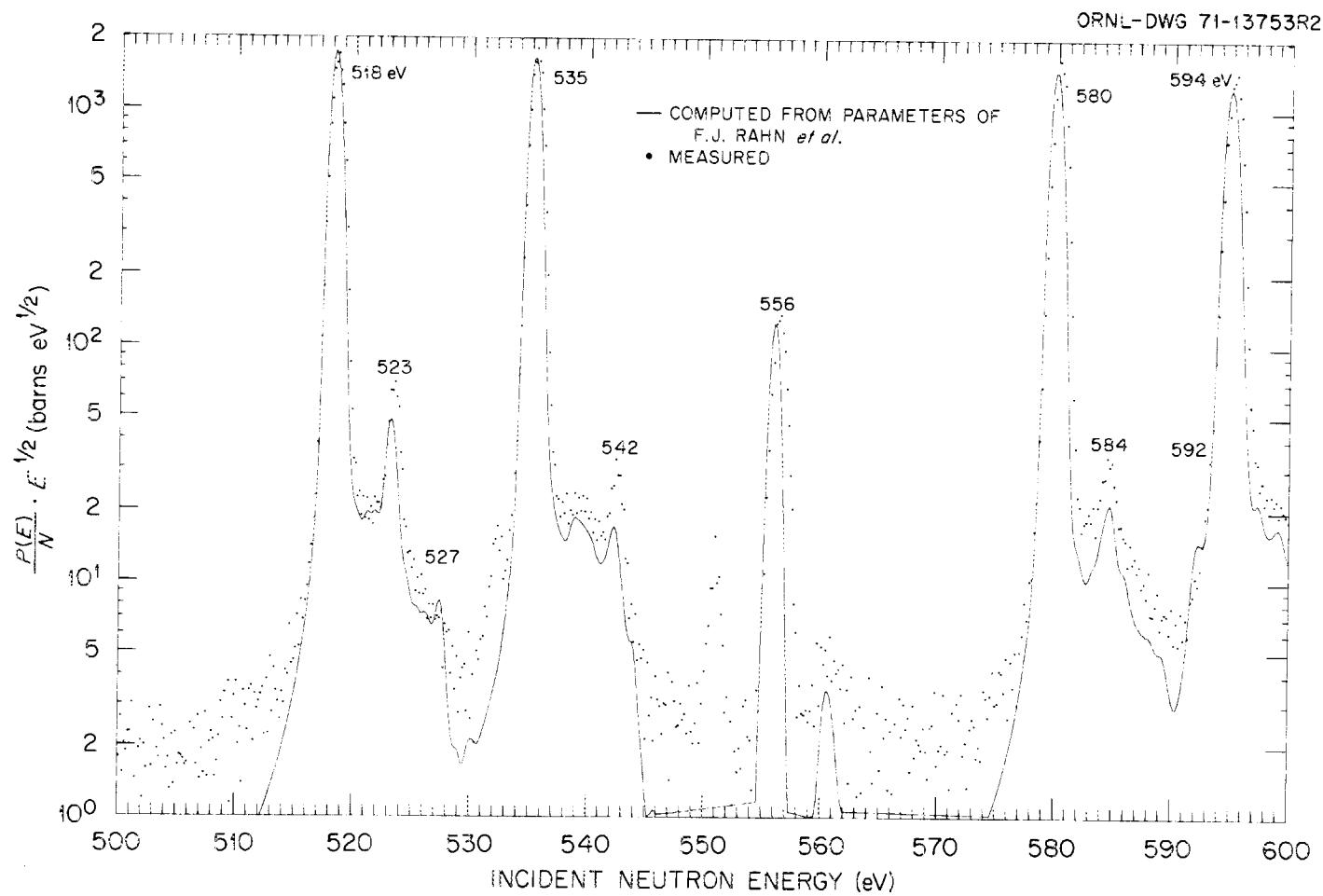


Fig. 19. Comparison of the measured and computed capture probabilities for a ^{238}U sample of .0028 atoms/barn and for incident neutron energies from 500 to 600 eV. The calculation was done with the resonance parameters of Rahn et al. Note that the level at 551 eV is not observed by Rahn et al.

TABLE X. COMPARISON OF RESONANCE PARAMETERS FOR ^{238}U FOR THE ENERGY INTERVAL 500 TO 600 eV

Energy (eV)	ORELA*		ENDF/B-III		Rahn et al.		Carraro et al.	
	Γ_n (mV)	Γ_γ (mV)	Γ_n	Γ_γ	Γ_n	Γ_γ	Γ_n	Γ_γ
511	not seen		.02	23.5				
518.5	55.5	24.4± 2	55.5	24.4	49 ± 5	24±2	55 ± 4	24.4±1.2
523.5	.36 ± .1	23.5	.27	23.5	.20± .07			
528	not seen		.07	23.5	.03± .03			
532.3	.082±.04	23.5	.08253	23.5				
535.4	45.2	27.3±3	45.2	24.7	45 ± 5	23±2	45.2±2	24.7±1.2
542.5	.177±.08	23.5	.1697	23.5	.05± .03			
551.0	.087±.005	23.5	.08674	23.5				
556.3	1.0 ± .3	23.5	.7	23.5	.6 ± .25		.7± .2	
560	.045	23.5	.045	23.5				
566.5			.033	23.5				
580.2	44.1	25.2±2	44.1	26.1	41 ± 4	21±2	44.1±2.7	26.1±1.5
584.7	.154±.05	23.5	.1423	23.5	.05± .04			
592					.05± .04			
595.2	84.4	25.3±2	84.4	23.5	85 ± 5	20±2	84.4±5	23.1±1
598			.11	23.5				

*The ORELA parameters which have no error estimate were assumed.

reported by Carraro *et al.*, but systematically larger than the widths given by Rahn *et al.*

For a quantitative determination of the discrepancies between various sets of data and evaluations, it is useful to compare averages of the capture probability and of the capture cross section over selected intervals.

In Table XI the capture probabilities are given for the five measurements listed in Table V, as well as average capture probabilities for the 3-mil and 25-mil samples that are averages over the various measurements with the two sample thicknesses. In Table XII the average values obtained from Table XI are compared below 4 keV with values computed using the resonance parameters of ENDF/B-III.

The capture cross section was obtained by multiplying the measured capture probability by the multiple scattering and self-shielding corrections listed in Table IX. The values of the capture cross section obtained from the two sample thicknesses are listed separately in Table XIII with the average of the two series of results. The good agreement between the results obtained for the two sample thicknesses is an indication that the sample thickness correction is of the right magnitude.

There are two other recent high resolution time-of-flight measurements of the capture cross section of ^{238}U : the measurements by M. Moxon at Harwell^{11,36} and S. Friesenhahn *et al.*, at Gulf General Atomic.¹⁰ The results from these two measurements are compared with the data of the present experiment in Table XIV and in Fig. 20. The table shows large systematic discrepancies between the three sets of data both in the magnitude of the cross section and in its shape with respect to energy. The present data are

TABLE XI. MEASURED CAPTURE PROBABILITIES IN ^{238}U FOR TWO SAMPLE THICKNESSES

Energy Interval (keV)	.0004 atoms/barn			.0028 atoms/barn			Average
	R0033002	R0101401	Average Capture Probability, Barns	R0031901	R0110101	R0110601	
.1-.2	13.52	13.36	13.44+.60	6.55	6.46	6.53	6.51+.50
.2-.3	8.88	8.77	8.82+.40	5.82	5.78	5.81	5.80+.30
.3-.4	3.12	3.20	3.16+.20	2.13	2.09	2.15	2.12+.18
.4-.5	3.11	3.21	3.16+.18	2.82	2.84	2.87	2.84+.16
.5-.6	5.15	5.05	5.10+.20	4.04	3.98	3.98	4.00+.18
.6-.7	3.87	3.91	3.89+.16	3.20	3.19	3.21	3.20+.14
.7-.8	2.07	2.15	2.11+.15	2.03	2.05	2.05	2.04+.13
.8-.9	3.24	3.26	3.25+.15	2.81	2.84	2.83	2.83+.13
.9-1	4.34	4.30	4.32+.20	3.41	3.42	3.41	3.41+.15
1-2	2.09	2.17	2.13+.10	1.92	1.93	1.93	1.93+.09
2-3	1.59	1.56	1.57+.09	1.53	1.53	1.53	1.53+.08
3-4	1.29	1.31	1.30+.09	1.33	1.32	1.31	1.32+.08
4-5	.999	1.01	1.00+.08	1.05	1.05	1.05	1.05+.07
5-6	1.05	.994	1.02+.07	1.06	1.05	1.05	1.05+.06
6-7	1.03	.977	1.00+.07	1.02	1.04	1.02	1.03+.06
7-8	.864	.855	.860+.05	.893	.893	.881	.889+.05
8-9	.777	.769	.773+.04	.799	.802	.790	.797+.04
9-10	.766	.745	.755+.04	.803	.805	.795	.799+.04
10-20	.691	.686	.688+.03	.724	.725	.696	.715+.03
20-30	.564	.547	.556+.03	.585	.588	.544	.572+.03
30-40	.489	.496	.493+.03	.520	.522	.473	.505+.03
40-50	.422	.429	.426+.03	.450	.448	.408	.435+.02
50-60	.341	.352	.346+.02	.367	.362	.327	.352+.02
60-70	.296	.302	.299+.02	.319	.313	.285	.306+.02
70-80	.254	.263	.259+.02	.278	.274	.252	.268+.02
80-90	.229	.241	.235+.02	.253	.245	.229	.242+.02
90-100	.201	.219	.210+.02	.224	.222	.203	.216+.02

The quantity tabulated is $[P(E)]/N$ where $[P(E)]$ is the average capture probability in the sample and N is the sample thickness in atoms/barn.

TABLE XII. COMPARISON OF MEASURED CAPTURE PROBABILITIES WITH CAPTURE PROBABILITIES COMPUTED WITH ENDF/B-III RESONANCE PARAMETERS IN THE RANGE FROM .1 TO 4 keV

Energy Interval (keV)	Capture Probabilities (barn)			Capture Probabilities (barn)		
	N=.0004 at/barn sample			N=.0028 at/barn sample		
	Experiment	ENDF/B-III	Ratio	Experiment	ENDF/B-III	Ratio
.1-.2	13.44 \pm .60	12.77	1.05	6.51 \pm .50	6.14	1.06
.2-.3	8.82 \pm .40	7.97	1.11	5.80 \pm .30	5.16	1.12
.3-.4	3.16 \pm .20	2.87	1.10	2.12 \pm .18	1.98	1.07
.4-.5	3.16 \pm .18	2.65	1.19	2.84 \pm .16	2.46	1.15
.5-.6	5.10 \pm .20	4.87	1.05	4.00 \pm .18	3.75	1.07
.6-.7	3.89 \pm .16	3.60	1.08	3.20 \pm .14	2.96	1.08
.7-.8	2.11 \pm .15	1.96	1.08	2.04 \pm .13	1.92	1.06
.8-.9	3.25 \pm .15	3.15	1.03	2.83 \pm .13	2.76	1.03
.9-1	4.32 \pm .20	4.17	1.04	3.41 \pm .15	3.28	1.04
1-2	2.13 \pm .10	1.86	1.15	1.93 \pm .09	1.72	1.12
2-3	1.57 \pm .09	1.41	1.11	1.53 \pm .08	1.37	1.12
3-4	1.30 \pm .09	1.25	1.04	1.32 \pm .08	1.25	1.06

TABLE XIII. MEASURED ^{238}U CAPTURE CROSS SECTIONS AVERAGED OVER DECIMAL INTERVALS

Energy Interval (keV)	.0004 atoms/barn sample				.0028 atoms/barn sample				Average Between the two Sample Thickness (barn)	
	Resonance Self-Shielding and Multiple Scattering Correction				Resonance Self-Shielding and Multiple Scattering Correction					
	Capture Probability (barn)	Capture Cross Section (barn)	Capture Probability (barn)	Capture Cross Section (barn)	Capture Probability (barn)	Capture Cross Section (barn)				
.1-.2	13.44	1.388	18.65	6.51	2.886	18.79	18.72 \pm .44			
.2-.3	8.82	1.099	9.69	5.80	1.698	9.85	9.77 \pm .30			
.3-.4	3.16	1.091	3.45	2.12	1.581	3.35	3.40 \pm .17			
.4-.5	3.16	1.004	3.17	2.84	1.081	3.07	3.12 \pm .15			
.5-.6	5.10	1.047	5.34	4.00	1.360	5.44	5.39 \pm .17			
.6-.7	3.89	1.033	4.02	3.20	1.257	4.02	4.02 \pm .14			
.7-.8	2.11	1.005	2.12	2.04	1.021	2.08	2.10 \pm .12			
.8-.9	3.25	1.016	3.30	2.83	1.159	3.28	3.29 \pm .12			
.9-1	4.32	1.050	4.54	3.41	1.335	4.55	4.54 \pm .14			
1-2	2.13	1.005	2.14	1.93	1.087	2.10	2.12 \pm .09			
2-3	1.57	1.000	1.57	1.53	1.022	1.56	1.56 \pm .08			
3-4	1.30	1.000	1.30	1.32	1.000	1.32	1.31 \pm .07			
4-5	1.00	.998	.998	1.05	.992	1.04	1.02 \pm .06			
5-6	1.02	.997	1.02	1.05	.984	1.03	1.02 \pm .05			
6-7	1.00	.997	.997	1.03	.979	1.01	1.00 \pm .05			
7-8	.860	.996	.857	.889	.976	.868	.862 \pm .04			
8-9	.773	.996	.770	.797	.973	.775	.772 \pm .04			
9-10	.755	.995	.751	.799	.971	.776	.764 \pm .04			
10-20	.668	.995	.685	.715	.966	.691	.688 \pm .03			
20-30	.556	.995	.553	.572	.962	.550	.551 \pm .03			
30-40	.493	.994	.490	.505	.962	.486	.488 \pm .02			
40-50	.426	.994	.423	.435	.962	.419	.421 \pm .02			
50-60	.346	.994	.344	.352	.961	.338	.341 \pm .02			
60-70	.299	.994	.297	.306	.961	.294	.296 \pm .02			
70-80	.259	.994	.257	.268	.961	.257	.257 \pm .02			
80-90	.235	.994	.234	.242	.961	.233	.234 \pm .02			
90-100	.210	.994	.209	.216	.960	.207	.208 \pm .02			

TABLE XIV. COMPARISON OF EXPERIMENTAL ^{238}U CAPTURE CROSS SECTIONS
AVERAGED OVER DECIMAL INTERVALS FROM 500 eV TO 100 keV

Energy Interval (keV)	ORELA (barn)	Moxon (barn)		Friesenhahn et al. (c) (barn)	ORELA vs Moxon I	ORELA vs Moxon II	Ratios	
		I (a)	II (b)				vs Moxon I	vs Friesenhahn et al.
.5-.6	5.39±.17	4.97±.13	4.86		1.08	1.11		
.6-.7	4.02±.14	3.75±.11	3.63		1.07	1.11		
.7-.8	2.10±.12	2.105±.08	1.85		.998	1.14		
.8-.9	3.29±.12	3.37±.10	3.24		.976	1.02		
.9-1	4.54±.14	3.64±.11	3.93		1.25	1.16		
1-2	2.12±.09	1.97±.08	1.95	1.70±.20	1.08	1.09	1.25	
2-3	1.56±.08	1.48±.07	1.45	1.33±.13	1.05	1.08	1.17	
3-4	1.31±.07	1.23±.06	1.23	1.06±.08	1.07	1.07	1.24	
4-5	1.02±.06	.964±.06		.816±.06	1.06		1.25	
5-6	1.02±.05	.940±.05		.792±.05	1.09		1.29	
6-7	1.00±.05	.824±.05		.708±.04	1.21		1.41	
7-8	.862±.04	.793±.05		.684±.04	1.09		1.26	
8-9	.772±.04	.723±.04		.608±.03	1.07		1.27	
9-10	.764±.04	.722±.04		.667±.04	1.06		1.15	
10-20	.688±.03	.612±.03		.550±.03	1.12		1.25	
20-30	.551±.03	.462±.03		.476±.03	1.13		1.16	
30-40	.488±.02	.369±.02		.436±.02	1.32		1.12	
40-50	.421±.02	.349±.02		.374±.02	1.21		1.13	
50-60	.341±.02	.301±.02		.327±.02	1.13		1.04	
60-70	.296±.02	.256±.02		.298±.01	1.16		.99	
70-80	.257±.02	.215±.01		.250±.01	1.20		1.03	
80-90	.234±.02	.185±.02		.227±.01	1.26		1.03	
90-100	.208±.02	.183±.02		.212±.01	1.14		.98	

- (a) The values given in this column are those obtained by Moxon using the resonance self-protection corrections computed by the method of Dresner. These values were given to L. Stewart in a private communication dated September 1971.
- (b) The values given here were obtained by using the measurements of Moxon and resonance self-protection corrections computed by the Monte Carlo technique using the ENDF/B-III resonance parameters - the same technique that was used on the ORELA data, below 4 keV.
- (c) Friesenhahn et al. give a table of cross-section values at selected energies. The cross section was interpolated linearly between the points given to obtain the averages given in this column. An additional "correction", always smaller than 4%, was applied to refer the data to the same ^{10}B cross-section shape that was used for the ORELA and Moxon data.

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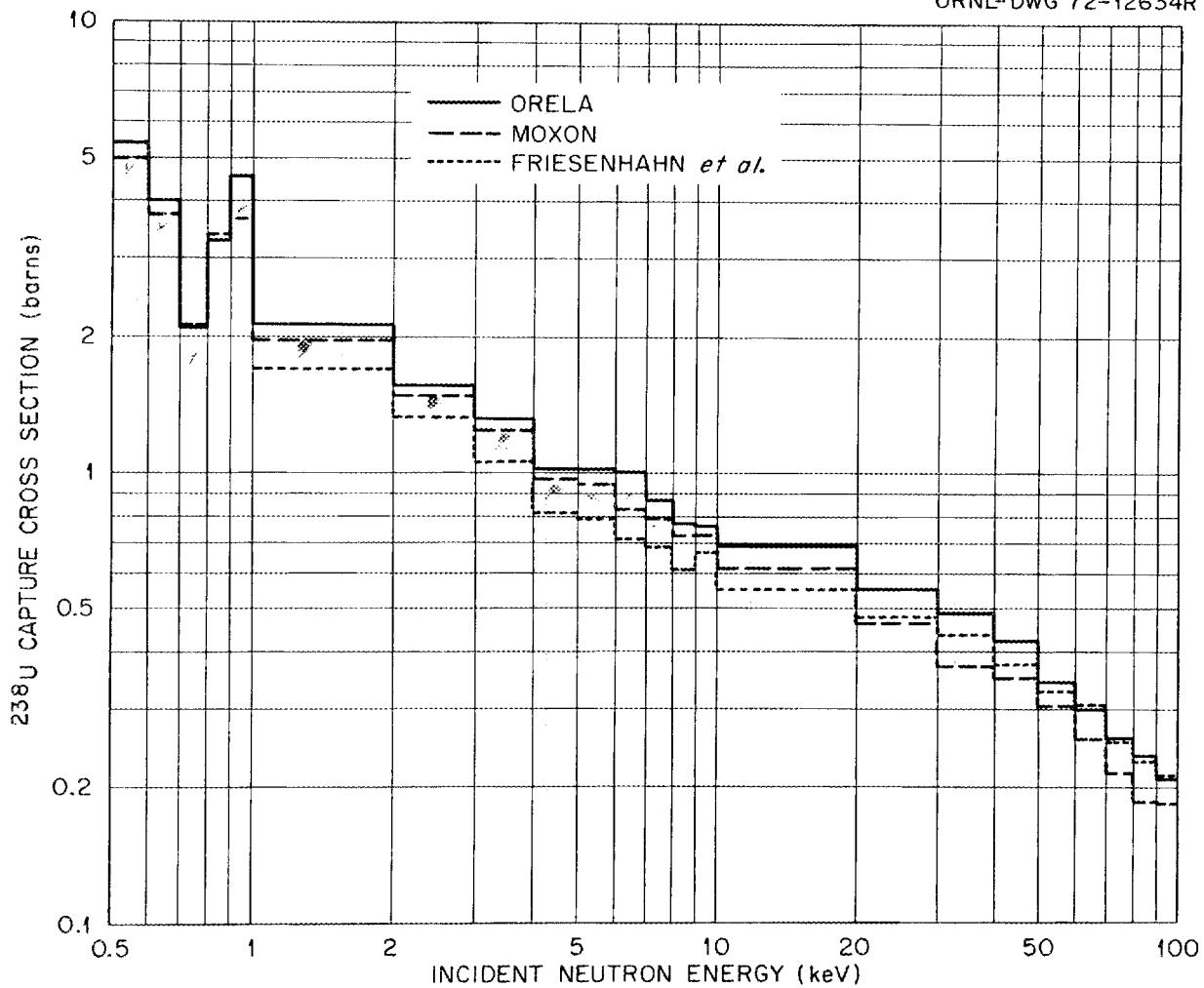


Fig. 20. Comparison of 3 sets of data on the capture cross section of ^{238}U . The 3 sets of data have been averaged over the decimal intervals and are relative to the same standard, the $^{10}\text{B}(\text{n}\alpha)$ cross section (see text). The errors on the three measurements are given in Table XIV.

systematically higher than both previous measurements; the discrepancy with the data of Moxon is about 8% below 10 keV and 20% above, whereas the present data are consistent with those of Friesenhahn *et al.* above 50 keV but higher by about 25% below 50 keV.

There are many older measurements of the capture cross section in ^{238}U below 100 keV. Many of these were done near 30 keV using the $^7\text{Li}(\text{p},\text{n})$ reaction near threshold or near 65 keV using the $\text{D}(\text{t},\text{n})$ reaction. These measurements have been reviewed and reevaluated by Davey.³ In Table XV and Fig. 21 the results of some of these earlier measurements are compared with the present results.

It is clear from Fig. 20 and Fig. 21 that there are still discrepancies of the order of 20% even among the most recent measurements of the ^{238}U capture cross section. These discrepancies are systematic and involve the shape of the cross-section curve as well as the magnitude. The cause of the discrepancies is not understood, as will be discussed below.

Various evaluations of the ^{238}U cross sections have recently been performed; these evaluations are based on the existing measurements and sometimes on other information such as the statistics of the resonance parameters or the results of "integral" measurements. In Table XVI we compare our results with the ENDF/B-III evaluation as well as with the UK evaluation by Sowerby *et al.*³⁷ and the USSR evaluation by Abagyan *et al.*⁵ It is perhaps surprising that the evaluation by Abagyan *et al.*, which did not consider the data presented here, agrees better with these data than do the other two evaluations which did consider these data.

TABLE XV. COMPARISON OF ^{238}U CAPTURE CROSS-SECTION MEASUREMENTS AT 30 keV

(The data in this table have been reevaluated, and sometimes extrapolated to 30 keV, following Davey and Konschin; these references should be consulted for details)

REFERENCE	VALUE (mb)
Macklin, Lazar and Lyon; Phys. Rev. <u>107</u> , 504 (1957)	556 ± 56
Hanna and Rose; J. Nucl. Energy <u>8</u> , 197 (1959)	376 ± 77
Bilpuch, Weston and Newson; Ann. Phys. <u>10</u> , 455 (1960)	461 ± 46
Gibbons, et al.; Phys. Rev. <u>122</u> , 182 (1961)	473 ± 47
de Saussure, et al.; ORNL-3360, 61 (1962)	470 ± 38
Macklin, Gibbons and Pasma; WASH-1046, 88 (1963)	507 ± 51
Bergquist; Arkiv för Fysik <u>23</u> , 425 (1963)	394 ± 85
Belonova, et al.; J. Nucl. Energy <u>20</u> , 411 (1966)	422 ± 34
Miessner and Aray; Nukleonik <u>8</u> , 428 (1966)	540 ± 60
Menlove and Poenitz; Nucl. Sci. and Eng. <u>33</u> , 24 (1968)	479 ± 14
Poenitz; Trans. ANS <u>12</u> , 279 (1968)	467 ± 18
Moxon; AERE R-6064 (1969)	418 ± 29
Friesenhahn, et al.; GA-10194 (1970)	463 ± 23
This work	528 ± 30

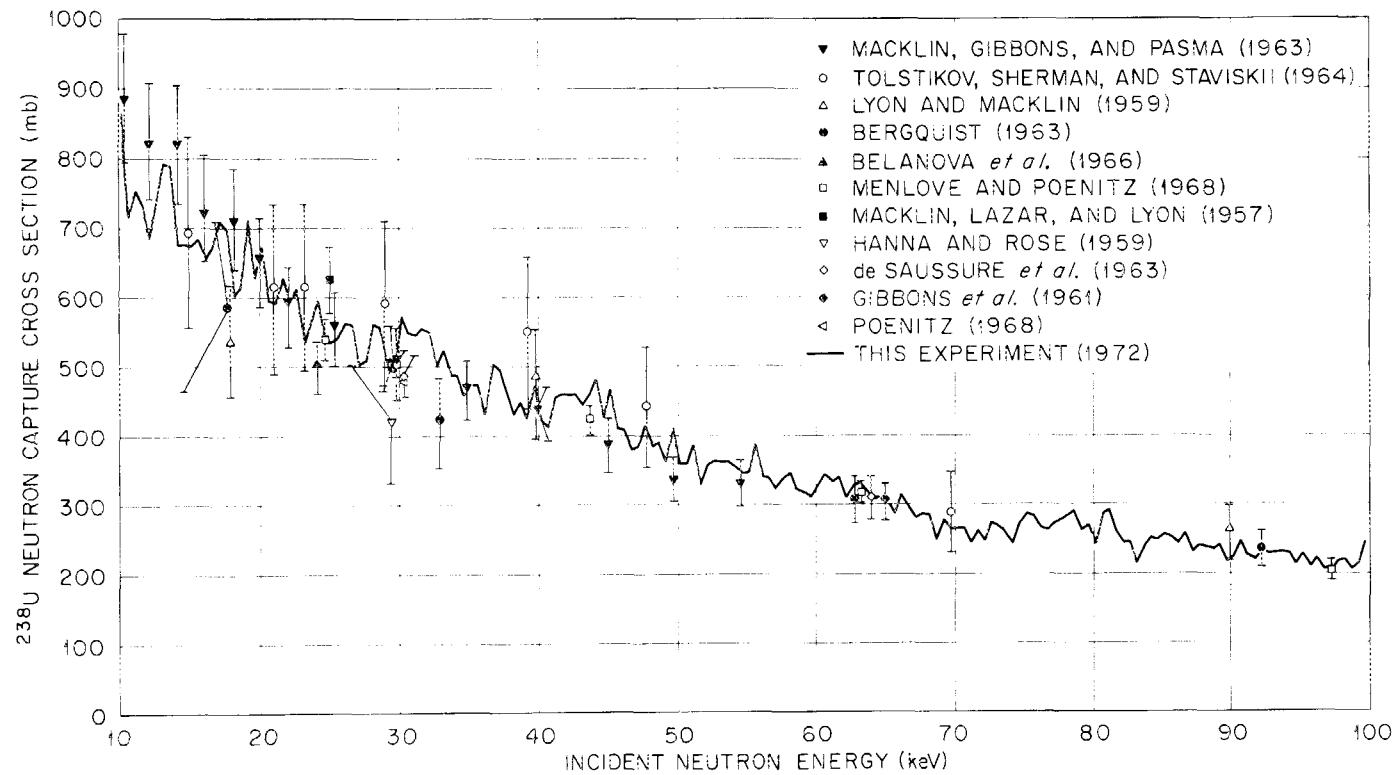


Fig. 21. Comparison of various measured values of the ^{238}U capture cross section in the energy range from 10 keV to 100 keV. The solid line was obtained by averaging the data from run R0031901 over 500 eV intervals and applying a sample thickness correction of 0.962. The other data were taken from Table XIX of Davey's evaluation.³

TABLE XVI. COMPARISON OF PRESENT MEASUREMENTS WITH THREE RECENT EVALUATIONS

Energy Interval (keV)	Data (barn)	ENDF/B-III (barn)	Ratio	Sowerby et al. (barn)	Ratio	Abagyan et al. (barn)	Ratio
.5-.6	5.39±.17	5.10	1.06				
.6-.7	4.02±.14	3.72	1.08				
.7-.8	2.10±.12	1.97	1.07				
.8-.9	3.29±.12	3.20	1.03				
.9-1	4.54±.14	4.38	1.04				
1-2	2.12±.09	1.87	1.13	2.02	1.05	2.10	1.01
2-3	1.56±.08	1.40	1.11	1.53	1.02	1.52	1.03
3-4	1.31±.07	1.24	1.06	1.28	1.02	1.28	1.02
4-5	1.02±.06	.992	1.03	1.00	1.02	1.15	.89
5-6	1.02±.05	.972	1.05	.979	1.04	1.04	.98
6-7	1.00±.05	.909	1.10	.880	1.14	.96	1.04
7-8	.862±.04	.828	1.04	.822	1.05	.90	.96
8-9	.772±.04	.758	1.02	.755	1.03	.86	.90
9-10	.764±.04	.743	1.03	.754	1.01	.82	.93
10-20	.688±.03	.645	1.07	.616	1.12	.68	1.01
20-30	.551±.03	.505	1.09	.491	1.12	.54	1.02
30-40	.488±.02	.431	1.13	.436	1.12	.46	1.06
40-50	.421±.02	.380	1.11	.374	1.13	.40	1.05
50-60	.341±.02	.326	1.05	.321	1.06	.35	.97
60-70	.296±.02	.280	1.06	.275	1.08	.304	.97
70-80	.257±.02	.237	1.08	.233	1.10	.259	.99
80-90	.234±.02	.212	1.10	.220	1.06	.228	1.03
90-100	.208±.02	.199	1.05	.208	1.00	.208	1.00

Note: The results of the present measurement were considered in the ENDF/B-III evaluation and in the evaluation of Sowerby et al. They were not considered in the evaluation of Abagyan et al. which was completed before our measurements were initiated.

V. CONCLUSIONS AND DISCUSSION

Although the accuracy requirement for the ^{238}U capture cross sections is of the order of 2%,^{1,5} it is clear from Tables XIV and XV that the uncertainties of this parameter are considerably larger. Some of the possible causes of errors in the measurements completed before 1969 have been discussed in detail in the excellent review of Davey,³ and this discussion need not be repeated here. It is more difficult to understand the reason for the discrepancies among the three recent time-of-flight measurements which are compared in Fig. 20 and Table XIV; these discrepancies are at least 15% and indicate that large, unrecognized systematic errors must be present in at least two of the three measurements. It may be instructive to compare briefly some of the features of these measurements.

The three measurements were each done with a pulsed source of neutrons produced by a linac and used the time-of-flight technique to cover a large energy range in one experiment. The capture gamma-ray detector used by Friesenhahn *et al.* was very similar, in principle, to the one used in the measurements presented here. The capture gamma-ray detector used by Moxon, a Moxon-Rae detector,²⁴ operates on a somewhat different principle; but both types of detectors have been used extensively in other capture cross-section measurements. Below 80 keV all three measurements were done relative to the $^{10}\text{B}(\text{n},\alpha)$ cross section, and the same evaluation was used for the shape of that cross section.^{22,38} The normalization of all three measurements was done by the same method, the saturated resonance technique, and the technique is particularly well suited for ^{238}U which has a large resonance at 6.67 eV with a large ratio of the capture width to the neutron width.

The multiple-scattering and resonance self-shielding corrections increase in magnitude with increasing sample thickness. The sample thicknesses used in the three measurements were as follows, in atoms per barn: Moxon - .0016, Friesenhahn et al. - .00555, and present experiment - .0028 and .0004. Above 4 keV the same technique was used by Moxon as was used here to estimate the sample thickness corrections. Below 4 keV different techniques were used in the two experiments, and the correction factors obtained were significantly different; however, as is shown in Table XIV, these differences do not help in explaining the discrepancies between our results and Moxon's.

Friesenhahn et al. have used a Monte Carlo technique with statistically selected resonance parameters to compute the multiple scattering and self-protection corrections. It appears possible, but unlikely, that a difference in the evaluation of this correction is one reason for the discrepancies between the data of Friesenhahn et al. and our own data. Yet the two sets of data agree well above 50 keV where these sample thickness corrections are negligible, and the discrepancies between the two sets of data increase as the energy decreases and the sample thickness corrections become more important, particularly for the relatively thick sample used by Friesenhahn et al.

Probably the most effective method of uncovering unknown systematic errors is to compare the data obtained by different experimenters in detail in the resolved resonance region. In this energy region several possible sources of systematic errors (such as a wrong energy scale, an error in background estimate, an impurity in the sample) can be identified by an examination of the resonance structure (see Figs. 11 to 19). Unfortunately

channel-by-channel data from the measurements of Moxon and Friesenhahn et al. are not available to the authors so that detailed comparisons between results of these measurements and results of the present experiment cannot be done.

However, a detailed comparison in the resolved resonance region between the data from the present experiment and the ENDF/B-III evaluation was done and is presented in Figs. 11 to 19. From Fig. 18, for instance, the following can be concluded:

1. there is agreement between the energy scales of ENDF/B-III and the present experiment,

2. the background in the present experiment cannot have been underestimated by more than $3 \text{ b.eV}^{1/2}$ (even this extreme value would produce an error of less than 2% in the integrated cross section over the interval 500 to 600 eV),

3. all levels observed in the measurements are listed in ENDF/B-III, and some levels listed in ENDF/B-III are not observed clearly in the data; hence the samples used in the measurements could not have impurities with an appreciable contribution in the resonance region,

4. the area of most of the small levels which are observed in the measurement is underpredicted by the evaluation, and

5. in the range from 500 to 600 eV most of the difference in area between the measurement and the evaluation is associated with the two levels at 535.4 eV and 595.2 eV; for these two levels the capture width obtained from the measurements is about 10% larger than that given in the evaluation.

The systematic differences between the present measurement and the ENDF/B-III evaluation, which have been described for the interval 500 eV

to 600 eV, are apparent throughout the resolved resonance range and are more pronounced at the high energy end of that range (near 4 keV). Of course, these systematic differences are a reflection of the differences among the measurements available to the evaluator; the procedure used to evaluate the resonance parameters has been described in detail by the evaluators,⁶ and one of the requirements is that these parameters yield the capture areas obtained in the measurements. For these reasons the detailed comparison between the measurement and the evaluation, presented in Figs. 11 to 19, can eliminate some possible sources of systematic error, but cannot resolve the discrepancies between different measurements.

The best method of uncovering possible systematic errors is probably to perform additional measurements with different techniques, or different experimental conditions. A new series of measurements is being undertaken by the authors of this paper on a flight path of 150 m. The time of flight corresponding to a given energy will then be increased by a factor of 3.75 with respect to what it was at 40 m. Any time-of-flight-dependent error will then be apparent from a detailed comparison of the data taken at the two different flight paths. Furthermore, a different type of neutron flux monitor will be used in the new measurements in addition to the $^{10}\text{BF}_3$, and additional measurements will be done of the fission cross section of ^{235}U . This will permit the direct determination of the ratio of the capture cross section of ^{238}U to the fission cross section of ^{235}U and to other standard cross sections and will reduce the possibility of systematic errors associated with the neutron monitor.

It is unlikely that these new measurements will yield the 2% precision required by the reactor designers, but it is hoped that they will contribute

to the identification of some of the unknown systematic errors which cause the large discrepancies observed in the existing measurements.

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20. We are particularly indebted to N. A. Betz, D. R. Winkler and J. Craven of the ORNL Mathematics Division and J. W. Reynolds of the I and C Division for developing the data acquisition system on the SEL810B computer.
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36. The data presented in the report of reference 11 have been revised in 1971. Private communication from M. C. Moxon to L. Stewart, September 1971 (see Ref. 6). The revised data are those used in Table XIV.
37. M. G. Sowerby, G. H. Patrick and D. S. Mather, "The Simultaneous Evaluation of the Fission Cross Sections of ^{235}U , ^{239}Pu and ^{238}U and the Capture Cross Sections of ^{238}U in the Energy Range 100 eV to 20 MeV," AERE-M2497, EANDC(UK) 138AL.
38. In the work of Friesenhahn et al.¹⁰ the $^{10}\text{B}(\text{n}\alpha)$ was taken as proportional to $E^{-1/2}$ up to 80 keV, whereas the evaluation of Sowerby et al.²² indicates a 6% deviation from this $E^{-1/2}$ law near 20 keV. However, the data of Friesenhahn et al. as presented in Table XIV and Fig. 20 have been "corrected" to reflect this deviation from the $E^{-1/2}$ law.

APPENDIX

This appendix contains the tabulated values of the effective cross section of ^{238}U from Run R0031901.

The quantities tabulated are the energy in eV and the effective cross section $\frac{P(E)\sqrt{E}}{N}$ in barn.eV^{1/2}.

For a definition of $\frac{P(E)\sqrt{E}}{N}$ and for a discussion of the uncertainties, see the text.

E	P/E N/E	E	P/F N/F	E	P/E N/E	E	P/E N/E										
ev	bey ^{1/2}	ev	bey ^{1/2}														
6.077	24.7	6.090	25.6	6.104	24.3	6.117	25.0	6.131	32.6	6.144	29.4	6.158	33.8	6.172	31.5		
6.185	30.5	6.199	37.6	6.213	34.2	6.227	44.4	6.241	48.6	6.255	43.4	6.269	54.8	6.283	57.0		
6.297	53.	6.311	65.	6.325	65.	6.339	75.	6.353	80.	6.368	79.	6.382	88.	6.396	103.		
6.411	114.	6.425	128.	6.440	146.	6.455	162.	6.469	179.	6.484	211.	6.499	251.	6.513	289.		
6.528	360.	6.543	449.	6.558	552.	6.573	698.	6.588	817.	6.603	882.	6.618	895.	6.634	915.		
6.649	899.	6.664	903.	6.680	904.	6.695	899.	6.710	909.	6.726	900.	6.742	901.	6.757	885.		
6.773	878.	6.789	793.	6.804	679.	6.820	541.	6.836	425.	6.852	350.	6.868	281.	6.884	245.		
6.900	209.	6.917	181.	6.933	163.	6.949	140.	6.966	124.	6.982	108.	6.998	97.	7.015	82.		
7.032	78.2	7.048	71.8	7.065	65.7	7.082	60.2	7.099	57.0	7.115	44.4	7.132	41.2	7.149	44.0		
7.167	43.8	7.184	33.1	7.201	30.8	7.218	31.5	7.235	28.4	7.253	32.1	7.270	20.3	7.288	26.6		
7.305	24.9	7.323	28.1	7.341	17.8	7.359	21.0	7.376	18.6	7.394	19.5	7.412	15.6	7.430	17.4		
7.448	18.2	7.466	9.5	7.485	13.4	7.503	13.1	7.521	12.8	7.540	9.3	7.558	13.2	7.577	8.2		
7.596	9.0	7.614	10.4	7.633	10.3	7.652	10.5	7.671	11.3	7.690	13.5	7.709	11.8	7.728	6.3		
7.747	9.5	7.766	10.6	7.786	9.5	7.805	4.9	7.825	2.4	7.844	1.6	7.864	5.7	7.883	9.7		
7.903	5.2	7.923	6.6	7.943	8.2	7.963	4.3	7.983	5.8	8.003	7.1	8.023	1.7	8.044	5.0		
8.054	3.4	8.085	3.2	8.105	4.3	8.126	4.4	8.146	4.8	8.167	2.2	8.188	3.8	8.209	5.8		
8.230	2.1	8.251	3.6	8.272	4.9	8.294	2.5	8.315	0.8	8.336	2.0	8.358	6.8	8.379	1.2		
8.431	2.6	8.423	0.4	8.445	2.6	8.467	2.8	8.489	2.3	8.511	-1.8	8.533	3.9	8.555	2.2		
8.578	3.3	8.600	0.4	8.623	2.7	8.645	2.4	8.668	-0.4	8.691	2.1	8.714	3.2	8.737	3.1		
8.760	2.3	8.783	3.8	8.806	3.2	8.829	2.2	8.853	1.1	8.876	3.3	8.900	4.0	8.924	3.9		
8.948	-1.2	8.972	3.1	8.996	1.8	9.020	0.3	9.044	3.2	9.068	3.4	9.093	-0.6	9.117	3.7		
9.142	0.3	9.166	0.2	9.191	1.5	9.216	0.8	9.241	-0.8	9.266	0.3	9.291	1.1	9.317	-1.6		
9.342	1.3	9.368	3.9	9.393	4.2	9.419	1.0	9.445	-2.0	9.471	-0.5	9.497	2.1	9.523	1.9		
9.549	3.3	9.576	-0.1	9.602	-1.3	9.629	0.8	9.655	4.0	9.682	-0.4	9.709	1.7	9.736	-0.0		
9.763	-2.2	9.790	2.8	9.818	1.8	9.845	-1.2	9.873	2.0	9.901	1.5	9.929	-0.7	9.956	-1.5		
9.985	-1.9	10.013	3.0	10.041	-1.9	10.069	1.4	10.098	5.3	10.127	3.8	10.156	5.3	10.184	10.3		
10.213	12.1	10.243	17.0	10.272	15.8	10.301	11.5	10.331	5.2	10.361	6.0	10.390	3.1	10.420	1.0		
10.450	1.5	10.481	1.4	10.511	-1.3	10.541	3.0	10.572	-2.0	10.603	-1.4	10.634	0.9	10.665	1.2		
10.696	2.6	10.727	-2.7	10.758	2.1	10.790	1.4	10.822	-0.5	10.853	1.9	10.885	-0.9	10.917	-0.2		
10.950	0.6	10.982	-1.7	11.015	2.4	11.047	1.7	11.080	-1.9	11.113	2.7	11.146	1.6	11.179	1.6		
11.213	-2.1	11.246	1.7	11.280	1.5	11.314	2.9	11.348	5.4	11.382	4.6	11.416	1.5	11.451	-1.0		
11.436	3.6	11.520	-1.1	11.555	-1.8	11.590	0.2	11.626	1.9	11.661	-0.7	11.697	1.4	11.732	1.7		
11.759	-2.7	11.777	-2.2	11.795	0.3	11.814	-1.0	11.832	0.3	11.850	-4.8	11.886	-3.4	11.886	6.6		
11.905	1.1	11.923	-1.8	11.941	3.0	11.960	3.9	11.978	2.4	11.997	1.3	12.015	-0.2	12.034	0.3		
12.052	0.7	12.071	0.1	12.090	-0.5	12.109	-2.4	12.127	2.3	12.146	-0.5	12.165	0.7	12.184	-4.5		
12.203	0.1	12.222	4.7	12.241	-2.1	12.260	1.8	12.279	-3.2	12.299	-1.1	12.318	-0.3	12.337	4.0		
12.357	0.5	12.376	-1.3	12.395	-0.5	12.415	0.1	12.434	2.3	12.454	1.6	12.474	-2.2	12.493	-3.6		
12.513	-0.2	12.533	5.6	12.553	3.0	12.572	0.9	12.592	-0.1	12.612	-3.3	12.632	-5.6	12.652	5.5		
12.672	-1.2	12.693	0.6	12.713	-0.3	12.733	3.9	12.753	-0.8	12.774	3.4	12.794	-1.6	12.814	3.8		
12.835	1.1	12.855	-1.8	12.876	1.5	12.897	-0.8	12.917	-0.8	12.938	-0.7	12.959	0.2	12.980	-0.1		
13.000	1.1	13.021	2.2	13.042	0.9	13.063	1.4	13.084	1.6	13.106	3.6	13.127	0.1	13.148	2.0		
13.169	-3.6	13.191	0.7	13.212	2.6	13.233	0.2	13.255	-3.7	13.277	0.1	13.298	-1.1	13.320	-0.0		
13.341	-1.4	13.363	1.3	13.385	-0.3	13.407	1.1	13.429	-2.9	13.451	2.2	13.473	-1.9	13.495	0.2		
13.517	-3.8	13.539	-0.7	13.561	-0.8	13.584	-4.5	13.606	-0.1	13.628	3.9	13.651	1.9	13.673	-0.1		
13.696	-3.6	13.719	3.2	13.741	-2.0	13.764	0.8	13.787	-0.3	13.810	0.2	13.833	3.1	13.856	3.3		
13.879	-0.8	13.902	1.2	13.925	0.6	13.948	0.3	13.971	0.9	13.995	0.8	14.018	0.5	14.041	-0.2		
14.063	1.2	14.088	0.5	14.112	0.2	14.136	1.3	14.159	2.3	14.183	2.3	14.207	2.9	14.231	0.3		
14.255	1.4	14.279	2.2	14.303	-1.4	14.327	-1.5	14.351	0.5	14.376	-1.9	14.400	0.5	14.424	2.8		
14.449	3.9	14.473	-0.2	14.498	0.9	14.523	0.9	14.547	2.3	14.572	7.5	14.597	-0.4	14.622	1.9		
14.647	-0.3	14.672	-1.9	14.697	-1.8	14.722	-2.0	14.747	-0.4	14.773	-2.6	14.798	2.4	14.823	0.9		
14.849	0.3	14.874	1.1	14.900	0.3	14.926	1.7	14.951	3.0	14.977	5.8	15.003	4.6	15.029	0.3		
15.055	3.5	15.081	-0.6	15.107	0.4	15.134	-0.7	15.160	0.6	15.186	-2.0	15.213	2.2	15.239	0.1		
15.266	1.2	15.292	-2.2	15.319	1.0	15.346	1.3	15.373	2.2	15.400	0.3	15.427	-1.6	15.454	2.2		
15.481	-0.8	15.508	4.2	15.535	0.6	15.563	1.8	15.590	1.7	15.617	3.9	15.645	1.8	15.673	-2.0		
15.700	2.0	15.728	0.3	15.756	0.8	15.784	0.3	15.812	0.3	15.840	0.6	15.866	1.3	15.896	3.3		

E eV	$P_{N/E}$ beV ^{1/2}																	
15.925	0.8	15.953	1.3	15.981	2.2	16.010	3.3	16.039	1.8	16.067	3.9	16.096	0.3	16.125	4.4			
15.154	2.3	16.183	-0.6	16.212	1.6	16.241	-0.7	16.270	-1.1	16.299	1.1	16.329	5.0	16.358	3.6			
16.388	-0.1	16.417	3.7	16.447	4.6	16.477	4.0	16.507	2.3	16.537	1.4	16.567	2.4	16.597	-1.5			
16.627	-1.2	16.657	0.7	16.688	-1.3	16.718	1.4	16.749	-0.5	16.779	-1.6	16.810	1.0	16.841	0.3			
16.872	3.2	16.903	2.6	16.934	2.4	16.965	4.4	16.996	4.0	17.027	1.7	17.059	5.3	17.090	3.4			
17.122	6.5	17.153	1.4	17.185	5.5	17.217	1.2	17.249	3.7	17.281	4.1	17.313	2.6	17.345	6.3			
17.377	2.1	17.409	2.7	17.442	2.7	17.474	4.9	17.507	3.0	17.540	6.4	17.572	1.0	17.605	4.0			
17.638	4.7	17.671	-0.6	17.705	1.0	17.738	3.2	17.771	3.7	17.805	3.6	17.838	4.2	17.872	4.9			
17.906	4.2	17.939	7.0	17.973	4.6	18.007	4.2	18.042	6.0	18.076	1.9	18.110	4.7	18.144	8.7			
18.179	4.0	18.214	6.3	18.248	4.5	18.283	7.8	18.318	5.1	18.353	5.6	18.388	5.1	18.423	6.9			
18.459	7.4	18.494	7.4	18.530	9.1	18.565	6.3	18.601	5.9	18.637	8.3	18.673	9.2	18.709	9.4			
18.745	10.5	19.781	8.1	18.817	9.3	18.854	11.4	18.890	12.2	18.927	9.4	18.964	9.2	19.001	13.5			
19.038	11.6	19.075	13.2	19.112	14.0	19.149	11.7	19.187	14.5	19.224	14.6	19.262	10.7	19.300	15.9			
19.338	13.4	19.375	18.0	19.414	18.6	19.452	20.3	19.490	24.6	19.529	27.4	19.567	27.1	19.606	30.4			
19.644	27.5	19.683	25.7	19.722	26.6	19.761	30.2	19.801	29.4	19.840	32.5	19.879	38.4	19.919	37.4			
19.959	39.9	19.999	43.8	20.039	46.7	20.079	54.6	20.119	60.1	20.159	70.8	20.199	77.3	20.240	79.6			
20.281	97.	20.321	111.	20.362	125.	20.403	151.	20.445	173.	20.486	212.	20.527	271.	20.569	345.			
20.610	461.	20.652	690.	20.694	1074.	20.736	1410.	20.778	1484.	20.821	1469.	20.863	1459.	20.906	1467.			
20.948	1462.	20.991	1460.	21.034	1472.	21.077	1382.	21.120	1086.	21.164	779.	21.207	583.	21.251	454.			
21.295	360.	21.338	290.	21.382	235.	21.427	197.	21.471	165.	21.515	139.	21.560	115.	21.605	95.			
21.649	82.2	21.694	75.3	21.740	65.4	21.785	56.2	21.830	54.0	21.876	49.0	21.922	41.6	21.967	38.2			
22.013	33.7	22.059	32.8	22.106	27.0	22.152	26.7	22.199	25.8	22.245	21.7	22.292	23.2	22.339	19.5			
22.386	17.7	22.434	18.6	22.481	15.8	22.529	14.6	22.577	10.6	22.624	11.9	22.673	13.1	22.721	12.5			
22.769	10.0	22.818	9.9	22.868	11.8	22.915	11.2	22.964	9.5	23.013	9.9	23.063	12.1	23.112	9.1			
23.162	8.8	23.211	7.9	23.261	6.8	23.312	9.2	23.362	6.2	23.412	7.8	23.463	7.0	23.514	5.2			
23.564	9.3	23.616	5.4	23.667	5.8	23.718	6.3	23.770	5.5	23.822	5.2	23.874	5.3	23.926	5.2			
23.978	3.0	24.030	5.8	24.083	3.3	24.136	7.5	24.189	7.2	24.242	1.8	24.295	3.4	24.349	4.2			
24.402	3.3	24.456	3.7	24.510	0.8	24.564	2.5	24.619	4.1	24.673	0.6	24.728	1.5	24.783	1.5			
24.838	3.2	24.893	2.2	24.949	2.5	25.004	3.4	25.060	2.1	25.116	1.4	25.173	5.9	25.229	2.0			
25.286	1.2	25.342	1.2	25.399	1.9	25.456	2.5	25.514	2.5	25.571	3.1	25.629	2.2	25.687	2.1			
25.745	3.1	25.804	3.6	25.862	4.7	25.921	1.7	25.980	1.5	26.039	2.9	26.098	-0.3	26.158	2.4			
26.218	2.3	26.278	3.0	26.338	3.6	26.398	2.7	26.459	3.4	26.520	4.2	26.581	1.5	26.642	4.7			
26.703	2.4	26.765	2.7	26.827	2.6	26.889	4.2	26.951	4.6	27.013	4.9	27.076	3.0	27.139	3.7			
27.202	2.4	27.266	2.5	27.329	3.6	27.393	1.4	27.457	2.0	27.521	4.4	27.586	5.6	27.651	2.8			
27.716	-0.7	27.781	2.8	27.846	0.7	27.912	4.0	27.978	2.6	28.044	1.7	28.110	1.0	28.177	1.7			
28.243	3.1	28.310	1.4	28.378	4.2	28.445	2.5	28.513	1.0	28.581	2.8	28.649	3.3	28.718	1.3			
28.787	1.3	28.856	2.9	28.925	3.4	28.994	2.5	29.064	1.4	29.134	3.1	29.204	3.8	29.275	2.3			
29.346	4.1	29.417	1.7	29.488	1.1	29.559	2.9	29.631	2.8	29.703	1.6	29.776	3.6	29.848	1.2			
29.921	0.1	29.994	2.1	30.067	2.6	30.141	4.3	30.215	2.6	30.289	5.0	30.364	3.1	30.438	3.0			
30.513	3.4	30.589	2.5	30.654	2.8	30.740	2.1	30.816	3.0	30.893	2.1	30.969	3.2	31.046	1.5			
31.124	4.7	31.201	4.1	31.279	2.5	31.357	3.8	31.436	3.4	31.514	4.1	31.593	2.9	31.673	4.3			
31.732	3.1	31.772	6.4	31.812	5.7	31.852	4.5	31.893	3.8	31.933	4.9	31.973	3.2	32.013	3.7			
32.054	4.5	32.094	6.2	32.135	8.3	32.175	6.5	32.216	4.7	32.257	7.8	32.298	4.4	32.339	7.3			
32.380	6.6	32.421	5.5	32.462	6.3	32.503	9.6	32.545	8.0	32.586	5.2	32.628	8.6	32.669	7.5			
32.711	7.5	32.753	3.7	32.795	6.4	32.837	7.5	32.879	6.5	32.921	5.3	32.963	7.4	33.005	6.9			
33.047	9.2	33.090	7.1	33.132	7.1	33.175	7.5	33.217	8.9	33.260	7.3	33.303	9.2	33.346	12.7			
33.389	9.9	33.432	9.8	33.475	12.7	33.518	10.2	33.561	14.2	33.605	8.7	33.648	10.5	33.692	12.8			
33.735	9.9	33.779	12.6	33.823	15.0	33.867	13.1	33.911	12.7	33.955	11.7	33.999	11.5	34.043	15.6			
34.088	12.3	34.132	13.6	34.177	14.1	34.221	16.1	34.266	13.9	34.311	16.9	34.356	17.1	34.400	18.1			
34.445	19.9	34.491	19.4	34.536	19.1	34.581	21.2	34.626	20.9	34.672	24.3	34.718	25.6	34.763	24.7			
34.809	22.2	34.855	29.7	34.901	30.9	34.947	33.3	34.993	32.2	35.039	36.1	35.085	36.4	35.132	34.9			
35.178	43.8	35.225	40.7	35.271	44.3	35.318	45.8	35.365	51.4	35.412	53.6	35.459	55.6	35.506	52.1			
35.553	68.	35.601	73.	35.648	79.	35.695	86.	35.743	94.	35.791	105.	35.839	115.	35.886	130.			
35.934	143.	35.982	171.	36.031	191.	36.079	219.	36.127	265.	36.176	314.	36.224	377.	36.273	474.			
36.322	579.	36.371	772.	36.419	1031.	36.469	1281.	36.518	1436.	36.567	1439.	36.616	1420.	36.666	1413.			

E eV	P/ N/E bev ^{1/2}														
36.715	1408.	36.765	1412.	36.815	1403.	36.865	1420.	36.914	1447.	36.965	1460.	37.015	1382.	37.065	1214.
37.115	1038.	37.166	864.	37.216	744.	37.267	638.	37.318	556.	37.369	479.	37.420	418.	37.471	363.
37.522	312.	37.573	271.	37.625	241.	37.676	206.	37.728	178.	37.779	160.	37.831	139.	37.883	118.
37.935	108.	37.987	92.	38.040	84.	38.092	75.	38.144	64.	38.197	61.	38.250	53.	38.303	49.
38.355	49.2	38.408	42.4	38.462	37.2	38.515	37.9	38.568	35.9	38.622	31.4	38.675	31.1	38.729	26.0
38.783	25.6	38.837	25.4	38.891	23.1	38.945	21.3	38.999	19.1	39.053	20.7	39.108	21.3	39.162	19.3
39.217	15.8	39.272	14.3	39.327	13.8	39.382	14.4	39.437	15.0	39.492	12.4	39.548	13.4	39.603	12.1
39.659	11.5	39.714	9.9	39.770	9.8	39.826	11.7	39.882	9.7	39.939	10.3	39.995	8.4	40.051	10.0
40.108	8.8	40.165	7.7	40.221	8.9	40.278	4.6	40.335	8.1	40.393	9.0	40.450	7.2	40.507	7.4
40.565	7.0	40.623	7.3	40.680	8.5	40.738	6.0	40.796	6.8	40.854	6.0	40.913	7.2	40.971	6.8
41.030	8.1	41.088	6.7	41.147	5.8	41.208	5.9	41.265	3.4	41.324	5.9	41.383	6.3	41.443	6.0
41.502	5.5	41.562	3.4	41.622	3.9	41.682	3.0	41.742	6.8	41.802	7.0	41.862	4.1	41.923	3.8
41.983	2.3	42.044	5.7	42.105	2.3	42.166	3.8	42.227	2.1	42.288	3.0	42.350	3.1	42.411	0.9
42.473	5.1	42.535	4.4	42.597	0.9	42.659	1.3	42.721	2.9	42.783	3.2	42.846	1.6	42.908	5.5
42.971	2.8	43.034	2.4	43.397	4.7	43.160	0.3	43.223	4.6	43.287	4.2	43.350	5.6	43.414	4.8
43.458	4.3	43.522	0.6	43.606	0.0	43.670	3.7	43.735	-1.2	43.799	4.9	43.864	2.8	43.929	4.1
43.994	0.9	44.059	1.6	44.124	-0.3	44.189	0.7	44.255	1.6	44.321	0.4	44.387	2.2	44.453	4.1
44.519	0.9	44.585	2.6	44.651	3.0	44.718	1.8	44.785	2.2	44.852	2.6	44.919	1.7	44.986	-0.8
45.053	2.6	45.121	3.9	45.188	6.2	45.256	5.8	45.324	7.1	45.392	2.8	45.461	2.4	45.529	-1.3
45.598	2.0	45.666	2.9	45.735	0.5	45.804	2.8	45.873	-0.9	45.943	0.4	46.012	2.1	46.082	1.7
46.152	1.1	46.222	0.8	46.292	2.3	46.362	2.2	46.433	-1.1	46.503	1.6	46.574	1.7	46.645	-0.5
46.716	2.4	46.787	3.8	46.859	1.7	46.930	3.8	47.002	1.0	47.074	2.6	47.146	0.9	47.218	1.9
47.291	2.9	47.363	2.0	47.436	0.6	47.509	2.2	47.582	0.7	47.655	2.8	47.729	1.9	47.802	1.2
47.876	-0.5	47.950	1.3	48.324	0.3	48.099	2.2	48.173	2.0	48.248	-0.1	48.322	1.9	48.397	0.5
48.473	-0.1	48.548	2.3	48.623	-0.3	48.699	1.8	48.775	0.6	48.851	1.8	48.927	-0.9	49.004	0.0
49.080	0.1	49.157	1.6	49.234	-0.2	49.311	1.0	49.388	-0.4	49.466	1.5	49.543	-1.6	49.621	2.3
49.699	5.2	49.777	4.0	49.856	1.5	49.934	0.0	50.013	-1.3	50.092	1.0	50.171	0.5	50.251	1.5
50.330	0.4	50.410	0.2	50.490	1.4	50.570	-0.5	50.650	0.5	50.730	0.3	50.811	1.5	50.892	1.3
50.973	0.6	51.054	-0.2	51.136	0.6	51.217	0.7	51.299	0.8	51.381	1.4	51.463	-0.2	51.546	-0.2
51.628	0.5	51.711	1.9	51.794	1.6	51.877	1.7	51.961	0.4	52.044	2.3	52.128	0.7	52.212	2.0
52.296	-0.7	52.381	1.2	52.465	1.5	52.550	-0.5	52.635	0.7	52.721	0.8	52.806	0.3	52.892	1.4
52.978	-0.3	53.064	4.3	53.150	1.1	53.236	0.5	53.323	0.4	53.410	0.6	53.497	1.1	53.584	-1.7
53.672	2.1	53.760	0.7	53.848	1.5	53.936	1.3	54.024	-1.5	54.113	0.9	54.202	-0.4	54.291	1.8
54.380	2.7	54.470	1.2	54.560	0.0	54.649	0.6	54.740	0.2	54.830	3.1	54.921	-1.4	55.012	2.1
55.103	0.7	55.194	0.5	55.285	2.1	55.377	1.2	55.469	1.8	55.561	0.2	55.654	1.4	55.747	1.9
55.839	0.3	55.933	2.9	56.026	0.8	56.120	1.7	56.213	2.6	56.308	0.8	56.402	1.1	56.496	0.4
56.591	-0.1	56.686	1.8	56.782	1.7	56.877	0.8	56.973	1.3	57.069	0.4	57.165	3.7	57.262	0.6
57.358	0.9	57.455	1.3	57.552	-0.2	57.650	2.4	57.748	2.0	57.846	0.4	57.944	1.7	58.042	2.8
58.141	2.0	58.240	3.2	58.339	0.2	58.439	0.5	58.538	3.3	58.638	2.7	58.739	1.5	58.839	3.0
58.940	2.0	59.041	1.5	59.142	2.0	59.244	1.1	59.345	1.0	59.447	2.5	59.550	3.7	59.552	1.7
59.755	0.3	59.858	2.8	59.962	3.1	60.065	1.4	60.169	4.8	60.273	2.4	60.378	0.4	60.483	2.4
60.588	2.6	60.693	3.5	60.799	3.3	60.904	3.2	61.010	2.4	61.117	1.9	61.224	5.1	61.330	2.8
61.438	3.0	61.545	3.8	61.653	4.5	61.761	2.5	61.869	3.1	61.978	4.7	62.087	3.4	62.196	3.9
62.306	5.5	62.415	3.2	62.526	3.3	62.636	4.9	62.747	6.3	62.858	6.7	62.969	6.3	63.080	7.1
63.192	7.1	63.304	8.7	63.417	15.8	63.530	25.3	63.643	23.3	63.756	19.5	63.870	15.9	63.984	13.7
64.098	15.2	64.212	15.8	64.327	19.5	64.442	21.7	64.558	24.6	64.674	25.9	64.790	29.6	64.906	39.0
65.023	47.	65.140	64.	65.257	77.	65.375	107.	65.493	164.	65.611	287.	65.730	684.	65.849	1553.
65.968	1965.	66.088	1988.	66.208	1985.	66.328	1804.	66.449	1107.	66.570	520.	66.691	322.	66.813	240.
66.934	180.	67.057	145.	67.179	121.	67.302	88.	67.425	74.	67.549	53.	67.673	40.	67.797	31.
67.922	27.6	68.047	22.0	68.172	17.8	68.298	14.8	68.424	13.0	68.550	9.6	68.677	9.9	68.804	10.4
68.900	10.2	68.963	6.8	69.027	10.6	69.091	8.6	69.155	9.9	69.219	8.3	69.284	6.6	69.348	5.6
69.412	7.6	69.477	5.7	69.542	6.1	69.606	5.5	69.671	5.9	69.736	5.4	69.801	2.8	69.866	6.1
69.931	5.9	69.996	3.4	70.062	7.4	70.127	2.0	70.193	3.6	70.258	4.9	70.324	4.8	70.390	4.0
70.456	4.9	70.521	2.1	70.588	2.9	70.654	3.0	70.720	3.4	70.786	3.1	70.853	0.7	70.919	3.5
70.986	2.1	71.053	1.8	71.119	3.5	71.186	4.4	71.253	1.9	71.320	0.1	71.388	2.1	71.455	3.2

E	P _{N/E}														
eV	beV ^{1/2}														
71.522	3.2	71.590	2.9	71.657	6.2	71.725	3.9	71.793	1.5	71.861	1.6	71.929	5.5	71.997	4.1
72.065	3.5	72.133	-1.6	72.201	1.6	72.270	1.3	72.338	4.0	72.407	8.7	72.476	4.7	72.544	7.4
72.613	2.3	72.682	3.3	72.752	3.6	72.821	-0.1	72.890	2.5	72.960	1.0	73.029	4.5	73.099	1.2
73.164	0.1	73.238	2.3	73.308	-0.2	73.378	4.0	73.448	2.5	73.518	3.5	73.589	3.6	73.659	1.3
73.730	1.4	73.800	-0.1	73.871	4.1	73.942	4.1	74.013	0.2	74.084	-0.9	74.155	3.0	74.226	2.6
74.298	1.5	74.369	1.5	74.441	1.4	74.512	3.9	74.584	0.3	74.656	-0.1	74.728	-0.1	74.800	2.1
74.872	1.8	74.944	1.7	75.017	4.7	75.089	-0.1	75.162	1.1	75.234	3.9	75.307	1.7	75.380	0.7
75.453	1.6	75.526	2.4	75.599	3.2	75.673	1.6	75.746	3.4	75.820	2.8	75.893	1.7	75.967	1.2
76.041	0.5	76.115	3.4	76.189	2.1	76.263	-0.6	76.338	-1.5	76.412	-0.3	76.486	2.6	76.561	1.0
76.635	1.9	76.711	0.6	76.786	1.2	76.861	1.4	76.936	2.1	77.011	4.5	77.087	4.6	77.162	0.7
77.238	3.3	77.313	0.6	77.389	2.0	77.465	3.7	77.541	0.4	77.617	-0.8	77.694	0.3	77.770	1.5
77.847	3.7	77.923	1.3	78.000	-0.6	78.077	2.0	78.154	0.6	78.231	-1.4	78.308	1.3	78.385	0.5
78.463	-0.2	78.540	4.6	78.618	1.6	78.696	2.1	78.774	2.3	78.852	4.0	78.930	5.2	79.008	-1.1
79.086	2.1	79.165	3.1	79.243	2.3	79.322	2.4	79.401	1.8	79.480	4.4	79.559	4.1	79.638	2.7
79.717	4.4	79.797	2.3	79.876	5.2	79.956	6.1	80.036	7.6	80.115	10.3	80.195	13.7	80.275	20.5
80.355	3.5	80.435	8.4	80.517	22.6	80.597	55.5	80.678	107.8	80.759	151.6	80.840	168.7	80.921	149.2
81.002	1024.	81.083	538.	81.165	229.	81.246	94.	81.328	56.	81.410	42.	81.492	35.	81.574	35.
81.656	31.4	81.738	23.8	81.821	27.5	81.903	20.5	81.985	22.3	82.069	14.3	82.152	10.9	82.235	8.9
82.313	6.8	82.401	7.8	82.485	4.8	82.568	4.5	82.652	4.4	82.736	3.5	82.820	0.5	82.904	3.6
82.988	1.7	83.073	4.0	83.157	5.3	83.242	1.4	83.326	4.7	83.411	0.1	83.498	2.7	83.581	4.8
83.667	7.8	83.752	12.8	83.837	15.0	83.923	9.5	84.009	3.5	84.095	3.0	84.181	2.4	84.267	1.6
84.353	1.5	84.440	2.0	84.526	1.3	84.613	3.2	84.700	0.8	84.787	-0.8	84.874	1.9	84.961	3.8
85.048	1.9	85.136	1.0	85.223	1.7	85.311	2.2	85.399	0.1	85.487	1.1	85.575	0.0	85.664	1.9
85.752	3.1	85.841	1.4	85.929	2.3	86.018	0.9	86.107	1.2	86.196	1.3	86.286	1.6	86.375	-0.4
86.465	2.5	86.554	2.9	86.644	1.1	86.734	-0.1	86.824	3.7	86.915	3.6	87.005	1.7	87.096	-0.3
87.186	2.2	87.277	1.9	87.368	-0.6	87.459	1.3	87.550	0.9	87.642	2.6	87.733	0.1	87.825	2.5
87.917	0.6	88.009	2.3	88.101	3.2	88.193	2.8	88.285	-0.0	88.378	0.9	88.471	0.8	88.564	2.7
88.657	2.	88.750	-0.6	88.843	3.	88.936	6.	89.030	18.	89.124	47.	89.218	86.	89.312	118.
89.406	109.	89.500	76.	89.594	37.	89.689	17.	89.784	4.	89.879	1.	89.974	5.	90.069	6.
90.164	4.0	90.260	7.4	90.356	4.2	90.451	2.5	90.547	3.9	90.643	3.5	90.740	2.0	90.836	1.4
90.933	2.2	91.030	2.4	91.126	2.1	91.223	0.7	91.321	0.3	91.418	3.9	91.516	1.5	91.613	3.1
91.711	3.3	91.809	-0.5	91.907	1.0	92.005	2.1	92.104	1.7	92.203	1.7	92.301	1.9	92.400	1.5
92.499	3.8	92.599	3.8	92.698	2.3	92.788	2.5	92.897	7.2	92.997	5.4	93.097	6.8	93.197	7.9
93.298	11.6	93.398	7.8	93.499	3.2	93.600	1.6	93.701	4.5	93.802	1.8	93.903	2.0	94.005	-1.1
94.107	3.7	94.209	2.7	94.311	1.9	94.413	4.2	94.515	3.0	94.618	4.0	94.720	3.8	94.823	2.3
94.926	3.2	95.029	0.7	95.133	2.7	95.236	1.2	95.340	1.7	95.444	3.7	95.548	2.2	95.652	3.6
95.756	4.4	95.861	4.9	95.966	3.8	96.070	3.7	96.176	4.4	96.281	6.3	96.386	3.4	96.492	2.1
96.597	1.4	96.703	3.4	96.809	7.4	96.916	5.7	97.022	8.4	97.129	4.8	97.236	7.1	97.343	4.6
97.450	6.3	97.557	5.5	97.665	7.7	97.772	7.0	97.880	7.7	97.988	10.0	98.096	10.8	98.205	9.3
98.313	11.7	98.422	9.0	98.531	6.5	98.640	7.3	98.749	8.7	98.859	10.7	98.969	10.6	99.078	10.1
99.188	11.9	99.299	10.9	99.409	13.5	99.520	15.9	99.630	15.0	99.741	12.2	99.852	18.7	99.964	18.4
100.08	18.4	100.19	22.2	100.30	23.5	100.41	25.5	100.52	27.9	100.64	30.6	100.75	35.7	100.86	42.1
100.97	47.	101.09	51.	101.20	62.	101.31	68.	101.43	88.	101.54	102.	101.66	131.	101.77	163.
101.89	233.	102.00	337.	102.11	53.8	102.23	921.	102.35	3297.	102.46	1453.	102.58	1512.	102.69	1503.
102.81	1498.	102.92	1457.	103.04	1294.	103.16	922.	103.27	639.	103.39	460.	103.51	364.	103.63	302.
103.74	252.	103.85	222.	103.98	192.	104.10	171.	104.22	147.	104.34	126.	104.45	111.	104.57	95.
104.69	76.5	104.81	62.9	104.93	56.3	105.05	45.7	105.17	38.5	105.29	35.2	105.41	32.5	105.53	27.7
105.56	23.4	105.78	22.3	105.90	20.9	105.02	16.7	105.14	19.4	105.26	12.8	105.39	14.4	105.51	10.3
106.63	10.8	106.75	10.0	106.88	11.1	107.00	8.0	107.12	6.1	107.25	8.3	107.37	7.8	107.49	8.5
107.62	6.2	107.74	4.9	107.87	7.5	107.99	7.8	108.12	5.2	108.24	5.1	108.37	5.5	108.50	5.4
108.62	3.1	108.75	4.1	108.87	6.6	109.00	9.5	109.13	5.5	109.26	3.4	109.38	4.8	109.51	6.3
109.54	3.4	109.77	3.4	109.89	3.9	110.02	3.5	110.15	1.8	110.28	4.9	110.41	5.5	110.54	2.5
110.67	4.8	110.80	7.7	110.93	4.3	111.06	6.1	111.19	10.3	111.32	7.6	111.45	9.5	111.58	4.9
111.71	4.1	111.85	5.1	111.98	4.5	112.11	4.6	112.24	5.4	112.38	2.1	112.51	4.9	112.64	5.4
112.78	4.1	112.91	5.1	113.04	5.4	113.18	3.1	113.31	6.9	113.45	3.6	113.58	4.9	113.72	7.4

E	P/E	E	P/E	E	P/E														
eV	bev ^{1/2}	eV	bev ^{1/2}	eV	bev ^{1/2}														
113.85	4.1	113.99	4.4	114.12	6.3	114.26	9.2	114.39	9.8	114.53	10.6	114.67	9.5	114.80	13.2				
114.94	14.3	115.08	12.2	115.22	11.9	115.36	18.8	115.49	18.1	115.63	26.5	115.77	27.8	115.91	37.9				
116.05	49.	116.19	79.	116.33	120.	116.47	292.	116.61	834.	116.75	1739.	116.89	2246.	117.03	2264.				
117.17	2154.	117.31	1616.	117.46	751.	117.60	314.	117.74	188.	117.88	144.	118.02	112.	118.17	98.				
118.28	85.4	118.35	84.0	118.42	79.4	118.49	81.1	118.56	66.6	118.63	65.0	118.71	64.1	118.78	58.8				
118.85	48.6	118.92	46.1	119.00	43.6	119.07	36.8	119.14	34.5	119.21	27.8	119.29	24.8	119.36	21.8				
119.43	23.5	119.50	20.5	119.58	14.7	119.65	14.7	119.72	11.9	119.80	14.5	119.87	12.0	119.94	12.6				
120.02	11.7	120.09	9.2	120.16	8.3	120.24	9.9	120.31	7.0	120.38	5.7	120.46	6.8	120.53	5.8				
120.60	3.6	120.68	3.0	120.75	7.3	120.83	6.9	120.90	4.7	120.97	2.9	121.05	2.8	121.12	4.3				
121.20	4.8	121.27	2.5	121.35	7.0	121.42	0.7	121.49	7.1	121.57	-0.3	121.64	1.8	121.72	3.5				
121.79	3.1	121.87	3.9	121.94	-0.9	122.02	3.7	122.09	2.1	122.17	0.3	122.24	2.6	122.32	3.1				
122.39	3.4	122.47	2.5	122.55	5.6	122.62	2.3	122.70	0.7	122.77	2.7	122.85	0.4	122.92	3.3				
123.00	0.9	123.08	-0.7	123.15	2.3	123.23	1.9	123.31	5.1	123.38	3.5	123.46	3.2	123.53	4.1				
123.61	2.7	123.69	2.2	123.76	2.2	123.84	1.2	123.92	3.6	124.00	1.0	124.07	4.7	124.15	-0.1				
124.23	1.0	124.30	7.8	124.38	1.1	124.46	1.9	124.54	1.3	124.61	1.0	124.69	3.5	124.77	3.6				
124.85	6.5	124.92	7.8	125.00	16.0	125.08	23.7	125.16	16.4	125.24	17.1	125.31	11.8	125.39	9.8				
125.47	2.9	125.55	1.6	125.63	3.1	125.71	1.2	125.78	3.8	125.86	2.3	125.94	-1.1	126.02	1.8				
126.10	2.3	126.18	2.3	126.26	3.7	126.34	3.3	126.42	-0.1	126.50	1.1	126.57	2.2	126.65	0.2				
126.73	-1.8	126.81	3.1	126.89	3.4	126.97	2.4	127.05	-1.3	127.13	2.6	127.21	3.6	127.29	0.2				
127.37	-1.2	127.45	4.3	127.53	1.0	127.61	0.8	127.69	-0.1	127.77	1.3	127.85	4.3	127.93	1.7				
128.02	-0.1	128.10	1.3	128.18	3.3	128.26	2.0	128.34	3.3	128.42	-0.5	128.50	0.7	128.58	-1.0				
128.66	1.5	128.75	-2.2	128.83	3.2	128.91	3.2	128.99	-1.0	129.07	4.3	129.15	1.7	129.23	-1.8				
129.32	-0.4	129.40	1.8	129.48	-1.3	129.56	0.5	129.65	3.1	129.73	2.1	129.81	0.8	129.89	-0.9				
129.98	-0.8	130.06	3.6	130.14	2.0	130.22	0.8	130.31	0.1	130.39	-0.2	130.47	-0.4	130.56	-0.1				
130.64	0.2	130.72	1.8	130.80	-0.5	130.89	1.1	130.97	-0.8	131.06	-0.3	131.14	3.1	131.22	2.0				
131.31	0.7	131.39	2.6	131.47	-1.5	131.56	0.5	131.64	0.4	131.73	0.6	131.81	-1.7	131.90	1.9				
131.98	-1.4	132.06	1.0	132.15	2.1	132.23	2.2	132.32	-1.1	132.40	-1.6	132.49	4.3	132.57	0.1				
132.66	0.9	132.74	3.4	132.83	2.6	132.91	2.9	133.00	-0.2	133.09	3.1	133.17	3.4	133.26	5.3				
133.34	8.0	133.43	6.4	133.51	6.9	133.60	3.6	133.69	0.9	133.77	4.0	133.86	2.1	133.95	1.2				
134.03	0.0	134.12	1.9	134.21	-1.7	134.29	3.2	134.38	2.1	134.47	-1.0	134.55	0.1	134.64	1.9				
134.73	1.2	134.81	2.8	134.90	1.8	134.99	3.5	135.08	4.4	135.16	1.9	135.25	0.1	135.34	0.9				
135.43	-0.1	135.51	5.2	135.60	3.2	135.69	-1.5	135.78	-0.9	135.87	-0.1	135.96	-0.7	136.04	1.3				
136.13	0.4	136.22	1.2	136.31	-0.5	136.40	-2.4	136.49	0.5	136.58	1.6	136.66	0.0	136.75	2.2				
136.84	0.8	136.93	0.9	137.02	1.6	137.11	-0.8	137.20	1.8	137.29	1.4	137.38	0.8	137.47	1.2				
137.56	1.5	137.65	-0.7	137.74	2.6	137.83	2.7	137.92	0.8	138.01	-4.3	138.10	0.8	138.19	2.8				
138.28	2.4	138.37	1.1	138.46	2.4	138.55	0.8	138.65	2.6	138.76	1.8	138.83	3.5	138.92	1.2				
139.01	-0.4	139.10	-1.0	139.19	-0.0	139.28	1.2	139.38	-0.8	139.47	-2.3	139.56	1.6	139.65	-0.7				
139.74	1.3	139.84	0.3	139.93	-0.6	140.02	1.5	140.11	-0.6	140.21	5.1	140.30	1.9	140.39	1.1				
140.48	0.6	140.58	1.3	140.67	3.7	140.76	1.2	140.86	2.1	140.95	2.4	141.04	2.3	141.14	3.1				
141.23	-0.5	141.32	1.6	141.42	3.7	141.51	0.8	141.60	3.1	141.70	-0.1	141.79	1.3	141.89	1.4				
141.98	-0.1	142.07	-0.2	142.17	-3.0	142.26	-1.3	142.36	-2.0	142.45	0.1	142.55	-0.2	142.64	0.4				
142.74	2.6	142.83	-0.4	142.93	1.2	143.02	1.9	143.12	3.4	143.21	0.6	143.31	-2.5	143.40	3.3				
143.50	0.2	143.63	4.7	143.69	-1.1	143.79	4.6	143.88	3.0	143.98	0.2	144.08	0.6	144.17	2.7				
144.27	1.4	144.37	3.8	144.46	2.8	144.56	0.4	144.66	3.9	144.75	2.4	144.85	3.9	144.95	4.7				
145.05	6.	145.14	10.	145.24	17.	145.34	51.	145.44	130.	145.53	264.	145.63	425.	145.73	583.				
145.83	60.9	145.93	515.	146.02	342.	146.12	184.	146.22	70.	146.32	30.	146.42	17.	146.52	12.				
146.62	10.3	146.72	9.8	146.81	13.5	146.91	9.6	147.01	14.3	147.11	10.0	147.21	12.9	147.31	14.3				
147.41	3.5	147.51	6.8	147.61	9.0	147.71	6.5	147.81	7.8	147.91	4.2	148.01	4.4	148.11	4.6				
148.21	2.2	148.31	5.0	148.41	2.7	148.51	0.2	148.62	1.7	148.72	1.7	148.82	2.1	148.92	-0.4				
149.02	2.2	149.12	0.2	149.22	2.4	149.33	1.5	149.43	0.5	149.53	1.1	149.63	2.7	149.73	0.5				
149.83	0.8	149.94	1.5	150.04	0.8	150.14	-1.7	150.24	-0.4	150.35	-0.0	150.45	0.1	150.55	2.7				
150.66	1.7	150.76	1.3	150.86	-0.8	150.97	5.4	151.07	0.6	151.17	1.0	151.28	-1.4	151.38	1.0				
151.48	2.8	151.59	0.3	151.69	1.6	151.80	2.2	151.90	2.4	152.01	0.3	152.11	2.4	152.21	8.4				
152.32	16.3	152.42	29.3	152.53	43.8	152.63	37.9	152.74	32.2	152.84	18.3	152.95	9.0	153.05	3.4				
153.16	4.6	153.27	1.9	153.37	2.3	153.48	1.8	153.58	-1.0	153.69	2.1	153.80	4.2	153.90	1.7				

E	$\frac{P}{N}E$														
eV	beV ^{1/2}														
154.01	5.4	154.12	3.7	154.22	1.7	154.33	-0.6	154.44	-0.6	154.54	0.2	154.65	0.9	154.76	-1.7
154.87	2.1	154.97	2.0	155.06	2.0	155.19	1.1	155.30	2.9	155.40	0.3	155.51	1.6	155.62	-0.1
155.73	3.8	155.84	0.6	155.94	1.0	156.05	-1.3	156.16	1.3	156.27	3.2	156.38	3.2	156.49	2.4
156.60	0.9	156.71	2.0	156.82	0.7	156.93	2.5	157.04	0.1	157.15	-0.5	157.26	0.4	157.37	0.4
157.48	1.6	157.59	2.4	157.70	0.0	157.81	1.9	157.92	1.6	158.03	4.0	158.14	2.8	158.25	2.6
158.36	1.0	158.47	1.7	158.58	1.8	158.69	0.6	158.81	5.9	158.92	9.6	159.03	12.3	159.14	13.5
159.25	11.5	159.36	9.0	159.48	4.6	159.59	1.7	159.70	2.6	159.81	3.3	159.93	2.8	160.04	1.3
160.15	4.8	160.27	0.4	160.38	-0.4	160.49	0.5	160.61	-0.8	160.72	-0.5	160.83	1.7	160.95	0.9
161.06	0.4	161.17	-0.6	161.29	0.9	161.40	2.2	161.52	0.8	161.63	1.5	161.75	0.6	161.86	1.8
161.88	-1.0	162.09	1.9	162.21	2.9	162.32	4.0	162.44	2.5	162.55	3.8	162.67	-0.1	162.78	4.4
162.90	1.9	163.01	-1.8	163.13	1.7	163.25	3.2	163.36	3.8	163.48	4.0	163.60	0.4	163.71	2.5
163.93	0.9	163.95	4.4	164.06	3.2	164.18	3.9	164.30	10.4	164.42	10.2	164.53	9.2	164.65	13.1
164.77	30.	164.89	88.	165.00	250.	165.12	585.	165.24	1050.	165.36	1476.	165.48	1572.	165.60	1281.
165.72	813.	165.83	377.	165.95	136.	166.07	52.	166.19	31.	166.31	28.	166.43	26.	166.55	23.
166.67	24.5	166.79	24.9	166.91	23.7	167.03	20.1	167.15	19.4	167.27	14.6	167.39	12.6	167.51	13.5
167.63	11.9	167.75	7.9	167.88	7.3	168.00	9.0	168.12	4.2	168.24	8.7	168.36	2.4	168.48	4.6
168.61	4.3	168.73	2.2	168.85	3.9	168.97	-0.9	169.10	3.5	169.22	1.0	169.34	1.8	169.46	1.6
169.59	3.3	169.71	0.8	169.83	-1.4	169.96	1.4	170.08	2.8	170.20	3.3	170.33	2.0	170.45	0.6
170.58	0.4	170.70	2.7	170.92	1.6	170.95	0.7	171.07	2.0	171.20	-0.6	171.32	0.9	171.45	1.1
171.57	3.5	171.70	-0.8	171.82	1.6	171.95	2.7	172.09	0.5	172.20	2.9	172.33	5.6	172.45	-0.3
172.58	2.4	172.71	2.9	172.83	2.5	172.96	6.9	173.09	15.4	173.21	25.9	173.34	32.6	173.47	28.7
173.60	23.8	173.72	12.0	173.85	7.0	173.95	5.2	174.11	3.1	174.24	2.9	174.36	2.8	174.49	1.1
174.67	2.9	174.75	2.6	174.88	1.8	175.01	3.2	175.14	2.8	175.27	0.8	175.39	2.6	175.52	1.4
175.65	0.7	175.78	2.7	175.91	3.3	176.04	2.3	176.17	2.2	176.30	3.1	176.43	-0.8	176.57	1.1
176.70	3.7	176.83	3.8	176.96	2.3	177.09	-0.4	177.22	2.6	177.35	1.4	177.48	1.5	177.62	2.0
177.75	2.7	177.88	6.7	178.01	1.2	178.15	3.5	178.28	3.7	178.41	2.9	178.54	2.7	178.68	-0.3
178.81	2.9	178.94	3.9	179.08	2.6	179.21	2.9	179.34	3.0	179.48	3.8	179.61	-1.3	179.75	4.7
179.88	35.	180.02	4.2	180.15	5.3	180.28	2.4	180.42	3.6	180.56	3.2	180.69	3.2	180.83	3.2
180.96	3.2	181.10	3.1	181.23	3.6	181.37	3.7	181.51	4.3	181.64	2.9	181.78	3.2	181.91	6.2
182.05	5.5	182.19	4.0	182.33	2.0	182.46	4.2	182.60	4.0	182.74	5.7	182.88	4.5	183.01	5.5
183.15	6.4	183.29	1.7	183.43	6.9	183.57	5.7	183.71	4.9	183.84	5.9	183.98	8.7	184.12	9.0
184.26	8.7	184.40	7.6	184.54	6.0	184.68	9.2	184.82	7.7	184.96	7.1	185.10	9.7	185.24	6.6
185.38	12.3	185.52	8.3	185.66	11.7	185.81	15.5	185.95	14.3	186.09	15.4	186.23	15.6	186.37	16.6
185.51	19.4	186.66	23.8	186.80	19.7	186.94	24.0	187.08	30.3	187.23	32.1	187.37	38.9	187.51	39.0
187.65	45.	187.80	52.	187.94	66.	188.08	76.	188.23	89.	188.37	101.	188.52	140.	188.66	171.
188.81	223.	188.95	314.	189.10	45.	189.24	654.	189.39	861.	189.53	944.	189.68	989.	189.82	979.
189.97	988.	190.11	981.	190.26	950.	190.41	838.	190.55	644.	190.70	498.	190.85	384.	190.99	309.
191.14	256.	191.29	219.	191.44	187.	191.58	169.	191.73	144.	191.88	133.	192.03	124.	192.18	110.
192.32	103.	192.47	95.	192.62	88.	192.77	77.	192.92	68.	193.07	66.	193.22	52.	193.37	49.
193.52	41.6	193.67	38.8	193.82	33.5	193.97	29.9	194.12	26.7	194.27	23.9	194.42	22.7	194.57	18.6
194.73	26.0	194.88	28.1	195.03	31.7	195.18	30.2	195.33	23.0	195.48	14.1	195.64	12.4	195.79	8.9
195.94	8.2	196.10	8.3	196.25	0.0	196.40	10.2	196.56	8.6	196.71	5.0	196.86	7.9	197.02	8.6
197.17	7.1	197.33	5.5	197.48	5.3	197.64	5.5	197.79	3.9	197.95	5.7	198.10	5.1	198.26	4.4
198.41	2.7	198.57	3.0	198.72	4.6	198.88	3.6	199.04	5.5	199.19	1.8	199.35	5.3	199.51	6.1
199.66	2.9	199.82	5.7	199.98	2.7	200.14	5.3	200.29	3.7	200.45	10.0	200.61	16.4	200.77	29.1
200.93	35.7	201.09	25.6	201.25	18.8	201.40	5.7	201.56	3.5	201.72	4.4	201.88	5.0	202.04	5.0
202.20	6.0	202.36	2.5	202.52	5.0	202.69	4.5	202.85	7.4	203.01	13.1	203.17	18.8	203.33	24.0
203.49	15.6	203.65	9.1	203.82	7.2	203.98	8.1	204.14	6.6	204.30	5.2	204.47	3.9	204.63	8.1
204.79	8.7	204.96	3.8	205.12	9.8	205.28	6.9	205.45	8.8	205.61	10.2	205.78	11.8	205.94	13.6
206.11	14.2	206.27	12.4	206.44	14.6	206.60	21.8	206.77	18.9	206.93	23.1	207.10	29.3	207.26	38.7
207.43	49.	207.60	68.	207.76	105.	207.93	213.	208.10	539.	208.27	1128.	208.43	1710.	208.60	1945.
208.77	1894.	208.94	1753.	209.11	1271.	209.28	625.	209.44	285.	209.61	179.	209.78	130.	209.95	109.
210.12	87.9	210.29	76.4	210.46	73.4	210.63	67.8	210.80	64.5	210.97	52.4	211.14	52.2	211.31	48.7
211.49	43.7	211.66	41.7	211.83	35.9	212.00	31.9	212.17	31.6	212.35	22.1	212.52	19.6	212.69	14.0
212.86	12.8	213.04	13.9	213.21	11.4	213.38	6.4	213.56	5.8	213.73	1.8	213.91	2.6	214.08	6.4

E eV	P/ N/E beV ^{1/2}																
214.26	5.5	214.43	6.7	214.61	10.6	214.78	17.6	214.96	30.2	215.13	31.1	215.31	18.3	215.48	9.7		
215.66	4.6	215.84	3.1	216.01	2.3	216.19	3.5	216.37	2.5	216.55	1.8	216.72	5.5	216.90	1.5		
217.08	4.0	217.26	1.8	217.44	1.1	217.62	2.8	217.80	2.0	217.97	2.9	218.15	8.9	218.33	14.0		
218.51	14.6	218.59	15.4	218.87	8.1	219.05	3.2	219.24	0.7	219.42	2.2	219.60	2.3	219.78	2.9		
219.96	2.9	220.14	1.0	220.33	2.7	220.51	1.5	220.69	1.8	220.87	-0.5	221.06	0.5	221.24	1.7		
221.42	2.2	221.61	3.2	221.79	0.9	221.97	0.9	222.15	1.7	222.34	0.1	222.53	1.2	222.71	2.6		
222.90	0.6	223.08	1.0	223.27	4.0	223.46	3.2	223.64	1.7	223.83	-2.8	224.02	2.5	224.20	2.0		
224.39	0.7	224.58	2.4	224.77	3.0	224.95	1.0	225.14	1.0	225.33	0.7	225.52	0.7	225.71	3.3		
225.90	3.4	226.09	3.8	226.28	4.0	226.47	2.8	226.66	0.5	226.85	3.3	227.04	3.4	227.23	0.6		
227.42	0.9	227.61	3.4	227.80	2.1	227.99	1.3	228.19	-0.6	228.38	2.9	228.57	1.7	228.76	3.7		
228.96	3.5	229.15	4.0	229.34	7.8	229.54	5.1	229.73	3.2	229.92	1.5	230.12	4.1	230.31	1.2		
230.51	2.7	230.70	1.9	230.90	3.7	231.09	1.6	231.29	1.7	231.49	1.2	231.68	2.0	231.88	2.7		
232.08	0.1	232.27	0.9	232.47	1.3	232.67	2.9	232.87	3.8	233.06	2.5	233.26	4.3	233.46	2.3		
233.66	4.7	233.86	5.1	234.06	3.9	234.26	4.8	234.46	6.0	234.66	6.5	234.86	5.4	235.06	6.7		
235.26	7.4	235.46	8.0	235.66	10.9	235.87	11.1	236.07	14.4	236.27	20.5	236.47	44.0	236.68	79.1		
236.88	233.	237.08	79.6	237.29	169.6	237.49	234.3	237.59	224.8	237.90	160.3	238.10	70.4	238.31	258.		
238.51	133.	238.72	97.	238.92	67.	239.13	56.	239.34	47.	239.54	43.	239.75	42.	239.96	38.		
240.16	36.8	240.37	34.1	240.58	30.2	240.79	26.6	241.00	25.2	241.20	21.5	241.41	18.3	241.62	16.8		
241.83	9.5	242.04	10.0	242.25	9.9	242.46	26.2	242.67	57.5	242.88	84.0	243.10	78.3	243.31	40.9		
243.52	12.4	243.73	6.3	243.94	5.6	244.15	5.0	244.37	5.8	244.58	4.3	244.79	5.7	245.01	5.0		
245.22	4.3	245.44	3.1	245.65	-1.8	245.86	4.2	246.08	2.3	246.30	2.4	246.51	0.9	246.73	1.9		
246.94	2.6	247.16	0.1	247.38	0.7	247.59	2.3	247.81	3.9	248.03	-0.9	248.25	0.3	248.46	1.2		
248.63	1.6	248.74	-0.0	248.85	0.9	248.96	0.9	249.07	1.1	249.17	0.3	249.28	2.5	249.39	6.1		
249.50	2.4	249.61	0.5	249.72	-0.8	249.83	-0.2	249.94	2.2	250.05	1.8	250.16	1.8	250.27	1.8		
250.38	-0.1	250.50	-0.8	250.61	2.0	250.72	1.8	250.83	0.7	250.94	0.1	251.05	2.0	251.16	-1.9		
251.27	-0.2	251.38	-0.2	251.49	-1.2	251.60	0.5	251.72	4.4	251.83	0.3	251.94	1.4	252.05	2.9		
252.16	1.8	252.27	1.4	252.38	3.6	252.50	4.7	252.61	1.8	252.72	0.3	252.83	1.4	252.94	0.1		
253.06	2.3	253.17	-1.7	253.28	3.2	253.39	5.8	253.51	6.4	253.62	10.8	253.73	17.6	253.84	24.4		
253.96	29.0	254.07	41.1	254.18	51.8	254.29	44.6	254.41	22.3	254.52	16.6	254.63	10.8	254.75	8.2		
254.86	-1.7	254.97	1.6	255.09	1.4	255.20	-2.5	255.31	-0.8	255.43	-0.1	255.54	3.2	255.66	2.5		
255.77	0.8	255.88	3.2	256.00	3.2	256.11	3.6	256.23	1.6	256.34	1.9	256.46	-0.1	256.57	2.8		
256.68	3.9	256.80	3.7	256.91	1.7	257.03	3.9	257.14	6.1	257.26	12.9	257.37	12.7	257.49	12.9		
257.60	12.2	257.72	11.8	257.83	6.5	257.95	4.5	258.07	1.7	258.18	0.6	258.30	1.7	258.41	1.7		
258.53	0.8	258.64	0.7	258.76	1.2	258.88	4.2	258.99	0.9	259.11	3.1	259.22	-0.6	259.34	-0.6		
259.46	0.5	259.57	1.3	259.69	2.4	259.81	1.3	259.92	0.9	260.04	1.8	260.16	-0.7	260.27	3.1		
260.39	-0.0	260.51	0.4	260.63	0.9	260.74	1.8	260.86	-0.9	260.98	2.0	261.10	0.9	261.21	1.8		
261.33	-0.2	261.45	-0.4	261.57	1.1	261.68	0.5	261.80	1.1	261.92	5.1	262.04	0.2	262.16	-1.1		
262.28	1.4	262.39	-0.0	262.51	1.6	262.63	-0.0	262.75	0.7	262.87	-1.1	262.99	5.5	263.11	3.1		
263.22	2.	263.34	3.	263.46	6.	263.58	16.	263.70	32.	263.82	54.	263.94	78.	264.06	105.		
264.18	118.	264.30	102.	264.42	78.	264.54	46.	264.66	24.	264.78	9.	264.90	1.	265.02	2.		
265.14	3.1	265.26	2.9	265.38	0.9	265.50	3.4	265.62	-1.1	265.74	3.1	265.86	2.3	265.98	7.2		
266.10	4.1	266.23	7.1	266.35	2.3	266.47	0.5	266.59	2.3	266.71	1.8	266.83	7.8	266.95	1.8		
267.08	5.6	267.20	4.5	267.32	3.0	267.44	4.1	267.56	3.0	267.68	2.5	267.81	4.5	267.93	3.0		
268.05	3.4	268.17	-0.8	268.30	1.4	268.42	4.3	268.54	-0.8	268.66	0.3	268.79	3.0	268.91	2.8		
269.03	0.1	269.15	5.4	269.28	2.5	269.40	6.6	269.52	4.1	269.65	-1.9	269.77	7.5	269.89	4.3		
270.02	2.8	270.14	2.6	270.27	4.3	270.39	3.0	270.51	6.8	270.64	3.4	270.76	4.3	270.89	5.0		
271.01	7.7	271.13	3.9	271.26	4.1	271.38	4.8	271.51	6.2	271.63	4.6	271.76	8.1	271.88	8.1		
272.01	9.7	272.13	9.7	272.26	13.1	272.38	15.5	272.51	22.0	272.63	27.4	272.76	37.1	272.89	65.5		
273.01	119.	273.14	237.	273.26	49.5	273.39	916.	273.51	1449.	273.64	1989.	273.77	2334.	273.89	2416.		
274.02	2292.	274.15	1838.	274.27	1310.	274.40	768.	274.53	391.	274.65	187.	274.78	105.	274.91	81.		
275.03	83.	275.16	96.	275.29	114.	275.42	119.	275.54	115.	275.67	95.	275.80	70.	275.93	51.		
276.05	47.8	276.18	39.1	276.31	33.2	276.44	35.7	276.57	34.9	276.69	31.9	276.82	34.2	276.95	30.8		
277.08	30.1	277.21	22.2	277.34	24.2	277.46	27.6	277.59	25.8	277.72	20.4	277.85	16.3	277.98	15.8		
278.11	13.1	278.24	13.1	278.37	16.7	278.50	12.2	278.63	10.8	278.76	11.1	278.89	6.9	279.02	7.0		
279.15	12.0	279.28	7.2	279.41	1.7	279.54	5.6	279.67	4.0	279.80	-0.3	279.93	3.1	280.06	1.9		

E	$\frac{P}{N}E$														
eV	beV ^{1/2}														
280.19	2.8	280.32	5.6	280.45	4.3	280.58	4.5	280.71	0.4	280.84	1.7	280.98	2.6	281.11	4.5
281.24	3.1	281.37	2.4	281.50	3.1	281.63	0.1	281.76	-0.1	281.90	1.0	282.03	4.5	282.16	11.6
282.29	17.1	282.42	28.3	282.56	36.4	282.69	37.3	282.82	36.4	282.95	28.6	283.09	14.6	283.22	8.7
283.35	7.5	283.49	4.0	283.62	2.9	283.75	4.5	283.89	4.5	284.02	-1.2	284.15	2.0	284.29	-0.3
284.42	5.2	284.55	1.6	284.69	1.3	284.82	1.8	284.95	-0.7	285.09	1.5	285.22	-0.5	285.36	4.3
285.49	1.5	285.63	2.3	285.76	0.4	285.90	3.0	286.03	-1.2	286.16	3.4	286.30	1.6	286.43	2.9
286.57	-0.5	286.71	3.7	286.84	5.9	286.98	5.7	287.11	3.7	287.25	3.2	287.38	0.6	287.52	8.0
287.65	2.7	287.79	4.4	287.93	4.3	288.06	4.4	288.20	1.4	288.34	2.5	288.47	5.3	288.61	3.2
288.75	5.8	288.88	9.7	289.02	4.6	289.16	5.5	289.29	4.9	289.43	6.4	289.57	5.8	289.71	9.7
289.84	16.	289.98	18.	290.12	21.	290.26	53.	290.39	137.	290.53	286.	290.67	579.	290.81	1051.
290.95	1642.	291.08	2111.	291.22	2278.	291.36	2058.	291.50	1589.	291.64	1018.	291.78	539.	291.92	236.
292.06	108.	292.19	53.	292.33	39.	292.47	36.	292.61	37.	292.75	35.	292.89	31.	293.03	32.
293.17	27.0	293.31	35.5	293.45	32.2	293.59	28.4	293.73	29.8	293.87	28.4	294.01	24.6	294.15	25.8
294.29	29.2	294.43	21.9	294.58	21.6	294.72	23.8	294.86	20.2	295.00	21.6	295.14	13.9	295.28	20.3
295.42	14.1	295.56	14.8	295.71	5.8	295.85	11.5	295.99	11.8	296.13	8.2	296.27	7.8	296.42	5.6
296.56	3.7	296.70	5.7	296.84	4.4	296.99	-0.5	297.13	2.5	297.27	2.6	297.41	4.5	297.56	0.9
297.70	2.1	297.84	2.3	297.99	0.2	298.13	1.8	298.27	3.3	298.42	0.5	298.56	1.4	298.70	1.1
298.85	0.5	298.99	0.5	299.14	3.8	299.28	-0.8	299.42	-1.4	299.57	1.6	299.71	5.5	299.86	-2.1
300.00	1.7	300.15	1.4	300.29	2.3	300.44	-2.2	300.58	-0.2	300.73	3.6	300.87	0.0	301.02	0.7
301.17	0.0	301.31	0.5	301.45	0.2	301.60	0.3	301.75	0.3	301.89	1.9	302.04	0.0	302.19	1.4
302.33	2.2	302.48	0.9	302.63	0.2	302.77	0.3	302.92	3.6	303.07	-0.0	303.21	1.7	303.36	2.9
303.51	0.2	303.66	-0.2	303.80	-0.5	303.95	-0.0	304.10	4.6	304.25	-1.4	304.40	2.6	304.54	3.6
304.69	-2.1	304.84	-0.7	304.99	2.2	305.14	4.1	305.29	1.0	305.43	4.1	305.58	3.3	305.73	3.1
305.88	0.9	306.03	0.0	306.18	2.5	306.33	0.4	306.48	2.0	306.63	1.8	306.78	-1.1	306.93	-1.3
307.08	-2.5	307.23	-2.9	307.38	-1.8	307.53	-0.5	307.68	3.3	307.83	6.1	307.98	5.9	308.13	4.0
308.28	7.1	308.43	4.6	308.58	6.3	308.73	0.6	308.88	-1.3	309.04	-0.3	309.19	-1.5	309.34	4.4
309.49	1.9	309.64	0.6	309.79	1.8	309.95	2.3	310.10	3.0	310.25	3.0	310.40	7.8	310.56	6.8
310.71	18.	310.86	47.	311.01	87.	311.17	169.	311.32	263.	311.47	333.	311.63	336.	311.78	267.
311.93	14.3	312.09	72.	312.24	22.	312.39	10.	312.55	5.	312.70	5.	312.86	4.	313.01	6.
313.16	5.2	313.32	7.0	313.47	4.3	313.63	8.4	313.78	6.0	313.94	8.7	314.09	5.8	314.25	11.3
314.40	6.5	314.56	7.0	314.71	8.4	314.87	3.3	315.03	2.9	315.18	5.8	315.34	1.2	315.49	-1.5
315.65	4.8	315.81	3.1	315.96	6.0	316.12	1.5	316.28	4.1	316.43	0.9	316.59	1.0	316.75	1.5
316.90	-1.2	317.06	-1.2	317.22	2.4	317.38	1.2	317.53	-1.4	317.69	1.4	317.85	1.9	318.01	0.3
318.17	-3.9	318.32	0.8	318.48	1.4	318.64	0.2	318.80	-2.7	318.96	4.4	319.12	-0.5	319.28	-0.2
319.43	2.5	319.55	1.2	319.75	3.7	319.91	0.8	320.07	-0.7	320.23	0.2	320.39	0.3	320.55	1.3
320.71	0.5	320.87	-1.0	321.03	2.2	321.19	-1.4	321.35	4.1	321.51	0.7	321.67	-0.0	321.83	3.0
322.00	0.8	322.16	0.7	322.32	4.9	322.48	3.5	322.64	6.2	322.80	11.3	322.96	15.7	323.13	11.1
323.29	9.1	323.45	5.6	323.61	1.5	323.77	0.1	323.94	1.1	324.10	0.6	324.26	4.9	324.42	2.2
324.59	1.1	324.75	0.3	324.91	2.5	325.08	1.5	325.24	-1.1	325.40	0.5	325.57	-1.1	325.73	0.1
325.90	0.6	325.06	0.3	325.22	0.5	325.39	3.3	325.55	2.6	325.72	-1.7	325.88	1.5	327.05	0.3
327.21	2.1	327.38	1.3	327.54	2.3	327.71	-0.1	327.87	1.5	328.04	1.5	328.20	0.4	328.37	3.1
328.53	-0.2	328.70	-0.7	328.87	2.0	329.03	-0.7	329.20	0.9	329.37	0.9	329.53	-0.6	329.70	2.3
329.87	0.8	330.03	0.9	330.20	1.5	330.37	-0.7	330.54	0.9	330.70	-0.2	330.87	0.3	331.04	1.3
331.21	1.4	331.37	1.3	331.54	2.1	331.71	1.9	331.88	11.0	332.05	11.2	332.22	15.7	332.39	13.2
332.55	11.5	332.72	6.0	332.89	5.0	333.06	3.3	333.23	1.9	333.40	1.9	333.57	1.4	333.74	2.6
333.91	3.6	334.08	1.9	334.25	0.3	334.42	1.1	334.59	-0.3	334.76	3.6	334.93	4.1	335.10	1.1
335.27	-0.8	335.45	-0.3	335.62	-1.1	335.79	1.9	335.96	-0.4	336.13	1.4	336.30	2.9	336.48	0.7
336.65	0.2	336.82	6.3	336.99	9.3	337.16	14.6	337.34	23.5	337.51	33.5	337.68	37.2	337.86	19.3
338.03	12.3	338.20	8.8	338.38	2.6	338.55	1.9	338.72	3.4	338.90	3.9	339.07	2.4	339.24	-0.6
339.42	1.4	339.59	1.7	339.77	0.1	339.94	2.2	340.12	0.9	340.29	-0.8	340.47	3.7	340.64	2.9
340.82	3.5	340.99	4.0	341.17	0.0	341.34	3.4	341.52	5.2	341.70	1.5	341.87	2.4	342.05	2.0
342.22	2.9	342.40	5.5	342.58	2.7	342.75	3.4	342.93	-0.1	343.11	1.5	343.29	5.5	343.46	5.0
343.64	1.0	343.82	4.2	344.00	5.0	344.17	5.5	344.35	5.7	344.53	8.3	344.71	8.3	344.89	8.2
345.06	6.5	345.24	9.5	345.42	14.8	345.60	16.8	345.78	14.8	345.96	24.2	346.14	23.7	346.32	33.2
346.50	36.	346.68	58.	346.86	87.	347.04	173.	347.22	331.	347.40	648.	347.58	1063.	347.76	1437.

E eV	P/ N/E bev ^{1/2}																		
347.94	1608.	348.12	1591.	348.30	142.9.	348.48	1117.	348.67	672.	348.85	363.	349.03	182.	349.21	110.				
349.39	85.2	349.57	66.1	349.76	63.4	349.94	59.6	350.12	45.6	350.30	45.2	350.49	38.2	350.67	38.0				
350.85	33.2	351.04	34.2	351.22	33.7	351.40	38.3	351.59	43.5	351.77	62.6	351.95	81.2	352.14	91.5				
352.32	83.3	352.51	59.3	352.69	38.5	352.88	25.9	353.06	15.9	353.25	18.3	353.43	15.7	353.62	16.7				
353.80	21.3	353.99	15.4	354.17	15.8	354.36	13.5	354.54	7.6	354.73	10.3	354.92	3.7	355.10	5.3				
355.29	5.5	355.48	8.3	355.66	4.2	355.85	5.2	356.04	3.7	356.23	5.5	356.41	2.4	356.60	2.7				
356.79	3.0	356.98	4.0	357.16	0.9	357.35	4.7	357.54	4.7	357.73	0.1	357.92	-1.7	358.11	5.1				
358.30	3.3	358.48	4.6	358.67	1.6	358.86	2.4	359.05	-1.7	359.24	-0.4	359.43	-0.6	359.62	0.8				
359.81	1.0	360.00	1.1	360.19	-0.3	360.38	1.9	360.57	2.6	360.76	0.1	360.96	0.8	361.15	1.1				
361.34	5.4	361.53	-0.4	361.72	0.1	361.91	-0.0	362.11	0.3	362.30	3.4	362.49	-1.8	362.68	1.9				
362.87	2.3	363.07	1.8	363.26	-0.7	363.45	0.1	363.65	3.9	363.84	1.3	364.03	1.9	364.23	0.1				
364.42	0.9	364.61	0.9	364.81	1.1	365.00	2.1	365.20	1.7	365.39	0.3	365.59	-1.4	365.78	4.8				
365.98	5.3	366.17	3.2	366.37	3.4	366.56	3.5	366.76	1.9	366.95	1.4	367.15	-0.2	367.35	0.8				
367.54	-0.1	367.74	1.1	367.94	1.4	368.13	1.7	368.33	1.4	368.53	-1.4	368.72	3.7	368.92	-2.0				
369.12	-2.2	369.32	2.9	369.51	2.2	369.71	3.6	369.91	-3.6	370.11	2.7	370.31	-0.9	370.51	5.6				
370.70	1.7	370.90	3.9	371.10	-0.2	371.30	1.1	371.50	2.2	371.70	2.8	371.90	0.9	372.10	2.5				
372.30	1.9	372.50	7.5	372.70	5.8	372.90	7.2	373.10	6.7	373.30	9.6	373.51	7.2	373.71	2.2				
373.91	0.6	374.11	0.2	374.31	-1.1	374.51	1.5	374.72	2.0	374.92	2.0	375.12	2.3	375.32	1.8				
375.53	6.	375.73	7.	375.93	5.	376.13	15.	376.34	26.	376.54	73.	376.74	126.	376.95	231.				
377.15	234.	377.36	260.	377.56	159.	377.77	73.	377.97	24.	378.18	8.	378.38	8.	378.59	2.				
378.79	3.3	379.00	4.9	379.20	1.2	379.41	2.0	379.61	8.0	379.82	4.8	380.03	6.7	380.23	10.4				
380.44	5.3	380.65	6.7	380.85	5.6	381.06	4.4	381.27	4.8	381.48	3.5	381.68	5.1	381.89	0.7				
382.10	1.0	382.31	2.7	382.52	-1.2	382.73	1.7	382.93	2.3	383.14	2.0	383.35	2.0	383.56	-1.1				
383.77	2.0	383.98	4.1	384.19	1.8	384.40	2.3	384.61	-0.6	384.82	0.5	385.03	-2.0	385.24	1.4				
385.45	0.9	385.66	3.3	385.87	-0.1	386.09	0.7	386.30	0.2	386.51	1.5	386.72	0.1	386.93	0.4				
387.14	2.0	387.36	-2.0	387.57	-0.6	387.78	-1.1	388.00	1.0	388.21	1.8	388.42	3.4	388.64	1.5				
388.85	2.8	389.06	1.2	389.28	1.3	389.49	2.1	389.71	2.9	389.92	0.0	390.13	0.5	390.35	3.1				
390.56	3.8	390.78	2.1	390.99	3.6	391.21	5.5	391.43	4.8	391.64	5.0	391.86	-0.3	392.07	-0.3				
392.29	0.4	392.51	-2.2	392.72	-0.9	392.94	3.9	393.16	0.3	393.38	2.7	393.59	1.5	393.81	2.1				
394.03	2.4	394.25	4.5	394.46	2.1	394.68	4.3	394.90	10.3	395.12	13.3	395.34	19.7	395.56	13.9				
395.78	6.	396.00	4.	396.22	4.	396.44	7.	396.66	16.	396.88	55.	397.10	139.	397.32	361.				
397.54	742.	397.76	1041.	397.98	1072.	398.20	752.	398.42	360.	398.65	120.	398.87	40.	399.09	17.				
399.31	7.6	399.54	9.5	399.76	9.5	399.98	14.5	400.20	14.0	400.43	13.3	400.65	16.4	400.87	21.0				
401.10	14.8	401.32	16.4	401.55	19.5	401.77	15.9	401.99	11.7	402.22	5.4	402.44	9.5	402.67	10.9				
402.89	9.8	403.12	8.7	403.35	3.3	403.57	7.6	403.80	0.9	404.02	5.0	404.25	5.7	404.46	2.3				
404.70	8.1	404.93	1.7	405.16	3.8	405.39	0.9	405.61	2.7	405.84	2.7	406.07	4.4	406.30	3.4				
406.52	1.9	406.75	4.5	406.98	3.3	407.21	3.1	407.44	4.4	407.67	11.0	407.90	12.6	408.13	17.7				
408.36	22.	408.59	24.	408.82	23.	409.05	25.	409.28	50.	409.51	133.	409.74	360.	409.97	859.				
410.20	1511.	410.44	1933.	410.67	1758.	410.90	1161.	411.13	504.	411.36	166.	411.60	59.	411.83	29.				
412.06	23.1	412.30	21.4	412.53	24.5	412.76	24.7	413.00	26.4	413.23	28.3	413.47	31.1	413.70	31.7				
413.88	20.3	413.99	26.7	414.11	26.1	414.23	22.9	414.35	22.1	414.46	28.9	414.58	28.3	414.70	22.3				
414.82	14.0	414.93	20.4	415.05	14.3	415.17	17.5	415.29	17.7	415.40	18.4	415.52	10.6	415.64	12.1				
415.76	12.8	415.88	12.1	416.00	11.5	416.11	18.4	416.23	9.6	416.35	8.9	416.47	10.0	416.59	13.3				
416.71	3.1	416.82	9.5	416.94	5.6	417.06	2.6	417.18	4.0	417.30	-0.3	417.42	3.7	417.54	7.0				
417.66	2.2	417.77	7.0	417.89	2.5	418.01	2.5	418.13	2.5	418.25	2.2	418.37	-1.5	418.49	2.2				
418.61	-0.3	418.73	-1.6	418.85	-1.2	418.97	-2.2	419.09	-1.5	419.21	-3.5	419.33	0.0	419.45	3.2				
419.56	-1.2	419.68	1.0	419.80	4.3	419.92	3.2	420.04	1.6	420.16	1.9	420.28	0.0	420.40	4.1				
420.52	-0.9	420.64	2.2	420.77	-1.2	420.89	1.9	421.01	2.8	421.13	3.8	421.25	-1.2	421.37	-1.9				
421.49	2.5	421.61	-1.6	421.73	1.2	421.85	2.2	421.97	5.9	422.09	-1.6	422.21	-0.6	422.33	3.5				
422.45	0.6	422.57	4.4	422.70	0.3	422.82	4.4	422.94	1.9	423.06	0.6	423.18	-0.9	423.30	-0.3				
423.42	0.3	423.54	0.9	423.67	2.2	423.79	2.5	423.91	3.1	424.03	0.6	424.15	0.3	424.27	5.7				
424.40	-0.3	424.52	4.7	424.64	-0.9	424.76	4.4	424.88	-2.2	425.01	5.6	425.13	1.8	425.25	1.3				
425.37	0.9	425.49	0.6	425.62	0.9	425.74	2.2	425.86	1.2	425.98	0.9	426.11	1.2	426.23	2.8				
426.35	-1.6	426.48	4.4	426.60	-4.0	426.72	5.0	426.84	0.6	426.97	0.6	427.09	-0.6	427.21	-0.6				
427.34	3.1	427.46	-3.5	427.58	-0.3	427.70	-0.0	427.83	-0.6	427.95	4.1	428.07	0.3	428.20	1.9				

8

E	$\frac{P}{N}E$															
eV	beV ^{1/2}	eV														
488.32	32.	488.47	56.	488.62	76.	488.77	129.	488.92	160.	489.07	169.	489.22	156.	489.37	158.	
489.52	94.9	489.67	75.8	489.83	39.8	489.98	19.7	490.13	9.5	490.28	5.8	490.43	-0.8	490.58	4.9	
490.73	4.2	490.88	2.8	491.04	-0.5	491.19	3.1	491.34	-1.4	491.49	0.7	491.64	4.2	491.79	0.4	
491.95	4.2	492.10	3.7	492.25	2.5	492.40	1.9	492.55	6.0	492.71	3.1	492.86	1.9	493.01	-0.2	
493.17	4.6	493.32	7.4	493.47	5.1	493.62	3.4	493.78	6.9	493.93	8.6	494.08	4.0	494.24	4.3	
494.39	3.1	494.54	2.2	494.69	3.4	494.85	6.2	495.00	1.3	495.16	-0.5	495.31	1.3	495.46	1.3	
495.62	0.4	495.77	1.3	495.92	-1.4	496.08	-0.8	496.23	2.2	496.39	3.4	496.54	-1.1	496.69	-0.5	
496.85	1.6	497.00	-2.0	497.16	-2.6	497.31	5.2	497.47	1.3	497.62	1.9	497.78	0.7	497.93	4.6	
498.09	2.2	498.24	-1.4	498.40	3.3	498.55	10.7	498.71	12.8	498.86	19.1	499.02	16.6	499.17	20.0	
499.33	21.7	499.48	22.1	499.64	14.3	499.79	8.5	499.95	1.9	500.10	-0.8	500.26	0.4	500.42	5.8	
500.57	0.1	500.73	6.4	500.89	-0.2	501.04	1.0	501.20	-0.5	501.35	1.0	501.51	-2.9	501.67	1.0	
501.82	1.3	501.98	8.2	502.14	0.1	502.29	3.7	502.45	1.8	502.61	2.5	502.76	2.1	502.92	1.9	
503.08	2.4	503.24	0.1	503.39	0.4	503.55	1.6	503.71	4.8	503.87	4.0	504.02	-1.1	504.18	0.7	
504.34	-1.7	504.50	2.8	504.66	0.4	504.81	0.1	504.97	0.4	505.13	4.9	505.29	-1.1	505.45	2.8	
505.60	-0.5	505.76	1.3	505.92	0.1	506.08	4.6	506.24	3.1	506.40	1.0	506.56	-0.5	506.72	-1.7	
506.87	2.2	507.03	1.0	507.19	3.7	507.35	1.3	507.51	3.4	507.67	-4.1	507.83	4.5	507.99	2.2	
508.15	-1.7	508.31	-0.5	508.47	3.6	508.63	1.9	508.79	-0.2	508.95	1.0	509.11	-1.4	509.27	2.5	
509.43	-1.7	509.59	1.6	509.75	2.8	509.91	-0.2	510.07	1.0	510.23	2.8	510.39	2.2	510.55	4.3	
510.71	-1.7	510.87	-1.1	511.03	4.2	511.19	5.8	511.36	-1.4	511.52	-2.0	511.68	0.4	511.84	5.2	
512.00	0.4	512.16	7.3	512.32	1.0	512.49	5.2	512.65	4.2	512.81	6.7	512.97	3.9	513.13	0.1	
513.29	-2.6	513.46	-2.9	513.62	2.7	513.78	2.8	513.94	4.2	514.11	-0.2	514.27	2.4	514.43	2.2	
514.59	3.9	514.76	7.0	514.92	5.1	515.08	1.3	515.24	1.8	515.41	2.8	515.57	6.8	515.73	8.8	
515.90	3.3	516.06	9.7	516.22	8.3	516.39	16.0	516.55	10.1	516.71	14.2	516.88	25.3	517.04	31.9	
517.21	65.	517.37	100.	517.53	169.	517.70	310.	517.86	484.	518.03	793.	518.19	1083.	518.36	1523.	
518.52	1584.	518.68	1761.	518.85	1531.	519.01	1375.	519.18	897.	519.34	629.	519.51	321.	519.67	181.	
519.84	82.4	520.00	56.1	520.17	38.5	520.33	29.8	520.50	21.9	520.67	25.1	520.83	17.5	521.00	22.7	
521.16	21.6	521.33	22.4	521.49	16.9	521.66	20.3	521.83	22.8	521.99	20.3	522.16	16.6	522.32	25.0	
522.49	20.7	522.66	24.5	522.82	26.8	522.99	37.9	523.16	48.5	523.32	53.4	523.49	62.5	523.66	72.9	
523.82	69.0	523.99	55.3	524.16	31.3	524.33	38.7	524.49	20.8	524.66	15.6	524.83	10.8	525.00	8.7	
525.18	14.0	525.33	13.2	525.50	11.1	525.67	8.1	525.84	7.0	526.00	13.2	526.17	8.8	526.34	8.1	
526.51	7.0	526.68	11.7	526.85	8.2	527.01	13.2	527.18	6.2	527.35	8.3	527.52	9.1	527.69	6.9	
527.86	0.8	528.03	4.2	528.20	8.5	528.36	6.3	528.53	7.4	528.70	3.0	528.87	3.8	529.04	3.9	
529.21	2.9	529.38	9.6	529.55	-0.6	529.72	3.0	529.89	6.2	530.06	8.0	530.23	2.7	530.40	7.2	
530.57	1.5	530.74	5.4	530.91	0.9	531.08	6.6	531.25	3.8	531.42	4.5	531.59	2.9	531.77	11.9	
531.94	8.5	532.11	13.7	532.28	15.8	532.45	20.6	532.62	14.9	532.79	14.9	532.96	13.4	533.14	11.0	
533.31	11.1	533.48	19.	533.65	20.	533.82	28.	533.99	38.	534.17	64.	534.34	97.	534.51	204.	
534.68	344.	534.85	654.	535.03	925.	535.20	1420.	535.37	1537.	535.54	1832.	535.72	1617.	535.89	1524.	
536.06	1073.	536.24	749.	536.41	38.6	536.58	209.	536.76	89.	536.93	60.	537.10	37.	537.28	25.	
537.45	24.0	537.62	25.4	537.80	26.0	537.97	17.1	538.14	16.4	538.32	26.3	538.49	21.1	538.67	19.2	
538.94	17.0	539.02	20.3	539.19	18.5	539.36	14.4	539.54	20.5	539.71	15.3	539.89	19.8	540.06	21.5	
540.24	29.8	540.41	15.3	540.59	15.0	540.76	17.7	540.94	11.2	541.11	21.5	541.29	10.6	541.47	14.7	
541.64	12.6	541.82	16.5	541.99	19.8	542.17	24.1	542.34	25.9	542.52	31.2	542.70	28.5	542.87	29.7	
543.05	19.6	543.23	22.3	543.40	13.8	543.58	12.3	543.75	7.4	543.93	11.1	544.11	4.8	544.29	6.7	
544.46	2.2	544.64	6.4	544.82	6.3	544.99	3.3	545.17	6.0	545.35	0.5	545.53	0.8	545.70	2.9	
545.88	2.8	546.06	4.1	546.24	-0.9	546.41	7.6	546.59	-1.8	546.77	2.0	546.95	-2.7	547.13	4.9	
547.31	0.5	547.48	3.8	547.66	5.1	547.84	-0.1	548.02	1.1	548.20	4.8	548.38	5.1	548.56	3.7	
548.74	2.2	548.91	-1.3	549.09	6.2	549.27	-2.1	549.45	2.8	549.63	-0.7	549.81	0.5	549.99	5.2	
550.17	6.0	550.35	4.0	550.53	8.0	550.71	11.7	550.89	12.8	551.07	15.5	551.25	4.8	551.43	16.1	
551.61	11.1	551.79	4.3	551.97	0.8	552.15	0.5	552.34	1.1	552.52	-2.1	552.70	1.3	552.88	4.0	
553.06	0.5	553.24	3.1	553.42	1.3	553.60	2.8	553.79	2.2	553.97	-0.7	554.15	4.2	554.33	0.2	
554.51	0.5	554.69	6.1	554.88	2.2	555.06	1.1	555.24	9.4	555.42	14.9	555.61	32.7	555.79	68.9	
555.97	85.	556.15	114.	556.34	126.	556.52	141.	556.70	111.	556.89	89.	557.07	70.	557.25	50.	
557.44	28.1	557.62	18.4	557.80	9.4	557.99	3.2	558.17	1.7	558.35	1.4	558.54	2.2	558.72	1.7	
558.91	-0.1	559.09	4.6	559.27	2.8	559.46	4.0	559.64	0.5	559.83	3.7	560.01	3.4	560.20	2.3	
560.38	0.2	560.57	3.4	560.75	3.1	560.94	6.1	561.12	-0.1	561.31	4.0	561.49	1.4	561.68	6.7	

E	P _{N/E}														
eV	beV ^{1/2}														
561.85	3.4	562.05	1.4	562.23	4.2	562.42	6.1	562.61	1.4	562.79	1.7	562.98	0.2	563.16	-0.1
563.35	2.5	563.54	5.8	563.72	-0.9	563.91	1.4	564.10	1.3	564.28	5.5	564.47	-0.4	564.66	-0.1
564.84	2.5	565.03	0.8	565.22	0.2	565.41	5.5	565.59	0.5	565.78	3.7	565.97	2.8	566.16	3.1
566.34	0.5	566.53	4.6	566.72	2.5	566.91	7.8	567.10	0.2	567.28	2.2	567.47	2.8	567.66	1.4
567.85	-0.9	568.04	2.8	568.23	3.3	568.41	4.3	568.60	-1.8	568.79	4.0	568.98	3.9	569.17	-0.1
569.36	3.0	569.55	3.4	569.74	0.2	569.93	1.7	570.12	1.0	570.31	1.1	570.50	-4.1	570.69	5.4
570.88	-0.7	571.07	-1.6	571.26	-1.8	571.45	6.2	571.64	-3.5	571.83	-0.1	572.02	1.6	572.21	1.4
572.40	0.5	572.59	0.5	572.78	0.2	572.97	2.8	573.17	0.8	573.36	0.5	573.55	1.6	573.74	3.1
573.93	-0.4	574.12	4.3	574.31	1.9	574.51	4.0	574.70	2.5	574.89	2.8	575.08	1.6	575.27	3.4
575.47	0.5	575.65	2.8	575.85	2.7	576.04	7.7	576.24	1.9	576.43	1.0	576.62	1.6	576.82	5.4
577.01	2.7	577.20	9.2	577.40	3.9	577.59	2.8	577.78	5.6	577.98	9.5	578.17	4.4	578.36	13.8
578.56	17.	578.75	37.	578.94	5.5	579.14	138.	579.33	211.	579.53	439.	579.72	709.	579.92	1130.
580.11	1363.	580.31	1723.	580.50	1590.	580.70	1462.	580.89	952.	581.09	659.	581.28	306.	581.48	149.
581.67	59.1	581.87	39.8	582.06	23.9	582.26	22.7	582.45	20.3	582.65	23.0	582.85	14.3	583.04	22.1
583.24	18.6	583.44	18.1	583.63	23.4	583.83	25.3	584.02	23.4	584.22	32.3	584.42	27.0	584.62	39.5
584.81	36.1	585.01	28.5	585.21	30.7	585.40	27.9	585.60	18.0	585.80	20.1	586.00	12.0	586.19	19.2
586.39	10.3	586.59	12.9	586.79	10.0	586.99	16.9	587.18	9.2	587.38	7.4	587.58	6.1	587.78	7.9
587.98	8.6	588.18	12.0	588.38	5.8	588.57	12.5	588.77	4.4	588.97	13.1	589.17	2.9	589.37	5.6
589.57	7.2	589.77	9.9	589.97	6.0	590.17	8.5	590.37	3.8	590.57	4.5	590.77	3.5	590.97	5.0
591.17	6.1	591.37	5.6	591.57	8.1	591.77	7.9	591.97	8.1	592.17	6.2	592.37	10.6	592.57	5.3
592.78	17.	592.98	19.	593.18	20.	593.38	32.	593.58	47.	593.78	81.	593.98	120.	594.19	241.
594.39	384.	594.59	674.	594.79	91.9	594.99	1308.	595.20	1379.	595.40	1485.	595.60	1282.	595.80	1038.
596.01	686.	596.21	438.	596.41	202.	596.61	118.	596.82	61.	597.02	43.	597.22	36.	597.43	38.
597.53	27.9	597.73	28.5	598.04	14.7	598.24	21.9	598.45	19.8	598.65	21.9	598.85	23.4	599.06	15.6
599.26	20.9	599.47	21.0	599.67	14.1	599.88	20.7	600.08	16.4	600.29	26.2	600.49	12.4	600.70	15.0
600.90	11.0	601.11	14.7	601.31	12.1	601.52	17.9	601.72	10.7	601.93	17.9	602.14	9.3	602.34	15.8
602.55	7.9	602.75	15.0	602.96	9.9	603.17	10.1	603.37	8.2	603.58	11.0	603.79	8.2	603.99	9.2
604.20	8.5	604.43	9.8	604.61	9.6	604.82	9.2	605.03	15.5	605.24	14.1	605.44	11.0	605.65	8.4
605.85	11.0	606.07	9.2	606.27	14.3	606.48	24.1	606.69	35.9	606.90	47.8	607.11	45.1	607.32	47.3
607.57	27.2	607.73	18.9	607.94	7.3	608.15	8.4	608.36	3.4	608.57	2.1	608.78	1.7	608.99	0.1
609.20	1.2	609.41	2.9	609.62	2.3	609.83	-0.5	610.04	-1.1	610.25	4.1	610.46	2.3	610.67	1.2
610.88	7.3	611.09	5.8	611.30	1.5	611.51	5.8	611.72	-1.8	611.93	-0.8	612.14	1.7	612.35	2.6
612.56	2.6	612.77	1.5	612.99	0.3	613.20	1.8	613.41	0.9	613.62	5.5	613.83	3.1	614.04	6.6
614.26	1.7	614.47	5.6	614.68	2.8	614.89	4.6	615.11	0.0	615.32	8.3	615.53	8.1	615.74	15.2
615.96	20.7	616.17	25.4	616.38	27.7	616.60	24.6	616.81	10.9	617.02	13.2	617.24	0.9	617.45	3.7
617.66	4.	617.88	10.	618.09	8.	618.31	18.	618.52	30.	618.74	53.	618.95	96.	619.16	224.
619.38	375.	619.59	717.	619.81	1025.	620.02	1432.	620.24	1487.	620.45	1456.	620.67	1060.	620.89	709.
621.10	341.	621.32	152.	621.53	59.	621.75	31.	621.97	14.	622.18	18.	622.40	13.	622.61	15.
622.83	14.	623.05	19.	623.26	23.	623.48	35.	623.70	47.	623.91	87.	624.13	111.	624.35	147.
624.57	134.	624.78	114.	625.00	81.	625.22	60.	625.44	24.	625.66	18.	625.87	16.	626.09	14.
626.31	14.	626.53	17.	626.75	16.	626.97	20.	627.19	18.	627.40	40.	627.62	54.	627.84	151.
628.06	218.	628.28	424.	628.50	558.	628.72	767.	628.94	671.	629.16	583.	629.38	359.	629.60	207.
629.82	84.1	630.04	31.0	630.26	15.7	630.48	14.9	630.70	10.7	630.92	7.6	631.14	9.9	631.36	7.3
631.59	6.8	631.81	8.7	632.03	3.5	632.25	14.9	632.47	10.1	632.69	12.3	632.91	15.6	633.14	29.0
633.36	34.4	633.58	36.8	633.80	28.9	634.03	29.0	634.25	11.2	634.47	16.0	634.69	7.9	634.92	8.4
635.14	4.9	635.36	11.5	635.59	6.6	635.81	5.0	636.03	12.6	636.28	10.5	636.48	7.7	636.70	8.7
636.93	6.6	637.15	6.4	637.38	4.6	637.60	3.0	637.82	2.4	638.05	7.3	638.27	5.7	638.50	8.4
638.72	3.5	638.95	0.5	639.17	2.1	639.40	-1.5	639.62	1.0	639.85	1.1	640.07	3.0	640.30	-0.6
640.53	-1.4	640.75	6.1	640.98	1.3	641.20	2.7	641.43	-2.0	641.66	2.2	641.88	1.6	642.11	8.1
642.34	-3.4	642.56	-1.8	642.79	0.5	643.02	3.0	643.25	2.9	643.47	2.7	643.70	4.9	643.93	1.0
644.16	0.7	644.38	3.3	644.61	-0.4	644.84	1.0	645.07	1.8	645.30	3.0	645.52	0.2	645.75	5.3
645.98	0.7	646.21	2.7	646.44	0.2	646.67	-0.5	646.90	8.4	647.13	6.6	647.36	6.6	647.59	8.6
647.82	0.2	648.05	4.7	648.28	5.7	648.51	5.2	648.74	-1.5	648.97	-0.9	649.20	2.7	649.43	1.0
649.56	3.2	649.89	5.0	650.12	-1.7	650.35	2.2	650.58	-1.7	650.81	6.1	651.04	0.2	651.28	2.7
651.51	3.7	651.74	4.1	651.97	0.5	652.20	1.0	652.44	-2.0	652.67	4.4	652.90	2.6	653.13	-0.1

E	P _{N/E}	E	P _{N/E}	E	P _{N/E}	D _{N/E}														
eV	bey ^{1/2}	eV	bey ^{1/2}	eV	bey ^{1/2}															
653.37	3.2	653.60	7.2	653.83	4.6	654.06	5.8	654.30	1.6	654.53	5.0	654.76	0.5	655.00	4.4					
655.23	6.2	655.47	4.7	655.70	5.1	655.93	1.6	656.17	6.2	656.40	3.5	656.64	6.2	656.87	4.7					
657.10	6.7	657.34	10.2	657.57	9.5	657.81	12.5	658.04	7.6	658.28	6.6	658.52	9.7	658.75	20.0					
658.99	22.	659.22	78.	659.46	35.	659.69	74.	659.93	111.	660.17	214.	660.40	323.	660.64	611.					
660.88	849.	661.11	1178.	661.35	1221.	661.59	1314.	661.82	1014.	662.06	810.	662.30	509.	662.54	336.					
662.77	142.	663.01	89.	663.25	55.	663.49	40.	663.73	30.	663.96	32.	664.20	23.	664.44	25.					
664.69	26.2	664.92	21.8	665.16	21.6	665.40	17.9	665.64	16.2	665.88	26.0	666.12	20.2	666.36	19.8					
666.59	14.2	666.83	15.9	667.07	13.7	667.32	22.9	667.56	13.4	667.80	20.1	668.04	19.4	668.28	29.2					
668.52	31.3	668.76	42.8	669.00	32.7	669.24	35.1	669.48	22.6	669.72	12.3	669.97	10.7	670.21	6.5					
670.45	6.6	670.59	8.4	670.93	10.4	671.17	14.0	671.42	10.4	671.58	13.4	671.90	7.7	672.15	11.5					
672.39	4.2	672.63	2.6	672.87	6.3	673.12	7.9	673.36	2.5	673.60	2.9	673.85	3.1	674.09	2.6					
674.34	1.2	674.58	7.3	674.82	3.6	675.07	2.6	675.31	3.6	675.56	0.9	675.80	3.9	676.05	7.3					
676.29	5.5	676.54	5.4	676.78	12.0	677.03	20.1	677.27	33.4	677.52	62.4	677.76	77.1	678.01	85.4					
678.26	83.8	678.50	70.4	678.75	36.1	679.00	13.7	679.24	B.0	679.49	7.0	679.74	-0.4	679.98	3.2					
680.23	0.1	680.48	2.9	680.72	0.9	680.97	2.0	681.22	2.8	681.47	2.6	681.72	8.5	681.96	8.1					
682.21	3.1	682.45	3.1	682.71	9.8	682.96	2.0	683.21	5.8	683.46	2.9	683.70	6.3	683.95	5.9					
684.20	4.2	684.45	3.4	684.70	0.1	684.95	1.5	685.20	2.8	685.45	1.8	685.70	2.5	685.95	6.4					
686.20	-2.6	686.45	4.5	686.70	0.9	686.95	2.9	687.21	4.7	687.46	2.3	687.71	6.0	687.96	6.4					
688.21	5.2	688.46	6.2	688.71	7.6	688.97	8.4	689.22	6.3	689.47	10.3	689.72	4.9	689.97	9.2					
690.23	3.	690.48	4.	690.73	5.	690.99	11.	691.24	15.	691.49	35.	691.75	56.	692.00	144.					
692.25	279.	692.51	542.	692.76	880.	693.02	1306.	693.27	1368.	693.52	1423.	693.78	995.	694.03	676.					
694.29	292.	694.54	118.	694.80	46.	695.05	18.	695.31	19.	695.56	17.	695.82	13.	696.08	13.					
696.33	11.8	696.59	16.5	696.84	15.6	697.10	18.4	697.36	16.1	697.61	32.4	697.87	35.2	698.13	48.3					
698.38	55.1	698.64	57.4	698.90	33.3	699.16	25.9	699.41	16.4	699.67	21.7	699.93	13.2	700.19	10.8					
700.45	8.9	700.71	13.5	700.96	11.1	701.22	9.1	701.48	7.8	701.74	8.8	702.00	7.3	702.26	9.4					
702.52	2.2	702.78	7.2	703.04	11.1	703.30	5.6	703.56	5.5	703.82	5.8	704.08	-0.2	704.34	4.2					
704.60	2.8	704.86	6.1	705.12	2.8	705.38	6.9	705.64	7.1	705.90	5.0	706.16	10.3	706.43	13.5					
706.69	25.	706.95	56.	707.21	101.	707.47	247.	707.74	442.	708.00	825.	708.26	1046.	708.52	1287.					
708.79	1036.	709.05	805.	709.31	408.	709.58	213.	709.84	92.	710.10	108.	710.37	116.	710.63	162.					
710.89	140.	711.16	118.	711.42	66.	711.69	39.	711.95	21.	712.22	15.	712.48	12.	712.75	19.					
713.01	22.5	713.28	28.7	713.54	35.3	713.81	38.3	714.07	42.5	714.34	46.4	714.61	30.7	714.87	30.6					
715.14	16.0	715.41	22.1	715.67	11.2	715.94	13.7	716.21	15.8	716.47	12.8	716.74	10.4	717.01	13.4					
717.28	7.0	717.54	4.7	717.81	4.8	718.08	6.8	718.35	5.1	718.62	5.5	718.88	2.7	719.15	7.4					
719.42	6.	719.69	6.	719.96	7.	720.23	11.	720.50	15.	720.77	36.	721.04	61.	721.31	113.					
721.58	138.	721.85	176.	722.12	144.	722.39	102.	722.66	49.	722.93	16.	723.20	5.	723.47	3.					
723.74	-0.3	724.02	6.3	724.29	0.5	724.56	2.5	724.83	1.3	725.10	1.4	725.37	-1.6	725.65	4.3					
725.92	0.8	726.19	3.3	726.46	4.5	726.74	5.4	727.01	4.8	727.28	6.5	727.56	5.3	727.83	7.3					
728.10	6.	728.38	4.	728.65	5.	728.93	10.	729.20	16.	729.48	43.	729.75	65.	730.02	108.					
730.30	117.	730.57	118.	730.85	77.	731.13	95.	731.40	34.	731.68	56.	731.95	94.	732.23	166.					
732.50	189.	732.78	226.	733.06	200.	733.33	128.	733.61	59.	733.89	25.	734.16	15.	734.44	17.					
734.72	20.1	735.00	24.6	735.27	20.6	735.55	21.4	735.83	8.2	736.11	9.2	736.39	9.8	736.67	11.3					
736.94	1.6	737.22	5.6	737.50	2.1	737.78	2.9	738.06	7.4	738.34	4.9	738.62	9.3	738.90	5.9					
739.18	3.7	739.46	6.2	739.74	5.5	740.02	2.7	740.30	3.2	740.58	5.7	740.86	2.6	741.14	0.5					
741.42	4.2	741.71	1.3	741.99	4.5	742.27	8.6	742.55	14.5	742.83	37.9	743.12	44.7	743.40	50.3					
743.68	38.3	743.96	25.7	744.25	2.6	744.53	4.0	744.81	3.7	745.10	-0.8	745.38	4.5	745.66	4.3					
744.95	-0.8	746.23	1.9	746.51	1.0	746.80	4.8	747.08	-0.3	747.37	-1.4	747.65	0.8	747.94	0.8					
748.22	-2.7	748.51	2.4	748.79	1.0	749.08	4.8	749.36	6.0	749.65	1.9	749.94	1.8	750.22	2.9					
750.51	0.5	750.80	-0.0	751.08	3.1	751.37	0.5	751.66	-1.9	751.94	1.9	752.23	1.0	752.52	2.4					
752.81	-3.2	753.09	3.5	753.38	0.5	753.67	4.8	753.96	1.8	754.25	3.5	754.54	0.2	754.83	6.4					
755.11	1.0	755.40	10.7	755.69	25.6	755.98	46.3	756.27	62.5	756.56	78.4	756.85	45.6	757.14	32.8					
757.43	13.9	757.72	6.7	758.01	0.5	758.31	3.2	758.60	-2.1	758.89	4.0	759.18	3.1	759.47	5.3					
759.76	1.3	760.05	5.1	760.35	1.3	760.64	-0.3	760.93	5.0	761.22	-1.4	761.52	4.4	761.81	4.3					
762.10	6.	762.40	5.	762.69	4.	762.98	9.	763.28	10.	763.57	24.	763.86	54.	764.16	138.					
764.45	246.	764.75	430.	765.04	583.	765.34	711.	765.63	524.	765.93	356.	766.22	140.	766.52	54.					
766.81	16.8	767.11	9.1	767.41	2.6	767.70	6.1	768.00	4.2	768.30	2.4	768.59	5.5	768.89	4.3					

E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$																
eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}																
769.19	4.9	769.48	7.5	769.78	6.0	770.08	6.1	770.38	7.0	770.68	15.5	770.97	6.5	771.27	12.8								
771.57	8.6	771.87	12.0	772.17	11.0	772.47	6.1	772.77	5.2	773.07	8.8	773.37	10.7	773.67	10.9								
773.96	2.0	774.27	4.5	774.57	4.1	774.87	7.7	775.17	6.0	775.47	3.4	775.77	1.3	776.07	6.1								
776.37	2.0	776.67	2.0	776.97	7.8	777.28	7.7	777.58	4.1	777.88	13.4	778.18	28.8	778.49	71.5								
778.79	103.	779.09	172.	779.39	19.6	779.70	19.6	780.00	125.	780.30	81.	780.61	27.	780.91	18.								
781.22	3.9	781.52	5.6	781.83	4.4	782.13	1.8	782.43	3.3	782.74	2.4	783.04	-1.6	783.35	4.2								
783.66	5.2	783.96	9.3	784.27	1.5	784.57	6.4	784.88	7.8	785.19	13.6	785.49	17.5	785.80	27.5								
786.11	32.1	786.41	42.4	786.72	28.4	787.03	47.2	787.34	48.3	787.65	58.2	787.95	38.1	788.26	25.0								
788.57	1.7	788.88	11.	789.19	1.8	789.50	4.6	789.81	93.	790.11	206.	790.42	345.	790.73	502.								
791.04	514.	791.35	471.	791.66	27.8	791.98	156.	792.29	84.	792.60	49.	792.91	16.	793.22	8.								
793.53	3.6	793.84	2.7	794.15	3.6	794.47	5.8	794.78	0.9	795.09	2.6	795.40	4.9	795.72	0.2								
796.03	3.0	796.34	7.1	796.65	5.4	796.97	9.7	797.28	6.4	797.59	13.5	797.91	10.3	798.22	11.6								
798.54	6.4	798.85	13.2	799.17	6.4	799.48	3.9	799.80	3.8	800.11	8.1	800.43	1.7	800.74	12.7								
801.06	-13.2	801.37	11.1	801.69	11.3	802.01	7.4	802.32	8.0	802.64	0.4	802.96	6.7	803.27	0.7								
803.59	1.5	803.91	6.8	804.23	-0.9	804.55	4.4	804.86	1.2	805.18	1.8	805.50	0.7	805.82	1.0								
806.14	0.4	806.48	5.5	806.78	5.1	807.10	6.5	807.41	13.9	807.73	283.	808.05	35.2	808.37	55.1								
808.70	37.3	809.02	33.6	809.34	12.6	809.66	6.5	809.98	-3.5	810.30	3.9	810.62	3.8	810.94	3.3								
811.26	-7.9	811.59	0.7	811.91	0.2	812.23	7.9	812.55	2.7	812.88	2.3	813.20	0.1	813.52	3.6								
813.85	1.7	814.17	2.8	814.49	-0.9	814.82	0.7	815.14	0.4	815.47	3.6	815.79	-1.9	816.12	3.9								
816.44	1.4	816.77	-1.7	817.09	-0.4	817.42	4.9	817.74	1.7	818.07	5.4	818.39	5.6	818.72	11.0								
819.05	14.	819.37	22.	819.70	3.6	820.03	71.	820.36	153.	820.68	364.	821.01	616.	821.34	1027.								
821.59	104.9	821.75	1324.	821.91	1224.	822.08	1211.	822.24	841.	822.41	794.	822.57	585.	822.73	417.								
822.90	24.4	823.06	183.	823.23	137.	823.39	108.	823.56	76.	823.72	75.	823.89	62.	824.05	67.								
824.22	38.9	824.38	32.5	824.55	22.3	824.71	13.5	824.88	18.2	825.04	11.9	825.21	10.4	825.37	9.3								
825.54	12.0	825.70	13.5	825.87	6.1	826.03	12.4	826.20	7.9	826.36	19.1	826.53	7.7	826.69	10.9								
826.86	9.9	827.03	10.4	827.19	13.6	827.36	26.8	827.52	17.2	827.69	20.6	827.86	20.1	828.02	31.4								
828.19	21.8	828.35	35.5	828.52	46.6	828.69	49.3	828.85	42.0	829.02	49.4	829.18	40.1	829.35	30.4								
829.52	13.5	829.68	27.8	829.85	18.5	830.02	13.9	830.18	4.8	830.35	14.5	830.52	10.4	830.68	8.3								
830.85	8.4	831.02	6.8	831.18	5.0	831.35	8.8	831.52	5.8	831.69	5.7	831.85	9.8	832.02	14.4								
832.19	6.3	832.35	2.7	832.52	3.9	832.69	3.7	832.86	1.1	833.02	7.8	833.19	14.7	833.36	7.3								
833.53	8.4	833.69	9.3	833.86	6.0	834.03	3.7	834.20	3.2	834.37	8.3	834.53	8.2	834.70	6.7								
834.87	3.2	835.04	9.3	835.21	2.8	835.37	5.2	835.54	6.8	835.71	0.1	835.88	7.6	836.05	4.7								
836.22	1.1	836.38	1.1	836.55	0.6	836.72	0.1	836.89	3.2	837.06	0.1	837.23	5.5	837.40	5.7								
837.57	1.6	837.73	4.2	837.90	-3.7	838.07	8.3	838.24	1.5	838.41	3.1	838.58	1.7	838.75	2.8								
838.92	2.1	839.09	1.1	839.26	8.7	839.43	4.2	839.60	-3.5	839.77	0.6	839.93	-2.1	840.10	5.2								
840.27	-0.4	840.44	7.8	840.61	1.7	840.78	2.6	840.95	-1.5	841.12	1.1	841.29	3.9	841.46	2.6								
841.63	-5.1	841.80	2.6	841.97	9.2	842.14	2.6	842.31	-3.0	842.48	0.6	842.65	-2.1	842.83	0.1								
843.00	-2.0	843.17	3.7	843.34	6.0	843.51	1.6	843.69	4.7	843.85	7.2	844.02	-0.5	844.19	1.6								
844.36	0.6	844.53	2.6	844.70	7.1	844.87	8.7	845.05	2.6	845.22	7.7	845.39	9.8	845.56	24.1								
845.73	21.	845.90	30.	846.07	53.	846.25	67.	846.42	68.	846.59	101.	846.75	94.	846.93	117.								
847.10	75.8	847.28	87.0	847.45	68.5	847.62	52.2	847.79	27.4	847.96	15.9	848.13	17.9	848.31	22.0								
848.48	23.	848.65	9.	848.82	2.6	849.00	29.	849.17	39.	849.34	68.	849.51	98.	849.69	166.								
849.86	175.	850.03	330.	850.20	45%	850.38	620.	850.55	700.	850.72	944.	850.90	1159.	851.07	1328.								
851.24	1113.	851.41	1231.	851.59	106.5	851.76	897.	851.93	565.	852.11	480.	852.28	284.	852.45	201.								
852.63	77.0	852.80	63.7	852.97	43.5	853.15	29.1	853.32	20.6	853.49	33.2	853.67	26.9	853.84	39.7								
854.07	33.	854.19	57.	854.36	57.	854.54	103.	854.71	126.	854.89	227.	855.06	295.	855.23	440.								
855.41	509.	855.58	810.	855.76	96.6	855.93	1203.	856.11	1137.	856.28	1339.	856.46	1291.	856.63	1234.								
856.81	860.	856.98	794.	857.15	587.	857.23	309.	857.50	222.	857.68	176.	857.85	101.	858.03	76.								
858.20	44.0	858.38	53.8	858.56	47.6	858.73	46.1	858.91	41.4	859.08	42.6	859.26	50.8	859.43	54.2								
859.61	27.6	859.78	46.7	859.96	36.9	860.13	35.5	860.31	20.4	860.49	28.9	860.66	24.6	860.84	31.9								
861.01	20.9	861.19	17.9	861.37	19.2	861.54	27.9	861.72	16.9	861.90	19.3	862.07	24.0	862.25	23.8								
862.42	12.8	862.60	19.3	862.78	31.0	862.95	33.4	863.13	26.0	863.31	30.4	863.48	22.9	863.66	24.3								
863.84	11.2	864.01	29.9	864.19	19.7	864.37	29.9	864.55	12.2	864.72	26.8	864.90	33.6	865.08	55.1			</td					

E	P/E	E	P/E														
eV	bey ^{1/2}	eV	bey ^{1/2}														
868.10	21.9	868.28	16.7	868.46	7.4	868.63	7.6	868.81	6.6	868.99	9.6	869.17	8.0	869.35	13.6		
869.53	2.5	869.70	8.6	869.88	5.8	870.06	8.1	870.24	4.6	870.42	8.1	870.60	7.4	870.78	4.5		
870.96	-2.1	871.14	6.0	871.32	2.6	871.49	11.6	871.67	7.6	871.85	11.6	872.03	3.2	872.21	10.1		
872.39	7.1	872.57	6.0	872.75	12.2	872.93	8.5	873.11	6.1	873.29	7.0	873.47	9.5	873.65	15.6		
873.83	9.1	874.01	14.1	874.19	7.9	874.37	14.1	874.55	4.5	874.73	9.1	874.91	6.9	875.09	16.1		
875.27	2.0	875.45	5.5	875.63	11.1	875.81	6.5	875.99	2.0	876.17	4.5	876.35	6.3	876.53	6.0		
876.72	2.0	876.90	-0.5	877.08	1.0	877.26	7.0	877.44	8.1	877.62	4.5	877.80	1.6	877.98	2.5		
878.16	-3.1	878.35	3.5	878.53	4.8	878.71	8.5	878.89	-0.5	879.07	1.5	879.25	3.2	879.43	10.1		
879.62	-1.0	879.80	2.5	879.98	3.2	880.16	3.5	880.34	-3.6	880.53	-0.5	880.71	-0.6	880.89	1.5		
881.07	-2.1	881.25	2.5	881.44	1.0	881.62	3.0	881.80	3.0	881.98	-1.5	882.17	4.8	882.35	-4.6		
882.53	-9.2	882.71	-1.0	882.90	-2.2	883.08	0.5	883.26	-3.1	883.45	6.5	883.63	1.6	883.81	2.0		
884.00	-0.0	884.18	2.5	884.36	3.2	884.54	3.5	884.73	-2.1	884.91	3.5	885.09	-1.1	885.28	7.0		
885.46	-3.1	885.65	2.0	885.83	-4.3	886.01	2.0	886.20	-1.5	886.38	1.5	886.56	6.9	886.75	4.5		
886.93	-2.0	887.12	3.0	887.30	0.5	887.48	-1.0	887.67	-1.5	887.85	-0.5	888.04	4.8	888.22	6.5		
888.41	-1.5	888.59	2.0	888.78	6.4	888.96	3.5	889.14	-6.1	889.33	3.5	889.51	2.6	889.70	8.5		
889.88	10.6	890.07	5.5	890.25	17.0	890.44	21.6	890.62	26.9	890.81	36.8	890.99	45.6	891.18	69.9		
891.37	57.3	891.55	59.9	891.74	80.6	891.92	58.3	892.11	37.0	892.29	21.6	892.48	12.7	892.66	13.1		
892.85	0.5	893.04	3.0	893.22	1.5	893.41	7.5	893.59	-2.1	893.78	3.0	893.97	6.9	894.15	5.5		
894.34	-0.5	894.53	3.0	894.71	3.2	894.90	1.5	895.09	5.5	895.27	4.0	895.46	1.0	895.65	0.5		
895.83	5.5	896.02	2.5	896.21	2.1	896.39	0.5	896.58	5.5	896.77	6.5	896.95	-2.2	897.14	-0.5		
897.33	-5.1	897.52	6.0	897.70	5.3	897.89	4.5	898.08	4.5	898.27	5.0	898.45	3.1	898.64	11.0		
898.83	-0.0	899.02	4.5	899.20	1.5	899.39	4.5	899.58	-0.0	899.77	6.5	899.96	2.6	900.14	5.0		
900.33	-0.5	900.52	1.5	900.71	-2.2	900.90	5.0	901.09	-3.1	901.27	3.0	901.46	4.7	901.65	11.5		
901.84	6.0	902.03	11.5	902.22	3.7	902.41	15.0	902.60	19.2	902.78	30.6	902.97	35.4	903.16	55.6		
903.35	53.	903.54	101.	903.73	161.	903.92	273.	904.11	317.	904.30	547.	904.49	711.	904.68	1007.		
904.87	931.	905.06	1273.	905.25	1186.	905.44	1195.	905.63	904.	905.82	811.	906.01	554.	906.20	394.		
906.39	201.	906.58	145.	906.77	108.	906.96	99.	907.15	63.	907.34	83.	907.53	94.	907.72	76.		
907.91	53.4	908.10	43.5	908.29	32.8	908.48	41.0	908.67	21.1	908.86	28.5	909.05	40.6	909.24	64.0		
909.44	73.	909.63	112.	909.82	116.	910.01	149.	910.20	119.	910.39	153.	910.58	125.	910.77	92.		
910.97	57.4	911.16	54.0	911.35	26.8	911.54	16.4	911.73	9.0	911.92	15.0	912.12	13.6	912.31	8.4		
912.50	14.0	912.69	9.4	912.88	15.2	913.08	11.9	913.27	9.5	913.46	11.9	913.65	9.9	913.85	9.9		
914.04	4.0	914.23	9.4	914.42	3.6	914.62	17.4	914.81	8.0	915.00	7.4	915.19	11.0	915.39	11.4		
915.58	8.5	915.77	7.4	915.97	9.9	916.16	8.4	916.35	11.5	916.55	2.4	916.74	3.6	916.93	1.4		
917.13	4.0	917.32	6.4	917.51	7.3	917.71	11.9	917.90	4.5	918.10	6.4	918.29	4.1	918.48	12.4		
918.68	1.4	918.87	4.4	919.06	4.1	919.26	4.4	919.45	3.4	919.65	4.9	919.84	7.3	920.04	12.9		
920.23	1.9	920.43	2.9	920.62	5.7	920.81	0.9	921.01	3.9	921.20	4.4	921.40	-0.1	921.59	5.9		
921.79	-0.1	921.98	4.9	922.18	2.0	922.37	7.9	922.57	7.5	922.76	7.4	922.96	12.0	923.16	21.8		
923.35	37.	923.55	62.	923.74	93.	923.94	140.	924.13	178.	924.33	327.	924.52	437.	924.72	628.		
924.92	612.	925.11	818.	925.31	825.	925.50	798.	925.70	592.	925.90	569.	926.09	360.	926.29	240.		
926.49	100.	926.68	65.	926.88	38.	927.08	15.	927.27	12.	927.47	6.	927.67	3.	927.86	5.		
928.06	4.9	928.26	7.9	928.45	1.0	928.65	4.4	928.85	4.9	929.05	9.4	929.24	5.7	929.44	2.9		
929.54	2.9	929.84	7.9	930.03	13.0	930.23	5.4	930.43	4.9	930.63	13.4	930.82	9.3	931.02	17.3		
931.22	8.9	931.42	8.4	931.62	8.8	931.81	10.3	932.01	-0.6	932.21	6.4	932.41	17.2	932.61	11.8		
932.81	4.4	933.00	12.8	933.20	14.1	933.40	17.8	933.60	10.4	933.80	14.8	934.00	24.0	934.20	15.8		
934.40	16.	934.59	27.	934.79	47.	934.99	60.	935.19	68.	935.39	100.	935.59	169.	935.79	257.		
935.99	315.	936.19	505.	936.39	626.	936.59	819.	936.79	790.	936.99	1026.	937.19	1046.	937.39	1108.		
937.59	825.	937.79	828.	937.99	629.	938.19	450.	938.39	234.	938.59	180.	938.79	111.	938.99	82.		
939.19	48.4	939.39	37.6	939.59	38.1	939.79	46.0	939.99	31.4	940.19	43.1	940.39	44.9	940.60	57.4		
940.80	53.4	941.00	76.4	941.20	73.1	941.40	73.3	941.60	46.4	941.80	47.5	942.00	32.3	942.21	23.2		
942.41	13.9	942.61	15.8	942.81	12.9	943.01	11.8	943.21	10.4	943.42	15.8	943.62	12.9	943.82	15.7		
944.02	4.4	944.22	13.3	944.43	5.6	944.63	16.7	944.83	11.4	945.03	6.8	945.23	9.8	945.44	11.8		
945.64	8.4	945.84	11.3	946.05	14.5	946.25	8.3	946.45	12.9	946.65	6.3	946.86	8.8	947.06	8.3		
947.26	3.4	947.47	13.8	947.67	5.6	947.87	9.3	948.08	11.9	948.28	4.9	948.48	5.6	948.69	10.8		
948.89	-0.6	949.09	11.8	949.30	7.2	949.50	6.3	949.70	3.9	949.91	6.3	950.11	7.2	950.32	3.8		
950.52	3.4	950.73	7.8	950.93	2.5	951.13	10.3	951.34	1.9	951.54	4.8	951.75	10.3	951.95	9.3		

E eV	P/ N/E beV ^{1/2}														
952.16	2.9	952.36	8.8	952.57	11.9	952.77	9.8	952.98	6.9	953.18	9.3	953.39	5.6	953.59	12.7
953.80	4.9	954.00	10.3	954.21	7.7	954.41	7.8	954.62	7.4	954.82	13.7	955.03	15.0	955.23	14.7
955.44	21.	955.65	18.	955.85	3.0	956.06	4.7	956.26	42.	956.47	59.	956.68	71.	956.88	124.
957.09	138.	957.29	256.	957.50	356.	957.71	486.	957.91	539.	958.12	705.	958.33	797.	958.53	927.
958.74	766.	958.95	835.	959.15	729.	959.36	606.	959.57	439.	959.78	333.	959.98	225.	960.19	155.
960.40	88.0	960.61	64.6	960.81	45.6	961.02	34.4	961.23	26.7	961.44	24.6	961.64	24.8	961.85	22.5
962.06	22.7	962.27	14.2	962.47	14.9	962.68	10.2	962.89	10.8	963.10	24.0	963.31	26.9	963.52	33.4
963.72	31.7	963.93	52.2	964.14	40.4	964.35	58.5	964.56	54.0	964.77	57.1	964.98	36.7	965.18	44.7
965.39	23.2	965.60	18.6	965.81	20.6	966.02	9.2	966.23	6.8	966.44	10.2	966.65	9.7	966.86	11.2
967.07	7.3	967.28	13.7	967.49	6.6	967.70	15.6	967.91	4.8	968.12	12.2	968.33	9.7	968.54	9.7
968.75	5.3	968.96	6.3	969.17	4.5	969.38	8.7	969.59	5.3	969.80	7.2	970.01	6.6	970.22	8.7
970.43	1.8	970.64	8.2	970.85	5.0	971.06	1.3	971.27	5.8	971.48	2.3	971.69	8.1	971.91	13.1
972.12	1.3	972.33	6.2	972.54	2.4	972.75	5.7	972.96	3.8	973.17	7.7	973.38	2.9	973.60	7.2
973.81	3.3	974.02	3.3	974.23	1.4	974.44	7.2	974.66	-2.2	974.87	5.2	975.08	1.4	975.29	5.7
975.50	7.3	975.72	10.7	975.93	13.8	976.14	16.5	976.35	26.6	976.57	47.1	976.78	50.1	976.99	71.6
977.20	53.3	977.42	69.7	977.53	84.2	977.84	52.9	978.05	38.5	978.27	37.7	978.48	23.1	978.70	34.1
978.91	2.3	979.12	10.1	979.34	1.4	979.55	6.7	979.76	-1.7	979.98	-3.1	980.19	0.8	980.40	3.8
980.62	2.3	980.83	2.8	981.05	5.5	981.26	7.7	981.47	3.3	981.69	4.7	981.90	11.2	982.12	14.6
982.33	16.2	982.55	17.0	982.76	21.6	982.98	29.8	983.19	11.7	983.41	14.6	983.62	31.9	983.84	37.6
984.05	28.5	984.27	41.1	984.48	24.1	984.70	31.2	984.91	22.6	985.13	10.6	985.34	15.3	985.56	13.1
985.77	1.3	985.99	11.1	986.20	8.6	986.42	31.1	986.64	14.2	986.85	5.2	987.07	11.7	987.28	12.1
987.50	16.1	987.72	21.4	987.93	15.3	988.15	26.3	988.37	36.4	988.58	27.3	988.80	35.5	988.02	62.1
989.23	56.	989.45	77.	989.67	118.	989.88	163.	990.10	165.	990.32	281.	990.53	301.	990.75	422.
990.97	435.	991.19	617.	991.40	662.	991.62	774.	991.84	601.	992.05	639.	992.27	576.	992.49	539.
992.71	320.	992.93	323.	993.15	24.9	993.36	19.4	993.58	95.	993.80	98.	994.02	75.	994.24	71.
994.46	50.1	994.67	37.5	994.89	45.1	995.11	44.3	995.33	39.2	995.55	47.8	995.77	32.8	995.99	36.4
996.21	26.9	996.42	26.2	996.64	20.9	996.86	20.3	997.08	23.0	997.30	15.5	997.52	25.5	997.74	17.4
997.96	12.6	998.18	22.8	998.40	26.6	998.62	22.8	998.84	7.2	999.06	16.4	999.28	10.6	999.50	12.5
999.7	11.1	999.9	14.0	1000.2	20.4	1000.4	18.4	1000.6	11.1	1000.8	12.5	1001.0	15.2	1001.3	11.5
1001.5	8.2	1001.7	11.5	1001.9	17.3	1002.1	16.9	1002.4	12.1	1002.6	14.0	1002.8	22.0	1003.0	32.5
1003.3	10.2	1003.5	16.9	1003.7	13.7	1003.9	9.1	1004.1	11.6	1004.4	5.2	1004.6	11.1	1004.8	10.5
1005.0	6.2	1005.2	4.7	1005.5	8.0	1005.7	4.7	1005.9	2.8	1006.1	7.1	1006.4	10.1	1006.6	9.6
1006.8	0.8	1007.0	10.1	1007.3	6.0	1007.5	2.7	1007.7	3.2	1007.9	11.0	1008.1	2.4	1008.4	5.2
1008.5	-0.2	1008.8	3.7	1009.0	4.4	1009.3	5.7	1009.5	9.1	1009.7	16.4	1009.9	13.2	1010.2	19.8
1010.4	26.	1010.6	54.	1010.8	70.	1011.0	102.	1011.3	110.	1011.5	138.	1011.7	140.	1011.9	151.
1012.2	97.6	1012.4	81.8	1012.6	62.5	1012.8	36.3	1013.1	14.5	1013.3	8.1	1013.5	0.3	1013.7	3.2
1014.0	-1.2	1014.2	6.6	1014.4	-0.2	1014.6	1.7	1014.9	4.7	1015.1	2.7	1015.3	-2.8	1015.5	8.1
1015.8	-0.2	1016.0	3.7	1016.2	4.4	1016.4	3.7	1016.7	-5.6	1016.9	8.1	1017.1	0.8	1017.3	2.2
1017.6	-2.7	1017.8	1.2	1018.0	5.9	1018.3	5.6	1018.5	1.7	1018.7	5.6	1018.9	3.4	1019.2	7.6
1019.4	1.3	1019.6	2.2	1019.8	11.1	1020.1	8.1	1020.3	5.7	1020.5	10.5	1020.7	19.8	1021.0	39.2
1021.2	35.	1021.4	60.	1021.7	96.	1021.9	168.	1022.1	206.	1022.3	294.	1022.6	397.	1022.8	492.
1023.0	453.	1023.3	523.	1023.5	431.	1023.7	323.	1023.9	211.	1024.2	123.	1024.4	67.	1024.6	35.
1024.8	18.9	1025.1	10.5	1025.3	19.0	1025.5	6.1	1025.8	6.6	1026.0	0.7	1026.2	8.5	1026.5	9.0
1026.7	0.7	1026.9	7.1	1027.1	19.2	1027.4	23.5	1027.6	21.3	1027.8	43.0	1028.1	41.2	1028.3	87.1
1028.5	91.	1028.7	153.	1029.0	152.	1029.2	207.	1029.4	166.	1029.7	150.	1029.9	120.	1030.1	96.
1030.4	41.8	1030.6	33.7	1030.8	18.7	1031.0	17.7	1031.3	13.9	1031.5	11.4	1031.7	12.0	1032.0	24.0
1032.2	19.8	1032.4	27.4	1032.7	24.6	1032.9	33.2	1033.1	48.6	1033.4	59.9	1033.6	63.1	1033.8	64.2
1034.1	57.4	1034.3	51.2	1034.5	40.6	1034.7	29.3	1035.0	16.8	1035.2	6.1	1035.4	3.8	1035.7	6.5
1035.9	0.7	1036.1	5.1	1036.4	7.9	1036.6	5.6	1036.8	5.6	1037.1	11.4	1037.3	2.8	1037.5	5.6
1037.8	6.1	1038.0	4.6	1038.2	-0.8	1038.5	11.4	1038.7	7.1	1038.9	2.6	1039.2	-0.8	1039.4	12.8
1039.6	1.7	1039.9	4.6	1040.1	2.8	1040.3	4.1	1040.6	-2.2	1040.8	1.7	1041.0	1.8	1041.3	9.4
1041.5	6.1	1041.7	7.5	1042.0	4.3	1042.2	2.6	1042.4	-3.7	1042.7	4.6	1042.9	-1.8	1043.1	5.1
1043.4	2.7	1043.6	4.6	1043.9	6.9	1044.1	4.6	1044.3	1.2	1044.6	5.1	1044.8	4.8	1045.0	7.0
1045.3	3.1	1045.5	2.6	1045.7	11.9	1046.0	11.3	1046.2	6.6	1046.4	20.1	1046.7	19.6	1046.9	28.7
1047.2	30.9	1047.4	39.4	1047.6	32.3	1047.9	38.9	1048.1	20.7	1048.3	29.2	1048.6	8.4	1048.8	10.4

E	$\frac{P}{N}E$														
eV	beV ^{1/2}														
1161.5	2.9	1161.8	7.1	1162.1	4.5	1162.3	9.9	1162.6	-4.7	1162.9	7.1	1163.2	3.0	1163.4	3.8
1163.7	3.	1164.0	12.	1164.3	10.	1164.5	24.	1164.8	26.	1165.1	39.	1165.4	79.	1165.7	111.
1165.9	151.	1166.2	264.	1166.5	396.	1166.8	573.	1167.0	609.	1167.3	861.	1167.6	930.	1167.9	978.
1176.2	674.	1176.4	595.	1176.7	373.	1176.9	239.	1176.9	88.	1176.9	60.	1176.9	274.	1177.0	27.
1177.0	8.0	1177.0	15.0	1177.0	7.9	1177.1	8.9	1177.1	9.4	1177.1	8.0	1177.1	11.3	1177.3	19.7
1177.6	7.5	1177.9	8.0	1178.2	13.3	1178.5	22.0	1178.7	19.8	1179.0	37.5	1179.3	45.9	1179.6	95.5
1178.9	106.	1178.1	199.	1178.4	289.	1178.7	420.	1178.9	499.	1179.3	691.	1179.5	860.	1179.8	1069.
1177.1	897.	1177.4	1045.	1177.7	869.	1177.9	678.	1178.2	399.	1178.5	266.	1178.8	129.	1179.1	80.
1179.4	29.2	1179.6	31.8	1179.9	19.7	1180.2	24.7	1180.5	16.0	1180.8	16.3	1181.1	21.1	1181.3	14.0
1183.5	9.9	1181.9	17.3	1182.2	16.2	1182.5	13.0	1182.8	14.1	1183.0	21.5	1183.3	16.2	1183.5	16.3
1183.9	11.7	1184.2	13.0	1184.5	14.7	1184.7	19.1	1185.0	14.1	1185.3	13.5	1185.6	9.3	1185.9	15.4
1186.2	11.7	1186.4	18.5	1186.7	14.7	1187.0	17.9	1187.3	11.2	1187.6	21.9	1187.9	17.7	1188.2	9.7
1188.4	7.9	1188.7	14.9	1189.0	10.8	1189.3	9.3	1189.6	4.2	1189.9	10.2	1190.2	9.3	1190.4	15.3
1190.7	9.	1191.0	3.6	1191.3	1.9	1191.6	17.	1191.9	33.	1192.2	50.	1192.4	63.	1192.7	104.
1193.0	138.	1193.3	254.	1193.6	365.	1193.9	573.	1194.2	614.	1194.5	868.	1194.7	953.	1195.0	977.
1195.3	739.	1195.6	607.	1195.9	393.	1196.2	227.	1196.5	101.	1196.8	55.	1197.0	33.	1197.3	17.
1197.6	17.3	1197.9	12.5	1198.2	7.3	1198.5	16.2	1198.8	3.7	1199.1	7.4	1199.4	16.6	1199.7	12.5
1199.9	4.6	1200.2	14.8	1200.5	27.0	1200.8	36.2	1201.1	29.4	1201.4	47.8	1201.7	34.2	1202.0	52.9
1202.2	22.4	1202.6	31.6	1202.8	15.6	1203.1	13.9	1203.4	10.2	1203.7	5.0	1204.0	11.7	1204.3	16.2
1204.6	9.3	1204.9	11.1	1205.2	7.8	1205.5	7.8	1205.8	8.8	1206.0	13.4	1206.3	5.8	1206.6	17.6
1206.9	2.7	1207.2	9.2	1207.5	3.8	1207.8	5.0	1208.1	10.7	1208.4	26.9	1208.7	32.2	1209.0	41.2
1209.3	63.	1209.6	97.	1209.8	165.	1210.1	231.	1210.4	252.	1210.7	392.	1211.0	407.	1211.3	477.
1211.6	272.	1211.9	262.	1212.2	152.	1212.5	75.	1212.8	53.	1213.1	21.	1213.4	9.	1213.7	12.
1214.0	-1.0	1214.3	5.5	1214.6	2.8	1214.8	9.2	1215.1	-3.4	1215.4	5.5	1215.7	2.8	1216.0	3.1
1216.3	-3.8	1216.6	3.6	1216.9	1.4	1217.2	9.2	1217.5	4.6	1217.8	4.5	1218.1	8.2	1218.4	17.5
1218.7	12.5	1219.0	38.8	1219.3	33.1	1219.6	42.5	1219.9	37.2	1220.2	36.0	1220.5	34.5	1220.8	24.9
1221.1	13.4	1221.4	9.6	1221.7	5.7	1222.0	11.0	1222.3	6.8	1222.6	5.9	1222.9	3.3	1223.2	11.9
1223.4	1.8	1223.7	7.8	1224.0	1.4	1224.3	8.7	1224.6	-8.1	1224.9	0.2	1225.2	0.9	1225.5	2.7
1225.9	0.4	1226.1	5.9	1226.4	1.8	1226.7	6.8	1227.0	-3.8	1227.3	8.2	1227.6	-3.5	1227.9	7.8
1228.2	4.1	1228.5	7.8	1228.8	7.7	1229.1	17.5	1229.4	21.8	1229.7	27.7	1230.0	28.6	1230.3	34.5
1230.6	24.6	1230.9	23.9	1231.2	17.9	1231.5	13.3	1231.8	13.9	1232.1	23.0	1232.4	31.0	1232.7	35.9
1233.0	26.4	1233.3	34.1	1233.6	23.7	1234.0	17.9	1234.3	9.7	1234.6	5.9	1234.9	5.2	1235.2	5.4
1235.5	-1.5	1235.8	3.6	1236.1	2.8	1236.4	3.6	1236.7	5.9	1237.0	6.8	1237.3	0.8	1237.6	8.2
1237.9	-0.1	1238.2	2.2	1238.5	4.7	1238.8	7.7	1239.1	4.5	1239.4	4.5	1239.7	5.7	1240.0	12.8
1240.3	11.0	1240.6	10.5	1240.9	7.2	1241.2	15.1	1241.5	23.6	1241.8	31.8	1242.1	42.7	1242.4	70.9
1242.8	71.	1243.1	120.	1243.4	278.	1243.7	331.	1244.0	378.	1244.3	572.	1244.6	636.	1244.9	712.
1245.2	604.	1245.5	610.	1245.8	464.	1246.1	329.	1246.4	195.	1246.7	140.	1247.0	82.	1247.3	47.
1247.7	19.4	1248.0	24.3	1248.3	21.2	1248.6	22.0	1248.9	14.7	1249.2	16.9	1249.5	23.1	1249.8	28.9
1250.1	19.8	1250.4	40.4	1250.7	48.9	1251.0	66.6	1251.3	46.1	1251.7	67.6	1252.0	39.7	1252.3	42.2
1252.6	30.5	1252.9	22.4	1253.2	8.6	1253.5	12.7	1253.8	6.4	1254.1	7.7	1254.4	10.5	1254.7	6.8
1255.1	10.1	1255.4	7.2	1255.7	3.7	1256.0	5.4	1256.3	2.6	1256.6	9.5	1256.9	2.8	1257.2	14.1
1257.5	7.7	1257.8	4.0	1258.2	9.5	1258.5	5.8	1258.8	4.5	1259.1	13.7	1259.4	6.1	1259.7	13.2
1260.0	9.6	1260.3	13.2	1260.6	13.9	1261.0	14.1	1261.3	10.0	1261.6	7.7	1261.9	12.0	1262.2	15.9
1262.5	10.0	1262.8	10.4	1263.1	13.4	1263.5	11.8	1263.8	15.1	1264.1	17.3	1264.4	33.2	1264.7	66.4
1265.0	77.	1265.3	183.	1265.7	256.	1266.0	440.	1266.3	497.	1266.6	668.	1266.9	711.	1267.2	745.
1267.5	528.	1267.9	406.	1268.2	227.	1268.5	125.	1268.8	39.	1269.1	26.	1269.4	14.	1269.7	26.
1270.1	21.	1270.4	31.	1270.7	62.	1271.0	95.	1271.3	171.	1271.6	300.	1272.0	392.	1272.3	571.
1272.3	591.	1272.9	724.	1273.2	685.	1273.5	544.	1273.9	340.	1274.2	212.	1274.5	112.	1274.8	67.
1275.1	35.8	1275.4	49.3	1275.8	51.4	1276.1	64.8	1276.4	51.5	1276.7	56.2	1277.0	57.2	1277.3	59.8
1277.7	34.4	1278.0	46.5	1278.3	45.1	1278.6	47.4	1278.9	25.6	1279.3	31.4	1279.6	18.6	1279.9	19.9
1280.2	14.1	1280.5	11.3	1280.8	11.9	1281.2	6.2	1281.5	9.0	1281.8	9.4	1282.1	16.7	1282.4	14.4
1282.8	13.6	1283.1	15.3	1283.4	15.7	1283.7	16.7	1284.0	9.5	1284.4	30.0	1284.7	34.5	1285.0	28.6
1285.2	17.3	1285.7	28.7	1286.0	24.4	1286.3	19.5	1286.6	6.3	1286.9	16.7	1287.3	7.5	1287.6	12.2
1287.9	4.9	1288.2	8.5	1288.5	15.2	1288.8	11.2	1289.2	13.2	1289.5	13.1	1289.8	11.8	1290.2	5.7
1290.5	9.6	1290.8	4.4	1291.1	0.8	1291.5	3.5	1291.8	3.5	1292.1	7.6	1292.4	2.2	1292.7	4.8

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E	$\frac{P}{N}E$														
ev	beV ^{1/2}														
1370.1	6.6	1370.3	1.3	1370.5	-2.7	1370.7	4.1	1370.8	1.1	1371.0	0.2	1371.2	-2.7	1371.4	5.3
1371.5	0.2	1371.7	0.2	1371.9	-2.7	1372.1	1.8	1372.3	-2.5	1372.4	-1.7	1372.6	0.2	1372.8	1.6
1373.0	-1.9	1373.1	4.3	1373.3	2.2	1373.5	-0.6	1373.7	1.1	1373.9	5.1	1374.0	0.2	1374.2	6.8
1374.4	1.3	1374.6	2.3	1374.7	3.2	1374.9	1.8	1375.1	2.0	1375.3	-4.7	1375.4	1.2	1375.6	1.6
1375.8	-2.9	1376.0	8.4	1376.2	1.2	1376.3	-0.6	1376.5	6.6	1376.7	-2.7	1376.9	4.1	1377.0	2.4
1377.2	-4.0	1377.4	4.3	1377.5	1.2	1377.8	10.4	1377.9	-2.5	1378.1	-1.7	1378.3	1.2	1378.5	5.3
1378.7	1.3	1378.8	5.3	1378.9	-2.7	1379.2	7.3	1379.4	3.8	1379.5	3.2	1379.7	-1.7	1379.9	6.0
1380.1	0.2	1380.3	3.3	1380.4	5.0	1380.6	4.1	1380.8	2.9	1381.0	1.2	1381.2	-0.7	1381.3	10.4
1381.5	3.4	1381.7	1.2	1381.9	4.1	1382.0	4.9	1382.2	1.1	1382.4	2.2	1382.6	-2.7	1382.8	9.0
1382.9	0.2	1383.1	-1.8	1383.3	7.0	1383.5	4.1	1383.7	4.7	1383.8	8.1	1384.0	12.7	1384.2	12.6
1384.4	1.3	1384.6	8.4	1384.7	10.8	1384.9	15.9	1385.1	17.5	1385.3	22.8	1385.5	21.3	1385.6	22.2
1385.8	24.5	1386.0	25.7	1386.2	24.4	1386.4	23.8	1386.5	23.8	1386.7	24.7	1386.9	22.3	1387.1	16.3
1387.3	14.0	1387.4	28.7	1387.6	12.8	1387.8	15.9	1388.0	12.9	1388.2	10.0	1388.3	6.0	1388.5	11.2
1388.7	12.9	1388.9	11.4	1389.1	11.8	1389.2	18.3	1389.4	18.4	1389.6	13.9	1389.8	14.6	1390.0	21.4
1390.1	33.	1390.3	23.	1390.5	41.	1390.7	47.	1390.9	62.	1391.0	78.	1391.2	84.	1391.4	117.
1391.5	163.	1391.6	194.	1391.9	234.	1392.1	285.	1392.3	344.	1392.5	399.	1392.7	474.	1392.8	498.
1393.0	680.	1393.2	691.	1393.4	698.	1393.6	692.	1393.8	674.	1393.9	716.	1394.1	627.	1394.3	509.
1394.5	424.	1394.7	366.	1394.8	328.	1395.0	220.	1395.2	153.	1395.4	129.	1395.6	74.	1395.8	56.
1395.9	42.4	1396.1	40.8	1396.3	29.1	1396.5	23.7	1396.7	21.9	1396.8	16.8	1397.0	22.2	1397.2	15.5
1397.4	6.5	1397.6	5.3	1397.8	14.8	1397.9	12.7	1398.1	13.8	1398.3	18.8	1398.5	9.8	1398.7	11.1
1398.8	9.7	1399.0	6.3	1399.2	13.7	1399.4	18.2	1399.6	5.6	1399.8	14.9	1399.9	20.3	1400.1	14.0
1400.3	13.9	1400.5	7.3	1400.7	16.6	1400.9	15.1	1401.0	19.2	1401.2	12.9	1401.4	17.4	1401.6	18.4
1401.8	33.	1401.9	39.	1402.1	3.3	1402.3	43.	1402.5	58.	1402.7	68.	1402.9	80.	1403.0	117.
1403.2	136.	1403.4	203.	1403.6	246.	1403.8	304.	1404.0	423.	1404.1	504.	1404.3	574.	1404.5	565.
1404.7	702.	1404.9	714.	1405.1	773.	1405.2	817.	1405.4	856.	1405.6	842.	1405.8	667.	1406.0	602.
1406.2	48.8	1406.3	391.	1406.5	286.	1406.7	171.	1406.9	124.	1407.1	183.	1407.3	44.	1407.4	32.
1407.6	25.4	1407.8	32.6	1408.0	13.6	1408.2	16.6	1408.4	8.3	1408.6	14.8	1408.7	7.8	1408.9	11.1
1409.1	12.8	1409.3	23.5	1409.5	12.7	1409.7	14.2	1409.8	13.7	1410.0	5.0	1410.2	14.5	1410.4	7.4
1410.6	2.3	1410.8	1.2	1411.0	6.9	1411.1	15.8	1411.3	11.9	1411.5	7.0	1411.7	5.9	1411.9	14.7
1412.1	10.7	1412.2	6.2	1412.4	12.6	1412.6	14.2	1412.8	24.5	1413.0	1.1	1413.2	14.5	1413.4	21.2
1413.5	9.6	1413.7	22.4	1413.9	21.3	1414.1	11.9	1414.3	41.6	1414.5	35.3	1414.7	43.1	1414.8	31.4
1415.0	48.	1415.2	48.	1415.4	67.	1415.6	98.	1415.8	101.	1415.9	141.	1416.1	114.	1416.3	145.
1416.5	172.	1416.7	179.	1416.9	170.	1417.1	182.	1417.2	177.	1417.4	179.	1417.6	155.	1417.8	149.
1418.0	152.	1418.2	189.	1418.4	154.	1418.6	210.	1418.7	252.	1418.9	276.	1419.1	359.	1419.3	339.
1419.5	369.	1419.7	361.	1419.9	350.	1420.0	323.	1420.2	279.	1420.4	221.	1420.6	169.	1420.8	109.
1421.0	99.7	1421.2	55.7	1421.3	32.7	1421.5	18.1	1421.7	2.8	1421.9	9.9	1422.1	7.8	1422.3	5.2
1422.5	7.5	1422.7	5.2	1422.8	9.7	1423.0	9.5	1423.2	7.3	1423.4	2.1	1423.6	13.5	1423.8	11.7
1424.0	17.9	1424.2	19.3	1424.3	27.0	1424.5	25.1	1424.7	27.1	1424.9	30.3	1425.1	50.6	1425.3	61.9
1425.5	73.	1425.7	66.	1425.8	106.	1426.0	146.	1426.2	197.	1426.4	232.	1426.6	316.	1426.8	406.
1427.0	480.	1427.2	558.	1427.3	807.	1427.5	603.	1427.7	635.	1427.9	674.	1428.1	640.	1428.3	512.
1428.5	46.9	1428.7	386.	1428.8	33.6	1429.0	218.	1429.2	151.	1429.4	103.	1429.6	77.	1429.8	46.
1430.0	21.0	1430.2	24.3	1430.3	21.2	1430.5	21.1	1430.7	13.6	1430.9	6.9	1431.1	6.8	1431.3	13.9
1431.5	7.4	1431.7	15.2	1431.9	1.1	1432.0	11.0	1432.2	4.6	1432.4	3.0	1432.6	13.4	1432.8	11.7
1433.0	3.3	1433.2	11.2	1433.4	6.8	1433.6	16.5	1433.7	13.8	1433.9	14.7	1434.1	7.7	1434.3	10.3
1434.5	9.5	1434.7	-0.9	1434.9	13.5	1435.1	18.0	1435.3	0.1	1435.5	4.0	1435.6	8.7	1435.8	10.2
1436.0	6.4	1436.2	5.2	1436.4	6.8	1436.6	6.3	1436.8	2.6	1437.0	9.8	1437.2	5.8	1437.3	15.3
1437.5	24.2	1437.7	9.2	1437.9	21.2	1438.1	8.7	1438.3	5.5	1438.5	2.0	1438.7	15.3	1438.9	23.3
1439.1	7.4	1439.2	19.3	1439.4	5.9	1439.6	17.2	1439.8	9.1	1440.0	15.6	1440.2	18.2	1440.4	26.2
1440.6	23.	1440.8	37.	1441.0	28.	1441.2	41.	1441.3	58.	1441.5	60.	1441.7	76.	1441.9	100.
1442.1	138.	1442.3	147.	1442.5	176.	1442.7	210.	1442.9	323.	1443.1	362.	1443.3	385.	1443.4	426.
1443.6	478.	1443.8	496.	1444.0	479.	1444.2	438.	1444.4	373.	1444.6	377.	1444.8	283.	1445.0	219.
1445.2	148.	1445.4	96.	1445.5	6.0	1445.7	48.	1445.9	42.	1446.1	42.	1446.3	45.	1446.5	51.
1446.7	52.3	1446.9	67.5	1447.1	46.9	1447.3	60.0	1447.5	76.9	1447.7	69.9	1447.8	62.7	1448.0	64.5
1448.2	46.0	1448.4	45.3	1448.6	20.1	1448.8	18.7	1449.0	17.1	1449.2	9.8	1449.4	13.4	1449.6	4.4
1449.8	1.1	1450.0	7.1	1450.2	3.9	1450.3	6.3	1450.5	5.5	1450.7	4.0	1450.9	2.0	1451.1	5.1

E eV	P _{N/E} bev ^{1/2}																	
1451.3	7.4	1451.5	0.1	1451.7	3.0	1451.9	9.4	1452.1	9.0	1452.3	-0.9	1452.5	2.9	1452.7	7.3			
1452.8	1.1	1453.0	7.1	1453.2	4.9	1453.4	8.6	1453.6	0.1	1453.8	6.9	1454.0	13.4	1454.2	13.8			
1454.4	9.5	1454.6	7.1	1454.8	17.3	1455.0	9.4	1455.2	26.9	1455.4	7.8	1455.6	20.9	1455.7	21.0			
1455.9	10.5	1456.1	14.1	1456.3	10.6	1456.5	15.4	1456.7	13.5	1456.9	12.7	1457.1	19.0	1457.3	11.6			
1457.5	4.3	1457.7	2.1	1457.9	9.6	1458.1	17.9	1458.3	-1.7	1458.5	4.9	1458.7	6.7	1458.8	2.2			
1459.0	-4.1	1459.2	8.1	1459.4	3.9	1459.6	8.6	1459.8	2.8	1460.0	0.1	1460.2	2.0	1460.4	0.8			
1460.6	0.1	1460.8	5.1	1461.0	2.9	1461.2	3.9	1461.4	8.1	1461.6	4.9	1461.8	-3.7	1462.0	2.9			
1462.2	2.2	1462.3	4.1	1462.5	4.8	1462.7	3.9	1462.9	-0.8	1463.1	7.8	1463.3	0.1	1463.5	5.8			
1463.7	5.3	1463.9	7.1	1464.1	4.8	1464.3	-3.7	1464.5	8.1	1464.7	2.0	1464.9	2.0	1465.1	8.0			
1465.3	5.3	1465.5	-2.9	1465.7	3.9	1465.9	7.0	1466.1	2.8	1466.3	-0.9	1466.5	8.6	1466.6	10.9			
1466.8	3.2	1467.0	1.1	1467.2	4.8	1467.4	6.3	1467.6	4.5	1467.8	3.9	1468.0	-0.9	1468.2	6.6			
1468.4	8.4	1468.6	-1.9	1468.8	0.1	1469.0	8.8	1469.2	9.0	1469.4	12.6	1469.6	6.7	1469.8	15.9			
1470.0	26.	1470.2	22.	1470.4	3.2	1470.6	36.	1470.8	63.	1471.0	80.	1471.2	85.	1471.3	11.5			
1471.5	140.	1471.7	208.	1471.9	235.	1472.1	285.	1472.3	346.	1472.5	455.	1472.7	562.	1472.9	609.			
1473.1	685.	1473.3	725.	1473.5	738.	1473.7	692.	1473.9	703.	1474.1	576.	1474.3	512.	1474.5	426.			
1474.7	357.	1474.9	222.	1475.1	170.	1475.3	113.	1475.5	71.	1475.7	39.	1475.9	31.	1476.1	14.			
1476.3	16.7	1476.5	10.1	1476.7	13.4	1476.9	10.9	1477.1	-3.5	1477.3	1.0	1477.5	5.7	1477.7	10.1			
1477.9	9.4	1478.1	7.1	1478.3	-3.7	1478.5	12.4	1478.7	11.7	1478.8	0.1	1479.0	7.6	1479.2	2.9			
1479.4	4.2	1479.6	1.1	1479.8	0.1	1480.0	3.1	1480.2	9.0	1480.4	3.9	1480.6	2.9	1480.8	2.9			
1481.0	-1.0	1481.2	7.1	1481.4	5.8	1481.6	11.7	1481.8	5.4	1482.0	3.9	1482.2	4.8	1482.4	7.2			
1482.6	3.2	1482.8	6.1	1483.0	4.8	1483.2	12.4	1483.4	14.3	1483.6	13.6	1483.8	17.0	1484.0	10.1			
1484.2	15.6	1484.4	9.1	1484.6	12.4	1484.8	16.0	1485.0	16.1	1485.2	20.3	1485.4	10.4	1485.6	8.0			
1485.8	20.8	1486.0	30.1	1486.2	17.1	1486.4	14.0	1486.6	19.7	1486.8	23.2	1487.0	12.3	1487.2	23.1			
1487.4	1.1	1487.6	14.1	1487.8	4.8	1488.0	18.6	1488.2	2.7	1488.4	2.0	1488.6	8.5	1488.8	1.5			
1489.0	11.5	1489.2	4.1	1489.4	5.7	1489.6	11.6	1489.8	-2.6	1490.0	6.8	1490.2	7.6	1490.4	10.8			
1490.6	7.3	1490.8	7.0	1491.0	8.6	1491.2	14.7	1491.4	9.8	1491.6	15.5	1491.8	11.4	1492.0	13.7			
1492.2	14.6	1492.4	10.0	1492.6	13.3	1492.8	17.8	1493.0	2.7	1493.2	2.9	1493.4	-1.8	1493.6	9.4			
1493.8	5.2	1494.0	4.0	1494.2	-3.7	1494.4	8.5	1494.6	2.7	1494.8	-2.8	1495.0	3.8	1495.2	7.2			
1495.4	0.1	1495.6	-3.9	1495.8	2.9	1496.0	2.4	1496.2	6.3	1496.4	-0.9	1496.6	-5.6	1496.8	2.2			
1497.0	10.4	1497.2	4.0	1497.4	6.7	1497.6	2.4	1497.9	-2.6	1498.1	-3.8	1498.3	4.7	1498.5	0.8			
1498.7	-1.0	1498.9	-1.0	1499.1	15.2	1499.3	9.3	1499.5	2.7	1499.7	-3.8	1499.9	3.8	1500.1	3.6			
1500.3	-1.0	1500.5	1.0	1500.7	7.6	1500.9	1.6	1501.1	1.8	1501.3	0.0	1501.5	-3.7	1501.7	10.1			
1501.9	9.4	1502.1	0.0	1502.3	2.9	1502.5	13.1	1502.7	8.0	1502.9	15.4	1503.1	15.1	1503.3	19.4			
1503.5	15.6	1503.7	30.0	1503.9	15.2	1504.1	16.2	1504.3	20.5	1504.5	13.5	1504.7	14.2	1504.9	14.4			
1505.1	14.5	1505.4	3.0	1505.6	7.6	1505.8	10.1	1506.0	2.7	1506.2	9.7	1506.4	5.7	1506.6	14.4			
1506.8	10.4	1507.0	19.0	1507.2	19.9	1507.4	17.0	1507.6	10.7	1507.8	22.1	1508.0	15.1	1508.2	27.3			
1508.4	12.5	1508.6	21.0	1508.8	25.6	1509.0	23.9	1509.2	28.5	1509.4	44.2	1509.6	41.4	1509.8	33.8			
1510.0	47.6	1510.2	50.9	1510.5	52.1	1510.7	50.9	1510.9	29.4	1511.1	21.2	1511.3	17.0	1511.5	23.0			
1511.7	21.8	1511.9	9.0	1512.1	4.8	1512.3	3.9	1512.5	-4.4	1512.7	5.8	1512.9	-2.8	1513.1	-0.7			
1513.3	3.0	1513.5	-2.0	1513.7	-2.8	1513.9	5.4	1514.1	-0.9	1514.3	-1.9	1514.5	4.7	1514.8	5.0			
1515.0	-2.0	1515.2	3.0	1515.4	5.7	1515.6	6.2	1515.8	3.6	1516.0	20.2	1516.2	3.8	1516.4	5.0			
1516.6	8.3	1516.8	5.0	1517.0	4.8	1517.2	5.4	1517.4	13.4	1517.6	5.8	1517.8	7.5	1518.0	20.1			
1518.3	20.7	1518.5	23.9	1518.7	19.9	1518.9	35.4	1519.1	36.4	1519.3	50.9	1519.5	67.6	1519.7	78.1			
1519.9	103.	1520.1	132.	1520.3	147.	1520.5	168.	1520.7	272.	1520.9	329.	1521.1	376.	1521.3	445.			
1521.6	499.	1521.8	566.	1522.0	645.	1522.2	658.	1522.4	664.	1522.6	612.	1522.8	607.	1523.0	486.			
1523.2	498.	1523.4	399.	1523.6	328.	1523.8	219.	1524.0	176.	1524.2	115.	1524.5	91.	1524.7	64.			
1524.9	44.3	1525.1	21.9	1525.3	22.7	1525.5	30.7	1525.7	21.3	1525.9	32.6	1526.1	60.0	1526.3	46.5			
1526.5	43.3	1526.7	41.7	1526.9	66.0	1527.2	62.2	1527.4	49.6	1527.6	48.8	1527.8	47.8	1528.0	60.1			
1528.2	43.3	1528.4	50.7	1528.6	30.2	1528.8	29.2	1529.0	26.6	1529.2	12.4	1529.4	17.8	1529.6	14.3			
1529.9	11.3	1530.1	12.9	1530.3	0.9	1530.5	10.0	1530.7	12.4	1530.9	5.7	1531.1	11.2	1531.3	8.6			
1531.5	-1.0	1531.7	16.9	1531.9	14.1	1532.2	14.6	1532.4	15.9	1532.6	17.2	1532.8	15.0	1533.0	27.9			
1533.2	20.6	1533.4	20.8	1533.6	33.9	1533.8	27.6	1534.0	43.4	1534.2	26.8	1534.5	33.7	1534.7	44.3			
1534.9	38.1	1535.1	27.8	1535.3	35.8	1535.5	31.5	1535.7	17.7	1535.9	9.6	1536.1	7.5	1536.3	15.7			
1535.6	11.3	1535.8	6.0	1537.0	1.9	1537.2	4.6	1537.4	9.7	1537.6	2.9	1537.8	2.8	1538.0	5.0			
1538.2	-3.0	1538.4	-0.0	1538.7	10.4	1538.9	4.6	1539.1	8.8	1539.3	7.6	1539.5	9.4	1539.7	13.6			

E eV	$\frac{P}{N}E$ beV ^{1/2}																	
1539.9	2.1	1540.1	9.9	1540.3	8.5	1540.5	6.9	1540.8	2.6	1541.0	1.9	1541.2	1.9	1541.4	5.7			
1541.6	1.0	1541.8	5.9	1542.0	9.4	1542.2	10.7	1542.4	-0.0	1542.7	1.0	1542.9	0.9	1543.1	12.8			
1543.3	4.1	1543.5	9.9	1543.7	10.4	1543.9	9.2	1544.1	27.4	1544.3	15.3	1544.6	17.8	1544.8	32.8			
1545.0	4.0	1545.2	4.4	1545.4	5.6	1545.6	7.0	1545.8	-8.4	1546.0	102.	1546.2	133.	1546.5	150.			
1546.7	14.4	1546.9	154.	1547.1	16.4	1547.3	136.	1547.5	126.	1547.7	116.	1547.9	94.	1548.2	75.			
1548.4	7.0	1548.6	8.4	1548.8	11.0	1549.0	111.	1549.2	146.	1549.4	143.	1549.6	160.	1549.9	170.			
1550.1	17.9	1550.3	146.	1550.5	154.	1550.7	135.	1550.9	93.	1551.1	93.	1551.3	71.	1551.6	36.			
1551.8	22.6	1552.0	14.8	1552.2	9.4	1552.4	7.6	1552.6	12.4	1552.8	9.5	1553.0	12.1	1553.3	7.8			
1553.5	9.2	1553.7	9.9	1553.9	16.9	1554.1	14.5	1554.3	12.3	1554.5	21.9	1554.8	21.5	1555.0	26.3			
1555.2	23.8	1555.4	8.9	1555.6	14.1	1555.8	13.8	1556.0	7.0	1556.2	10.5	1556.5	11.2	1556.7	7.8			
1556.9	-0.0	1557.1	12.8	1557.3	6.6	1557.5	3.0	1557.7	-3.5	1558.0	-1.9	1558.2	0.9	1558.4	11.4			
1558.6	6.1	1558.8	9.9	1559.0	8.4	1559.2	2.3	1559.5	9.7	1559.7	5.7	1559.9	2.8	1560.1	5.0			
1559.3	16.4	1560.5	9.9	1560.8	9.4	1561.0	20.6	1561.2	22.9	1561.4	23.8	1561.6	34.5	1561.8	33.4			
1562.0	35.	1562.2	35.	1562.5	38.	1562.7	62.	1562.9	62.	1563.1	86.	1563.3	80.	1563.5	111.			
1563.8	12.0	1564.0	14.9	1564.2	16.0	1564.4	19.5	1564.6	214.	1564.8	234.	1565.1	229.	1565.3	199.			
1565.5	20.8	1565.7	150.	1565.9	128.	1566.1	103.	1566.4	76.	1566.6	61.	1566.8	47.	1567.0	45.			
1567.2	47.1	1567.4	51.3	1567.6	45.9	1567.9	53.4	1568.1	42.2	1568.3	55.2	1568.5	33.5	1568.7	27.7			
1568.9	31.7	1569.2	23.6	1569.4	14.0	1569.6	0.9	1569.8	7.9	1570.0	7.6	1570.2	6.5	1570.5	3.5			
1570.7	10.2	1570.9	1.0	1571.1	-0.0	1571.3	3.8	1571.5	3.5	1571.8	2.8	1572.0	0.9	1572.2	13.5			
1572.4	3.0	1572.6	1.0	1572.8	-1.9	1573.1	-0.0	1573.3	1.7	1573.5	7.6	1573.7	4.6	1573.9	2.8			
1574.2	-0.0	1574.4	0.9	1574.6	-4.7	1574.8	7.6	1575.0	9.6	1575.2	-3.8	1575.5	2.8	1575.7	7.1			
1575.9	-0.0	1576.1	-8.0	1576.3	0.9	1576.5	5.3	1576.8	8.8	1577.0	15.2	1577.2	4.6	1577.4	14.9			
1577.6	-3.1	1577.9	6.9	1578.1	4.6	1578.3	4.5	1578.5	3.5	1578.7	8.5	1579.0	4.6	1579.2	10.6			
1579.4	-0.0	1579.6	4.9	1579.8	-1.9	1580.0	5.3	1580.3	-0.0	1580.5	-1.9	1580.7	-0.0	1580.9	-1.4			
1581.1	9.2	1581.4	0.9	1581.6	-1.0	1581.8	5.3	1582.0	4.4	1582.2	-0.0	1582.5	-0.0	1582.7	3.5			
1582.9	2.0	1583.1	-4.0	1583.3	-2.8	1583.6	4.5	1583.8	5.2	1584.0	7.6	1584.2	3.7	1584.4	-0.0			
1584.6	2.0	1584.9	5.9	1585.1	-0.0	1585.3	2.3	1585.5	-1.8	1585.7	3.8	1586.0	-0.0	1586.2	4.2			
1586.4	1.0	1586.6	6.9	1586.8	8.4	1587.1	1.5	1587.3	7.9	1587.5	3.8	1587.7	7.4	1588.0	14.2			
1588.2	10.2	1588.4	4.9	1588.6	10.3	1588.8	22.1	1589.1	15.8	1589.3	20.9	1589.5	29.7	1589.7	31.9			
1589.9	38.8	1590.2	45.3	1590.4	39.3	1590.6	59.4	1590.8	72.9	1591.0	51.2	1591.3	67.8	1591.5	60.2			
1591.7	47.0	1591.9	41.3	1592.1	46.7	1592.4	26.6	1592.6	40.4	1592.8	22.7	1593.0	18.5	1593.3	32.6			
1593.5	32.	1593.7	32.	1593.9	36.	1594.1	45.	1594.4	66.	1594.6	63.	1594.8	74.	1595.0	108.			
1595.3	139.	1595.5	181.	1595.7	207.	1596.1	237.	1596.4	292.	1596.6	359.	1596.8	420.	1596.8	442.			
1597.0	57.1	1597.3	52.9	1597.5	55.8	1597.7	510.	1597.9	484.	1598.1	403.	1598.4	402.	1598.6	295.			
1598.8	259.	1599.0	171.	1599.3	136.	1599.5	90.	1599.7	78.	1599.9	49.	1600.1	53.	1600.4	45.			
1600.5	21.3	1600.8	17.6	1601.0	22.3	1601.3	28.1	1601.5	22.7	1601.7	19.8	1601.9	17.6	1602.2	29.7			
1602.4	23.4	1602.6	12.7	1602.8	9.3	1603.0	9.1	1603.3	11.3	1603.5	13.2	1603.7	21.3	1603.9	14.1			
1604.2	17.3	1604.4	15.7	1604.6	14.9	1604.8	15.9	1605.1	9.6	1605.3	13.2	1605.5	14.8	1605.7	13.4			
1606.0	-1.1	1606.2	4.8	1606.4	11.1	1606.6	8.3	1606.9	17.5	1607.1	13.2	1607.3	10.1	1607.5	10.6			
1607.8	1.0	1608.0	1.9	1608.2	2.7	1608.4	7.5	1608.7	5.1	1608.9	4.7	1609.1	-1.0	1609.3	9.8			
1609.6	9.1	1609.8	4.8	1610.0	13.9	1610.2	9.1	1610.5	6.9	1610.7	8.5	1610.9	1.8	1611.1	9.1			
1611.4	2.0	1611.6	7.8	1611.8	8.3	1612.0	10.5	1612.3	8.7	1612.5	16.0	1612.7	11.0	1612.9	19.0			
1613.2	16.2	1613.4	24.5	1613.6	19.5	1613.8	9.1	1614.1	17.4	1614.3	8.4	1614.5	11.0	1614.7	12.0			
1615.0	6.0	1615.2	5.8	1615.4	-1.0	1615.6	13.6	1615.9	7.8	1616.1	4.7	1616.3	10.1	1616.5	7.7			
1616.8	10.1	1617.0	0.9	1617.2	2.7	1617.5	10.6	1617.7	12.2	1617.9	14.1	1618.1	14.7	1618.4	33.9			
1618.6	40.	1618.8	29.	1619.0	32.	1619.2	45.	1619.5	78.	1619.7	84.	1619.9	117.	1620.2	159.			
1620.4	205.	1620.6	291.	1620.9	304.	1621.1	375.	1621.3	445.	1621.5	577.	1621.8	574.	1622.0	631.			
1622.2	663.	1622.5	574.	1622.7	586.	1622.9	518.	1623.1	429.	1623.4	359.	1623.6	246.	1623.8	176.			
1624.0	98.5	1624.3	40.1	1624.5	39.9	1624.7	29.5	1625.0	8.7	1625.2	7.5	1625.4	10.1	1625.6	6.3			
1625.9	7.0	1626.1	7.8	1626.3	4.6	1626.6	6.7	1626.8	6.0	1627.0	7.5	1627.2	3.6	1627.5	7.0			
1627.7	10.1	1627.9	3.9	1628.2	13.9	1628.4	4.5	1628.6	6.0	1628.8	-1.0	1629.1	4.5	1629.3	9.1			
1629.5	-71.1	1629.8	8.7	1630.0	4.6	1630.2	6.0	1630.4	0.8	1630.7	3.7	1630.9	0.8	1631.1	9.8			
1631.4	2.9	1631.6	7.7	1631.8	12.0	1632.1	7.5	1632.3	3.4	1632.5	4.6	1632.7	7.3	1633.0	18.2			
1633.2	13.1	1633.4	5.8	1633.7	23.1	1633.9	21.9	1634.1	52.3	1634.4	33.9	1634.6	60.8	1634.8	57.0			
1635.0	101.	1635.3	122.	1635.5	131.	1635.7	189.	1636.0	228.	1636.2	290.	1636.4	349.	1636.7	462.			

E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$																	
eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}															
1636.9	543.	1637.1	536.	1637.3	627.	1637.6	628.	1637.8	622.	1638.0	563.	1638.3	468.	1638.5	383.									
1638.7	315.	1639.0	251.	1639.2	164.	1639.4	82.	1639.7	50.	1639.9	27.	1640.1	22.	1640.4	19.									
1640.6	16.1	1640.8	19.4	1641.0	12.0	1641.3	11.2	1641.5	18.2	1641.7	6.5	1642.0	7.3	1642.2	13.3									
1642.4	17.1	1642.7	12.6	1642.9	4.5	1643.1	6.0	1643.4	11.2	1643.6	0.8	1643.8	5.4	1644.1	7.6									
1644.3	6.0	1644.5	7.7	1644.8	5.4	1645.0	5.2	1645.2	3.4	1645.5	1.8	1645.7	6.3	1645.9	9.0									
1646.2	4.9	1646.4	0.9	1646.6	6.4	1646.9	6.7	1647.1	4.2	1647.3	1.8	1647.6	14.6	1647.8	4.8									
1648.0	7.0	1648.3	3.8	1648.5	2.7	1648.7	11.2	1649.0	3.4	1649.2	12.1	1649.4	4.5	1649.7	14.0									
1649.9	18.1	1650.1	13.5	1650.4	14.7	1650.6	11.2	1650.8	12.1	1651.1	4.6	1651.3	9.1	1651.5	8.3									
1651.8	5.9	1652.0	1.8	1652.2	2.7	1652.5	8.2	1652.7	6.0	1652.9	10.2	1653.2	8.2	1653.4	7.6									
1653.6	-9.1	1653.9	5.7	1654.1	4.5	1654.3	5.9	1654.6	6.0	1654.8	9.3	1655.0	8.2	1655.3	3.4									
1655.5	12.0	1655.7	7.7	1656.0	9.2	1656.2	10.5	1656.4	16.4	1656.7	16.8	1656.9	22.0	1657.1	25.2									
1657.4	27.	1657.6	28.	1657.9	43.	1658.1	37.	1658.3	63.	1658.6	72.	1658.8	63.	1659.0	102.									
1659.3	100.	1659.5	129.	1659.7	167.	1660.0	182.	1660.2	253.	1660.4	327.	1660.7	397.	1660.9	446.									
1661.1	541.	1661.4	560.	1661.6	599.	1661.9	623.	1662.1	641.	1662.3	605.	1662.6	497.	1662.8	447.									
1663.0	322.	1663.3	253.	1663.5	216.	1663.7	123.	1664.0	75.	1664.2	52.	1664.5	43.	1664.7	34.									
1664.9	20.1	1665.2	14.5	1665.4	21.2	1665.6	11.2	1665.9	12.0	1666.1	12.1	1666.3	8.1	1666.6	10.4									
1666.8	4.9	1667.1	9.6	1667.3	8.2	1667.5	8.2	1667.8	3.4	1668.0	6.4	1668.2	7.2	1668.5	15.3									
1668.7	-0.1	1669.0	4.7	1669.2	-3.8	1669.4	10.4	1669.7	4.2	1669.9	10.2	1670.1	10.9	1670.4	10.4									
1670.6	5.9	1670.9	6.7	1671.1	7.3	1671.3	17.2	1671.6	11.2	1671.8	15.8	1672.1	7.2	1672.3	18.1									
1672.5	15.0	1672.8	30.0	1673.0	15.6	1673.2	11.9	1673.5	16.4	1673.7	13.0	1674.0	19.2	1674.2	16.7									
1674.4	15.0	1674.7	8.6	1674.9	9.1	1675.2	16.4	1675.4	12.9	1675.6	6.4	1675.9	10.0	1676.1	9.0									
1676.3	5.9	1676.6	19.3	1676.8	3.6	1677.1	0.6	1677.3	5.9	1677.5	4.6	1677.8	-2.0	1678.0	9.0									
1678.3	-0.1	1678.5	12.5	1678.7	4.5	1679.0	11.2	1679.2	10.3	1679.5	1.7	1679.7	3.5	1679.9	6.9									
1680.2	10.9	1680.4	-3.1	1680.7	8.2	1680.9	11.9	1681.1	13.7	1681.4	13.0	1681.6	10.0	1681.9	12.5									
1682.1	15.0	1682.3	20.3	1682.6	8.2	1682.8	17.2	1683.1	15.5	1683.3	21.4	1683.5	11.8	1683.8	16.0									
1684.0	18.0	1684.3	20.3	1684.5	24.8	1684.7	41.2	1685.0	45.8	1685.2	51.4	1685.5	87.9	1685.7	99.2									
1686.0	143.	1686.2	175.	1686.4	236.	1686.7	281.	1686.9	371.	1687.2	450.	1687.4	518.	1687.6	559.									
1687.9	647.	1688.1	736.	1688.4	658.	1688.6	606.	1688.8	524.	1689.1	463.	1689.3	377.	1689.6	278.									
1689.8	165.	1690.1	111.	1690.3	93.	1690.5	55.	1690.8	38.	1691.0	28.	1691.3	18.	1691.5	15.									
1691.8	10.9	1692.0	15.4	1692.2	10.9	1692.5	10.4	1692.7	9.4	1693.0	4.5	1693.2	12.7	1693.5	9.0									
1693.7	8.9	1693.9	11.5	1694.2	9.1	1694.4	14.1	1694.7	9.4	1694.9	6.4	1695.2	14.5	1695.4	13.8									
1695.6	9.9	1695.9	13.4	1696.1	12.7	1696.4	17.1	1696.6	4.2	1696.9	12.9	1697.1	1.7	1697.3	13.1									
1697.6	3.8	1697.8	13.4	1698.1	11.8	1698.3	4.4	1698.6	9.4	1698.8	12.0	1699.0	8.1	1699.3	8.3									
1699.5	11.9	1699.8	6.6	1700.0	8.1	1700.3	11.9	1700.5	13.7	1700.8	5.4	1701.0	11.7	1701.2	12.4									
1701.5	3.8	1701.7	14.4	1702.0	12.7	1702.2	12.6	1702.5	6.8	1702.7	5.4	1703.0	10.8	1703.2	15.9									
1703.4	14.9	1703.7	11.5	1703.9	12.7	1704.2	18.6	1704.4	26.6	1704.7	37.2	1704.9	36.4	1705.2	40.3									
1705.4	56.	1705.7	59.	1705.9	107.	1706.1	85.	1706.4	135.	1706.6	116.	1706.9	168.	1707.1	204.									
1707.4	231.	1707.6	279.	1707.9	336.	1708.1	425.	1708.4	519.	1708.6	563.	1708.8	596.	1709.1	650.									
1709.3	695.	1709.6	551.	1709.8	591.	1710.1	479.	1710.3	390.	1710.6	327.	1710.8	256.	1711.1	188.									
1711.3	140.	1711.6	130.	1711.8	109.	1712.1	91.	1712.3	59.	1712.5	46.	1712.8	48.	1713.0	18.									
1713.3	12.9	1713.5	6.6	1713.8	15.4	1714.0	4.3	1714.3	7.6	1714.5	10.1	1714.8	9.0	1715.0	11.7									
1715.3	3.8	1715.5	7.6	1715.8	11.8	1716.0	5.1	1716.3	6.7	1716.5	3.5	1716.8	8.0	1717.0	10.3									
1717.2	6.8	1717.5	1.7	1717.7	18.2	1718.0	19.3	1718.2	24.0	1718.5	17.5	1718.7	30.8	1719.0	43.0									
1719.2	47.	1719.5	60.	1719.7	70.	1720.0	93.	1720.2	113.	1720.5	141.	1720.7	214.	1721.0	254.									
1721.2	277.	1721.5	334.	1721.7	424.	1722.0	427.	1722.2	444.	1722.5	381.	1722.7	402.	1723.0	294.									
1723.2	282.	1723.5	200.	1723.7	157.	1724.0	108.	1724.2	46.	1724.5	45.	1724.7	23.	1725.0	19.									
1725.2	17.8	1725.5	12.4	1725.7	9.9	1726.0	8.1	1726.2	24.8	1726.5	0.7	1726.7	14.4	1727.0	8.9									
1727.2	4.8	1727.5	8.5	1727.7	5.3	1728.0	14.0	1728.2	6.7	1728.5	-2.1	1728.7	2.5	1729.0	4.0									
1729.2	15.8	1729.5	1.7	1729.7	3.5	1730.0	8.1	1730.2	11.0	1730.5	1.7	1730.7	13.5	1731.0	12.4									
1731.2	-0.2	1731.5	4.6	1731.7	9.0	1732.0	7.3	1732.2	1.5	1732.5	3.5	1732.7	4.4	1733.0	6.8									
1733.2	8.8	1733.5	8.5	1733.7	5.3	1734.0	6.6	1734.2	8.4	1734.5	8.2	1734.7	14.4	1735.0	4.0									
1735.2	3.8	1735.5	15.2	1735.7	9.9	1736.0	16.3	1736.2	9.3	1736.5	9.1	1736.7	12.5	1737.0	10.3					</td				

E	P _{N/E}														
eV	bev ^{1/2}														
1860.5	12.5	1860.8	13.0	1861.0	4.2	1861.3	4.9	1861.6	2.3	1861.9	1.5	1862.2	1.5	1862.4	3.2
1862.7	3.6	1863.0	3.5	1863.3	6.0	1863.6	9.3	1863.8	7.3	1864.1	12.5	1864.4	23.0	1864.7	31.2
1865.0	22.3	1865.2	26.3	1865.5	34.9	1865.8	47.5	1866.1	36.1	1866.4	59.2	1866.6	63.3	1866.9	77.7
1867.2	86.3	1867.5	76.6	1867.8	80.8	1868.1	73.9	1868.3	75.9	1868.6	71.0	1868.9	66.9	1869.2	59.9
1869.5	58.7	1869.7	44.2	1870.0	19.5	1870.3	24.7	1870.6	14.1	1870.9	9.7	1871.2	0.6	1871.4	8.0
1871.7	7.5	1872.0	7.3	1872.3	-4.8	1872.6	-1.0	1872.8	1.4	1873.1	6.1	1873.4	2.4	1873.7	7.3
1874.0	2.6	1874.3	7.3	1874.5	-1.9	1874.8	1.9	1875.1	1.4	1875.4	0.6	1875.7	2.4	1876.0	-0.2
1876.2	2.6	1876.5	-1.3	1876.8	-2.1	1877.1	5.6	1877.4	14.1	1877.7	8.8	1877.9	14.9	1878.2	16.8
1878.5	26.2	1878.8	41.4	1879.1	40.2	1879.4	52.5	1879.6	49.6	1879.9	60.0	1880.2	75.7	1880.5	55.7
1880.8	63.6	1881.1	44.2	1881.3	27.6	1881.6	21.7	1881.9	8.2	1882.2	14.3	1882.5	10.4	1882.8	-0.2
1883.1	2.6	1883.3	10.1	1883.6	8.7	1883.9	2.7	1884.2	7.3	1884.5	4.2	1884.8	0.6	1885.0	4.5
1885.3	3.6	1885.6	6.3	1885.9	-0.3	1886.2	2.7	1886.5	-2.0	1886.8	-2.2	1887.0	1.5	1887.3	5.9
1887.6	4.6	1887.9	-0.3	1888.2	-3.9	1888.5	4.9	1888.8	3.1	1889.0	4.2	1889.3	3.3	1889.6	7.9
1889.9	2.6	1890.2	4.4	1890.5	18.6	1890.8	18.8	1891.0	20.0	1891.3	21.6	1891.6	25.6	1891.9	38.6
1892.2	41.9	1892.5	51.7	1892.8	40.1	1893.1	50.3	1893.3	67.2	1893.6	50.8	1893.9	36.3	1894.2	33.1
1894.5	27.1	1894.8	30.9	1895.1	30.2	1895.4	14.4	1895.6	14.0	1895.9	8.8	1896.2	13.1	1896.5	8.6
1896.8	1.6	1897.1	11.0	1897.4	11.4	1897.7	21.0	1897.9	34.3	1898.2	27.0	1898.5	37.2	1898.8	46.7
1899.1	86.	1899.4	122.	1899.7	141.	1900.0	175.	1900.2	242.	1900.5	275.	1900.8	370.	1901.1	419.
1901.4	472.	1901.7	555.	1902.0	532.	1902.3	506.	1902.6	442.	1902.8	370.	1903.1	290.	1903.4	190.
1903.7	114.	1904.0	60.	1904.3	50.	1904.6	36.	1904.9	25.	1905.2	21.	1905.5	9.	1905.7	15.
1905.0	9.4	1905.3	4.4	1906.6	1.5	1906.9	9.2	1907.2	14.0	1907.5	10.6	1907.8	1.4	1908.1	7.2
1908.4	9.4	1908.6	14.8	1908.9	14.9	1909.2	15.8	1909.5	30.9	1909.8	22.4	1910.1	35.3	1910.4	61.6
1910.7	66.	1911.0	83.	1911.3	107.	1911.6	123.	1911.8	163.	1912.1	181.	1912.4	202.	1912.7	162.
1913.0	172.	1913.3	186.	1913.6	186.	1913.9	176.	1914.2	186.	1914.5	214.	1914.8	235.	1915.0	326.
1915.3	436.	1915.6	438.	1915.9	521.	1916.2	543.	1916.5	492.	1916.8	440.	1917.1	389.	1917.4	277.
1917.7	213.	1918.0	111.	1918.3	77.	1918.6	50.	1918.8	21.	1919.1	28.	1919.4	13.	1919.7	1.
1920.0	-0.4	1920.3	10.9	1920.6	8.6	1920.9	20.1	1921.2	10.6	1921.5	6.9	1921.8	9.4	1922.1	12.6
1922.4	21.1	1922.7	16.6	1923.0	31.9	1923.2	29.6	1923.5	28.3	1923.8	40.5	1924.1	36.1	1924.4	42.5
1924.7	28.0	1925.0	36.4	1925.3	18.4	1925.6	26.7	1925.9	15.6	1926.2	6.0	1926.5	6.8	1926.8	13.3
1927.1	7.4	1927.4	10.0	1927.7	1.4	1928.0	9.2	1928.3	1.3	1928.5	6.9	1928.8	15.6	1929.1	10.6
1929.4	7.4	1929.7	9.0	1930.0	5.0	1930.3	8.4	1930.6	4.7	1930.9	3.3	1931.2	13.0	1931.5	8.5
1931.8	9.4	1932.1	2.4	1932.4	13.1	1932.7	5.5	1933.0	4.7	1933.3	6.9	1933.6	3.2	1933.9	2.4
1934.2	13.3	1934.5	2.4	1934.8	5.9	1935.1	8.4	1935.4	4.7	1935.6	12.3	1935.9	-3.0	1936.2	6.5
1936.5	7.4	1936.8	12.0	1937.1	-0.4	1937.4	3.3	1937.7	2.2	1938.0	2.3	1938.3	8.5	1938.6	3.1
1938.9	1.6	1939.2	6.2	1939.5	8.6	1939.8	7.7	1940.1	10.6	1940.4	21.4	1940.7	17.4	1941.0	15.3
1941.3	24.0	1941.6	74.1	1941.9	16.6	1942.2	23.0	1942.5	15.6	1942.8	25.0	1943.1	12.9	1943.4	9.9
1943.7	-0.4	1944.0	4.3	1944.3	8.6	1944.6	3.3	1944.9	3.8	1945.2	6.0	1945.5	1.4	1945.8	3.8
1946.1	-1.4	1946.4	6.5	1946.7	-3.1	1947.0	4.1	1947.3	4.7	1947.6	6.0	1947.9	4.1	1948.2	7.2
1948.5	12.3	1948.8	9.0	1949.1	13.9	1949.4	12.1	1949.7	15.6	1950.0	20.5	1950.3	31.6	1950.6	42.4
1950.9	44.	1951.2	65.	1951.5	84.	1951.8	102.	1952.1	118.	1952.4	127.	1952.7	134.	1953.0	132.
1953.3	130.	1953.6	94.	1953.9	92.	1954.2	68.	1954.5	36.	1954.8	22.	1955.1	12.	1955.4	15.
1955.7	0.6	1956.0	4.3	1956.3	10.3	1956.6	6.2	1956.9	-1.2	1957.2	4.1	1957.5	15.6	1957.8	12.6
1958.1	5.4	1958.4	12.8	1958.7	4.1	1959.0	10.6	1959.3	8.9	1959.6	8.7	1959.9	8.5	1960.2	19.3
1960.5	9.3	1960.8	9.0	1961.1	19.2	1961.4	27.3	1961.7	33.2	1962.0	36.7	1962.3	36.8	1962.6	51.8
1962.9	42.	1963.2	71.	1963.5	73.	1963.8	78.	1964.1	103.	1964.4	104.	1964.7	117.	1965.1	143.
1965.4	189.	1965.7	188.	1966.0	254.	1966.3	279.	1966.6	290.	1966.9	342.	1967.2	400.	1967.5	382.
1967.8	422.	1968.1	398.	1968.4	366.	1968.7	350.	1969.0	328.	1969.3	279.	1969.6	229.	1969.9	216.
1970.2	211.	1970.5	184.	1970.8	198.	1971.1	172.	1971.4	189.	1971.7	229.	1972.1	291.	1972.4	312.
1972.7	368.	1973.0	435.	1973.3	425.	1973.6	448.	1973.9	502.	1974.2	481.	1974.5	411.	1974.8	335.
1975.1	291.	1975.4	209.	1975.7	177.	1976.0	121.	1976.3	92.	1976.6	71.	1976.9	61.	1977.2	56.
1977.6	39.4	1977.9	38.9	1978.2	43.2	1978.5	30.1	1978.8	23.0	1979.1	28.5	1979.4	27.0	1979.7	27.3
1980.0	33.6	1980.3	23.9	1980.6	25.4	1980.9	17.8	1981.2	10.5	1981.5	22.1	1981.8	24.3	1982.2	25.3
1982.5	23.8	1982.8	28.6	1983.1	19.1	1983.4	24.3	1983.7	28.8	1984.0	30.3	1984.3	19.9	1984.6	33.4
1984.9	16.1	1985.2	23.9	1985.5	25.4	1985.9	25.7	1986.2	18.0	1986.5	19.4	1986.8	26.1	1987.1	30.0
1987.4	37.4	1987.7	26.7	1988.0	44.9	1988.3	39.5	1988.6	42.2	1988.9	42.9	1989.2	43.7	1989.6	42.1

Σ	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$		
eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}	eV	
1989.9	30.6	1990.2	24.8	1990.5	29.8	1990.8	19.9	1991.1	17.1	1991.4	16.7	1991.7	11.9	1992.0	5.1						
1992.3	11.2	1992.7	5.2	1993.0	5.8	1993.3	9.8	1993.6	10.4	1993.9	2.3	1994.2	13.7	1994.5	8.4						
1994.8	3.4	1995.1	12.7	1995.4	9.3	1995.8	6.2	1996.1	6.3	1996.4	8.6	1996.7	5.8	1997.0	8.4						
1997.3	-1.6	1997.5	4.2	1997.9	9.3	1998.2	22.7	1998.5	16.3	1998.9	21.2	1999.2	19.0	1999.5	17.8						
1999.8	29.6	2000.1	26.7	2000.4	15.6	2000.7	13.4	2001.0	10.4	2001.4	9.5	2001.7	9.3	2002.0	11.1						
2002.3	13.1	2002.6	6.1	2002.9	8.4	2003.2	9.0	2003.5	9.6	2003.9	8.6	2004.2	8.4	2004.5	18.5						
2004.8	1.5	2005.1	2.4	2005.4	12.0	2005.7	11.9	2006.0	-0.4	2006.4	2.3	2006.7	-4.0	2007.0	8.4						
2007.3	0.5	2007.6	2.4	2007.9	2.2	2008.2	9.0	2008.5	2.9	2008.9	-1.3	2009.2	4.0	2009.5	9.1						
2009.8	0.5	2010.1	4.2	2010.4	2.2	2010.7	0.4	2011.1	0.4	2011.4	5.9	2011.7	0.5	2012.0	5.7						
2012.3	-5.2	2012.5	2.3	2012.9	1.3	2013.3	3.3	2013.6	2.1	2013.9	-0.4	2014.2	3.1	2014.5	3.0						
2014.8	-2.4	2015.1	9.3	2015.5	6.7	2015.8	4.7	2016.1	7.9	2016.4	0.5	2016.7	8.4	2017.0	11.1						
2017.4	17.1	2017.7	19.1	2018.0	12.9	2018.3	21.3	2018.6	54.5	2018.9	47.2	2019.3	69.1	2019.6	91.7						
2019.9	12.3	2020.2	114.	2320.5	136.	2020.8	233.	2021.2	309.	2021.5	376.	2021.8	423.	2022.1	452.						
2022.4	512.	2022.7	483.	2023.1	432.	2023.4	405.	2023.7	340.	2024.0	234.	2024.3	183.	2024.6	123.						
2025.0	74.	2025.3	55.	2025.6	54.	2025.9	63.	2026.2	54.	2026.5	89.	2026.9	110.	2027.2	150.						
2027.5	226.	2027.8	252.	2028.1	299.	2028.5	371.	2028.8	421.	2029.1	459.	2029.4	486.	2029.7	431.						
2030.0	411.	2030.4	328.	2030.7	241.	2031.0	163.	2031.3	114.	2031.6	56.	2032.0	30.	2032.3	18.						
2032.6	13.0	2032.9	20.0	2033.2	16.3	2033.6	17.3	2033.9	12.9	2034.2	22.0	2034.5	11.0	2034.8	25.1						
2035.2	13.0	2035.5	19.1	2035.8	15.5	2036.1	12.6	2036.4	7.9	2036.8	14.8	2037.1	21.5	2037.4	17.1						
2037.7	14.0	2038.0	14.4	2038.4	12.8	2038.7	6.8	2039.0	13.7	2039.3	7.6	2039.6	11.8	2040.0	9.7						
2040.3	-2.4	2040.6	1.4	2040.9	11.9	2041.2	10.4	2041.6	8.7	2041.9	12.1	2042.2	3.9	2042.5	9.7						
2042.8	4.3	2043.2	11.6	2043.5	11.0	2043.8	17.6	2044.1	14.5	2044.5	17.5	2044.8	14.5	2045.1	22.4						
2045.4	18.8	2045.7	21.8	2046.1	43.7	2046.4	37.7	2046.7	39.4	2047.0	60.5	2047.4	39.9	2047.7	58.5						
2048.0	61.2	2048.3	66.4	2048.6	64.9	2049.0	42.0	2049.3	40.2	2049.6	31.8	2049.9	31.1	2050.3	24.4						
2050.6	25.5	2050.9	24.6	2051.2	37.5	2051.6	42.7	2051.9	35.2	2052.2	45.2	2052.5	32.8	2052.9	21.0						
2053.2	15.9	2053.5	6.0	2053.8	4.8	2054.2	3.9	2054.5	10.3	2054.8	6.7	2055.1	1.3	2055.5	9.7						
2055.8	1.4	2056.1	-0.5	2056.4	4.8	2056.7	13.3	2057.1	6.2	2057.4	-2.3	2057.7	0.4	2058.0	7.7						
2058.4	-2.4	2058.7	1.4	2059.0	2.2	2059.4	8.2	2059.7	4.5	2060.0	0.4	2060.3	5.7	2060.7	11.0						
2061.0	9.1	2061.3	2.2	2061.6	6.6	2062.0	14.0	2062.3	16.1	2062.6	17.4	2062.9	10.9	2063.3	13.0						
2063.5	4.3	2063.9	5.1	2064.2	-1.4	2064.6	3.9	2064.9	7.0	2065.2	3.1	2065.6	-2.2	2065.9	6.3						
2066.2	4.3	2066.5	6.9	2066.9	3.9	2067.2	9.7	2067.5	10.3	2067.8	19.2	2068.2	17.9	2068.5	43.1						
2068.8	38.0	2069.2	42.2	2069.5	55.9	2069.8	62.7	2070.1	80.6	2070.5	64.8	2070.8	63.4	2071.1	54.4						
2071.4	54.3	2071.8	33.8	2072.1	25.9	2072.4	9.7	2072.8	7.0	2073.1	11.1	2073.4	-1.3	2073.8	7.0						
2075.1	-1.5	2075.4	2.3	2075.7	18.3	2075.1	17.8	2075.4	10.3	2075.7	8.5	2076.1	2.1	2076.4	12.3						
2076.7	-5.3	2077.0	20.8	2077.4	14.5	2077.7	24.0	2078.0	34.3	2078.4	34.4	2078.7	41.5	2079.0	57.7						
2079.4	52.4	2079.7	63.5	2080.0	62.0	2080.3	41.2	2080.7	45.0	2081.0	42.4	2081.3	31.9	2081.7	27.7						
2082.0	34.	2082.3	42.	2082.7	45.	2083.0	70.	2083.3	86.	2083.7	112.	2084.0	154.	2084.3	172.						
2084.6	202.	2085.0	232.	2085.3	26.5	2085.6	275.	2086.0	289.	2086.3	339.	2086.6	347.	2087.0	362.						
2087.3	403.	2087.6	368.	2088.0	34.5	2088.3	282.	2088.6	222.	2089.0	144.	2089.3	83.	2089.6	57.						
2090.0	22.5	2090.3	20.8	2090.6	27.6	2091.0	25.4	2091.3	31.7	2091.6	45.9	2092.0	42.3	2092.3	72.9						
2092.6	55.	2093.0	147.	2093.3	18.0	2093.6	239.	2094.0	264.	2094.3	340.	2094.6	357.	2095.0	393.						
2095.3	424.	2095.6	350.	2095.9	328.	2096.3	272.	2096.6	140.	2097.0	78.	2097.3	68.	2097.6	44.						
2098.0	18.6	2098.3	15.2	2098.6	11.8	2099.0	9.6	2099.3	18.5	2099.7	13.7	2100.0	18.7	2100.3	26.2						
2101.7	34.9	2101.0	49.4	2101.3	42.5	2101.7	58.9	2102.0	58.0	2102.3	79.6	2102.7	61.4	2103.0	59.5						
2103.3	46.4	2103.7	53.1	2104.0	24.1	2104.4	24.6	2104.7	20.1	2105.0	8.4	2105.4	10.0	2105.7	12.9						
2106.0	12.9	2106.4	1.3	2106.7	15.3	2107.0	5.7	2107.4	16.0	2107.7	8.4	2108.1	10.8	2108.4	16.9						
2108.7	5.2	2109.1	12.4	2109.4	10.9	2109.7	6.0	2110.1	11.9	2110.4	4.8	2110.8	20.4	2111.1	22.9						
2111.4	18.6	2111.8	27.2	2112.1	31.9	2112.4	34.6	2112.8	28.3	2113.1	26.2	2113.5	23.0	2113.8	26.9						
2114.1	12.8	2114.5	22.5	2114.8	20.5	2115.2	16.7	2115.5	12.7	2115.8	14.6	2116.2	5.6	2116.5	7.6						
2116.8	5.2	2117.2	0.4	2117.5	3.9	2117.9	10.3	2118.2	11.0	2118.5	13.7	2118.9	14.3	2119.2	15.5						
2119.6	9.0	2119.9	11.5	2120.2	17.9	2120.6	27.4	2120.9	32.4	2121.3	59.9	2121.6	57.8	2121.9	75.3						
2122.3	19.4	2122.7	101.	2123.0	102.	2123.3	69.	2123.6	94.	2124.0	79.	2124.3	66.	2124.7	47.						
2125.0	58.7	2125.4	36.3	2125.7	35.4	2126.0	21.0	2126.4	33.2	2126.7	35.5	2127.1	9.0	2127.4	8.9						
2127.7	-0.6	2128.1	1.3	2128.4	7.4	2128.8	2.4	2129.1	6.1	2129.5	0.4	2129.8	4.7	2130.1	5.6						
2130.5	2.3	2130.8	-1.5	2131.2	1.2	2131.5	6.0	2131.9</													

E eV	P N/E bev ^{1/2}																
2133.2	8.0	2133.6	1.3	2133.9	9.1	2134.3	1.0	2134.6	-2.1	2134.9	0.4	2135.3	3.0	2135.6	12.2		
2136.0	9.0	2136.3	11.4	2136.7	3.0	2137.0	11.0	2137.4	18.4	2137.7	11.0	2138.0	22.1	2138.4	28.8		
2138.7	37.6	2139.1	27.1	2139.4	49.3	2139.8	34.5	2140.1	53.7	2140.5	50.9	2140.8	61.2	2141.1	84.4		
2141.5	105.	2141.8	164.	2142.2	160.	2142.5	237.	2142.9	293.	2143.2	351.	2143.6	415.	2143.9	450.		
2144.3	478.	2144.6	480.	2144.9	429.	2145.3	356.	2145.6	279.	2146.0	162.	2146.3	104.	2146.7	74.		
2147.0	55.	2147.4	59.	2147.7	70.	2148.1	88.	2148.4	104.	2148.8	124.	2149.1	167.	2149.5	202.		
2149.8	254.	2150.1	319.	2150.5	378.	2150.8	426.	2151.2	438.	2151.5	443.	2151.9	492.	2152.2	348.		
2152.6	309.	2152.9	256.	2153.3	171.	2153.6	118.	2154.0	72.	2154.3	78.	2154.7	47.	2155.0	60.		
2155.4	35.6	2155.7	44.4	2156.1	22.1	2156.4	30.8	2156.8	20.0	2157.1	10.1	2157.5	18.5	2157.8	7.5		
2158.2	12.7	2158.5	4.0	2158.9	16.9	2159.2	4.5	2159.6	15.0	2159.9	18.0	2160.3	23.7	2160.6	14.1		
2161.0	14.6	2161.3	10.4	2161.7	8.2	2162.0	7.4	2162.4	15.0	2162.7	10.9	2163.1	5.5	2163.4	8.2		
2163.8	7.0	2164.1	4.0	2164.5	15.1	2164.8	8.8	2165.2	5.2	2165.5	18.0	2165.9	4.8	2166.2	19.4		
2166.6	8.9	2166.9	0.3	2167.3	18.6	2167.6	10.9	2168.0	13.4	2168.3	12.7	2168.7	9.8	2169.0	18.7		
2169.4	38.4	2169.7	27.9	2170.1	36.0	2170.4	52.8	2170.8	61.7	2171.1	76.4	2171.5	73.9	2171.8	78.2		
2172.2	51.7	2172.5	49.9	2172.9	34.3	2173.3	19.4	2173.6	20.7	2174.0	16.2	2174.3	12.4	2174.7	22.0		
2175.0	7.0	2175.4	12.2	2175.7	16.9	2176.1	18.0	2176.4	26.5	2176.8	34.8	2177.1	30.6	2177.5	41.2		
2177.8	43.1	2178.2	26.0	2178.6	19.5	2178.9	29.3	2179.3	26.5	2179.6	23.3	2180.0	25.4	2180.3	26.0		
2180.7	37.	2181.0	36.	2181.4	51.	2181.7	63.	2182.1	96.	2182.5	120.	2182.8	157.	2183.2	200.		
2183.5	263.	2183.9	272.	2184.2	300.	2184.6	347.	2184.9	348.	2185.3	338.	2185.7	341.	2186.0	303.		
2186.4	253.	2186.7	216.	2187.1	156.	2187.4	111.	2187.8	94.	2188.2	51.	2188.5	48.	2188.9	38.		
2189.2	32.6	2189.6	28.7	2189.9	22.9	2190.3	24.3	2190.7	28.0	2191.0	20.6	2191.4	21.9	2191.7	17.4		
2192.1	24.1	2192.4	16.8	2192.8	13.3	2193.2	15.9	2193.5	26.4	2193.9	22.3	2194.2	27.9	2194.6	42.4		
2194.9	30.	2195.3	45.	2195.7	59.	2196.0	70.	2196.4	83.	2196.7	107.	2197.1	131.	2197.5	170.		
2197.8	240.	2198.2	290.	2198.5	363.	2198.9	432.	2199.2	511.	2199.6	529.	2200.0	522.	2200.3	518.		
2200.7	466.	2201.0	366.	2201.4	292.	2201.8	182.	2202.1	110.	2202.5	55.	2202.8	24.	2203.2	9.		
2203.6	19.3	2203.9	13.1	2204.3	2.9	2204.6	17.9	2205.0	7.6	2205.4	5.6	2205.7	9.8	2206.1	6.1		
2206.5	6.0	2206.8	8.5	2207.2	13.3	2207.5	15.8	2207.9	16.6	2208.3	9.1	2208.6	6.3	2209.0	15.3		
2209.3	6.9	2209.7	3.9	2210.1	15.0	2210.4	20.7	2210.8	17.4	2211.2	32.0	2211.5	24.4	2211.9	31.8		
2212.2	47.	2212.6	55.	2213.0	77.	2213.3	82.	2213.7	101.	2214.1	92.	2214.4	99.	2214.8	80.		
2215.1	50.5	2215.5	46.9	2215.9	31.5	2216.2	24.2	2216.6	24.7	2217.0	14.4	2217.3	10.6	2217.7	12.0		
2218.1	22.1	2218.4	14.9	2218.8	12.4	2219.1	12.9	2219.5	16.5	2219.9	10.8	2220.2	8.9	2220.6	18.0		
2221.0	8.0	2221.3	2.1	2221.7	11.5	2222.1	8.0	2222.4	1.9	2222.8	1.2	2223.2	5.4	2223.5	12.0		
2223.9	4.1	2224.2	-2.5	2224.6	4.6	2225.0	5.9	2225.3	5.1	2225.7	2.0	2226.1	-1.5	2226.4	2.8		
2226.8	1.2	2227.2	8.5	2227.5	7.2	2227.9	3.0	2228.3	10.0	2228.6	6.4	2229.0	5.4	2229.4	7.4		
2229.7	-1.6	2230.1	3.9	2230.5	10.7	2230.8	11.5	2231.2	6.8	2231.6	2.0	2231.9	6.3	2232.3	4.1		
2232.7	1.2	2233.0	22.2	2233.4	9.8	2233.8	16.4	2234.1	14.9	2234.5	13.5	2234.9	15.8	2235.3	15.3		
2235.6	9.7	2236.0	14.0	2236.4	3.7	2236.7	2.3	2237.1	10.8	2237.5	10.8	2237.8	20.0	2238.2	19.2		
2238.6	34.3	2238.9	34.9	2239.3	43.5	2239.7	40.4	2240.0	32.8	2240.4	29.3	2240.8	39.8	2241.2	23.8		
2241.5	10.7	2241.9	13.0	2242.3	8.9	2242.6	10.1	2243.0	9.2	2243.4	4.7	2243.7	-4.9	2244.1	6.1		
2244.5	6.0	2244.9	3.0	2245.2	-0.6	2245.6	3.0	2246.0	-1.4	2246.3	0.3	2246.7	3.7	2247.1	12.0		
2247.5	0.3	2247.8	-5.2	2248.2	11.5	2248.6	4.4	2248.9	4.3	2249.3	2.9	2249.7	7.1	2250.1	0.2		
2250.4	-1.6	2250.8	8.5	2251.2	-0.6	2251.5	10.1	2251.9	-0.6	2252.3	5.5	2252.7	12.3	2253.0	25.8		
2253.4	32.	2253.8	28.	2254.1	41.	2254.5	60.	2254.9	84.	2255.3	92.	2255.6	134.	2256.0	160.		
2255.4	250.	2256.8	293.	2257.1	370.	2257.5	414.	2257.9	448.	2258.3	486.	2258.6	467.	2259.0	351.		
2259.4	302.	2259.7	261.	2260.1	204.	2260.5	158.	2260.9	140.	2261.2	153.	2261.6	170.	2262.0	227.		
2262.4	250.	2262.7	333.	2263.1	354.	2263.5	402.	2263.9	434.	2264.2	425.	2264.6	457.	2265.0	452.		
2265.4	467.	2265.7	399.	2266.1	358.	2266.5	243.	2266.9	192.	2267.3	117.	2267.6	117.	2268.0	83.		
2268.4	89.	2268.8	127.	2269.1	94.	2269.5	101.	2269.9	83.	2270.3	67.	2270.6	77.	2271.0	54.		
2271.4	32.3	2271.8	22.0	2272.1	7.1	2272.5	20.6	2272.9	10.7	2273.3	21.2	2273.7	15.7	2274.0	22.4		
2274.4	7.	2274.8	29.	2275.2	24.	2275.5	40.	2275.9	36.	2276.3	61.	2276.7	69.	2277.1	114.		
2277.4	125.	2277.8	161.	2278.2	228.	2278.6	290.	2279.0	356.	2279.3	431.	2279.7	483.	2280.1	467.		
2280.5	555.	2280.9	528.	2281.2	451.	2281.6	316.	2282.0	241.	2282.4	155.	2282.8	82.	2283.1	65.		
2283.5	39.8	2283.9	24.7	2284.3	19.2	2284.7	20.5	2285.0	22.1	2285.4	18.6	2285.8	22.5	2286.2	27.6		
2286.6	13.4	2286.9	21.1	2287.3	20.0	2287.7	18.4	2288.1	25.3	2288.5	13.3	2288.8	18.2	2289.2	26.3		
2289.6	12.5	2290.0	28.3	2290.4	20.0	2290.8	40.9	2291.1	39.8	2291.5	35.2	2291.9	32.7	2292.3	59.6		

E	P _{N/E}														
eV	beV ^{1/2}														
2292.7	75.	2293.0	90.	2293.4	96.	2293.9	102.	2294.2	85.	2294.6	108.	2295.0	106.	2295.3	99.
2295.7	93.	2296.1	113.	2296.5	63.	2296.9	72.	2297.3	47.	2297.6	33.	2298.0	23.	2298.4	20.
2298.8	4.9	2299.2	9.3	2299.6	7.1	2299.9	12.1	2300.3	18.8	2300.7	7.2	2301.1	13.9	2301.5	11.2
2301.9	22.8	2302.3	10.2	2302.6	4.5	2303.0	10.0	2303.4	23.6	2303.8	15.9	2304.2	7.9	2304.6	11.2
2304.9	9.6	2305.3	4.7	2305.7	-1.5	2306.1	3.7	2306.5	4.2	2306.9	-1.5	2307.3	12.2	2307.6	13.8
2308.0	7.7	2308.4	8.4	2308.8	-0.7	2309.2	14.2	2309.6	17.1	2310.0	15.9	2310.4	30.1	2310.7	36.0
2311.1	45.	2311.5	78.	2311.9	102.	2312.3	128.	2312.7	166.	2313.1	234.	2313.5	246.	2313.8	268.
2314.2	286.	2314.6	284.	2315.0	218.	2315.4	218.	2315.8	153.	2316.2	126.	2316.6	106.	2316.9	67.
2317.3	57.4	2317.7	45.4	2318.1	30.3	2318.5	21.8	2318.9	13.9	2319.3	-2.4	2319.7	10.4	2320.1	4.7
2320.4	0.2	2320.8	6.5	2321.2	0.2	2321.6	4.4	2322.0	2.5	2322.4	2.8	2322.8	-1.5	2323.2	6.0
2323.5	-0.7	2324.0	14.7	2324.3	17.4	2324.7	12.7	2325.1	5.0	2325.5	22.8	2325.9	27.5	2326.3	24.2
2326.7	16.1	2327.1	17.4	2327.5	13.9	2327.9	14.1	2328.3	5.8	2328.6	6.3	2329.0	7.9	2329.4	16.4
2329.8	3.0	2330.2	7.4	2330.6	14.8	2331.0	5.7	2331.4	12.3	2331.8	13.3	2332.2	15.5	2332.6	26.2
2333.0	26.	2333.3	35.	2333.7	32.	2334.1	49.	2334.5	64.	2334.9	90.	2335.3	118.	2335.7	145.
2336.1	167.	2336.5	210.	2336.9	219.	2337.3	233.	2337.7	221.	2338.1	184.	2338.5	143.	2338.9	89.
2339.2	55.5	2339.6	33.6	2340.0	15.6	2340.4	13.4	2340.8	2.6	2341.2	8.9	2341.6	14.7	2342.0	9.9
2342.4	12.4	2342.8	2.0	2343.2	5.3	2343.6	6.4	2344.0	7.4	2344.4	6.3	2344.8	-0.7	2345.2	11.2
2345.6	13.	2346.0	32.	2346.4	26.	2346.8	38.	2347.2	48.	2347.5	58.	2347.9	95.	2348.3	128.
2348.7	154.	2349.1	192.	2349.5	264.	2349.9	327.	2350.3	394.	2350.7	474.	2351.1	481.	2351.5	479.
2351.9	494.	2352.3	477.	2352.7	469.	2353.1	493.	2353.5	503.	2353.9	504.	2354.3	482.	2354.7	371.
2355.1	323.	2355.5	232.	2355.9	17.1.	2356.3	103.	2356.7	52.	2357.1	27.	2357.5	17.	2357.9	14.
2358.3	10.5	2358.7	12.8	2359.1	11.3	2359.5	12.0	2359.9	7.4	2360.3	11.4	2360.7	12.9	2361.1	15.0
2361.5	9.5	2361.9	11.0	2362.3	13.0	2362.7	28.0	2363.1	25.9	2363.5	32.3	2363.9	37.5	2364.3	39.0
2364.7	56.	2365.1	61.	2365.5	82.	2365.9	77.	2366.3	104.	2366.7	109.	2367.1	133.	2367.5	115.
2367.9	125.	2368.3	88.	2368.7	75.	2369.1	73.	2369.5	39.	2369.9	34.	2370.3	22.	2370.7	25.
2371.1	20.7	2371.5	8.3	2371.9	8.7	2372.3	17.5	2372.7	13.0	2373.1	10.6	2373.5	1.0	2373.9	7.9
2374.3	3.0	2374.7	11.0	2375.1	8.7	2375.5	4.3	2375.9	8.2	2376.3	12.3	2376.7	5.2	2377.1	6.6
2377.5	4.8	2378.0	5.8	2378.4	6.1	2378.8	7.1	2379.2	3.3	2379.6	0.2	2380.0	6.9	2380.4	13.7
2380.8	18.8	2381.2	10.9	2381.6	18.1	2382.0	27.9	2382.4	25.0	2382.8	15.7	2383.2	24.7	2383.6	23.4
2384.0	7.6	2384.4	11.6	2384.8	18.9	2385.2	26.5	2385.6	32.2	2386.1	21.8	2386.5	55.3	2386.9	55.5
2387.3	74.	2387.7	112.	2388.1	132.	2388.5	183.	2388.9	225.	2389.3	257.	2389.7	300.	2390.1	343.
2390.5	351.	2390.9	311.	2391.3	249.	2391.7	183.	2392.1	101.	2392.6	75.	2393.0	42.	2393.4	50.
2393.8	53.	2394.2	56.	2394.6	68.	2395.0	98.	2395.4	100.	2395.8	127.	2396.2	115.	2396.6	105.
2397.1	78.	2397.5	77.	2397.9	87.	2398.3	83.	2398.7	67.	2399.1	75.	2399.5	98.	2399.9	112.
2400.3	111.	2400.7	106.	2401.1	79.	2401.6	58.	2402.0	43.	2402.4	23.	2402.8	15.	2403.2	20.
2403.6	10.4	2404.0	17.2	2404.4	10.3	2404.8	15.4	2405.3	14.5	2405.7	20.9	2406.1	29.7	2406.5	45.9
2406.9	54.	2407.3	66.	2407.7	91.	2408.1	102.	2408.5	125.	2409.0	117.	2409.4	125.	2409.8	138.
2410.2	109.	2410.6	91.	2411.0	81.	2411.4	53.	2411.8	32.	2412.3	6.	2412.7	14.	2413.1	8.
2413.5	4.8	2413.9	8.2	2414.3	15.4	2414.7	21.6	2415.1	23.3	2415.6	27.7	2416.0	24.6	2416.4	33.0
2416.8	39.2	2417.2	36.9	2417.5	29.0	2418.0	27.8	2418.5	29.7	2418.9	20.8	2419.3	33.1	2419.7	27.8
2420.1	33.	2420.5	40.	2420.9	47.	2421.4	64.	2421.8	78.	2422.2	106.	2422.6	140.	2423.0	224.
2423.4	263.	2423.8	316.	2424.3	389.	2424.7	430.	2425.1	405.	2425.5	431.	2425.9	387.	2426.3	267.
2426.8	203.	2427.2	122.	2427.6	87.	2428.0	39.	2428.4	21.	2428.8	29.	2429.3	8.	2429.7	14.
2430.1	19.6	2430.5	9.1	2430.9	11.1	2431.3	19.5	2431.8	21.6	2432.2	16.5	2432.6	6.9	2433.0	14.9
2433.4	15.0	2433.9	16.2	2434.3	14.5	2434.7	12.5	2435.1	10.5	2435.5	20.8	2435.9	11.1	2436.4	10.4
2436.8	7.5	2437.2	-2.6	2437.6	10.3	2438.0	23.6	2438.5	26.4	2438.9	13.9	2439.3	14.4	2439.7	33.5
2440.1	40.	2440.6	51.	2441.0	53.	2441.4	87.	2441.8	102.	2442.2	140.	2442.7	197.	2443.1	247.
2443.5	307.	2443.9	477.	2444.3	429.	2444.8	449.	2445.2	426.	2445.6	389.	2446.0	317.	2446.5	219.
2446.9	144.	2447.3	105.	2447.7	65.	2448.1	42.	2448.6	52.	2449.0	44.	2449.4	52.	2449.8	59.
2450.3	68.	2450.7	76.	2451.1	104.	2451.5	110.	2451.9	143.	2452.4	195.	2452.8	210.	2453.2	235.
2453.6	234.	2454.1	291.	2454.5	245.	2454.9	201.	2455.3	138.	2455.8	95.	2456.2	56.	2456.6	37.
2457.0	25.1	2457.5	11.7	2457.9	28.0	2458.3	16.7	2458.7	17.6	2459.1	8.7	2459.6	13.6	2460.0	7.1
2460.4	2.9	2460.8	9.9	2461.3	11.9	2461.7	7.7	2462.1	10.4	2462.6	7.0	2463.0	6.8	2463.4	15.5
2463.8	1.0	2464.3	4.5	2464.7	12.8	2465.1	17.3	2465.5	18.4	2466.0	10.4	2466.4	4.3	2466.8	9.7
2467.2	6.6	2467.7	4.5	2468.1	6.0	2468.5	7.6	2468.9	9.3	2469.4	13.8	2469.8	1.8	2470.2	9.7

E ev	$\frac{P}{N}E$																					
2470.7	1.0	2471.1	6.3	2471.5	8.5	2471.9	9.7	2472.4	7.2	2472.8	5.2	2473.2	-0.8	2473.7	8.4							
2474.1	3.8	2474.5	8.1	2474.9	9.1	2475.4	7.6	2475.8	0.1	2476.2	14.7	2476.7	5.1	2477.1	11.6							
2477.5	8.4	2477.9	22.3	2478.4	8.5	2478.8	9.0	2479.2	3.2	2479.7	2.6	2480.1	9.3	2480.5	9.7							
2481.0	9.3	2481.4	9.0	2481.8	22.9	2482.3	26.9	2482.7	46.1	2483.1	45.5	2483.5	63.1	2484.0	93.0							
2484.4	105.	2484.8	167.	2485.3	210.	2485.7	279.	2486.1	336.	2486.6	378.	2487.0	391.	2487.4	408.							
2487.9	407.	2488.3	320.	2488.7	190.	2489.2	148.	2489.6	70.	2490.0	42.	2490.5	22.	2490.9	17.							
2491.3	-0.9	2491.8	0.1	2492.2	0.1	2492.6	4.9	2493.1	7.2	2493.5	-3.4	2493.9	5.9	2494.4	9.0							
2494.8	1.9	2495.2	8.1	2495.7	10.2	2496.1	11.7	2496.5	30.2	2497.0	35.2	2497.4	26.9	2497.8	54.4							
2498.3	57.2	2498.7	68.5	2499.1	70.1	2499.6	82.5	2500.0	77.7	2500.4	67.7	2500.9	63.8	2501.3	55.7							
2501.8	66.4	2502.2	43.6	2502.6	27.9	2503.1	24.8	2503.5	4.8	2503.9	2.6	2504.4	-0.8	2504.8	5.2							
2505.2	17.6	2505.7	8.9	2506.1	11.0	2506.6	17.2	2507.0	11.9	2507.4	14.6	2507.9	16.8	2508.3	0.7							
2508.7	8.5	2509.2	14.3	2509.6	3.4	2510.1	0.0	2510.5	4.8	2510.9	4.3	2511.4	6.8	2511.8	16.0							
2512.2	8.3	2512.7	11.6	2513.1	6.0	2513.6	13.8	2514.0	5.6	2514.4	20.6	2514.9	30.2	2515.3	43.5							
2515.8	44.	2516.2	52.	2516.6	85.	2517.1	113.	2517.5	160.	2518.0	189.	2518.4	232.	2518.8	272.							
2519.3	291.	2519.7	281.	2520.2	263.	2520.6	196.	2521.0	143.	2521.5	87.	2521.9	43.	2522.4	18.							
2522.8	20.3	2523.2	25.8	2523.7	21.1	2524.1	15.8	2524.6	22.2	2525.0	32.5	2525.5	26.0	2525.9	22.4							
2526.3	17.5	2526.8	12.5	2527.2	16.9	2527.7	15.1	2528.1	0.8	2528.6	2.6	2529.0	7.6	2529.4	5.8							
2529.9	2.8	2530.3	5.4	2530.8	10.1	2531.2	10.3	2531.7	16.6	2532.1	6.9	2532.5	16.8	2533.0	10.9							
2533.4	14.8	2533.9	0.0	2534.3	8.5	2534.8	5.5	2535.2	3.2	2535.7	6.9	2536.1	10.9	2536.5	5.8							
2537.0	6.5	2537.4	9.8	2537.9	9.3	2538.3	14.4	2538.8	15.8	2539.2	13.7	2539.7	13.4	2540.1	24.3							
2540.6	40.	2541.0	46.	2541.4	45.	2541.9	74.	2542.3	100.	2542.8	133.	2543.2	168.	2543.7	196.							
2544.1	252.	2544.6	325.	2545.0	329.	2545.5	344.	2545.9	382.	2546.4	370.	2546.8	325.	2547.3	270.							
2547.7	203.	2548.2	151.	2548.6	99.	2549.1	68.	2549.5	43.	2550.0	37.	2550.4	34.	2550.8	29.							
2551.3	40.	2551.7	39.	2552.2	27.	2552.6	42.	2553.1	54.	2553.5	69.	2554.0	99.	2554.4	110.							
2554.9	150.	2555.3	215.	2555.8	278.	2556.2	328.	2556.7	370.	2557.1	429.	2557.6	410.	2558.0	363.							
2558.5	324.	2558.9	249.	2559.4	209.	2559.8	124.	2560.3	93.	2560.7	72.	2561.2	33.	2561.7	24.							
2562.1	16.5	2562.6	15.0	2563.0	22.7	2563.5	18.5	2563.9	10.3	2564.4	5.1	2564.8	8.3	2565.3	6.4							
2565.7	2.8	2566.2	7.1	2566.6	7.6	2567.1	10.9	2567.5	9.5	2568.0	14.5	2568.4	10.0	2568.9	15.9							
2569.3	10.1	2569.8	18.6	2570.3	3.4	2570.7	12.3	2571.2	17.3	2571.6	17.0	2572.1	28.3	2572.5	32.4							
2573.0	29.	2573.4	46.	2573.9	51.	2574.3	46.	2574.8	69.	2575.3	78.	2575.7	108.	2576.2	150.							
2576.6	191.	2577.1	221.	2577.5	290.	2578.0	349.	2578.4	382.	2578.9	391.	2579.4	388.	2579.8	306.							
2580.3	285.	2580.7	186.	2581.2	155.	2581.6	97.	2582.1	39.	2582.6	37.	2583.0	25.	2583.5	23.							
2583.9	32.0	2584.4	18.5	2584.8	19.3	2585.3	14.3	2585.8	11.0	2586.2	8.5	2586.7	12.5	2587.1	10.8							
2587.6	19.2	2588.1	15.0	2588.5	20.9	2589.0	23.2	2589.4	25.2	2589.9	39.1	2590.3	40.8	2590.8	64.7							
2591.3	74.	2591.7	79.	2592.2	108.	2592.6	156.	2593.1	186.	2593.6	205.	2594.0	288.	2594.5	294.							
2594.9	378.	2595.4	370.	2595.9	343.	2596.3	268.	2596.8	244.	2597.2	200.	2597.7	133.	2598.2	106.							
2598.6	73.1	2599.1	64.3	2599.6	61.9	2600.0	53.1	2600.5	45.5	2600.9	47.5	2601.4	31.6	2601.9	43.7							
2602.3	50.2	2602.8	54.6	2603.3	56.8	2603.7	58.5	2604.2	80.9	2604.6	67.9	2605.1	56.5	2605.6	54.5							
2606.0	51.1	2606.5	29.0	2607.0	38.4	2607.4	46.3	2607.9	49.4	2608.4	69.5	2608.8	88.8	2609.3	79.8							
2609.7	87.6	2610.2	95.9	2610.7	53.5	2611.1	67.3	2611.6	36.9	2612.1	31.4	2612.5	33.2	2613.0	40.5							
2613.5	47.	2613.9	60.	2614.4	80.	2614.9	88.	2615.3	148.	2615.8	171.	2616.3	229.	2616.7	251.							
2617.2	312.	2617.7	344.	2618.1	351.	2618.6	292.	2619.1	220.	2619.5	164.	2620.0	94.	2620.5	46.							
2620.9	21.9	2621.4	11.4	2621.9	24.2	2622.3	12.2	2622.8	5.5	2623.3	6.7	2623.7	11.6	2624.2	12.0							
2624.7	6.3	2625.1	14.0	2625.6	13.3	2626.1	15.6	2626.5	23.5	2627.0	24.5	2627.5	27.3	2628.0	33.5							
2628.4	40.1	2628.9	57.1	2629.4	50.9	2629.8	90.2	2630.3	87.8	2630.8	92.3	2631.2	86.2	2631.7	66.4							
2632.2	69.2	2632.6	65.9	2633.1	60.0	2633.6	65.2	2634.1	50.1	2634.5	82.1	2635.0	62.1	2635.5	55.0							
2635.9	33.7	2636.4	32.5	2636.9	20.8	2637.4	15.6	2637.8	14.1	2638.3	8.4	2638.8	7.4	2639.2	5.7							
2639.7	12.7	2640.2	7.0	2640.7	14.1	2641.1	7.4	2641.6	6.2	2642.1	9.3	2642.6	15.7	2643.0	18.3							
2643.5	17.3	2644.0	14.9	2644.5	15.0	2644.9	10.1	2645.4	13.3	2645.9	12.6	2646.3	-0.0	2646.8	13.9							
2647.3	4.5	2647.8	3.5	2648.2	10.8	2648.7	6.1	2649.2	3.1	2649.7	17.7	2650.1	12.4	2650.6	18.3							
2651.1	23.6	2651.6	27.1	2652.0	26.6	2652.5	35.9	2653.0	30.5	2653.5	32.9	2654.0	37.2	2654.4	47.9							
2654.9	80.0	2655.4	81.5	2655.9	98.2	2656.3	99.0	2656.8	99.3	2657.3	87.8	2657.8	89.3	2658.2	39.7							
2658.7	35.4	2659.2	21.9	2659.7	13.3	2660.2	14.9	2660.6	9.3	2661.1	10.9	2661.6	14.8	2662.1	3.1							
2662.5	4.5	2663.0	16.6	2663.5	16.6	2664.0	14.2	2664.5	21.8	2664.9	27.8	2665.4	48.7	2665.9	63.0							
2666.4	84.	2666.9	105.	2667.3	149.	2667.8	198.	2668.3	242.	2668.8	293.	2669.3	339.	2669.7	344.							

E	P _{N/E}														
eV	beV ^{1/2}														
2670.2	322.	2670.7	322.	2671.2	230.	2671.7	167.	2672.1	99.	2672.6	76.	2673.1	45.	2673.6	20.
2674.1	19.0	2674.6	26.2	2675.0	16.6	2675.5	12.1	2676.0	10.9	2676.5	21.9	2677.0	14.0	2677.4	22.6
2677.9	27.2	2678.4	33.2	2678.9	49.8	2679.4	55.4	2679.9	63.1	2680.3	69.9	2680.8	48.6	2681.3	53.5
2681.8	23.1	2682.3	18.3	2682.8	15.7	2683.2	15.5	2683.7	17.1	2684.2	19.3	2684.7	27.2	2685.2	28.3
2685.7	23.5	2686.2	24.4	2686.6	25.7	2687.1	33.8	2687.6	20.2	2688.1	28.6	2688.6	18.1	2689.1	35.2
2689.6	43.	2690.0	44.	2690.5	56.	2691.0	73.	2691.5	114.	2692.0	151.	2692.5	186.	2693.0	211.
2693.4	31.6	2693.9	31.0	2694.4	295.	2694.9	259.	2695.4	203.	2695.9	135.	2696.4	77.	2696.9	55.
2697.3	38.9	2697.8	44.5	2698.3	36.4	2698.8	47.2	2699.3	43.6	2699.8	52.1	2700.3	41.1	2700.8	34.5
2701.3	31.6	2701.7	16.5	2702.2	19.8	2702.7	19.5	2703.2	7.7	2703.7	3.3	2704.2	9.8	2704.7	10.0
2705.2	8.1	2705.7	6.9	2706.1	9.0	2706.6	8.0	2707.1	9.3	2707.6	10.8	2708.1	21.3	2708.5	18.9
2709.1	26.	2709.6	40.	2710.1	51.	2710.6	63.	2711.1	74.	2711.6	109.	2712.0	133.	2712.5	184.
2713.0	292.	2713.5	288.	2714.0	358.	2714.5	381.	2715.0	414.	2715.5	389.	2716.0	344.	2716.5	263.
2717.0	184.	2717.5	164.	2718.0	113.	2718.5	86.	2718.9	67.	2719.4	53.	2719.9	44.	2720.4	35.
2720.9	25.2	2721.4	4.2	2721.9	2.4	2722.4	6.7	2722.9	13.1	2723.4	4.9	2723.9	6.5	2724.4	6.2
2724.9	8.9	2725.4	0.8	2725.9	6.5	2726.4	6.7	2726.9	11.6	2727.4	11.6	2727.9	9.8	2728.4	22.5
2728.8	21.6	2729.3	24.3	2729.8	37.1	2730.3	28.2	2730.8	32.5	2731.3	31.8	2731.8	15.5	2732.3	23.1
2732.8	20.7	2733.3	13.8	2733.8	6.5	2734.3	15.4	2734.8	13.1	2735.3	2.4	2735.8	7.3	2736.3	11.8
2736.8	7.1	2737.3	6.0	2737.8	5.7	2738.3	16.1	2738.8	16.2	2739.3	21.7	2739.8	13.9	2740.3	15.0
2740.8	24.3	2741.3	13.8	2741.8	13.9	2742.3	22.8	2742.8	22.4	2743.3	40.2	2743.8	41.8	2744.3	51.9
2744.8	80.	2745.3	104.	2745.8	126.	2746.3	154.	2746.8	234.	2747.3	320.	2747.8	364.	2748.3	336.
2748.8	339.	2749.3	282.	2749.8	222.	2750.3	150.	2750.8	63.	2751.3	35.	2751.8	20.	2752.3	13.
2752.8	8.9	2753.3	15.4	2753.8	15.6	2754.4	17.4	2754.9	17.7	2755.4	23.3	2755.9	32.7	2756.4	33.1
2756.9	66.	2757.4	85.	2757.9	109.	2758.4	132.	2758.9	173.	2759.4	194.	2759.9	216.	2760.4	262.
2760.9	207.	2761.4	183.	2761.9	128.	2762.4	107.	2762.9	95.	2763.4	94.	2763.9	95.	2764.5	73.
2765.0	83.7	2765.5	83.3	2766.0	46.9	2766.5	27.4	2767.0	20.0	2767.5	13.3	2768.0	15.4	2768.5	6.8
2769.0	18.8	2769.5	22.4	2770.0	27.9	2770.5	46.2	2771.0	42.5	2771.6	51.8	2772.1	51.5	2772.6	49.9
2773.1	34.1	2773.6	45.8	2774.1	27.9	2774.6	26.8	2775.1	24.7	2775.6	23.3	2776.1	38.4	2776.6	26.8
2777.2	27.8	2777.7	35.3	2778.2	32.0	2778.7	20.7	2779.2	16.1	2779.7	20.8	2780.2	26.1	2780.7	38.6
2781.2	45.	2781.7	75.	2782.3	83.	2782.8	119.	2783.3	143.	2783.8	198.	2784.3	205.	2784.8	233.
2785.3	193.	2785.8	179.	2786.4	132.	2786.9	78.	2787.4	36.	2787.9	26.	2788.4	10.	2788.9	15.
2789.4	3.4	2789.9	3.3	2790.5	8.9	2791.0	11.9	2791.5	13.8	2792.0	13.2	2792.5	17.8	2793.0	20.5
2793.5	32.	2794.1	35.	2794.6	47.	2795.1	73.	2795.6	79.	2796.1	98.	2796.6	109.	2797.1	106.
2797.7	108.	2798.2	88.	2798.7	67.	2799.2	58.	2799.7	49.	2800.2	48.	2800.8	50.	2801.3	79.
2801.8	91.	2802.3	118.	2802.8	165.	2803.3	140.	2803.9	179.	2804.4	143.	2804.9	163.	2805.4	120.
2805.9	100.	2806.4	60.	2807.0	66.	2807.5	64.	2808.0	89.	2808.5	108.	2809.0	99.	2809.6	88.
2810.1	75.3	2810.6	57.8	2811.1	60.7	2811.6	37.4	2812.1	47.7	2812.7	38.2	2813.2	44.7	2813.7	32.9
2814.2	38.4	2814.7	31.0	2815.3	25.3	2815.8	11.9	2816.3	13.0	2816.8	8.2	2817.4	14.6	2817.9	13.0
2818.4	14.2	2818.9	21.2	2819.4	29.4	2820.0	36.0	2820.5	41.5	2821.0	46.5	2821.5	52.1	2822.0	60.3
2822.6	67.	2823.1	92.	2823.6	93.	2824.1	111.	2824.7	129.	2825.2	163.	2825.7	192.	2826.2	221.
2826.8	223.	2827.3	228.	2827.8	109.	2828.3	132.	2828.8	85.	2829.4	41.	2829.9	10.	2830.4	17.
2830.9	4.3	2831.5	2.4	2832.0	-0.2	2832.5	9.2	2833.0	9.9	2833.6	7.3	2834.1	4.7	2834.6	9.2
2835.1	1.6	2835.7	0.7	2836.2	3.9	2836.7	3.2	2837.3	1.4	2837.8	2.3	2838.3	1.5	2838.8	3.6
2839.4	0.7	2839.9	6.7	2840.4	9.7	2840.9	11.2	2841.5	19.1	2842.0	19.8	2842.5	24.3	2843.1	27.2
2843.6	33.9	2844.1	30.9	2844.6	17.9	2845.2	21.2	2845.7	22.2	2846.2	17.3	2846.8	8.0	2847.3	2.3
2847.8	6.1	2848.3	10.2	2848.9	4.7	2849.4	6.5	2849.9	7.5	2850.5	10.6	2851.0	-3.4	2851.5	4.2
2852.0	4.3	2852.6	7.6	2853.1	6.4	2853.6	10.5	2854.2	13.7	2854.7	10.6	2855.2	13.7	2855.8	18.5
2856.3	16.	2856.8	26.	2857.4	24.	2857.9	41.	2858.4	68.	2859.0	80.	2859.5	89.	2860.0	148.
2860.6	202.	2861.1	245.	2861.6	294.	2862.2	369.	2862.7	357.	2863.2	333.	2863.8	250.	2864.3	194.
2864.9	113.	2865.4	79.	2865.9	28.	2866.4	17.	2867.0	18.	2867.5	10.	2868.0	14.	2868.6	7.
2869.1	-1.1	2869.6	11.0	2870.2	8.8	2870.7	13.8	2871.2	23.6	2871.8	27.2	2872.3	17.7	2872.9	35.9
2873.4	28.	2873.9	70.	2974.5	5.7	2875.0	73.	2875.5	103.	2876.1	95.	2876.6	126.	2877.2	151.
2877.7	176.	2878.2	218.	2878.8	269.	2879.3	275.	2879.8	309.	2880.4	304.	2880.9	263.	2881.5	211.
2882.0	179.	2882.5	146.	2883.1	93.	2883.6	70.	2884.2	41.	2884.7	33.	2885.2	14.	2885.8	24.
2886.3	17.6	2886.9	19.6	2887.4	13.7	2887.9	28.4	2888.5	25.9	2889.0	32.1	2889.6	26.6	2890.1	45.7
2890.6	59.	2891.2	90.	2891.7	104.	2892.3	126.	2892.8	162.	2893.3	245.	2893.9	242.	2894.4	236.

E	$\frac{P}{N}E$	E	$\frac{P}{N}E$															
eV	beV ^{1/2}	eV	beV ^{1/2}															
2895.0	238.	2895.5	197.	2896.1	162.	2896.6	100.	2897.1	75.	2897.7	42.	2898.2	15.	2898.8	14.			
2899.3	19.5	2899.9	13.5	2900.4	7.1	2901.0	11.8	2901.5	19.0	2902.0	3.1	2902.6	4.6	2903.1	12.8			
2903.7	5.1	2904.2	14.4	2904.8	12.8	2905.3	12.4	2905.9	9.8	2906.4	1.4	2906.9	7.9	2907.5	9.7			
2908.0	6.9	2908.6	10.9	2909.1	7.1	2909.7	3.8	2910.2	14.3	2910.8	17.2	2911.3	19.2	2911.9	19.6			
2912.4	30.	2913.0	32.	2913.5	50.	2914.1	72.	2914.6	105.	2915.2	121.	2915.7	121.	2916.3	106.			
2916.8	99.	2917.4	99.	2917.9	85.	2918.4	93.	2919.0	92.	2919.5	126.	2920.1	144.	2920.6	143.			
2921.2	152.	2921.7	123.	2922.3	158.	2922.8	128.	2923.4	115.	2923.9	97.	2924.5	83.	2925.1	56.			
2925.6	46.	2926.2	48.	2926.7	57.	2927.3	70.	2927.8	102.	2928.4	130.	2928.9	167.	2929.5	252.			
2930.0	277.	2930.6	293.	2931.1	258.	2931.7	217.	2932.2	177.	2932.8	106.	2933.3	54.	2933.9	22.			
2934.4	17.5	2935.0	7.5	2935.6	11.2	2936.1	7.8	2936.7	12.8	2937.2	16.3	2937.8	4.6	2938.3	22.0			
2938.9	11.3	2939.4	16.9	2940.0	16.0	2940.5	23.7	2941.1	31.1	2941.7	52.6	2942.2	38.6	2942.8	57.8			
2943.3	46.0	2943.9	44.3	2944.4	26.6	2945.0	30.9	2945.5	15.0	2946.1	11.3	2946.7	7.0	2947.2	22.0			
2947.8	21.	2948.3	39.	2948.9	29.	2949.5	51.	2950.0	56.	2950.6	67.	2951.1	103.	2951.7	135.			
2952.2	177.	2952.8	207.	2953.4	242.	2953.9	226.	2954.5	237.	2955.0	236.	2955.6	160.	2956.2	73.			
2956.7	50.3	2957.3	18.6	2957.8	8.7	2958.4	17.0	2959.0	9.7	2959.5	12.9	2960.1	11.0	2960.6	20.7			
2961.2	19.2	2961.8	20.3	2962.3	30.6	2962.9	48.1	2963.5	57.0	2964.0	63.2	2964.6	68.4	2965.1	70.6			
2965.7	47.6	2966.3	49.3	2966.8	33.9	2967.4	21.0	2968.0	9.7	2968.5	8.0	2969.1	3.0	2969.6	6.0			
2970.2	124.	2970.8	2.3	2971.3	6.2	2971.9	2.4	2972.5	3.6	2973.0	17.9	2973.6	7.0	2974.2	12.7			
2974.7	6.8	2975.3	2.3	2975.9	17.6	2976.4	5.7	2977.0	15.0	2977.6	0.6	2978.1	7.8	2978.7	9.0			
2979.2	14.8	2979.8	7.4	2980.4	17.6	2980.9	22.3	2981.5	24.9	2982.1	31.8	2982.7	34.4	2983.2	60.7			
2983.9	72.	2984.4	80.	2984.9	108.	2985.5	122.	2986.1	123.	2986.6	99.	2987.2	75.	2987.8	47.			
2988.3	30.7	2988.9	21.1	2989.5	7.0	2990.0	2.4	2990.6	5.8	2991.2	12.9	2991.8	5.4	2992.3	13.3			
2992.9	5.9	2993.5	15.9	2994.0	26.5	2994.6	23.5	2995.2	24.1	2995.7	49.1	2996.3	40.0	2996.9	71.1			
2997.5	124.	2998.0	154.	2998.6	179.	2999.2	262.	2999.7	315.	3000.0	353.	3000.9	350.	3001.5	304.			
3002.0	196.	3002.6	136.	3003.2	77.	3003.8	41.	3004.3	12.	3004.9	19.	3005.5	9.	3006.1	10.			
3006.6	4.1	3007.2	4.8	3007.8	2.1	3008.4	12.3	3008.9	2.8	3009.5	7.9	3010.1	17.4	3010.7	27.4			
3011.2	14.7	3011.8	14.2	3012.4	14.3	3013.0	18.2	3013.5	17.2	3014.1	10.4	3014.7	6.1	3015.3	10.8			
3015.8	11.2	3016.4	17.6	3017.0	12.7	3017.6	29.4	3018.1	30.1	3018.7	44.1	3019.3	46.3	3019.9	75.2			
3020.5	106.	3021.0	134.	3021.6	151.	3022.2	179.	3022.8	237.	3023.4	240.	3023.9	287.	3024.5	323.			
3025.1	357.	3025.7	398.	3026.2	305.	3026.8	237.	3027.4	139.	3028.0	97.	3028.5	51.	3029.2	22.			
3029.7	9.4	3030.3	11.6	3030.9	8.6	3031.5	7.0	3032.1	5.8	3032.6	7.1	3033.2	6.9	3033.8	10.8			
3034.4	12.9	3035.0	12.5	3035.5	11.0	3036.1	14.2	3036.7	24.8	3037.3	21.8	3037.9	25.4	3038.5	37.8			
3039.0	51.8	3039.6	56.7	3040.2	71.6	3040.8	71.5	3041.4	58.9	3042.0	39.9	3042.6	39.8	3043.1	16.9			
3043.7	15.6	3044.3	26.1	3044.9	22.3	3045.5	25.4	3046.1	19.4	3046.6	23.5	3047.2	10.1	3047.8	15.7			
3048.4	11.1	3049.0	9.0	3049.6	18.3	3050.2	16.2	3050.8	32.3	3051.3	40.7	3051.9	40.6	3052.5	52.4			
3053.1	83.	3053.7	104.	3054.3	164.	3054.9	198.	3055.5	234.	3056.0	269.	3056.6	281.	3057.2	254.			
3057.8	217.	3058.4	137.	3059.0	79.	3059.6	55.	3060.2	35.	3060.8	16.	3061.3	21.	3061.9	17.			
3062.5	9.3	3063.1	9.9	3063.7	6.1	3064.3	7.6	3064.9	19.4	3065.5	5.4	3066.1	10.9	3066.7	17.5			
3067.3	17.3	3067.8	24.3	3068.4	29.5	3069.0	26.0	3069.6	33.8	3070.2	26.7	3070.8	18.9	3071.4	19.3			
3072.0	11.1	3072.6	11.6	3073.2	7.7	3073.8	15.2	3074.4	11.1	3075.0	18.5	3075.6	24.5	3076.2	37.0			
3076.7	32.2	3077.3	48.9	3077.9	54.5	3078.5	53.6	3079.1	32.2	3079.7	44.7	3080.3	39.7	3080.9	31.5			
3081.5	13.7	3082.1	32.8	3082.7	39.2	3083.3	49.5	3083.9	55.7	3084.5	66.7	3085.1	82.9	3085.7	81.6			
3086.3	72.7	3086.9	45.5	3087.5	50.4	3088.1	26.0	3088.7	3.5	3089.3	2.9	3089.9	9.3	3090.5	3.4			
3091.1	5.8	3091.7	5.4	3092.3	1.3	3092.9	5.6	3093.5	5.7	3094.1	8.7	3094.7	13.3	3095.3	14.4			
3095.9	7.6	3096.5	10.7	3097.1	14.2	3097.7	31.2	3098.3	36.0	3098.9	52.8	3099.5	48.5	3100.1	64.4			
3100.7	66.	3101.3	95.	3101.9	102.	3102.5	124.	3103.1	176.	3103.7	231.	3104.3	292.	3104.9	388.			
3105.5	444.	3106.1	519.	3106.7	475.	3107.3	409.	3107.9	331.	3108.5	219.	3109.1	159.	3109.7	125.			
3110.3	82.2	3110.9	57.2	3111.5	51.1	3112.1	41.0	3112.7	23.1	3113.3	17.6	3113.9	10.0	3114.5	8.3			
3115.2	0.5	3115.8	9.0	3116.4	10.1	3117.0	15.4	3117.6	17.0	3118.2	9.4	3118.8	10.8	3119.4	6.4			
3120.0	3.1	3120.6	14.0	3121.2	9.3	3121.8	12.8	3122.4	11.8	3123.0	25.7	3123.6	33.2	3124.3	33.8			
3124.9	41.	3125.5	54.	3126.1	60.	3126.7	90.	3127.3	83.	3127.9	97.	3128.5	118.	3129.1	133.			
3129.7	169.	3130.3	151.	3131.0	163.	3131.6	157.	3132.2	130.	3132.8	82.	3133.4	62.	3134.0	30.			
3134.6	15.4	3135.2	7.2	3135.8	7.7	3136.5	14.8	3137.1	20.0	3137.7	14.3	3138.3	18.0	3138.9	21.0			
3139.5	18.	3140.1	41.	3140.7	52.	3141.4	51.	3142.0	86.	3142.6	123.	3143.2	162.	3143.8	205.			
3144.4	249.	3145.0	323.	3145.7	349.	3146.3	298.	3146.9	218.	3147.5	180.	3148.1	93.	3148.7	40.			

E	$\frac{P}{N}E$	E	$\frac{P}{N}E$	E	$\frac{P}{N}E$															
eV	bev ^{1/2}	eV	bev ^{1/2}	eV	bev ^{1/2}															
3149.3	27.6	3150.0	8.9	3150.6	13.3	3151.2	6.2	3151.8	11.7	3152.4	11.8	3153.0	8.4	3153.7	10.1					
3154.3	7.5	3154.9	10.6	3155.5	10.9	3156.1	8.8	3156.7	4.9	3157.4	8.6	3158.0	5.2	3158.6	7.0					
3159.2	14.5	3159.8	13.1	3160.5	10.9	3161.1	18.0	3161.7	18.5	3162.3	29.7	3162.9	29.1	3163.6	63.5					
3164.2	97.	3164.8	108.	3165.4	137.	3166.0	167.	3166.7	161.	3167.3	158.	3167.9	131.	3168.5	114.					
3169.1	84.	3169.8	91.	3170.4	9.8	3171.0	92.	3171.6	125.	3172.3	120.	3172.9	173.	3173.5	280.					
3174.1	286.	3174.7	320.	3175.4	329.	3176.0	317.	3176.6	253.	3177.2	213.	3177.9	135.	3178.5	66.					
3179.1	50.	3179.7	51.	3180.4	36.	3181.0	55.	3181.6	65.	3182.2	131.	3182.9	136.	3183.5	194.					
3184.1	246.	3184.7	294.	3185.4	301.	3186.0	296.	3186.6	232.	3187.2	168.	3187.9	82.	3188.5	51.					
3189.1	22.3	3189.8	17.3	3190.4	12.4	3191.0	23.8	3191.6	28.2	3192.3	15.0	3192.9	5.2	3193.5	19.1					
3194.1	24.0	3194.8	19.0	3195.4	37.2	3196.0	32.9	3196.7	30.4	3197.3	47.5	3197.9	70.3	3198.6	80.9					
3199.2	134.	3199.8	186.	3200.4	239.	3201.1	265.	3201.7	343.	3202.3	319.	3203.0	327.	3203.6	243.					
3204.2	190.	3204.9	106.	3205.5	83.	3206.1	80.	3206.8	69.	3207.4	51.	3208.0	49.	3208.7	42.					
3209.3	29.2	3209.9	28.2	3210.6	30.7	3211.2	37.4	3211.8	25.6	3212.5	43.4	3213.1	44.0	3213.7	86.8					
3214.4	99.	3215.0	120.	3215.6	145.	3216.3	141.	3216.9	141.	3217.5	121.	3218.2	96.	3218.8	92.					
3219.5	81.	3220.1	131.	3220.7	163.	3221.4	180.	3222.0	200.	3222.6	213.	3223.3	237.	3223.9	171.					
3224.6	130.	3225.2	73.	3225.8	43.	3226.5	30.	3227.1	38.	3227.7	14.	3228.4	39.	3229.0	23.					
3229.7	21.3	3230.3	23.1	3230.9	22.7	3231.6	12.0	3232.2	11.6	3232.9	27.1	3233.5	26.2	3234.1	23.3					
3234.3	31.8	3235.4	25.6	3236.1	33.1	3236.7	31.5	3237.3	28.1	3238.0	23.8	3238.6	24.1	3239.3	31.7					
3239.0	27.	3240.6	39.	3241.2	4.6	3241.8	67.	3242.5	113.	3243.1	135.	3243.8	195.	3244.4	224.					
3245.1	227.	3245.7	202.	3246.3	167.	3247.0	131.	3247.6	76.	3248.3	38.	3248.9	19.	3249.6	15.					
3250.2	10.8	3250.9	20.5	3251.5	11.5	3252.2	11.3	3252.8	13.8	3253.4	22.2	3254.1	20.9	3254.7	19.6					
3255.4	16.9	3256.0	18.0	3256.7	16.3	3257.3	21.0	3258.0	20.5	3258.6	29.5	3259.3	38.3	3259.9	39.5					
3260.6	61.	3261.2	79.	3261.9	93.	3262.5	116.	3263.2	120.	3263.8	143.	3264.5	121.	3265.1	120.					
3265.8	76.	3266.4	75.	3267.1	86.	3267.7	118.	3268.4	156.	3269.0	188.	3269.7	205.	3270.3	174.					
3271.0	165.	3271.6	171.	3272.3	14.0	3272.9	164.	3273.6	203.	3274.2	268.	3274.9	279.	3275.5	278.					
3276.2	314.	3276.8	255.	3277.5	193.	3278.2	121.	3278.8	65.	3279.5	30.	3280.1	13.	3280.8	11.					
3281.4	8.2	3282.1	9.6	3282.7	1.9	3283.4	6.1	3284.0	4.8	3284.7	8.4	3285.4	3.5	3286.0	12.3					
3286.7	22.1	3287.3	15.4	3288.0	9.9	3288.6	25.9	3289.3	41.4	3290.0	22.1	3290.6	54.8	3291.3	55.6					
3291.9	75.	3292.6	114.	3293.2	140.	3293.9	120.	3294.6	108.	3295.2	105.	3295.9	82.	3296.5	49.					
3297.2	26.4	3297.9	17.9	3298.5	18.6	3299.2	24.8	3299.8	22.7	3300.5	26.1	3301.2	39.0	3301.8	67.6					
3302.5	90.	3303.1	89.	3303.8	107.	3304.5	127.	3305.1	126.	3305.8	191.	3306.4	256.	3307.1	262.					
3307.8	300.	3308.4	305.	3309.1	273.	3309.8	231.	3310.4	151.	3311.1	85.	3311.8	55.	3312.4	42.					
3315.1	55.	3313.7	65.	3314.4	108.	3315.1	156.	3315.7	191.	3316.4	259.	3317.1	311.	3317.7	313.					
3316.4	272.	3314.1	214.	3319.7	140.	3320.4	98.	3321.1	48.	3321.7	51.	3322.4	25.	3323.1	30.					
3325.7	28.	3324.4	36.	3325.1	44.	3325.7	6.6	3326.4	101.	3327.1	155.	3327.7	181.	3328.4	233.					
3329.1	284.	3329.8	286.	3330.4	286.	3331.1	207.	3331.8	164.	3332.4	68.	3333.1	59.	3333.8	60.					
3334.4	60.9	3335.1	42.0	3335.8	72.3	3336.5	71.2	3337.1	88.8	3337.8	74.2	3338.5	51.4	3339.1	48.8					
3339.8	36.6	3340.5	36.2	3341.2	38.3	3341.8	40.8	3342.5	43.4	3343.2	43.7	3343.9	43.5	3344.5	35.0					
3345.2	44.	3345.9	35.	3345.5	51.	3347.2	6.6	3347.9	66.	3348.6	113.	3349.2	168.	3349.9	228.					
3350.5	275.	3351.3	324.	3352.0	309.	3352.6	256.	3353.3	213.	3354.0	111.	3354.7	68.	3355.3	38.					
3356.0	18.5	3356.7	13.6	3357.4	12.9	3358.0	10.5	3358.7	18.7	3359.4	20.4	3360.1	8.2	3360.8	14.6					
3361.4	7.2	3362.1	18.5	3362.8	16.1	3363.5	13.1	3364.2	4.0	3364.8	10.7	3365.5	7.4	3366.2	15.8					
3365.9	5.5	3367.6	14.5	3368.2	15.3	3368.9	20.8	3369.6	27.7	3370.3	27.6	3371.0	48.2	3371.6	51.1					
3372.3	65.	3373.0	83.	3373.7	10.1	3374.4	119.	3375.1	125.	3375.7	98.	3376.4	77.	3377.1	55.					
3377.8	61.	3378.5	79.	3379.2	62.	3379.8	90.	3380.5	76.	3381.2	72.	3381.9	59.	3382.6	100.					
3383.3	142.	3384.0	149.	3384.5	190.	3385.3	205.	3386.0	200.	3386.7	171.	3387.4	116.	3388.1	71.					
3388.8	20.1	3389.4	16.1	3390.1	20.8	3390.8	20.8	3391.5	30.6	3392.2	43.5	3392.9	55.9	3393.6	77.9					
3394.3	92.	3395.0	113.	3395.6	112.	3396.3	85.	3397.0	97.	3397.7	63.	3398.4	47.	3399.1	51.					
3399.8	62.	3400.5	83.	3401.2	106.	3401.9	135.	3402.5	225.	3403.2	270.	3403.9	284.	3404.6	304.					
3405.3	295.	3406.0	244.	3406.7	175.	3407.4	103.	3408.1	71.	3408.8	47.	3409.5	58.	3410.2	54.					
3410.9	58.8	3411.5	50.9	3412.2	41.2	3412.9	60.5	3413.6	74.2	3414.3	53.8	3415.0	55.0	3415.7	31.8					
3418.4	14.1	3417.1	21.0	3417.8	7.4	3418.5	6.5	3419.2	2.5	3419.9	-2.1	3420.6	1.8	3421.3	15.1					
3422.0	3.7	3422.7	11.9	3423.4	8.1	3424.1	23.3	3424.8	21.7	3425.5	21.0	3426.2	30.0	3426.9	44.3					
3427.6	66.	3428.3	96.	3429.0	104.	3429.7	150.	3430.4	237.	3431.1	282.	3431.8	298.	3432.5	266.					
3433.2	274.	3433.9	205.	3434.6	142.	3435.3	67.	3436.0	41.	3436.7	25.	3437.4	17.	3438.1	19.					

E ev	P/ N/E bev ^{1/2}																
3438.8	11.4	3439.5	3.6	3440.2	13.6	3440.9	19.4	3441.6	16.5	3442.3	19.4	3443.0	27.6	3443.7	31.2		
3444.4	24.3	3445.1	26.8	3445.8	33.3	3446.5	20.7	3447.2	35.7	3447.9	48.9	3448.6	59.6	3449.3	83.0		
3450.0	113.	3450.8	145.	3451.5	175.	3452.2	222.	3452.9	245.	3453.6	255.	3454.3	228.	3455.0	184.		
3455.7	163.	3456.4	141.	3457.1	70.	3457.8	39.	3458.5	33.	3459.2	14.	3460.0	23.	3460.7	22.		
3461.4	9.7	3462.1	11.8	3462.8	18.3	3463.5	15.5	3464.2	20.1	3464.9	7.4	3465.6	16.6	3466.3	15.7		
3467.1	9.7	3467.8	25.9	3468.5	15.2	3469.2	9.1	3469.9	10.5	3470.6	9.8	3471.3	5.7	3472.0	8.5		
3472.8	8.8	3473.5	15.1	3474.2	26.1	3474.9	34.1	3475.6	30.4	3476.3	40.9	3477.0	62.6	3477.7	88.2		
3478.5	122.	3479.2	189.	3479.9	214.	3480.6	245.	3481.3	268.	3482.0	276.	3482.8	218.	3483.5	153.		
3484.2	67.	3484.9	46.	3485.6	28.	3486.3	33.	3487.1	44.	3487.8	56.	3488.5	71.	3489.2	102.		
3489.9	124.	3490.6	155.	3491.4	130.	3492.1	116.	3492.8	87.	3493.5	63.	3494.2	34.	3495.0	15.		
3495.7	-1.5	3496.4	1.1	3497.1	9.6	3497.8	5.9	3498.6	9.0	3499.3	10.6	3500.0	18.9	3500.7	13.8		
3501.4	10.5	3502.2	25.8	3502.9	23.7	3503.6	27.0	3504.3	20.1	3505.1	23.3	3505.8	17.3	3506.5	32.2		
3507.2	23.3	3507.9	44.8	3508.7	40.9	3509.4	40.3	3510.1	39.2	3510.8	19.3	3511.6	18.9	3512.3	15.0		
3513.0	18.2	3513.7	17.5	3514.5	12.0	3515.2	28.9	3515.9	28.9	3516.6	42.3	3517.4	36.8	3518.1	52.4		
3518.8	47.2	3519.6	23.3	3520.3	26.8	3521.0	40.3	3521.7	51.6	3522.5	66.9	3523.2	77.2	3523.9	82.6		
3524.7	73.7	3525.4	76.0	3526.1	54.2	3526.8	23.8	3527.6	18.6	3528.3	5.8	3529.0	4.1	3529.8	7.9		
3530.5	-0.6	3531.2	-1.4	3532.0	2.6	3532.7	2.7	3533.4	3.9	3534.2	7.4	3534.9	4.9	3535.6	11.4		
3536.3	11.3	3537.1	12.6	3537.8	11.2	3538.5	15.4	3539.3	11.9	3540.0	5.0	3540.7	8.0	3541.5	16.2		
3542.2	14.7	3542.9	13.4	3543.7	15.1	3544.4	18.3	3545.2	9.7	3545.9	8.1	3546.6	9.5	3547.4	15.6		
3548.1	22.4	3548.8	16.7	3549.6	20.5	3550.3	28.2	3551.0	23.7	3551.8	42.2	3552.5	63.1	3553.3	77.7		
3554.0	132.	3554.7	170.	3555.5	213.	3556.2	251.	3556.9	266.	3557.7	270.	3558.4	221.	3559.2	138.		
3559.9	94.9	3560.6	47.1	3561.4	54.8	3562.1	52.9	3562.9	51.5	3563.6	62.8	3564.4	71.5	3565.1	93.0		
3565.8	107.	3566.6	165.	3567.3	181.	3568.1	231.	3568.8	277.	3569.5	250.	3570.3	232.	3571.0	158.		
3571.8	115.	3572.5	65.	3573.3	38.	3574.0	27.	3574.8	18.	3575.5	23.	3576.2	14.	3577.0	24.		
3577.7	26.6	3578.5	23.1	3579.2	31.4	3580.0	24.9	3580.7	25.1	3581.5	26.3	3582.2	26.5	3583.0	25.6		
3583.7	31.	3584.4	36.	3585.2	49.	3585.9	70.	3586.7	87.	3587.4	148.	3588.2	191.	3588.9	258.		
3589.7	291.	3590.4	328.	3591.2	312.	3591.9	244.	3592.7	175.	3593.4	116.	3594.2	82.	3594.9	50.		
3595.7	26.6	3596.4	19.6	3597.2	12.6	3597.9	26.2	3598.7	25.8	3599.4	18.4	3600.2	18.7	3601.0	15.5		
3601.7	4.4	3602.5	5.9	3603.2	8.7	3604.0	8.4	3604.7	9.7	3605.5	5.7	3606.2	19.5	3607.0	11.3		
3607.7	104.	3608.5	14.9	3609.2	11.9	3610.0	3.9	3610.8	11.1	3611.5	19.0	3612.3	21.8	3613.0	41.4		
3613.8	50.	3614.5	53.	3615.3	96.	3616.1	121.	3616.8	193.	3617.6	200.	3618.3	238.	3619.1	227.		
3619.8	194.	3620.6	178.	3621.4	160.	3622.1	168.	3622.9	198.	3623.6	228.	3624.4	264.	3625.2	288.		
3625.9	237.	3626.7	193.	3627.4	125.	3628.2	89.	3629.0	56.	3629.7	67.	3630.5	60.	3631.3	79.		
3632.0	107.	3632.8	93.	3633.5	94.	3634.3	75.	3635.1	30.	3635.8	18.	3636.6	13.	3637.4	11.		
3638.1	8.7	3638.9	0.2	3639.7	0.9	3640.4	12.1	3641.2	6.0	3641.9	13.6	3642.7	6.3	3643.5	8.4		
3644.2	20.5	3645.0	12.4	3645.8	10.2	3646.5	25.1	3647.3	40.3	3648.1	37.2	3648.8	43.4	3649.6	42.5		
3650.4	35.8	3651.2	37.8	3651.9	26.5	3652.7	22.9	3653.5	20.6	3654.2	19.8	3655.0	33.3	3655.8	41.9		
3656.5	40.9	3657.3	50.0	3658.1	41.3	3658.9	31.1	3659.6	16.9	3660.4	8.8	3661.2	5.5	3661.9	11.9		
3662.7	19.7	3663.5	20.6	3664.3	27.3	3665.0	27.9	3665.8	30.0	3666.6	59.2	3667.3	63.4	3668.1	73.6		
3668.9	74.7	3669.7	82.7	3670.4	58.3	3671.2	35.5	3672.0	22.7	3672.8	19.8	3673.5	7.8	3674.3	18.3		
3675.1	20.5	3675.9	32.8	3676.6	52.9	3677.4	50.6	3678.2	75.2	3679.0	60.7	3679.8	55.6	3680.5	47.1		
3681.3	50.	3682.1	40.	3682.9	61.	3683.6	77.	3684.4	109.	3685.2	162.	3686.0	199.	3686.8	272.		
3687.5	269.	3688.3	252.	3689.1	263.	3689.9	176.	3690.7	127.	3691.4	70.	3692.2	18.	3693.0	22.		
3693.8	8.6	3694.6	13.2	3695.4	7.9	3696.1	5.2	3696.8	7.4	3697.7	10.3	3698.5	6.3	3699.3	10.7		
3700.1	8.6	3700.8	5.0	3701.6	13.3	3702.4	6.4	3703.2	11.8	3704.0	15.8	3704.8	25.5	3705.6	40.6		
3706.3	35.	3707.1	65.	3707.9	83.	3708.7	171.	3709.5	167.	3710.3	241.	3711.1	272.	3711.8	291.		
3712.6	262.	3713.4	232.	3714.2	178.	3715.0	127.	3715.8	100.	3716.6	82.	3717.4	65.	3718.2	75.		
3718.9	77.9	3719.7	88.9	3720.5	74.4	3721.3	74.4	3722.1	55.3	3722.9	59.8	3723.7	50.8	3724.5	58.1		
3725.3	92.	3726.1	126.	3726.9	146.	3727.7	215.	3728.4	263.	3729.2	270.	3730.0	235.	3730.8	158.		
3731.6	109.	3732.4	55.	3733.2	29.	3734.0	27.	3734.8	35.	3735.6	28.	3736.4	29.	3737.2	36.		
3738.0	32.2	3738.8	25.3	3739.6	24.8	3740.4	27.1	3741.2	23.3	3742.0	18.9	3742.8	20.1	3743.6	15.3		
3744.4	3.5	3745.2	6.6	3746.0	6.3	3746.8	6.4	3747.6	12.4	3748.4	11.9	3749.2	10.8	3750.0	18.8		
3750.8	11.9	3751.6	18.0	3752.4	23.3	3753.2	43.5	3754.0	51.6	3754.8	49.5	3755.6	76.0	3756.4	95.5		
3757.2	154.	3758.0	187.	3758.8	227.	3759.6	265.	3760.4	288.	3761.2	237.	3762.0	146.	3762.8	100.		
3763.6	45.6	3764.4	36.7	3765.2	14.8	3766.0	13.9	3766.8	14.6	3767.6	17.3	3768.4	19.3	3769.2	26.4		

E eV	$\frac{P}{N}E$																					
3770.0	42.	3770.8	29.	3771.6	50.	3772.4	80.	3773.3	118.	3774.1	152.	3774.9	194.	3775.7	219.							
3776.5	239.	3777.3	227.	3778.1	205.	3778.9	149.	3779.7	79.	3780.5	67.	3781.3	32.	3782.2	26.							
3781.0	38.0	3782.8	35.0	3784.6	20.1	3785.4	43.4	3786.2	39.9	3787.0	39.2	3787.8	26.9	3788.6	26.4							
3789.5	19.8	3790.3	18.8	3791.1	15.5	3791.9	7.6	3792.7	8.8	3793.5	6.8	3794.3	10.0	3795.2	8.2							
3796.0	3.5	3796.8	5.8	3797.6	3.9	3798.4	12.8	3799.2	9.5	3800.0	14.2	3800.9	12.3	3801.7	22.8							
3802.5	24.5	3803.3	30.1	3804.1	20.9	3804.9	27.0	3805.8	21.8	3806.6	13.4	3807.4	11.6	3808.2	7.1							
3809.0	2.6	3809.9	6.6	3810.7	5.5	3811.5	1.9	3812.3	5.9	3813.1	4.8	3814.0	11.5	3814.8	20.5							
3815.5	15.2	3816.4	30.1	3817.2	35.5	3818.1	57.1	3818.9	60.1	3819.7	74.3	3820.5	78.1	3821.3	68.9							
3822.2	70.	3823.0	82.	3823.8	8.9	3824.6	115.	3825.5	128.	3826.3	118.	3827.1	104.	3827.9	85.							
3828.8	55.4	3829.6	30.0	3830.4	16.2	3831.2	7.6	3832.1	-2.8	3832.9	-3.8	3833.7	2.4	3834.6	5.3							
3835.4	-2.4	3836.2	2.5	3837.0	3.9	3837.9	8.2	3838.7	6.6	3839.5	4.0	3840.3	6.9	3841.2	11.7							
3842.0	0.9	3842.8	15.5	3843.7	24.7	3844.5	21.2	3845.3	31.8	3846.2	39.1	3847.0	47.4	3847.8	70.0							
3848.7	110.	3849.5	181.	3850.3	201.	3851.1	217.	3852.0	289.	3852.8	233.	3853.6	241.	3854.5	161.							
3855.3	130.	3856.1	66.	3857.0	49.	3857.8	27.	3858.7	32.	3859.5	54.	3860.3	50.	3861.2	77.							
3862.0	107.	3862.8	133.	3863.7	187.	3864.5	202.	3865.3	238.	3866.2	267.	3867.0	305.	3867.9	257.							
3868.7	222.	3869.5	177.	3870.4	108.	3871.2	68.	3872.0	50.	3872.9	54.	3873.7	60.	3874.6	42.							
3875.4	44.5	3876.2	26.7	3877.1	22.3	3877.9	20.7	3878.8	11.6	3879.6	15.6	3880.5	15.3	3881.3	12.8							
3882.1	16.8	3883.0	15.4	3883.8	23.0	3884.7	26.3	3885.5	38.9	3886.4	60.7	3887.2	69.4	3888.0	87.2							
3888.9	179.	3889.7	124.	3890.6	102.	3891.4	124.	3892.3	96.	3893.1	102.	3894.0	157.	3894.8	223.							
3895.7	252.	3896.5	265.	3897.3	271.	3898.2	172.	3899.0	136.	3899.9	70.	3900.7	56.	3901.6	31.							
3902.4	33.	3903.3	31.	3904.1	46.	3905.0	77.	3905.8	94.	3906.7	146.	3907.5	195.	3908.4	215.							
3909.2	264.	3910.1	250.	3910.9	170.	3911.8	118.	3912.7	63.	3913.5	31.	3914.4	29.	3915.2	25.							
3916.1	15.	3916.9	31.	3917.8	3.8	3918.6	62.	3919.5	74.	3920.3	106.	3921.2	125.	3922.0	139.							
3922.4	191.	3923.8	136.	3924.6	144.	3925.5	113.	3926.3	118.	3927.2	144.	3928.0	135.	3928.9	150.							
3929.8	125.	3930.6	139.	3931.5	149.	3932.3	195.	3933.2	229.	3934.1	217.	3934.9	252.	3935.8	196.							
3936.6	137.	3937.5	66.	3938.4	45.	3939.2	35.	3940.1	21.	3940.9	35.	3941.8	41.	3942.7	61.							
3943.5	65.	3944.4	76.	3945.2	118.	3946.1	138.	3947.0	169.	3947.8	202.	3948.7	232.	3949.6	241.							
3950.4	210.	3951.3	152.	3952.2	73.	3953.0	51.	3953.9	35.	3954.8	19.	3955.6	19.	3956.5	19.							
3957.4	10.8	3958.2	19.3	3959.1	7.6	3960.0	15.5	3960.8	15.8	3961.7	10.1	3962.6	15.2	3963.4	16.8							
3964.3	19.3	3965.2	8.8	3966.0	10.7	3966.9	23.5	3967.8	15.8	3968.7	14.7	3969.5	17.4	3970.4	17.3							
3971.3	15.8	3972.1	17.7	3973.0	11.4	3973.9	13.7	3974.8	12.2	3975.6	11.6	3976.5	5.3	3977.4	14.5							
3978.3	15.8	3979.1	8.8	3980.0	9.1	3980.9	11.8	3981.8	7.2	3982.6	17.0	3983.5	20.4	3984.4	29.5							
3985.3	40.0	3986.1	38.5	3987.0	41.2	3987.9	41.6	3988.8	32.2	3989.6	27.8	3990.5	21.2	3991.4	12.1							
3992.3	15.8	3993.2	7.8	3994.0	12.9	3994.9	9.9	3995.8	8.6	3996.7	5.4	3997.6	11.3	3998.4	13.5							
3999.3	18.3	4000.2	32.1	4001.1	34.3	4002.0	39.7	4002.8	45.8	4003.7	58.0	4004.6	43.9	4005.5	44.4							
4006.4	24.9	4007.3	35.3	4008.1	44.2	4009.0	49.0	4009.9	37.9	4010.8	26.3	4011.7	14.4	4012.6	11.0							
4013.5	1.6	4014.3	11.2	4015.2	3.0	4016.1	13.0	4017.0	24.3	4017.9	23.2	4018.8	26.5	4019.7	36.9							
4020.6	15.8	4021.4	12.8	4022.3	10.6	4023.2	13.6	4024.1	12.1	4025.0	15.4	4025.9	29.5	4026.8	37.5							
4027.7	50.	4028.6	66.	4029.4	115.	4030.3	128.	4031.2	188.	4032.1	222.	4033.0	245.	4033.9	258.							
4034.8	4035.7	247.	4035.8	230.	4037.5	167.	4038.4	155.	4039.3	155.	4040.2	18.	4041.1	10.								
4041.9	3.3	4042.8	8.0	4043.7	12.1	4044.6	17.9	4045.5	15.7	4046.4	23.1	4047.3	18.8	4048.2	14.4							
4049.1	9.9	4050.0	26.4	4050.9	24.3	4051.8	20.4	4052.7	24.9	4053.6	38.5	4054.5	53.6	4055.4	77.2							
4056.3	143.	4057.2	147.	4058.1	169.	4059.0	164.	4059.9	131.	4060.8	81.	4061.7	43.	4062.6	21.							
4063.5	1.6	4064.4	7.2	4065.3	13.6	4066.2	13.6	4067.1	10.7	4068.0	4.6	4068.9	8.3	4069.8	16.1							
4070.7	19.9	4071.7	28.7	4072.6	50.8	4073.5	56.8	4074.4	59.1	4075.3	67.0	4076.2	54.3	4077.1	78.2							
4078.0	57.	4078.9	67.	4079.8	71.	4080.7	175.	4081.6	165.	4082.5	232.	4083.4	251.	4084.4	241.							
4085.3	262.	4086.2	193.	4087.1	114.	4088.0	54.	4088.9	26.	4089.8	17.	4090.7	20.	4091.6	24.							
4092.5	33.9	4093.5	34.3	4094.4	55.3	4095.3	42.6	4096.2	35.6	4097.1	43.0	4098.0	48.9	4098.9	25.2							
4099.9	17.3	4100.8	20.7	4101.7	15.9	4102.6	17.2	4103.5	6.4	4104.4	11.5	4105.3	3.0	4106.3	6.0							
4107.2	11.5	4108.1	4.7	4109.0	19.6	4109.9	25.9	4110.9	20.6	4111.8	22.2	4112.7	44.4	4113.6	74.1							
4114.5	87.	4115.4	109.	4116.4	166.	4117.3	199.	4118.2	225.	4119.1	259.	4120.0	235.	4121.0	172.							
4121.9	131.	4122.8	105.	4123.7	89.	4124.7	112.	4125.6	113.	4126.5	118.	4127.4	75.	4128.4	61.							
4129.3	36.3	4130.2	12.7	4131.1	3.7	4132.1	8.0	4133.0	10.6	4133.9	9.1	4134.8	13.5	4135.8	10.8							
4136.7	18.9	4137.6	14.3	4138.5	23.4	4139.5	30.1	4140.4	37.6	4141.3	36.8	4142.2	36.0	4143.2	38.4							
4144.1	42.9	4145.0	24.6	4146.0	15.8	4146.9	19.7	4147.8	14.8	4148.9	21.4	4149.7	32.2	4150.6	32.1							

E eV	P/ N/E bev ^{1/2}																						
4151.6	43.	4152.5	49.	4153.4	54.	4154.3	65.	4155.3	83.	4156.2	104.	4157.1	170.	4158.1	198.								
4159.0	269.	4159.9	284.	4160.9	288.	4161.8	285.	4162.8	234.	4163.7	208.	4164.6	157.	4165.6	95.								
4166.5	60.	4167.4	56.	4168.4	67.	4169.3	122.	4170.2	146.	4171.2	182.	4172.1	200.	4173.1	189.								
4174.0	188.	4174.9	149.	4175.9	128.	4176.8	93.	4177.8	96.	4178.7	70.	4179.6	50.	4180.6	39.								
4181.5	18.9	4182.5	5.5	4183.4	7.5	4184.4	4.8	4185.3	9.1	4186.2	10.6	4187.2	8.2	4188.1	8.5								
4189.1	7.3	4190.0	17.4	4191.0	15.0	4191.9	16.5	4192.9	23.3	4193.8	13.7	4194.7	35.1	4195.7	34.2								
4196.6	42.	4197.6	48.	4198.5	28.	4199.5	65.	4200.4	62.	4201.4	93.	4202.3	129.	4203.3	158.								
4204.2	212.	4205.2	184.	4206.1	158.	4207.1	97.	4208.0	45.	4209.0	31.	4209.9	19.	4210.9	22.								
4211.8	8.1	4212.8	10.2	4213.7	17.2	4214.7	28.8	4215.6	25.4	4216.6	49.6	4217.6	58.3	4218.5	77.0								
4219.5	85.5	4220.4	76.1	4221.4	59.4	4222.3	40.4	4223.3	22.5	4224.2	14.4	4225.2	2.1	4226.2	14.8								
4227.1	18.8	4228.1	11.0	4229.0	27.0	4230.0	36.1	4230.9	21.8	4231.9	18.2	4232.9	7.4	4233.8	11.3								
4234.8	16.3	4235.7	9.4	4236.7	7.4	4237.7	27.5	4238.6	16.9	4239.5	12.9	4240.5	17.1	4241.5	10.2								
4242.5	20.	4243.4	15.	4244.4	16.	4245.4	29.	4246.3	31.	4247.3	55.	4248.3	74.	4249.2	106.								
4250.2	154.	4251.1	191.	4252.1	255.	4253.1	221.	4254.0	189.	4255.0	130.	4256.0	93.	4256.9	36.								
4257.9	9.7	4258.9	7.8	4259.9	0.6	4260.8	6.6	4261.8	7.7	4262.8	20.5	4263.7	15.6	4264.7	8.5								
4265.7	17.1	4266.6	15.7	4267.6	20.2	4268.6	34.2	4269.6	47.2	4270.5	46.4	4271.5	55.2	4272.5	59.2								
4273.4	37.6	4274.4	22.0	4275.4	22.4	4276.4	10.9	4277.3	9.1	4278.3	-0.9	4279.3	7.3	4280.3	12.4								
4281.2	5.6	4282.2	6.2	4283.2	9.6	4284.2	18.3	4285.1	9.8	4286.1	20.5	4287.1	31.2	4288.1	64.3								
4289.1	75.	4290.0	133.	4291.0	170.	4292.0	207.	4293.0	234.	4294.0	211.	4294.9	201.	4295.9	144.								
4298.9	136.	4297.9	162.	4298.9	183.	4299.8	237.	4300.8	230.	4301.8	203.	4302.8	171.	4303.8	112.								
4304.8	79.	4305.7	77.	4306.7	107.	4307.7	123.	4308.7	120.	4309.7	115.	4310.7	112.	4311.7	91.								
4312.6	71.	4313.6	72.	4314.6	76.	4315.6	110.	4316.6	149.	4317.6	179.	4318.6	185.	4319.6	202.								
4320.5	136.	4321.5	103.	4322.5	57.	4323.5	52.	4324.5	45.	4325.5	69.	4326.5	94.	4327.5	93.								
4328.5	114.	4329.5	106.	4330.5	71.	4331.4	62.	4332.4	29.	4333.4	34.	4334.4	43.	4335.4	25.								
4336.4	31.8	4337.4	22.7	4338.4	20.1	4339.4	7.8	4340.4	6.2	4341.4	12.8	4342.4	25.1	4343.4	22.6								
4344.4	21.1	4345.4	21.1	4346.4	12.6	4347.4	15.1	4348.4	12.5	4349.4	7.4	4350.4	11.7	4351.4	18.6								
4352.4	21.1	4353.4	36.9	4354.4	45.5	4355.4	55.4	4356.4	61.0	4357.4	79.6	4358.4	85.4	4359.4	99.2								
4360.4	172.	4361.4	210.	4362.4	228.	4363.4	240.	4364.4	268.	4365.4	268.	4366.4	205.	4367.4	207.								
4368.4	183.	4369.4	157.	4370.4	125.	4371.4	62.	4372.4	23.	4373.5	4.	4374.5	5.	4375.5	8.								
4376.5	-0.2	4377.5	-1.8	4378.5	3.6	4379.5	11.4	4380.5	9.0	4381.5	10.4	4382.5	11.0	4383.5	19.7								
4384.6	15.3	4385.6	36.8	4386.6	50.7	4387.6	68.6	4388.6	70.0	4389.6	76.4	4390.6	55.5	4391.6	58.8								
4392.7	35.7	4393.7	37.6	4394.7	52.1	4395.7	60.7	4396.7	43.3	4397.7	37.0	4398.8	41.4	4399.8	38.9								
4400.8	46.3	4401.8	56.5	4402.8	43.1	4403.8	44.9	4404.9	40.5	4405.9	31.6	4406.9	28.8	4407.9	19.1								
4408.9	7.1	4410.0	10.8	4411.0	1.3	4412.0	7.1	4413.0	4.0	4414.0	-0.9	4415.1	10.2	4416.1	21.9								
4417.1	14.5	4418.1	15.5	4419.2	17.0	4420.2	24.8	4421.2	24.4	4422.2	35.4	4423.2	50.2	4424.3	52.5								
4425.3	111.	4426.3	148.	4427.3	169.	4428.4	199.	4429.4	195.	4430.4	200.	4431.5	132.	4432.5	92.								
4433.5	52.8	4434.5	42.2	4435.6	29.6	4436.6	13.2	4437.6	17.3	4438.7	9.6	4439.7	10.9	4440.7	4.4								
4441.8	1.4	4442.8	-1.8	4443.8	2.8	4444.8	1.7	4445.9	4.7	4446.9	5.8	4447.9	4.2	4448.9	8.3								
4450.0	8.7	4451.0	10.0	4452.1	10.2	4453.1	15.0	4454.2	20.8	4455.2	31.6	4456.2	33.1	4457.3	34.9								
4458.3	69.8	4459.3	80.6	4460.4	61.6	4461.4	64.2	4462.4	46.0	4463.5	30.8	4464.5	35.3	4465.6	34.3								
4466.6	22.6	4467.6	18.6	4468.7	18.4	4469.7	7.7	4470.8	6.1	4471.8	2.1	4472.9	5.0	4473.9	23.6								
4474.9	18.	4475.0	4.	4477.0	21.	4478.1	30.	4479.1	48.	4480.2	71.	4481.2	100.	4482.2	113.								
4483.3	104.	4484.3	89.	4485.4	50.	4486.4	43.	4487.5	23.	4488.5	25.	4489.6	39.	4490.6	48.								
4491.7	39.	4492.7	48.	4493.8	72.	4494.8	82.	4495.9	104.	4496.9	90.	4498.0	78.	4499.0	78.								
4500.1	87.	4501.1	106.	4502.2	114.	4503.2	163.	4504.3	227.	4505.3	185.	4506.4	150.	4507.4	114.								
4508.5	53.4	4509.5	24.8	4510.5	21.3	4511.7	12.5	4512.7	2.6	4513.8	2.8	4514.8	10.1	4515.9	9.4								
4516.9	15.2	4518.0	1.3	4519.1	13.9	4520.1	25.2	4521.2	30.5	4522.2	26.9	4523.3	20.4	4524.4	23.5								
4525.4	12.7	4526.5	16.3	4527.5	21.3	4528.6	27.6	4529.7	24.9	4530.7	39.7	4531.8	66.2	4532.8	84.3								
4533.9	147.	4535.0	159.	4536.0	184.	4537.1	193.	4538.2	142.	4539.2	95.	4540.3	43.	4541.4	29.								
4542.4	8.7	4543.5	12.3	4544.6	10.9	4545.6	11.3	4546.7	13.0	4547.8	13.3	4548.8	7.1	4549.9	18.9								
4551.0	27.	4552.0	28.	4553.1	52.	4554.2	51.	4555.3	72.	4556.3	89.	4557.4	124.	4558.5	149.								
4559.5	163.	4560.6	163.	4561.7	170.	4562.8	121.	4563.8	92.	4564.9	55.	4566.0	44.	4567.1	28.								
4568.1	12.7	4569.2	12.2	4570.3	7.9	4571.4	7.0	4572.4	6.0	4573.5	16.3	4574.6	14.5	4575.7	21.2								
4576.8	13.	4577.8	18.	4578.9	17.	4580.0	28.	4581.1	37.	4582.1	40.	4583.2	71.										

E	P _{N/E}														
eV	beV ^{1/2}														
4594.1	23.2	4595.1	37.2	4596.2	28.6	4597.3	37.2	4598.4	17.8	4599.5	17.8	4600.6	12.3	4601.7	25.1
4602.7	35.	4603.8	45.	4604.9	69.	4606.0	92.	4607.1	119.	4608.2	133.	4609.3	169.	4610.4	169.
4611.5	144.	4612.6	138.	4613.6	67.	4614.7	52.	4615.8	37.	4616.9	28.	4618.0	32.	4619.1	36.
4620.2	48.	4621.3	86.	4622.4	104.	4623.5	133.	4624.6	162.	4625.7	184.	4626.8	160.	4627.9	86.
4629.0	58.7	4630.1	42.5	4631.2	55.9	4632.3	62.4	4633.4	77.5	4634.5	45.5	4635.6	61.4	4636.7	43.5
4637.8	25.3	4638.9	14.5	4640.0	14.5	4641.1	11.2	4642.2	13.6	4643.3	6.5	4644.4	5.6	4645.5	17.2
4646.6	21.	4647.7	32.	4648.8	37.	4649.9	52.	4651.0	85.	4652.1	123.	4653.2	197.	4654.3	218.
4655.4	23.	4656.5	223.	4657.6	192.	4658.7	111.	4659.8	55.	4660.9	24.	4662.1	13.	4663.2	10.
4664.3	15.8	4665.4	7.5	4666.5	13.7	4667.6	14.2	4668.7	24.7	4669.8	25.9	4670.9	14.4	4672.1	13.2
4673.2	11.0	4674.3	1.3	4675.4	6.4	4676.5	14.2	4677.6	12.9	4678.7	15.4	4679.8	11.4	4681.0	14.9
4682.1	37.	4683.2	39.	4684.3	67.	4685.4	121.	4686.5	144.	4687.7	172.	4688.8	156.	4689.9	129.
4691.0	111.	4692.1	104.	4693.3	126.	4694.4	180.	4695.5	209.	4696.6	233.	4697.7	251.	4698.9	239.
4700.0	211.	4701.1	171.	4702.2	134.	4703.4	78.	4704.5	61.	4705.6	47.	4706.7	56.	4707.9	71.
4709.0	38.3	4710.1	42.4	4711.2	36.5	4712.4	32.7	4713.5	29.5	4714.6	44.5	4715.7	46.5	4716.9	93.6
4718.0	125.	4719.1	154.	4720.3	141.	4721.4	117.	4722.5	88.	4723.6	58.	4724.8	50.	4725.9	54.
4727.0	60.8	4728.2	67.1	4729.3	66.7	4730.4	60.3	4731.6	57.1	4732.7	45.2	4733.8	58.9	4735.0	90.1
4736.1	110.	4737.2	89.	4738.4	76.	4739.5	82.	4740.7	87.	4741.8	83.	4742.9	80.	4744.1	82.
4745.2	73.6	4746.3	91.1	4747.5	61.4	4748.6	57.8	4749.8	49.4	4750.9	34.0	4752.0	32.6	4753.2	59.4
4754.3	70.	4755.5	122.	4756.6	133.	4757.8	131.	4758.9	123.	4760.0	112.	4761.2	70.	4762.3	31.
4763.5	30.3	4764.6	28.3	4765.8	46.7	4766.9	51.2	4768.1	53.5	4769.2	43.7	4770.3	41.3	4771.5	45.4
4772.7	68.	4773.8	80.	4775.0	94.	4776.1	123.	4777.3	119.	4778.4	114.	4779.6	89.	4780.7	78.
4781.9	77.	4783.0	62.	4784.2	97.	4785.3	99.	4786.5	108.	4787.6	113.	4788.8	157.	4789.9	177.
4791.1	212.	4792.2	200.	4793.4	179.	4794.6	151.	4795.7	86.	4796.9	55.	4798.0	70.	4799.2	86.
4800.3	105.	4801.5	99.	4802.7	98.	4803.8	93.	4805.0	76.	4806.1	73.	4807.3	81.	4808.5	88.
4809.6	86.	4810.8	101.	4811.9	98.	4813.1	70.	4814.3	32.	4815.4	26.	4816.6	20.	4817.8	24.
4818.9	16.	4820.1	20.	4821.3	26.	4822.4	49.	4823.6	75.	4824.8	79.	4825.9	134.	4827.1	167.
4828.3	167.	4829.4	199.	4830.6	168.	4831.8	152.	4832.9	96.	4834.1	69.	4835.3	37.	4836.5	27.
4837.5	26.6	4838.6	42.0	4840.0	72.9	4841.2	70.7	4842.3	93.9	4843.5	85.1	4844.7	57.8	4845.8	69.6
4847.0	90.	4848.2	117.	4849.4	16.5.	4850.6	191.	4851.7	190.	4852.9	179.	4854.1	106.	4855.3	58.
4856.4	28.4	4857.6	15.8	4858.8	34.8	4860.0	48.6	4861.2	62.9	4862.3	41.2	4863.5	52.0	4864.7	35.8
4865.9	26.0	4867.1	20.4	4868.3	20.8	4869.4	36.0	4870.6	56.7	4871.8	49.3	4873.0	67.2	4874.2	65.7
4875.4	60.3	4876.5	79.7	4877.7	88.8	4878.9	86.5	4880.1	72.4	4881.3	55.2	4882.5	41.7	4883.7	48.5
4884.9	57.	4886.0	72.	4887.2	113.	4888.4	132.	4889.6	178.	4890.8	211.	4892.0	166.	4893.2	136.
4894.4	91.	4895.6	135.	4896.8	135.	4898.0	170.	4899.2	213.	4900.4	199.	4901.6	196.	4902.7	136.
4903.9	109.	4905.1	99.	4906.3	94.	4907.5	135.	4908.7	125.	4909.9	156.	4911.1	178.	4912.3	207.
4913.5	201.	4914.7	162.	4915.9	118.	4917.1	67.	4918.3	35.	4919.5	18.	4920.7	19.	4921.9	10.
4923.1	9.1	4924.3	2.7	4925.5	6.9	4926.8	11.6	4928.0	5.8	4929.2	18.1	4930.4	20.6	4931.6	28.4
4932.8	41.0	4934.0	46.4	4935.2	44.8	4936.4	49.5	4937.6	32.5	4938.8	38.8	4940.0	32.9	4941.2	44.4
4942.5	90.	4943.7	113.	4944.9	158.	4946.1	203.	4947.3	206.	4948.5	198.	4949.7	123.	4950.9	82.
4952.2	40.9	4953.4	21.1	4954.6	79.5	4955.8	16.9	4957.0	23.6	4958.2	41.7	4959.4	41.3	4960.7	72.0
4961.9	101.	4963.1	130.	4964.3	154.	4965.5	153.	4966.8	132.	4968.0	36.	4969.2	55.	4970.4	17. ←
4971.6	4.3	4972.9	2.6	4974.1	4.0	4975.3	5.0	4976.5	3.7	4977.7	10.7	4979.0	3.2	4980.2	12.4
4981.4	10.	4982.6	29.	4983.9	32.	4985.1	48.	4986.3	31.	4987.5	96.	4988.8	107.	4990.0	106.
4991.2	99.	4992.5	81.	4993.7	80.	4994.9	103.	4996.1	142.	4997.4	151.	4998.6	148.	4999.8	110.
5001.1	75.8	5002.3	30.9	5003.5	17.8	5004.8	15.0	5005.0	8.5	5007.2	14.3	5008.5	30.4	5009.7	16.8
5010.9	15.4	5012.2	18.7	5013.4	35.2	5014.6	39.3	5015.9	44.6	5017.1	43.8	5018.4	25.3	5019.6	38.2
5020.8	4.6	5022.1	6.8	5023.3	103.	5024.6	138.	5025.8	225.	5027.0	242.	5028.3	257.	5029.5	220.
5030.8	238.	5032.0	172.	5033.3	122.	5034.5	66.	5035.7	32.	5037.0	19.	5038.2	23.	5039.5	19.
5040.7	39.9	5042.0	33.2	5043.2	48.2	5044.5	57.5	5045.7	60.9	5047.0	38.6	5048.2	28.4	5049.5	15.6
5050.7	12.2	5052.0	24.0	5053.2	28.6	5054.5	43.3	5055.7	43.9	5057.0	51.8	5058.2	44.2	5059.5	49.7
5060.7	82.	5062.0	92.	5063.2	110.	5064.5	141.	5065.8	147.	5067.0	144.	5068.3	110.	5069.5	100.
5070.8	75.	5072.0	83.	5073.3	96.	5074.6	164.	5075.8	221.	5077.1	245.	5078.3	300.	5079.6	221.
5080.9	176.	5082.1	100.	5083.4	55.	5084.6	42.	5085.9	29.	5087.2	28.	5088.4	30.	5089.7	29.
5091.0	19.3	5092.2	21.6	5093.5	11.9	5094.8	26.7	5096.0	30.8	5097.3	26.0	5098.6	39.8	5099.8	50.7
5101.1	60.	5102.4	68.	5103.6	86.	5104.9	87.	5106.2	128.	5107.5	179.	5108.7	173.	5110.0	159.

E eV	P/ N/E bev ^{1/2}																
5111.3	137.	5112.5	79.	5113.8	45.	5115.1	33.	5116.4	21.	5117.6	16.	5118.9	25.	5120.2	28.		
5121.5	21.	5122.8	27.	5124.0	47.	5125.3	60.	5126.6	82.	5127.9	91.	5129.1	106.	5130.4	85.		
5131.7	47.6	5133.0	26.9	5134.3	16.9	5135.5	7.3	5136.8	17.2	5138.1	9.1	5139.4	16.0	5140.7	13.3		
5142.0	15.3	5143.2	7.9	5144.5	20.5	5145.8	27.8	5147.1	33.5	5148.4	49.3	5149.7	77.0	5151.0	83.4		
5152.3	110.	5153.5	84.	5154.8	93.	5156.1	87.	5157.4	49.	5158.7	30.	5160.0	17.	5161.3	17.		
5162.6	12.9	5163.9	23.1	5165.2	26.9	5166.5	34.9	5167.7	63.9	5169.0	61.0	5170.3	43.2	5171.6	43.4		
5172.9	34.1	5174.2	12.4	5175.5	28.4	5176.8	23.7	5178.1	44.2	5179.4	61.0	5180.7	74.7	5182.0	85.4		
5183.3	95.	5184.6	104.	5185.9	89.	5187.2	74.	5188.5	50.	5189.8	34.	5191.1	42.	5192.4	37.		
5193.7	38.	5195.0	64.	5196.3	92.	5197.6	11.1	5198.9	133.	5200.3	143.	5201.6	150.	5202.9	104.		
5204.2	95.	5205.5	90.	5206.8	95.	5208.1	109.	5209.4	129.	5210.7	142.	5212.0	125.	5213.3	72.		
5214.7	39.6	5216.0	23.0	5217.3	6.7	5218.6	18.9	5219.9	11.7	5221.2	5.3	5222.5	18.1	5223.8	14.4		
5225.2	33.	5226.5	39.	5227.8	53.	5229.1	78.	5230.4	116.	5231.7	144.	5233.1	167.	5234.4	136.		
5235.7	109.	5237.0	52.	5238.3	40.	5239.7	31.	5241.0	30.	5242.3	54.	5243.6	67.	5245.0	88.		
5246.3	163.	5247.6	171.	5248.9	23.0	5250.3	213.	5251.6	194.	5252.9	168.	5254.2	107.	5255.6	84.		
5256.9	49.7	5258.2	35.0	5259.5	28.9	5260.9	14.8	5262.2	27.9	5263.5	46.1	5264.9	55.1	5266.2	73.1		
5267.5	93.	5268.9	98.	5270.2	109.	5271.5	86.	5272.9	80.	5274.2	67.	5275.5	58.	5276.9	58.		
5278.2	48.8	5279.5	30.5	5280.9	32.5	5282.2	32.3	5283.5	40.0	5284.9	57.0	5286.2	53.7	5287.6	42.6		
5289.9	15.	5290.2	21.	5291.6	17.	5292.9	23.	5294.3	37.	5295.6	49.	5296.9	80.	5298.3	110.		
5299.6	123.	5301.0	131.	5302.3	77.	5303.7	53.	5305.0	23.	5306.4	16.	5307.7	24.	5309.1	37.		
5310.4	48.8	5311.7	59.8	5313.1	71.1	5314.4	53.3	5315.8	63.4	5317.1	54.0	5318.5	30.1	5319.9	39.8		
5321.2	24.5	5322.6	12.3	5323.9	12.4	5325.3	20.0	5326.6	33.8	5328.0	27.8	5329.3	50.7	5330.7	94.6		
5332.0	134.	5333.4	180.	5334.8	170.	5336.1	182.	5337.5	174.	5338.8	155.	5340.2	140.	5341.5	191.		
5342.9	203.	5344.3	207.	5345.6	18.9	5347.0	114.	5348.3	59.	5349.7	41.	5351.1	49.	5352.4	57.		
5353.8	92.	5355.2	94.	5356.5	103.	5357.9	63.	5359.3	56.	5360.6	22.	5362.0	7.	5363.4	5.		
5364.7	0.2	5366.1	5.5	5367.5	6.6	5368.8	14.7	5370.2	4.9	5371.6	8.2	5373.0	10.1	5374.3	5.5		
5375.7	7.2	5377.1	8.5	5378.5	7.3	5379.8	10.0	5381.2	13.6	5382.6	14.7	5384.0	15.1	5385.3	12.0		
5386.7	11.1	5388.1	26.5	5389.5	28.0	5390.8	42.6	5392.2	59.2	5393.6	71.9	5395.0	88.1	5396.4	96.4		
5397.7	100.	5399.1	90.	5400.5	86.	5401.9	73.	5403.3	80.	5404.7	67.	5406.0	102.	5407.4	135.		
5408.8	161.	5410.2	171.	5411.6	154.	5413.0	89.	5414.4	66.	5415.7	73.	5417.1	95.	5418.5	104.		
5419.9	135.	5421.7	113.	5422.7	76.	5424.1	41.	5425.5	22.	5426.9	23.	5428.3	17.	5429.7	41.		
5431.0	31.3	5432.4	30.9	5433.8	30.8	5435.2	32.0	5436.6	14.9	5438.0	21.8	5439.4	28.5	5440.8	16.3		
5442.2	36.	5443.6	52.	5445.0	76.	5446.4	99.	5447.8	139.	5449.2	153.	5450.6	152.	5452.0	144.		
5453.4	140.	5454.8	119.	5455.2	11.9	5457.6	113.	5459.0	115.	5460.4	88.	5461.9	93.	5463.3	61.		
5464.7	37.	5466.1	65.	5467.5	76.	5468.9	137.	5470.3	166.	5471.7	206.	5473.1	204.	5474.5	254.		
5475.9	212.	5477.4	215.	5478.8	197.	5480.2	140.	5481.6	70.	5483.0	40.	5484.4	31.	5485.8	26.		
5487.3	47.	5488.7	50.	5490.1	85.	5491.5	92.	5492.9	103.	5494.3	128.	5495.8	98.	5497.2	93.		
5498.6	69.7	5500.0	75.6	5501.4	98.2	5502.9	96.1	5504.3	77.4	5505.7	58.2	5507.1	31.3	5508.6	26.4		
5510.0	27.	5511.4	38.	5512.8	51.	5514.3	67.	5515.7	107.	5517.1	126.	5518.5	151.	5520.0	144.		
5521.4	96.4	5522.8	56.6	5524.3	34.0	5525.7	11.2	5527.1	24.8	5528.5	18.7	5530.0	25.7	5531.4	40.4		
5532.8	47.	5534.3	82.	5535.7	125.	5537.1	183.	5538.6	239.	5540.0	296.	5541.5	286.	5542.9	239.		
5544.3	159.	5545.8	78.	5547.2	46.	5548.7	23.	5550.1	7.	5551.5	13.	5553.0	22.	5554.4	38.		
5555.9	41.	5557.3	60.	5558.7	74.	5560.2	60.	5561.6	72.	5563.1	84.	5564.5	109.	5566.0	145.		
5567.4	165.	5568.9	191.	5570.3	125.	5571.8	96.	5573.2	56.	5574.7	29.	5576.1	19.	5577.6	12.		
5579.0	7.7	5580.5	9.9	5581.9	9.4	5583.4	21.1	5584.8	9.4	5586.3	19.4	5587.7	22.8	5589.2	20.9		
5590.6	17.6	5592.1	9.1	5593.6	12.3	5595.0	14.6	5596.5	14.0	5597.9	9.4	5599.4	9.0	5600.8	14.0		
5602.3	13.0	5603.8	26.4	5605.2	30.2	5606.7	33.3	5608.2	44.5	5609.6	40.7	5611.1	35.9	5612.5	19.9		
5614.0	28.	5615.5	22.	5616.9	32.	5618.4	34.	5619.9	72.	5621.3	106.	5622.8	116.	5624.3	138.		
5625.8	170.	5627.2	130.	5628.7	145.	5630.2	83.	5631.6	54.	5633.1	60.	5634.6	76.	5636.1	132.		
5637.5	141.	5639.0	134.	5640.5	117.	5642.0	93.	5643.4	58.	5644.9	30.	5646.4	31.	5647.9	31.		
5649.3	25.	5650.8	35.	5652.3	34.	5653.8	47.	5655.3	54.	5656.8	80.	5658.2	85.	5659.7	157.		
5661.2	189.	5662.7	154.	5664.2	147.	5665.7	121.	5667.1	108.	5668.6	106.	5670.1	147.	5671.6	164.		
5673.1	152.	5674.6	123.	5676.1	70.	5677.6	59.	5679.0	76.	5680.5	76.	5682.0	120.	5683.5	121.		
5685.0	107.	5686.5	96.	5688.0	78.	5689.5	45.	5691.0	48.	5692.5	37.	5694.0	43.	5695.5	67.		
5697.0	92.	5698.5	123.	5700.0	129.	5701.5	134.	5703.0	118.	5704.5	96.	5706.0	82.	5707.5	88.		
5709.0	100.	5710.5	105.	5712.0	101.	5713.5	103.	5715.0	77.	5716.5	79.	5718.0	106.	5719.5	130.		

E eV	P _{N/E} beV ^{1/2}														
5721.0	120.	5722.5	105.	5724.0	79.	5725.5	46.	5727.1	32.	5728.6	53.	5730.1	48.	5731.6	68.
5733.1	77.	5734.6	68.	5736.1	59.	5737.6	59.	5739.2	67.	5740.7	82.	5742.2	123.	5743.7	152.
5745.2	184.	5746.7	194.	5748.3	171.	5749.8	148.	5751.3	110.	5752.8	113.	5754.3	98.	5755.9	86.
5757.4	53.9	5758.9	39.0	5760.4	62.3	5761.9	49.3	5763.5	58.3	5765.0	47.8	5766.5	31.0	5768.0	33.7
5769.6	34.	5771.1	39.	5772.6	76.	5774.1	105.	5775.7	127.	5777.2	143.	5778.7	137.	5780.3	95.
5781.8	61.	5783.3	44.	5784.9	38.	5786.4	39.	5787.9	48.	5789.5	53.	5791.0	65.	5792.5	105.
5794.1	131.	5795.6	151.	5797.1	138.	5798.7	141.	5800.2	160.	5801.8	146.	5803.3	152.	5804.8	94.
5806.4	52.	5807.9	38.	5809.5	61.	5811.0	79.	5812.6	129.	5814.1	134.	5815.6	182.	5817.2	142.
5818.7	133.	5820.3	110.	5821.8	120.	5823.4	119.	5824.9	171.	5826.5	161.	5828.0	162.	5829.6	118.
5831.1	105.	5832.7	89.	5834.2	103.	5835.8	131.	5837.3	141.	5838.9	129.	5840.4	118.	5842.0	84.
5843.5	128.	5845.1	136.	5846.7	172.	5848.2	193.	5849.8	187.	5851.3	145.	5852.9	88.	5854.5	68.
5856.0	96.	5857.5	90.	5859.1	153.	5860.7	158.	5862.3	102.	5863.8	64.	5865.4	52.	5867.0	36.
5868.5	21.6	5870.1	38.5	5871.7	41.3	5873.2	50.4	5874.8	66.6	5876.4	56.4	5877.9	55.3	5879.5	73.4
5881.1	71.6	5882.5	52.5	5884.2	32.8	5885.8	24.7	5887.4	32.6	5888.9	4.1	5890.5	10.7	5892.1	17.2
5893.7	24.	5895.2	23.	5896.8	18.	5898.4	40.	5900.0	35.	5901.6	55.	5903.1	100.	5904.7	126.
5906.2	104.	5907.9	105.	5909.5	75.	5911.0	57.	5912.5	71.	5914.2	62.	5915.8	58.	5917.4	85.
5919.0	97.	5920.6	115.	5922.1	142.	5923.7	132.	5925.3	134.	5926.9	112.	5928.5	79.	5930.1	64.
5931.7	59.4	5933.3	58.3	5934.9	54.7	5936.5	36.3	5938.0	39.0	5939.5	29.7	5941.2	22.4	5942.8	23.3
5944.4	24.	5946.0	20.	5947.6	29.	5949.2	27.	5950.8	50.	5952.4	82.	5954.0	103.	5955.6	121.
5957.2	179.	5958.5	173.	5960.4	203.	5962.0	244.	5963.6	240.	5965.2	246.	5966.8	161.	5968.4	119.
5970.1	102.	5971.7	106.	5973.3	119.	5974.9	123.	5976.5	120.	5978.1	112.	5979.7	90.	5981.3	119.
5982.9	133.	5984.5	122.	5985.2	117.	5987.8	48.	5989.4	31.	5991.0	20.	5992.6	22.	5994.2	29.
5995.8	33.7	5997.5	57.7	5999.1	55.1	6000.7	87.6	6002.3	75.3	6003.9	62.9	6005.6	46.9	6007.2	25.2
6008.8	17.	6010.4	23.	6012.1	20.	6013.7	27.	6015.3	37.	6016.9	63.	6018.6	85.	6020.2	157.
6021.8	185.	6023.4	212.	6025.1	241.	6026.7	191.	6028.3	138.	6030.0	101.	6031.6	81.	6033.2	133.
6034.0	147.	6036.5	171.	6038.1	174.	6039.8	151.	6041.4	145.	6043.0	151.	6044.7	200.	6046.3	235.
6047.9	222.	6049.6	170.	6051.2	84.	6052.9	37.	6054.5	15.	6056.1	10.	6057.8	18.	6059.4	10.
6061.1	70.	6062.7	22.	6064.4	31.	6065.0	46.	6067.7	77.	6069.3	72.	6070.9	95.	6072.3	191.
6074.2	166.	6075.0	211.	6077.5	205.	6079.2	237.	6080.8	185.	6082.5	126.	6084.1	72.	6085.8	45.
6087.5	33.4	6089.1	37.5	6090.8	35.8	6092.4	18.4	6094.1	12.1	6095.7	5.8	6097.4	3.4	6099.1	10.3
6100.7	3.8	6102.4	9.9	6104.0	-3.0	6105.7	11.8	6107.4	4.0	6109.0	-1.5	6110.7	9.0	6112.4	17.9
6114.0	16.2	6115.7	7.6	6117.3	14.5	6119.0	16.5	6120.7	22.2	6122.4	18.1	6124.0	53.1	6125.7	52.1
6127.4	65.	6129.0	108.	6130.7	77.	6132.4	61.	6134.0	19.	6135.7	15.	6137.4	10.	6139.1	19.
6140.7	13.	6142.4	15.	6144.1	29.	6145.8	75.	6147.5	45.	6149.1	61.	6150.8	111.	6152.5	163.
6154.2	231.	6155.9	272.	6157.5	279.	6159.2	208.	6160.9	158.	6162.6	74.	6164.3	32.	6166.0	35.
6167.7	50.	6169.3	80.	6171.0	110.	6172.7	164.	6174.4	169.	6176.1	154.	6177.8	174.	6179.5	190.
6181.2	280.	6182.9	288.	6184.6	342.	6186.3	337.	6188.0	346.	6189.7	267.	6191.3	173.	6193.0	112.
6194.7	81.2	6196.4	72.5	6198.1	59.9	6199.8	60.9	6201.5	78.7	6203.2	62.4	6204.9	62.3	6206.7	29.0
6208.4	21.	6210.1	46.	6211.8	53.	6213.5	104.	6215.2	136.	6216.9	159.	6218.6	183.	6220.3	167.
6222.0	105.	6223.7	71.	6225.4	56.	6227.1	78.	6228.9	128.	6230.5	201.	6232.3	189.	6234.0	212.
6235.7	156.	6237.4	118.	6239.1	69.	6240.9	59.	6242.6	66.	6244.3	89.	6246.0	81.	6247.7	71.
6249.5	66.2	6251.2	50.3	6252.9	53.8	6254.6	44.8	6256.3	19.8	6258.1	16.3	6259.8	17.1	6261.5	20.3
6263.7	21.	6265.0	25.	6266.7	34.	6268.4	54.	6270.2	68.	6271.9	91.	6273.6	114.	6275.4	143.
6277.1	127.	6278.8	149.	6280.5	128.	6282.3	104.	6284.0	100.	6285.8	68.	6287.5	49.	6289.2	44.
6291.0	17.	6292.7	26.	6294.4	18.	6296.2	30.	6297.9	37.	6299.7	62.	6301.4	78.	6303.2	106.
6304.9	124.	6306.6	127.	6308.4	124.	6310.1	118.	6311.9	101.	6313.6	154.	6315.4	148.	6317.1	127.
6318.9	120.	6320.6	114.	6322.4	114.	6324.1	136.	6325.9	190.	6327.6	200.	6329.4	227.	6331.1	163.
6332.9	108.	6334.6	66.	6335.4	43.	6338.2	56.	6339.9	65.	6341.7	61.	6343.4	73.	6345.2	65.
6347.0	71.1	6348.7	70.9	6350.5	77.0	6352.2	81.6	6354.0	59.3	6355.8	35.4	6357.5	22.5	6359.3	40.9
6361.1	58.2	6362.8	66.3	6364.6	86.9	6366.4	91.0	6368.1	78.4	6369.9	49.5	6371.7	42.3	6373.5	31.3
6375.2	52.1	6377.0	40.9	6378.8	47.6	6380.6	57.2	6382.3	48.7	6384.1	48.8	6385.9	52.6	6387.7	67.9
6389.4	58.8	6391.2	62.5	6393.0	40.5	6394.8	52.5	6396.5	73.0	6398.4	76.4	6400.1	82.3	6401.9	52.0
6403.7	40.6	6405.5	34.1	6407.3	26.2	6409.1	39.8	6410.8	48.6	6412.6	83.4	6414.4	91.5	6416.2	99.2
6418.0	67.	6419.8	42.	6421.6	64.	6423.4	56.	6425.2	85.	6427.0	107.	6428.8	156.	6430.6	214.
6432.4	225.	6434.2	209.	6436.0	151.	6437.8	126.	6439.6	100.	6441.4	129.	6443.2	129.	6445.0	161.

E eV	P/ N/E bev ^{1/2}																
6446.8	166.	6448.6	131.	6450.4	118.	6452.2	85.	6454.0	71.	6455.8	31.	6457.6	18.	6459.4	9.		
6461.2	5.1	6463.0	10.2	6464.8	12.6	6466.6	6.8	6468.5	18.9	6470.3	6.9	6472.1	8.0	6473.9	14.2		
6475.7	11.	6477.5	6.	6479.3	19.	6481.2	17.	6483.0	29.	6484.8	44.	6486.6	73.	6488.4	104.		
6490.3	155.	6492.1	128.	6493.9	104.	6495.7	77.	6497.5	44.	6499.4	34.	6501.2	53.	6503.0	68.		
6504.9	84.8	6506.7	78.9	6508.5	77.1	6510.3	60.3	6512.2	47.7	6514.0	43.5	6515.8	59.0	6517.7	63.3		
6519.5	106.	6521.3	109.	6523.2	140.	6525.0	132.	6526.8	112.	6528.7	93.	6530.5	108.	6532.4	150.		
6534.2	182.	6536.0	192.	6537.9	151.	6539.7	78.	6541.6	51.	6543.4	43.	6545.2	41.	6547.1	58.		
6548.9	68.8	6550.8	64.2	6552.6	72.0	6554.5	75.1	6556.3	48.9	6558.2	28.6	6560.0	22.2	6561.9	18.8		
6563.7	7.3	6565.6	11.6	6567.4	9.0	6569.3	21.1	6571.1	16.8	6573.0	29.3	6574.9	41.9	6576.7	62.1		
6578.6	84.5	6580.4	78.2	6582.3	42.9	6584.2	45.7	6586.0	18.1	6587.9	21.6	6589.7	18.8	6591.6	25.7		
6593.5	29.0	6595.3	26.4	6597.2	37.2	6599.1	31.4	6600.9	29.8	6602.8	25.1	6604.7	16.7	6606.5	24.1		
6608.4	11.	6610.3	20.	6612.2	41.	6614.0	61.	6615.9	107.	6617.8	131.	6619.7	144.	6621.5	122.		
6623.4	73.9	6625.3	31.5	6627.2	26.6	6629.1	19.9	6630.9	16.8	6632.8	20.8	6634.7	26.9	6636.6	55.6		
6638.5	81.	6640.3	118.	6642.2	125.	6644.1	147.	6646.0	123.	6647.9	127.	6649.8	123.	6651.7	114.		
6653.6	86.5	6655.5	58.7	6657.3	44.2	6659.2	37.0	6661.1	25.2	6663.0	12.4	6664.9	18.0	6666.8	21.4		
6668.7	25.2	6670.6	49.9	6672.5	71.6	6674.4	45.0	6676.3	35.0	6678.2	22.2	6680.1	22.1	6682.0	27.7		
6683.9	30.	6685.8	37.	6687.7	53.	6689.6	78.	6691.5	94.	6693.4	145.	6695.4	163.	6697.3	165.		
6699.2	165.	6701.1	125.	6703.0	79.	6704.9	50.	6706.8	36.	6708.7	33.	6710.6	30.	6712.6	35.		
6714.5	33.	6716.4	41.	6718.3	37.	6720.2	68.	6722.1	84.	6724.1	128.	6726.0	127.	6727.9	101.		
6729.8	69.1	6731.8	57.1	6733.7	38.1	6735.8	59.7	6737.5	72.6	6739.5	82.2	6741.4	76.0	6743.3	93.6		
6745.2	135.	6747.2	134.	6749.1	148.	6751.0	117.	6753.0	89.	6754.9	63.	6756.8	64.	6758.8	77.		
6760.7	90.	6762.7	103.	6764.6	116.	6766.5	103.	6768.5	87.	6770.4	63.	6772.3	40.	6774.3	76.		
6776.2	88.	6778.2	101.	6780.1	137.	6782.1	74.	6784.0	45.	6786.0	28.	6787.9	14.	6789.9	26.		
6791.8	31.	6793.8	57.	6795.7	84.	6797.7	101.	6799.6	100.	6801.6	94.	6803.5	93.	6805.5	104.		
6807.4	108.	6809.4	149.	6811.3	147.	6813.3	123.	6815.3	65.	6817.2	45.	6819.2	35.	6821.1	23.		
6823.1	33.1	6825.1	28.3	6827.0	31.2	6829.0	60.1	6831.0	57.4	6832.9	79.9	6834.9	52.2	6836.9	41.6		
6838.8	44.	6840.8	48.	6842.8	62.	6844.8	80.	6846.7	107.	6848.7	111.	6850.7	167.	6852.7	199.		
6854.6	235.	6856.6	225.	6858.6	206.	6860.6	149.	6862.5	132.	6864.5	100.	6866.5	73.	6868.5	75.		
6870.5	116.	6872.5	156.	6874.4	191.	6876.4	206.	6878.4	209.	6880.4	160.	6882.4	128.	6884.4	116.		
6886.4	147.	6888.4	109.	6890.4	103.	6892.3	94.	6894.3	124.	6896.3	145.	6898.3	176.	6900.3	178.		
6902.3	128.	6904.3	93.	6906.3	127.	6908.3	122.	6910.3	159.	6912.3	134.	6914.3	90.	6916.3	58.		
6918.3	23.4	6920.3	36.2	6922.3	38.8	6924.4	54.2	6926.4	52.7	6928.4	49.7	6930.4	54.0	6932.4	87.8		
6934.4	117.	6936.4	140.	6938.4	149.	6940.4	157.	6942.5	120.	6944.5	104.	6946.5	96.	6948.5	117.		
6950.5	139.	6952.5	126.	6954.6	76.	6956.6	38.	6958.6	14.	6960.6	16.	6962.6	12.	6964.7	16.		
6966.7	13.0	6968.7	20.8	6970.8	32.5	6972.8	47.3	6974.8	46.8	6976.8	64.9	6978.9	51.2	6980.9	39.8		
6982.9	27.	6985.0	14.	6987.0	32.	6989.0	53.	6991.1	64.	6993.1	102.	6995.1	133.	6997.2	150.		
6999.2	112.	7001.3	103.	7003.3	97.	7005.3	79.	7007.4	132.	7009.4	120.	7011.5	79.	7013.5	67.		
7015.6	96.4	7017.6	69.6	7019.7	72.1	7021.7	39.3	7023.8	38.3	7025.8	31.5	7027.9	39.1	7029.9	54.8		
7032.0	45.	7034.0	48.	7036.1	46.	7038.1	56.	7040.2	78.	7042.3	103.	7044.3	126.	7046.4	131.		
7048.4	135.	7050.5	135.	7052.6	147.	7054.6	140.	7056.7	139.	7058.8	111.	7060.8	107.	7062.9	43.		
7065.0	34.3	7067.0	31.6	7069.1	43.4	7071.2	66.3	7073.2	59.5	7075.3	57.7	7077.4	63.7	7079.5	44.3		
7081.5	41.6	7083.6	22.2	7085.7	12.8	7087.8	11.6	7089.8	24.7	7091.9	22.4	7094.0	19.0	7096.1	25.6		
7098.2	28.	7100.3	41.	7102.3	70.	7104.4	112.	7106.5	190.	7108.6	200.	7110.7	183.	7112.8	110.		
7114.9	53.4	7117.0	26.5	7119.0	29.5	7121.1	34.6	7123.2	38.8	7125.3	68.0	7127.4	81.6	7129.5	71.7		
7131.6	37.9	7133.7	36.6	7135.8	21.8	7137.9	20.5	7140.0	34.9	7142.1	42.4	7144.2	67.6	7146.3	71.6		
7148.4	93.	7150.5	106.	7152.6	116.	7154.8	102.	7156.9	93.	7159.0	98.	7161.1	110.	7163.2	152.		
7165.3	183.	7167.4	182.	7169.5	196.	7171.7	135.	7173.8	91.	7175.9	83.	7178.0	101.	7180.1	151.		
7182.2	163.	7184.4	178.	7186.5	147.	7188.6	102.	7190.7	80.	7192.9	95.	7195.0	111.	7197.1	137.		
7199.2	130.	7201.4	108.	7203.5	76.	7205.6	51.	7207.8	32.	7209.9	35.	7212.0	39.	7214.2	53.		
7216.3	64.	7218.4	86.	7220.5	96.	7222.7	101.	7224.8	109.	7227.0	99.	7229.1	99.	7231.3	115.		
7233.4	87.6	7235.5	58.9	7237.7	39.7	7239.8	30.5	7242.0	41.2	7244.1	45.0	7246.3	41.4	7248.4	42.0		
7250.6	36.	7252.7	47.	7254.9	51.	7257.0	50.	7259.2	51.	7261.3	64.	7263.5	96.	7265.7	117.		
7267.8	141.	7270.0	118.	7272.1	85.	7274.3	71.	7276.5	72.	7278.6	89.	7280.8	88.	7282.9	103.		
7285.1	77.2	7287.3	57.4	7289.4	37.6	7291.6	17.0	7293.8	16.2	7296.0	17.4	7298.1	23.5	7300.3	51.7		
7302.5	55.2	7304.6	37.8	7306.8	29.3	7309.0	35.5	7311.2	46.2	7313.4	36.7	7315.5	76.5	7317.7	66.6		

G

E	P/E	E	P/E	E	P/E														
eV	beV ^{1/2}	eV	beV ^{1/2}	eV	beV ^{1/2}														
7319.9	64.0	7322.1	58.0	7324.3	52.7	7326.4	28.8	7328.6	25.1	7330.8	25.7	7333.0	34.0	7335.2	37.8				
7337.4	26.	7339.6	48.	7341.8	60.	7343.9	89.	7346.1	101.	7348.3	124.	7350.5	127.	7352.7	112.				
7354.9	88.8	7357.1	65.2	7359.3	43.7	7361.5	30.4	7363.7	24.5	7365.9	43.4	7368.1	24.7	7370.3	31.5				
7372.5	21.5	7374.7	37.0	7376.9	41.26	7379.2	66.7	7381.4	82.4	7383.5	56.4	7385.8	51.8	7388.0	38.2				
7390.2	90.	7392.4	96.	7394.6	123.	7396.9	148.	7399.1	186.	7401.3	163.	7403.5	150.	7405.7	132.				
7407.9	119.	7410.2	141.	7412.4	176.	7414.6	157.	7416.8	157.	7419.1	197.	7421.3	183.	7423.5	158.				
7425.7	143.	7428.0	115.	7430.2	88.	7432.4	71.	7434.7	71.	7436.9	62.	7439.1	48.	7441.4	17.				
7443.6	22.9	7445.8	45.3	7448.1	35.3	7450.3	49.3	7452.5	41.5	7454.8	23.5	7457.1	16.1	7459.3	14.5				
7461.5	14.1	7463.8	8.9	7466.0	13.3	7468.3	17.5	7470.5	21.8	7472.8	23.5	7475.0	32.5	7477.3	46.8				
7469.5	80.3	7481.8	67.1	7484.0	42.8	7486.3	43.1	7488.6	30.1	7490.8	32.3	7493.1	29.9	7495.3	74.4				
7497.6	89.	7499.9	112.	7502.1	131.	7504.4	151.	7506.6	128.	7508.9	106.	7511.2	108.	7513.4	138.				
7515.7	137.	7518.0	152.	7520.3	133.	7522.5	93.	7524.8	78.	7527.1	59.	7529.4	84.	7531.6	78.				
7533.9	85.	7536.2	91.	7538.5	102.	7540.7	95.	7543.0	78.	7545.3	52.	7547.6	29.	7549.9	22.				
7552.2	15.	7554.5	12.	7556.7	14.	7559.0	24.	7561.3	43.	7563.6	56.	7565.9	72.	7568.2	104.				
7570.5	114.	7572.8	118.	7575.1	114.	7577.4	85.	7579.7	91.	7582.0	95.	7584.3	105.	7586.6	82.				
7588.9	65.	7591.2	93.	7593.5	111.	7595.8	137.	7598.1	138.	7600.4	145.	7602.7	130.	7605.0	133.				
7607.3	109.	7609.6	78.	7612.0	69.	7614.3	60.	7616.6	70.	7618.9	71.	7621.2	59.	7623.5	41.				
7625.9	9.6	7628.2	21.0	7630.5	33.0	7632.8	52.9	7635.2	62.8	7637.5	78.4	7639.8	78.3	7642.1	98.1				
7644.5	70.	7646.8	94.	7649.1	86.	7651.4	118.	7653.8	126.	7656.1	166.	7658.4	186.	7660.8	167.				
7663.1	124.	7665.5	93.	7667.8	58.	7670.1	61.	7672.5	80.	7674.8	98.	7677.2	122.	7679.5	100.				
7681.8	80.6	7684.2	64.5	7686.5	78.1	7688.9	54.5	7691.2	38.7	7693.6	36.2	7695.9	34.3	7698.3	41.4				
7700.5	62.	7703.0	87.	7705.4	104.	7707.7	107.	7710.1	99.	7712.4	115.	7714.8	72.	7717.1	69.				
7719.5	54.5	7721.9	45.9	7724.2	40.4	7726.6	45.5	7729.0	51.3	7731.3	57.2	7733.7	67.0	7736.1	85.5				
7738.4	62.	7740.8	49.	7743.2	47.	7745.6	82.	7747.9	114.	7750.3	134.	7752.7	142.	7755.1	164.				
7757.5	145.	7759.8	116.	7762.2	94.	7764.6	76.	7767.0	48.	7769.4	38.	7771.8	61.	7774.1	58.				
7776.5	82.	7778.9	75.	7781.3	109.	7783.7	142.	7786.1	130.	7788.5	173.	7790.9	119.	7793.3	92.				
7795.7	61.6	7798.1	55.7	7800.5	45.1	7802.9	37.2	7805.3	23.4	7807.7	15.7	7810.1	23.7	7812.5	37.7				
7814.9	71.	7817.3	104.	7819.7	130.	7822.1	145.	7824.5	121.	7826.9	108.	7829.4	55.	7831.8	25.				
7834.2	13.9	7836.6	11.5	7839.0	25.3	7841.4	40.4	7843.9	41.7	7846.3	36.7	7848.7	21.0	7851.1	36.3				
7853.5	49.9	7856.0	68.4	7858.4	76.3	7860.8	76.8	7863.2	59.2	7865.7	31.2	7868.1	24.9	7870.5	30.0				
7873.0	37.	7875.4	54.	7877.8	101.	7880.3	123.	7882.7	156.	7885.2	165.	7887.5	161.	7890.0	118.				
7892.5	79.	7894.9	68.	7897.4	57.	7899.8	70.	7902.3	67.	7904.7	85.	7907.2	97.	7909.6	116.				
7912.1	122.	7914.5	104.	7917.0	107.	7919.4	96.	7921.9	104.	7924.3	93.	7926.8	71.	7929.2	49.				
7931.7	31.8	7934.2	47.7	7936.6	70.7	7939.1	81.1	7941.6	72.3	7944.0	71.0	7946.5	80.2	7949.0	73.0				
7951.4	99.	7953.9	110.	7956.4	134.	7958.8	175.	7961.3	143.	7963.8	159.	7966.3	123.	7968.7	102.				
7971.2	66.3	7973.7	66.1	7975.2	84.5	7978.7	55.7	7981.1	60.3	7983.5	44.6	7986.1	33.3	7988.6	26.4				
7981.1	25.	7993.6	21.	7996.1	27.	7998.6	23.	8001.1	26.	8003.6	44.	8006.0	50.	8008.5	104.				
8011.0	104.	8013.6	103.	8015.0	123.	8018.5	97.	8021.0	95.	8023.5	115.	8026.0	113.	8028.6	81.				
8031.1	48.9	8033.6	29.1	8036.1	38.7	8038.6	38.0	8041.1	42.7	8043.6	41.2	8045.1	34.5	8048.6	29.8				
8051.2	25.9	8053.7	17.1	8056.2	29.9	8058.7	39.6	8061.2	31.4	8063.8	49.2	8066.3	44.9	8068.8	43.5				
8071.3	45.	8073.9	55.	8076.4	91.	8078.9	116.	8081.4	115.	8084.0	102.	8086.5	79.	8089.0	32.				
8091.6	30.2	8094.1	36.9	8096.5	25.1	8099.2	48.9	8101.7	42.0	8104.3	39.1	8106.8	35.1	8109.3	61.1				
8111.9	94.	8114.4	140.	8117.0	135.	8119.5	132.	8122.1	100.	8124.6	84.	8127.2	86.	8129.7	98.				
8132.3	68.9	8134.8	65.8	8137.4	48.7	8140.0	58.7	8142.5	74.4	8145.1	60.5	8147.6	54.5	8150.2	35.8				
8152.8	28.0	8155.3	23.4	8157.9	33.8	8160.5	45.0	8163.0	63.1	8165.6	73.3	8168.2	92.1	8170.7	77.6				
8173.2	97.	8175.9	98.	8178.5	112.	8181.0	134.	8183.5	121.	8186.2	124.	8188.8	130.	8191.4	126.				
8194.0	163.	8196.5	141.	8199.1	120.	8201.7	107.	8204.3	80.	8206.9	59.	8209.5	45.	8212.1	39.				
8214.7	35.1	8217.3	21.2	8219.9	12.2	8222.4	15.9	8225.0	15.0	8227.6	18.8	8230.2	29.2	8232.8	75.9				
8235.5	108.	8238.1	107.	8240.7	127.	8243.3	107.	8245.9	85.	8248.5	80.	8251.1	76.	8253.7	41.				
8256.3	146.	8258.9	64.	8261.5	83.	8264.2	117.	8266.8	115.	8269.4	118.	8272.0	74.	8274.6	53.				
8277.3	43.6	8279.9	35.2	8282.5	39.1	8285.1	22.4	8287.8	12.5	8290.4	17.4	8293.0	31.0	8295.7	50.2				
8298.3	81.	8300.9	135.	8303.6	31.3	8306.2	111.	8308.8	58.	8311.5	45.	8314.1	40.	8316.8	55.				
8319.4	47.8	8322.0	61.2	8324.7	63.9	8327.3	69.9	8330.0	84.0	8332.6	88.3	8335.3	87.2	8337.9	53.7				
8340.6	35.	8343.2	37.	8345.9	53.	8348.6	62.	8351.2	64.	8353.9	74.	8356.5	92.	8359.2	108.				
8361.9	115.	8364.5	53.	8367.2	64.	8369.9	71.	8372.5	100.	8375.2	127.	8377.9	124.	8380.5	113.				

E eV	P/E bev ^{1/2}																		
8383.2	122.	8385.9	131.	8388.6	132.	8391.2	123.	8393.9	73.	8396.6	67.	8399.3	49.	8402.0	25.				
8404.6	22.1	8407.3	23.2	8410.0	16.8	8412.7	18.0	8415.4	28.5	8418.1	18.0	8420.8	23.8	8423.5	15.5				
8426.2	10.0	8428.8	21.0	8431.5	28.2	8434.2	48.5	8436.9	50.2	8439.6	48.0	8442.3	36.1	8445.0	17.5				
8447.7	20.	8450.5	22.	8453.2	19.	8455.9	28.	8458.6	44.	8461.3	61.	8464.0	98.	8466.7	159.				
8469.4	200.	8472.1	195.	8474.9	172.	8477.6	134.	8480.3	76.	8483.0	81.	8485.7	78.	8488.5	71.				
8491.2	74.	8493.9	56.	8496.6	80.	8499.4	127.	8502.1	142.	8504.8	145.	8507.6	139.	8510.3	82.				
8513.0	45.	8515.8	36.	8518.5	24.	8521.3	43.	8524.0	78.	8526.7	95.	8529.5	139.	8532.2	149.				
8535.0	120.	8537.7	35.	8540.5	59.	8543.2	53.	8546.0	45.	8548.7	46.	8551.5	67.	8554.2	84.				
8557.0	97.9	8559.7	70.0	8562.5	91.6	8565.3	72.7	8568.0	87.2	8570.8	73.2	8573.6	59.7	8576.3	63.3				
8579.1	91.	8581.9	130.	8584.6	162.	8587.4	164.	8590.2	114.	8592.9	54.	8595.7	28.	8598.5	32.				
8601.3	33.	8604.1	59.	8606.8	87.	8609.6	119.	8612.4	137.	8615.2	122.	8618.0	126.	8620.8	84.				
8623.6	89.	8626.3	98.	8629.1	106.	8631.9	78.	8634.7	46.	8637.5	24.	8640.3	13.	8643.1	14.				
8645.9	14.8	8648.7	4.1	8651.5	22.6	8654.3	26.5	8657.1	19.7	8659.9	20.5	8662.7	28.1	8665.5	28.3				
8668.4	37.	8671.2	52.	8674.0	50.	8676.8	73.	8679.6	91.	8682.4	109.	8685.3	100.	8688.1	111.				
8690.9	83.4	8693.7	55.8	8696.5	55.3	8699.4	63.3	8702.2	71.5	8705.0	67.6	8707.9	67.8	8710.7	52.2				
8713.5	44.5	8716.4	33.4	8719.2	38.6	8722.0	41.1	8724.9	27.7	8727.7	46.3	8730.5	64.6	8733.4	80.5				
8736.2	114.	8739.1	116.	8741.9	115.	8744.8	106.	8747.6	79.	8750.5	58.	8753.3	49.	8756.2	57.				
8759.0	68.	8761.9	84.	8764.7	93.	8767.5	106.	8770.5	98.	8773.3	66.	8776.2	47.	8779.1	31.				
8781.9	19.0	8784.8	29.2	8787.7	48.5	8790.5	79.9	8793.4	66.4	8796.3	65.5	8799.1	44.6	8802.0	32.7				
8804.9	34.	8807.8	49.	8810.7	83.	8813.5	121.	8816.4	131.	8819.3	155.	8822.2	116.	8825.1	122.				
8828.0	130.	8830.9	124.	8833.8	82.	8836.6	59.	8839.5	23.	8842.4	27.	8845.3	41.	8848.2	72.				
8851.1	77.	8854.0	90.	8856.9	92.	8859.8	69.	8862.7	114.	8865.7	104.	8868.6	108.	8871.5	93.				
8874.4	76.7	8877.3	56.9	8880.2	45.7	8883.1	54.4	8886.0	51.5	8889.0	62.7	8891.9	78.3	8894.8	65.3				
8897.7	61.	8900.7	60.	8903.6	36.	8905.5	37.	8909.4	55.	8912.4	91.	8915.3	117.	8918.2	148.				
8921.2	156.	8924.1	142.	8927.0	145.	8930.0	157.	8932.9	148.	8935.9	133.	8938.8	92.	8941.7	55.				
8944.7	30.1	8947.6	33.9	8950.6	25.1	8953.5	28.3	8956.5	26.3	8959.4	34.2	8962.4	48.9	8965.4	56.3				
8968.3	74.	8971.3	75.	8974.2	89.	8977.2	110.	8980.2	120.	8983.1	165.	8986.1	196.	8989.1	209.				
8997.0	198.	8995.0	170.	8998.0	123.	9001.0	91.	9003.9	91.	9006.9	109.	9009.9	88.	9012.9	77.				
9015.8	37.	9018.8	64.	9021.8	64.	9024.8	93.	9027.8	150.	9030.8	135.	9033.8	114.	9036.8	103.				
9039.7	128.	9042.7	148.	9045.7	167.	9048.7	159.	9051.7	99.	9054.7	106.	9057.7	74.	9060.7	95.				
9063.7	79.9	9066.8	71.2	9068.8	46.2	9072.8	51.4	9075.8	56.2	9078.8	62.4	9081.8	47.5	9084.8	39.8				
9087.5	30.7	9090.9	31.0	9093.9	28.9	9096.9	36.9	9099.9	46.3	9103.0	35.4	9106.0	52.5	9109.0	74.3				
9112.0	97.	9115.1	120.	9118.1	114.	9121.1	131.	9124.2	147.	9127.2	133.	9130.2	112.	9133.3	94.				
9136.3	120.	9139.4	124.	9142.4	104.	9145.5	106.	9148.5	107.	9151.6	95.	9154.6	119.	9157.7	116.				
9160.7	106.	9163.8	77.	9166.8	74.	9169.9	55.	9172.9	50.	9176.0	44.	9179.1	68.	9182.1	79.				
9185.2	90.8	9188.3	93.7	9191.3	82.3	9194.4	57.7	9197.5	44.4	9200.5	28.7	9203.6	49.9	9206.7	56.0				
9209.8	87.3	9212.9	98.5	9215.9	75.0	9219.0	68.9	9222.1	37.7	9225.2	24.7	9228.3	15.0	9231.4	16.1				
9234.5	17.3	9237.5	8.8	9240.6	15.0	9243.7	24.5	9246.8	32.8	9249.9	41.8	9253.0	54.3	9256.1	74.1				
9259.2	65.5	9262.3	43.8	9265.4	42.0	9268.6	51.2	9271.7	52.2	9274.8	77.8	9277.9	81.4	9281.0	58.8				
9284.1	43.1	9287.2	38.4	9290.4	39.3	9293.5	39.9	9296.6	48.6	9299.7	41.1	9302.8	32.7	9306.0	22.4				
9309.1	14.5	9312.2	23.2	9315.4	21.5	9318.5	32.4	9321.6	37.0	9324.8	50.2	9327.9	78.8	9331.0	96.6				
9334.2	135.	9337.3	73.	9340.5	47.	9343.6	58.	9346.8	60.	9349.9	93.	9353.1	72.	9356.2	59.				
9359.4	40.	9362.5	38.	9365.7	42.	9368.8	56.	9372.0	68.	9375.2	117.	9378.3	158.	9381.5	166.				
9384.6	23.3	9387.8	214.	9391.0	189.	9394.2	94.	9397.3	39.	9400.5	40.	9403.7	32.	9406.9	57.				
9410.0	102.	9413.2	80.	9416.4	59.	9419.6	37.	9422.8	45.	9426.0	77.	9429.1	94.	9432.3	129.				
9435.5	164.	9438.7	144.	9441.9	105.	9445.1	73.	9448.3	47.	9451.5	62.	9454.7	64.	9457.9	76.				
9461.1	49.2	9464.3	38.2	9467.5	33.9	9470.7	51.5	9474.0	58.7	9477.2	64.4	9480.4	57.1	9483.6	50.2				
9486.8	47.	9490.0	64.	9493.3	80.	9496.5	110.	9499.7	108.	9502.9	65.	9506.2	58.	9509.4	67.				
9512.6	60.	9515.9	77.	9519.1	98.	9522.3	109.	9525.6	111.	9528.8	106.	9532.0	69.	9535.3	83.				
9538.5	93.	9541.8	112.	9545.0	85.	9548.3	96.	9551.5	118.	9554.8	132.	9558.0	139.	9561.3	164.				
9564.5	158.	9567.8	100.	9571.1	53.	9574.3	36.	9577.6	46.	9580.9	69.	9584.1	80.	9587.4	106.				
9590.7	114.	9593.9	137.	9597.2	134.	9600.5	132.	9603.8	112.	9607.0	69.	9610.3	76.	9613.6	97.				
9616.9	107.	9620.2	140.	9623.5	102.	9626.8	93.	9630.0	72.	9633.3	64.	9635.6	67.	9639.9	80.				
9643.2	100.	9646.5	122.	9649.8	146.	9653.1	112.	9656.4	75.	9659.7	67.	9663.1	68.	9666.4	88.				
9669.7	115.	9673.0	95.	9676.3	78.	9679.6	77.	9682.9	75.	9686.3	82.	9689.6	104.	9692.9	85.				

E eV	$\frac{P}{N/E}$ beV ^{1/2}														
9696.2	79.	9699.6	87.	9702.9	91.	9706.2	100.	9709.5	102.	9712.9	91.	9716.2	54.	9719.6	44.
9722.9	63.	9726.2	80.	9729.6	104.	9732.9	135.	9736.3	143.	9739.6	126.	9743.0	122.	9746.3	90.
9749.7	68.9	9753.0	51.6	9756.4	44.1	9759.7	52.7	9763.1	67.9	9766.5	69.8	9769.8	61.7	9773.2	39.7
9775.5	28.1	9779.9	36.6	9783.3	31.7	9786.7	36.8	9790.0	46.8	9793.4	57.5	9796.8	61.7	9800.2	53.8
9803.5	56.	9806.9	56.	9810.3	54.	9813.7	69.	9817.1	112.	9820.5	149.	9823.9	134.	9827.3	161.
9830.7	157.	9834.0	148.	9837.4	120.	9840.8	90.	9844.2	61.	9847.7	64.	9851.1	64.	9854.5	60.
9857.9	75.0	9861.3	61.7	9864.7	78.5	9868.1	95.7	9871.5	88.9	9874.9	56.3	9878.4	29.1	9881.8	35.2
9885.2	40.	9886.6	37.	9892.1	55.	9895.5	72.	9898.9	103.	9902.3	92.	9905.8	74.	9909.2	73.
9912.7	76.	9916.1	92.	9919.5	138.	9923.0	128.	9926.4	124.	9929.9	74.	9933.3	55.	9936.8	40.
9947.2	86.5	9943.7	65.0	9947.1	90.7	9950.6	69.4	9954.0	81.5	9957.5	59.8	9961.0	64.0	9964.4	93.3
9967.9	131.	9971.4	99.	9974.8	122.	9978.3	96.	9981.8	75.	9985.2	55.	9988.7	47.	9992.2	49.
9996.	55.	9999.	24.	10003.	18.	10006.	30.	10010.	51.	10013.	73.	10017.	113.	10020.	144.
10024.	164.	10027.	163.	10031.	159.	10034.	129.	10038.	133.	10041.	120.	10045.	96.	10048.	92.
10052.	63.0	10055.	54.0	10059.	38.6	10062.	54.0	10066.	59.1	10069.	80.3	10073.	73.8	10076.	50.1
10080.	37.	10083.	59.	10087.	61.	10090.	63.	10094.	76.	10097.	86.	10101.	103.	10104.	115.
10108.	137.	10112.	110.	10115.	107.	10119.	114.	10122.	142.	10126.	161.	10129.	172.	10133.	162.
10136.	128.	10140.	88.	10144.	64.	10147.	65.	10151.	88.	10154.	92.	10158.	127.	10161.	100.
10165.	72.	10168.	53.	10172.	44.	10176.	72.	10179.	87.	10183.	97.	10186.	107.	10190.	84.
10194.	137.	10197.	119.	10201.	143.	10204.	187.	10208.	158.	10211.	109.	10215.	75.	10219.	58.
10222.	55.	10226.	56.	10229.	72.	10233.	75.	10237.	104.	10240.	128.	10244.	177.	10248.	196.
10251.	174.	10255.	121.	10258.	73.	10262.	51.	10266.	56.	10269.	81.	10273.	94.	10276.	72.
10280.	47.	10284.	42.	10287.	44.	10291.	74.	10295.	122.	10298.	164.	10302.	180.	10306.	157.
10309.	159.	10313.	147.	10317.	90.	10320.	55.	10324.	52.	10327.	70.	10331.	85.	10335.	119.
10338.	121.	10342.	132.	10346.	74.	10349.	54.	10353.	44.	10357.	24.	10360.	38.	10364.	70.
10368.	121.	10371.	147.	10375.	145.	10379.	158.	10383.	116.	10386.	106.	10390.	101.	10394.	104.
10397.	57.	10401.	24.	10405.	25.	10408.	42.	10412.	61.	10418.	71.	10419.	102.	10423.	113.
10427.	147.	10431.	110.	10434.	85.	10438.	54.	10442.	37.	10445.	66.	10449.	92.	10453.	114.
10457.	95.9	10460.	76.4	10464.	38.9	10468.	44.1	10472.	28.2	10475.	32.2	10479.	35.4	10483.	31.4
10487.	41.	10490.	48.	10494.	91.	10498.	105.	10501.	104.	10505.	82.	10509.	53.	10513.	37.
10516.	15.9	10520.	15.7	10524.	27.2	10528.	31.0	10532.	36.5	10535.	45.0	10539.	37.3	10543.	68.3
10547.	82.1	10550.	69.5	10554.	50.4	10558.	35.1	10562.	51.3	10566.	50.7	10569.	70.6	10573.	63.4
10577.	47.	10581.	34.	10584.	36.	10588.	34.	10592.	42.	10596.	67.	10600.	101.	10603.	107.
10607.	107.	10611.	94.	10615.	93.	10619.	95.	10622.	94.	10626.	111.	10630.	119.	10634.	85.
10638.	66.	10642.	71.	10645.	71.	10649.	69.	10653.	88.	10657.	102.	10661.	114.	10665.	105.
10668.	86.0	10672.	68.0	10676.	67.6	10680.	65.8	10684.	67.8	10688.	68.6	10691.	74.7	10695.	55.2
10699.	40.	10703.	34.	10707.	41.	10711.	59.	10715.	115.	10718.	131.	10722.	142.	10726.	113.
10730.	74.	10734.	56.	10738.	84.	10742.	123.	10746.	113.	10749.	121.	10753.	96.	10757.	97.
10761.	118.	10765.	106.	10769.	107.	10773.	103.	10777.	129.	10781.	95.	10784.	76.	10788.	91.
10792.	102.	10796.	108.	10800.	90.	10804.	73.	10808.	51.	10812.	34.	10816.	45.	10820.	52.
10824.	49.	10829.	94.	10831.	140.	10835.	177.	10839.	74.	10843.	121.	10847.	122.	10851.	61.
10855.	42.	10859.	36.	10863.	49.	10867.	65.	10871.	107.	10875.	124.	10879.	122.	10883.	127.
10887.	99.9	10891.	56.3	10895.	44.3	10899.	23.5	10902.	23.2	10906.	31.3	10910.	50.5	10914.	79.7
10918.	82.2	10922.	78.4	10926.	53.2	10930.	48.3	10934.	50.3	10938.	50.3	10942.	54.7	10946.	55.8
10950.	50.	10954.	63.	10958.	54.	10962.	76.	10966.	109.	10970.	103.	10974.	126.	10978.	104.
10982.	100.	10986.	86.	10990.	63.	10994.	67.	10998.	56.	11002.	36.	11006.	29.	11010.	32.
11014.	18.	11018.	33.	11022.	52.	11026.	91.	11031.	135.	11035.	153.	11039.	173.	11043.	167.
11047.	127.	11051.	92.	11055.	54.	11056.	74.	11063.	89.	11067.	114.	11071.	140.	11075.	120.
11079.	81.	11083.	94.	11087.	94.	11091.	104.	11095.	102.	11099.	103.	11104.	81.	11108.	79.
11112.	76.	11116.	65.	11120.	65.	11124.	75.	11128.	98.	11132.	109.	11136.	82.	11140.	63.
11144.	48.1	11148.	26.1	11153.	24.3	11157.	24.4	11161.	40.1	11165.	58.4	11169.	73.4	11173.	85.5
11177.	104.	11181.	110.	11185.	129.	11190.	129.	11194.	137.	11198.	124.	11202.	107.	11206.	75.
11210.	59.	11214.	94.	11219.	112.	11223.	111.	11227.	98.	11231.	59.	11235.	69.	11239.	58.
11243.	43.	11248.	63.	11252.	78.	11256.	78.	11260.	61.	11264.	54.	11268.	98.	11273.	109.
11277.	83.7	11281.	60.6	11285.	45.2	11289.	55.2	11293.	74.7	11298.	77.2	11302.	74.5	11306.	43.6
11310.	57.	11314.	65.	11319.	64.	11323.	107.	11327.	107.	11331.	102.	11335.	87.	11340.	78.

E eV	P _{N/E} beV ^{1/2}																
11344.	77.	11348.	77.	11352.	92.	11356.	95.	11361.	103.	11365.	129.	11369.	129.	11373.	111.		
11377.	126.	11382.	82.	11386.	70.	11390.	60.	11394.	83.	11399.	91.	11403.	103.	11407.	110.		
11411.	78.7	11416.	85.6	11420.	92.6	11424.	73.6	11428.	68.6	11433.	74.5	11437.	54.2	11441.	52.5		
11445.	36.3	11450.	52.4	11454.	80.5	11458.	83.4	11463.	99.7	11467.	84.5	11471.	45.0	11475.	37.3		
11480.	50.	11484.	79.	11488.	101.	11492.	152.	11497.	155.	11501.	147.	11505.	125.	11510.	86.		
11514.	81.3	11518.	97.4	11523.	91.2	11527.	75.5	11531.	91.9	11536.	80.0	11540.	61.4	11544.	34.5		
11548.	35.6	11553.	49.7	11557.	55.1	11561.	79.6	11566.	78.4	11570.	91.3	11574.	73.5	11579.	83.5		
11583.	93.	11588.	99.	11592.	71.	11596.	75.	11601.	99.	11605.	130.	11609.	126.	11614.	129.		
11618.	74.	11622.	64.	11627.	85.	11631.	64.	11635.	81.	11640.	105.	11644.	91.	11649.	97.		
11653.	108.	11657.	119.	11662.	116.	11666.	130.	11671.	76.	11675.	74.	11679.	63.	11684.	76.		
11688.	52.	11692.	42.	11697.	54.	11701.	78.	11706.	91.	11710.	94.	11715.	119.	11719.	72.		
11723.	58.2	11728.	42.9	11732.	37.2	11737.	47.6	11741.	53.1	11746.	79.7	11750.	84.2	11754.	90.8		
11759.	87.0	11763.	76.6	11768.	69.4	11772.	65.0	11777.	49.6	11781.	64.6	11786.	44.2	11790.	50.3		
11794.	61.	11799.	78.	11803.	83.	11808.	90.	11812.	89.	11817.	99.	11821.	122.	11826.	113.		
11830.	149.	11835.	145.	11839.	175.	11844.	171.	11848.	185.	11853.	101.	11857.	50.	11862.	30.		
11886.	47.4	11871.	55.3	11875.	68.6	11880.	38.8	11884.	34.3	11889.	33.8	11893.	43.5	11898.	61.0		
11902.	64.7	11907.	75.1	11911.	77.4	11916.	97.6	11920.	88.5	11925.	94.5	11929.	68.9	11934.	80.2		
11939.	81.	11943.	53.	11948.	64.	11952.	77.	11957.	124.	11961.	127.	11966.	103.	11970.	76.		
11975.	54.7	11980.	63.8	11984.	96.2	11989.	95.9	11993.	66.3	11998.	50.6	12002.	59.1	12007.	66.1		
12012.	67.3	12016.	86.8	12021.	62.8	12025.	45.9	12030.	69.1	12035.	69.3	12039.	54.2	12044.	26.2		
12048.	17.	12053.	25.	12058.	31.	12062.	47.	12067.	69.	12071.	81.	12076.	84.	12081.	105.		
12085.	109.	12090.	93.	12095.	64.	12099.	44.	12104.	51.	12108.	76.	12113.	84.	12118.	50.		
12122.	34.5	12127.	55.7	12132.	45.7	12136.	76.9	12141.	64.4	12146.	71.7	12150.	80.1	12155.	73.4		
12160.	67.8	12164.	55.0	12169.	32.5	12174.	48.8	12178.	55.6	12183.	64.8	12188.	90.2	12192.	95.3		
12197.	84.	12202.	77.	12207.	60.	12211.	92.	12216.	126.	12221.	183.	12225.	174.	12230.	175.		
12235.	105.	12239.	44.	12244.	29.	12249.	28.	12254.	32.	12258.	58.	12263.	50.	12268.	78.		
12273.	109.	12277.	111.	12282.	91.	12287.	90.	12292.	111.	12296.	151.	12301.	170.	12306.	140.		
12311.	113.	12315.	98.	12320.	132.	12325.	133.	12330.	97.	12334.	66.	12339.	60.	12344.	46.		
12349.	55.	12353.	67.	12358.	109.	12363.	91.	12368.	58.	12373.	30.	12377.	21.	12382.	10.		
12387.	20.	12392.	30.	12397.	43.	12401.	70.	12408.	65.	12411.	70.	12416.	76.	12421.	100.		
12426.	78.	12430.	79.	12435.	103.	12440.	110.	12445.	114.	12450.	109.	12455.	99.	12459.	103.		
12464.	123.	12469.	108.	12474.	135.	12479.	105.	12484.	97.	12489.	89.	12493.	72.	12498.	104.		
12503.	144.	12508.	183.	12513.	205.	12518.	158.	12523.	131.	12527.	103.	12532.	75.	12537.	61.		
12542.	56.7	12547.	51.4	12552.	26.7	12557.	20.6	12562.	23.5	12567.	20.3	12572.	33.4	12576.	59.9		
12581.	63.	12586.	92.	12591.	107.	12596.	112.	12601.	82.	12606.	71.	12611.	56.	12616.	47.		
12621.	50.	12626.	61.	12631.	54.	12636.	71.	12641.	96.	12646.	114.	12651.	103.	12655.	110.		
12660.	112.	12665.	86.	12670.	89.	12675.	51.	12680.	26.	12685.	34.	12690.	47.	12695.	94.		
12700.	145.	12705.	149.	12710.	155.	12715.	143.	12720.	115.	12725.	110.	12730.	137.	12735.	126.		
12740.	103.	12745.	87.	12750.	87.	12755.	52.	12760.	48.	12765.	52.	12770.	82.	12775.	100.		
12780.	132.	12785.	119.	12790.	85.	12795.	65.	12801.	62.	12806.	94.	12811.	99.	12816.	108.		
12821.	96.	12826.	91.	12831.	86.	12836.	114.	12841.	110.	12846.	115.	12851.	139.	12856.	159.		
12861.	139.	12866.	126.	12871.	102.	12877.	109.	12882.	123.	12887.	107.	12892.	90.	12897.	79.		
12902.	65.6	12907.	46.5	12912.	52.5	12917.	66.8	12922.	85.3	12928.	99.1	12933.	86.1	12938.	58.1		
12943.	39.2	12948.	40.8	12953.	38.8	12958.	53.7	12964.	37.1	12969.	39.9	12974.	39.1	12979.	65.9		
12984.	88.	12989.	122.	12994.	111.	13000.	101.	13005.	112.	13010.	124.	13015.	162.	13020.	139.		
13025.	141.	13031.	144.	13036.	137.	13041.	134.	13046.	109.	13051.	99.	13057.	87.	13062.	65.		
13067.	54.	13072.	78.	13077.	64.	13083.	80.	13088.	96.	13093.	108.	13098.	103.	13103.	84.		
13109.	77.	13114.	79.	13119.	72.	13124.	61.	13130.	75.	13135.	75.	13140.	97.	13145.	101.		
13151.	84.3	13156.	52.8	13161.	49.8	13166.	67.0	13172.	87.8	13177.	74.8	13182.	76.9	13187.	79.5		
13193.	105.	13198.	114.	13203.	110.	13209.	106.	13214.	113.	13219.	118.	13224.	104.	13230.	85.		
13235.	56.	13240.	39.	13246.	64.	13251.	78.	13256.	95.	13262.	123.	13267.	132.	13272.	96.		
13278.	92.	13283.	88.	13288.	66.	13294.	79.	13299.	89.	13304.	118.	13310.	115.	13315.	130.		
13320.	93.	13326.	76.	13331.	59.	13336.	28.	13342.	36.	13347.	56.	13353.	87.	13358.	112.		
13363.	125.	13369.	136.	13374.	125.	13379.	107.	13385.	68.	13390.	69.	13396.	75.	13401.	95.		
13406.	89.	13412.	90.	13417.	91.	13423.	75.	13428.	97.	13434.	97.	13439.	117.	13444.	134.		

E	P/N/E	E	P/N/E	E	P/N/E														
eV	beV ^{1/2}	eV	beV ^{1/2}																
13450.	160.	13455.	136.	13461.	121.	13466.	89.	13472.	86.	13477.	107.	13482.	104.	13488.	111.				
13493.	112.	13499.	114.	13504.	116.	13510.	61.	13515.	56.	13521.	62.	13526.	73.	13532.	67.				
13537.	74.	13543.	87.	13548.	95.	13554.	127.	13559.	142.	13565.	158.	13570.	160.	13576.	160.				
13581.	148.	13587.	115.	13592.	73.	13598.	104.	13603.	140.	13609.	137.	13614.	134.	13620.	101.				
13625.	87.	13631.	52.	13636.	46.	13642.	54.	13645.	92.	13653.	116.	13659.	131.	13664.	96.				
13670.	66.1	13675.	46.5	13681.	42.6	13687.	30.1	13692.	40.0	13698.	40.6	13703.	59.2	13709.	99.5				
13714.	116.	13720.	152.	13726.	146.	13731.	162.	13737.	160.	13742.	147.	13748.	136.	13754.	134.				
13759.	97.	13765.	93.	13771.	72.	13776.	104.	13782.	93.	13788.	74.	13793.	66.	13799.	74.				
13804.	80.	13810.	96.	13816.	92.	13821.	120.	13827.	137.	13833.	118.	13838.	99.	13844.	66.				
13850.	35.	13855.	28.	13861.	24.	13867.	31.	13872.	40.	13878.	62.	13884.	88.	13890.	102.				
13895.	118.	13901.	106.	13907.	86.	13912.	98.	13918.	111.	13924.	127.	13930.	126.	13935.	120.				
13961.	94.	13947.	100.	13953.	51.	13958.	76.	13964.	91.	13970.	99.	13976.	96.	13981.	112.				
13987.	129.	13993.	135.	13999.	121.	14004.	110.	14010.	90.	14016.	88.	14022.	99.	14027.	135.				
14033.	173.	14039.	164.	14045.	171.	14051.	129.	14056.	118.	14062.	104.	14068.	121.	14074.	65.				
14080.	53.3	14086.	42.4	14091.	66.8	14097.	61.6	14103.	50.4	14109.	62.8	14115.	87.5	14121.	98.5				
14126.	81.8	14132.	63.4	14138.	55.3	14144.	55.1	14150.	57.3	14155.	85.4	14162.	71.6	14167.	57.9				
14173.	44.9	14179.	39.8	14185.	38.6	14191.	43.2	14197.	52.1	14203.	63.9	14209.	70.4	14215.	62.9				
14220.	56.	14226.	75.	14232.	76.	14238.	71.	14244.	84.	14250.	77.	14256.	84.	14262.	107.				
14268.	113.	14274.	96.	14280.	65.	14286.	72.	14292.	87.	14298.	98.	14303.	81.	14309.	73.				
14315.	65.	14321.	96.	14327.	107.	14333.	107.	14339.	82.	14345.	81.	14351.	108.	14357.	114.				
14363.	114.	14369.	120.	14375.	88.	14381.	73.	14387.	60.	14393.	71.	14399.	66.	14405.	80.				
14411.	79.	14417.	81.	14423.	96.	14429.	121.	14435.	124.	14442.	98.	14448.	81.	14454.	71.				
14460.	71.7	14466.	86.0	14472.	75.5	14478.	86.4	14484.	58.6	14490.	57.0	14496.	42.7	14502.	53.6				
14508.	50.4	14514.	60.5	14520.	54.2	14527.	61.7	14533.	90.0	14539.	95.6	14545.	73.0	14551.	78.9				
14557.	78.	14563.	93.	14569.	123.	14575.	114.	14582.	92.	14588.	92.	14594.	102.	14600.	109.				
14606.	79.3	14612.	83.3	14618.	85.7	14625.	79.9	14631.	84.8	14637.	78.0	14643.	91.5	14649.	75.6				
14655.	85.	14662.	111.	14668.	63.	14674.	72.	14680.	49.	14686.	39.	14693.	29.	14699.	39.				
14705.	44.	14711.	80.	14717.	83.	14724.	96.	14730.	95.	14736.	86.	14742.	102.	14749.	116.				
14755.	116.	14761.	120.	14767.	109.	14774.	88.	14780.	98.	14786.	84.	14792.	83.	14799.	95.				
14805.	95.	14811.	103.	14817.	79.	14824.	106.	14830.	124.	14836.	125.	14843.	120.	14849.	79.				
14855.	63.0	14862.	61.5	14868.	91.4	14874.	82.0	14881.	86.8	14887.	76.5	14893.	64.5	14900.	60.0				
14905.	82.	14912.	98.	14919.	123.	14925.	129.	14931.	107.	14938.	85.	14944.	70.	14950.	75.				
14957.	96.8	14963.	88.6	14969.	72.0	14976.	92.7	14982.	86.6	14989.	68.0	14995.	74.9	15001.	67.6				
15008.	87.	15014.	90.	15021.	89.	15027.	77.	15033.	71.	15040.	98.	15046.	123.	15053.	121.				
15059.	88.	15066.	83.	15072.	85.	15079.	86.	15085.	138.	15091.	152.	15098.	127.	15104.	105.				
15111.	77.	15117.	76.	15124.	92.	15130.	85.	15137.	81.	15143.	95.	15150.	104.	15156.	116.				
15163.	118.	15169.	109.	15176.	120.	15182.	123.	15189.	91.	15195.	91.	15202.	74.	15208.	63.				
15215.	54.3	15221.	62.4	15228.	89.2	15235.	93.9	15241.	70.2	15248.	52.7	15254.	39.3	15261.	29.2				
15267.	20.5	15274.	25.2	15280.	32.5	15287.	38.1	15294.	54.0	15300.	81.4	15307.	89.0	15313.	83.0				
15320.	129.	15327.	155.	15333.	150.	15340.	134.	15345.	135.	15353.	115.	15360.	93.	15366.	84.				
15373.	90.	15380.	79.	15386.	69.	15393.	102.	15400.	97.	15406.	124.	15413.	106.	15420.	97.				
15426.	89.	15433.	107.	15440.	93.	15446.	110.	15453.	66.	15460.	47.	15466.	37.	15473.	32.				
15480.	38.	15487.	45.	15493.	51.	15500.	70.	15507.	84.	15513.	105.	15520.	123.	15527.	111.				
15534.	81.	15540.	79.	15547.	74.	15554.	74.	15561.	104.	15567.	92.	15574.	100.	15581.	94.				
15588.	111.	15594.	129.	15601.	113.	15608.	73.	15615.	67.	15622.	89.	15628.	75.	15635.	97.				
15642.	116.	15649.	99.	15656.	94.	15663.	103.	15676.	117.	15683.	110.	15688.	102.	15690.	104.				
15697.	108.	15704.	103.	15710.	95.	15717.	107.	15724.	86.	15731.	76.	15738.	73.	15745.	79.				
15752.	76.	15759.	89.	15765.	94.	15772.	100.	15779.	111.	15786.	126.	15793.	116.	15800.	82.				
15807.	49.	15814.	56.	15821.	59.	15828.	58.	15835.	46.	15842.	58.	15849.	93.	15856.	111.				
15882.	111.	15869.	69.	15876.	74.	15883.	55.	15890.	65.	15897.	72.	15904.	104.	15911.	92.				
15918.	86.7	15925.	92.4	15932.	78.8	15939.	99.8	15946.	92.2	15953.	95.6	15960.	84.2	15967.	80.5				
15974.	72.7	15981.	78.6	15988.	73.9	15996.	95.4	16003.	96.0	16010.	80.1	16017.	73.3	16024.	72.5				
16031.	83.	16038.	84.	16045.	62.	16052.	70.	16059.	68.	16066.	106.	16073.	106.	16080.	86.				
16088.	78.	16095.	86.	16102.	88.	16109.	94.	16116.	101.	16123.	81.	16130.	74.	16137.	61.				
16145.	52.	16152.	87.	16159.	82.	16166.	100.	16173.	124.	16180.	161.	16188.	130.	16195.	79.				

E	P _{N/E}	E	P _{N/E}														
eV	beV ^{1/2}	eV	beV ^{1/2}														
16202.	61.	16209.	61.	16216.	65.	16223.	85.	16231.	75.	16238.	77.	16245.	96.	16252.	114.		
16259.	119.	16267.	115.	16274.	89.	16281.	76.	16288.	52.	16296.	51.	16303.	77.	16310.	82.		
16317.	84.4	16325.	72.7	16332.	76.0	16339.	76.1	16347.	60.4	16354.	58.4	16361.	62.1	16368.	73.0		
16376.	70.	16383.	79.	16390.	91.	16398.	98.	16405.	127.	16412.	108.	16420.	102.	16427.	105.		
16434.	130.	16442.	133.	16449.	126.	16456.	113.	16464.	104.	16471.	75.	16478.	58.	16486.	58.		
16493.	58.	16500.	74.	16508.	98.	16515.	88.	16523.	97.	16530.	99.	16537.	116.	16545.	107.		
16552.	104.	16560.	102.	16567.	94.	16575.	93.	16582.	129.	16589.	134.	16597.	133.	16604.	90.		
16612.	95.	16619.	92.	16627.	86.	16634.	65.	16642.	74.	16649.	106.	16657.	120.	16664.	124.		
16672.	87.	16679.	70.	16687.	98.	16694.	97.	16702.	101.	16709.	75.	16717.	67.	16724.	74.		
16732.	75.	16739.	96.	16747.	117.	16754.	99.	16762.	118.	16770.	86.	16777.	49.	16785.	55.		
16792.	52.	16800.	44.	16807.	58.	16815.	86.	16823.	106.	16830.	124.	16838.	91.	16845.	98.		
16853.	103.	16861.	120.	16868.	130.	16876.	112.	16884.	81.	16891.	66.	16899.	58.	16907.	76.		
16914.	81.	16922.	83.	16930.	101.	16937.	86.	16945.	87.	16953.	93.	16960.	68.	16968.	72.		
16976.	81.	16983.	75.	16991.	78.	16999.	89.	17007.	118.	17014.	148.	17022.	135.	17030.	115.		
17037.	97.	17045.	78.	17053.	109.	17061.	114.	17069.	86.	17076.	62.	17084.	81.	17092.	73.		
17100.	71.	17107.	117.	17115.	122.	17123.	142.	17131.	120.	17139.	86.	17146.	81.	17154.	91.		
17152.	93.	17170.	92.	17178.	106.	17186.	114.	17193.	121.	17201.	91.	17209.	60.	17217.	514.		
17225.	70.	17233.	59.	17241.	64.	17248.	74.	17256.	100.	17264.	123.	17272.	117.	17280.	92.		
17288.	77.	17296.	79.	17304.	64.	17312.	57.	17320.	74.	17328.	86.	17336.	120.	17344.	90.		
17353.	109.	17360.	141.	17368.	145.	17376.	104.	17384.	79.	17392.	67.	17400.	87.	17408.	80.		
17416.	90.	17424.	104.	17432.	124.	17440.	114.	17448.	95.	17456.	89.	17464.	110.	17472.	109.		
17480.	124.	17488.	126.	17496.	68.	17504.	133.	17512.	103.	17520.	108.	17528.	98.	17536.	75.		
17544.	71.	17552.	78.	17561.	89.	17569.	100.	17577.	86.	17585.	87.	17593.	100.	17601.	113.		
17609.	135.	17617.	125.	17626.	127.	17634.	125.	17642.	114.	17650.	106.	17658.	75.	17666.	74.		
17675.	88.5	17683.	82.4	17691.	90.5	17699.	72.0	17707.	90.1	17716.	99.9	17724.	88.6	17732.	49.5		
17740.	52.	17748.	43.	17757.	55.	17765.	77.	17773.	92.	17781.	113.	17790.	119.	17798.	137.		
17806.	112.	17815.	123.	17823.	129.	17831.	113.	17839.	111.	17848.	103.	17856.	106.	17864.	91.		
17873.	86.	17881.	104.	17889.	115.	17898.	102.	17906.	113.	17914.	104.	17923.	117.	17931.	95.		
17939.	90.7	17948.	93.1	17956.	84.3	17965.	77.4	17973.	96.9	17981.	99.5	17990.	92.7	17998.	83.3		
18007.	95.0	18015.	89.4	18023.	79.0	18032.	83.5	18040.	82.2	18049.	73.9	18057.	71.4	18066.	70.6		
18074.	73.	18083.	75.	18091.	80.	18100.	74.	18108.	66.	18117.	75.	18125.	89.	18134.	134.		
18142.	113.	18151.	109.	18159.	86.	18168.	56.	18176.	90.	18185.	117.	18193.	118.	18202.	152.		
18210.	119.	18219.	124.	18227.	126.	18236.	81.	18245.	79.	18253.	68.	18262.	69.	18270.	64.		
18279.	65.0	18288.	67.2	18296.	75.3	18305.	51.2	18313.	66.4	18322.	85.3	18331.	90.1	18339.	90.3		
18348.	64.	18357.	51.	18365.	48.	18374.	76.	18383.	109.	18391.	104.	18400.	112.	18409.	117.		
18418.	128.	18426.	91.	18435.	76.	18444.	53.	18452.	53.	18461.	62.	18470.	49.	18479.	65.		
18487.	57.5	18496.	65.2	18505.	66.9	18514.	50.4	18522.	77.5	18531.	92.0	18540.	96.5	18549.	86.7		
18558.	79.6	18566.	71.8	18575.	70.4	18584.	64.6	18593.	86.0	18602.	85.5	18611.	98.1	18619.	96.5		
18628.	95.	18637.	106.	18646.	100.	18655.	90.	18664.	86.	18673.	100.	18682.	95.	18690.	110.		
18899.	95.	18708.	98.	18717.	93.	18726.	95.	18735.	101.	18744.	87.	18753.	90.	18762.	108.		
18771.	95.	18780.	102.	18789.	93.	18798.	96.	18807.	106.	18816.	102.	18825.	100.	18834.	101.		
18843.	97.1	18852.	87.3	18861.	76.5	18870.	82.1	18879.	59.5	18888.	64.0	18897.	77.3	18906.	83.3		
18915.	68.	18924.	93.	18933.	74.	18942.	74.	18951.	89.	18960.	86.	18969.	103.	18979.	98.		
18988.	74.	18997.	84.	19006.	83.	19015.	125.	19024.	135.	19033.	105.	19042.	107.	19052.	93.		
19061.	94.	19070.	95.	19079.	102.	19088.	92.	19098.	77.	19107.	71.	19116.	73.	19125.	80.		
19134.	107.	19144.	85.	19153.	94.	19162.	112.	19171.	115.	19181.	118.	19190.	122.	19199.	131.		
19208.	127.	19218.	74.	19227.	87.	19236.	97.	19245.	133.	19255.	130.	19264.	133.	19273.	130.		
19283.	120.	19292.	114.	19301.	114.	19311.	111.	19320.	100.	19329.	78.	19339.	87.	19348.	90.		
19358.	78.	19367.	64.	19376.	71.	19386.	75.	19395.	62.	19405.	85.	19414.	103.	19423.	121.		
19433.	113.	19442.	93.	19452.	71.	19461.	95.	19471.	142.	19480.	151.	19490.	151.	19499.	157.		
19509.	129.	19518.	91.	19528.	62.	19537.	72.	19547.	69.	19556.	72.	19566.	64.	19575.	71.		
19585.	69.4	19594.	67.9	19604.	74.6	19612.	55.4	19623.	57.3	19633.	76.5	19642.	90.3	19652.	94.5		
19661.	100.	19671.	106.	19681.	88.	19690.	60.	19700.	52.	19709.	50.	19719.	66.	19729.	76.		
19738.	88.	19748.	114.	19758.	96.	19767.	104.	19777.	77.	19787.	66.	19796.	75.	19806.	83.		
19816.	106.	19826.	122.	19835.	124.	19845.	123.	19855.	113.	19865.	120.	19874.	135.	19884.	128.		

E eV	P _{N/E} beV ^{1/2}														
19894.	149.	19904.	126.	19913.	118.	19923.	106.	19933.	84.	19943.	59.	19953.	76.	19962.	76.
19972.	107.	19982.	128.	19992.	103.	20002.	94.	20012.	69.	20022.	58.	20031.	64.	20041.	72.
20051.	111.	20061.	109.	20071.	82.	20081.	84.	20091.	70.	20101.	51.	20111.	53.	20121.	79.
20131.	91.	20140.	123.	20150.	112.	20160.	85.	20170.	70.	20180.	75.	20190.	85.	20200.	95.
20230.	100.	20220.	126.	20230.	132.	20240.	138.	20250.	113.	20261.	113.	20271.	97.	20281.	122.
20291.	123.	20301.	111.	20311.	104.	20321.	117.	20331.	129.	20341.	123.	20351.	122.	20361.	104.
20371.	94.	20382.	93.	20392.	106.	20402.	131.	20412.	136.	20422.	155.	20432.	137.	20443.	120.
20453.	92.2	20463.	86.7	20473.	82.9	20483.	80.6	20494.	81.4	20504.	81.9	20514.	70.3	20524.	88.9
20535.	69.	20545.	80.	20555.	91.	20565.	113.	20576.	109.	20586.	87.	20596.	64.	20606.	60.
20617.	81.	20627.	94.	20637.	122.	20648.	98.	20658.	119.	20668.	114.	20679.	114.	20689.	90.
20699.	71.5	20710.	75.2	20720.	78.7	20731.	80.4	20741.	86.4	20751.	83.9	20762.	84.7	20772.	74.7
20783.	82.	20793.	111.	20804.	130.	20814.	107.	20825.	102.	20835.	79.	20846.	77.	20856.	78.
20866.	113.	20877.	103.	20888.	111.	20898.	106.	20909.	97.	20919.	71.	20930.	70.	20940.	81.
20951.	68.8	20961.	71.4	20972.	68.8	20982.	90.7	20993.	80.9	21004.	72.9	21014.	61.7	21025.	83.7
21036.	99.	21046.	117.	21057.	108.	21067.	112.	21078.	116.	21089.	98.	21099.	89.	21110.	111.
21121.	111.	21131.	101.	21142.	79.	21153.	70.	21164.	68.	21174.	55.	21185.	52.	21196.	69.
21207.	71.6	21217.	84.7	21228.	91.1	21239.	76.8	21250.	74.9	21260.	88.4	21271.	75.0	21282.	79.2
21293.	89.	21304.	113.	21315.	142.	21325.	137.	21336.	109.	21347.	93.	21358.	89.	21369.	74.
21380.	86.	21391.	57.	21402.	58.	21412.	52.	21423.	68.	21434.	80.	21445.	87.	21456.	112.
21467.	112.	21478.	110.	21489.	109.	21500.	81.	21511.	87.	21522.	101.	21533.	103.	21544.	96.
21555.	109.	21566.	135.	21577.	132.	21588.	109.	21599.	121.	21610.	141.	21621.	133.	21632.	96.
21644.	48.0	21655.	64.3	21665.	68.2	21677.	84.4	21688.	85.8	21699.	78.4	21710.	86.5	21721.	81.3
21733.	96.	21744.	85.	21755.	94.	21766.	101.	21777.	101.	21788.	77.	21800.	78.	21811.	95.
21822.	128.	21833.	125.	21845.	131.	21856.	96.	21867.	87.	21878.	104.	21890.	90.	21901.	109.
21912.	130.	21924.	164.	21935.	124.	21946.	106.	21958.	57.	21969.	48.	21980.	58.	21992.	64.
22003.	59.0	22014.	57.0	22025.	62.3	22037.	77.2	22048.	92.6	22060.	95.7	22071.	80.6	22083.	77.2
22094.	80.	22106.	69.	22117.	81.	22129.	90.	22140.	101.	22151.	81.	22163.	86.	22174.	80.
22185.	93.	22197.	129.	22209.	128.	22221.	127.	22232.	122.	22244.	112.	22255.	94.	22267.	94.
22278.	68.2	22290.	75.4	22302.	75.9	22313.	91.8	22325.	92.8	22336.	91.5	22348.	91.5	22360.	92.2
22371.	88.	22383.	83.	22395.	98.	22406.	104.	22418.	105.	22430.	94.	22441.	88.	22453.	98.
22465.	126.	22477.	109.	22488.	93.	22500.	94.	22512.	99.	22524.	110.	22535.	121.	22547.	119.
22559.	80.	22571.	76.	22583.	79.	22594.	100.	22606.	93.	22618.	88.	22630.	95.	22642.	98.
22654.	107.	22666.	143.	22677.	134.	22689.	121.	22701.	101.	22713.	99.	22725.	101.	22737.	102.
22749.	86.	22761.	85.	22773.	93.	22785.	83.	22797.	108.	22809.	90.	22821.	93.	22833.	85.
22845.	93.	22857.	64.	22869.	71.	22881.	92.	22893.	126.	22905.	100.	22917.	86.	22929.	82.
22941.	93.	22954.	88.	22966.	99.	22978.	102.	22990.	88.	23002.	110.	23014.	117.	23026.	105.
23039.	90.2	23051.	65.3	23063.	52.0	23075.	65.9	23087.	63.8	23100.	63.2	23112.	63.6	23124.	79.3
23136.	99.	23149.	101.	23161.	121.	23173.	98.	23186.	79.	23198.	59.	23210.	87.	23222.	89.
23235.	79.5	23247.	95.0	23259.	95.2	23272.	91.5	23284.	65.7	23297.	71.7	23309.	72.9	23321.	92.2
23334.	94.	23346.	77.	23359.	89.	23371.	89.	23384.	109.	23395.	111.	23408.	102.	23421.	77.
23433.	89.7	23446.	78.1	23458.	52.2	23471.	48.1	23484.	56.9	23496.	86.2	23509.	96.3	23521.	81.3
23534.	72.	23545.	76.	23559.	93.	23572.	100.	23584.	131.	23597.	111.	23609.	96.	23622.	83.
23635.	96.	23647.	86.	23660.	82.	23673.	89.	23685.	80.	23698.	109.	23711.	86.	23724.	77.
23736.	78.3	23749.	99.4	23762.	97.2	23775.	93.9	23787.	84.8	23800.	76.6	23813.	86.4	23826.	95.1
23833.	116.	23851.	121.	23864.	99.	23877.	89.	23890.	74.	23903.	77.	23916.	80.	23929.	87.
23941.	85.	23954.	67.	23967.	85.	23980.	80.	23993.	109.	24006.	115.	24019.	133.	24032.	126.
24045.	100.	24058.	119.	24071.	108.	24084.	97.	24097.	73.	24110.	83.	24123.	68.	24136.	91.
24149.	116.	24162.	98.	24175.	100.	24188.	108.	24202.	96.	24215.	112.	24228.	105.	24241.	101.
24254.	118.	24267.	123.	24280.	127.	24294.	112.	24307.	95.	24320.	79.	24333.	61.	24347.	69.
24361.	82.	24373.	89.	24386.	90.	24400.	78.	24413.	68.	24426.	78.	24439.	88.	24453.	101.
24466.	105.	24479.	94.	24493.	75.	24506.	81.	24519.	89.	24533.	78.	24546.	81.	24560.	89.
24573.	95.	24586.	104.	24600.	107.	24613.	121.	24627.	129.	24640.	105.	24654.	145.	24667.	121.
24681.	85.5	24694.	95.5	24708.	70.9	24721.	74.9	24735.	93.3	24748.	74.7	24762.	64.9	24776.	77.2
24789.	113.	24803.	112.	24816.	98.	24830.	80.	24844.	86.	24857.	70.	24871.	60.	24885.	68.
24898.	75.5	24912.	67.7	24926.	84.0	24939.	79.0	24953.	60.8	24967.	62.7	24981.	71.3	24994.	76.1

E eV	P/ N/E bev ^{1/2}																
25008.	65.	25022.	80.	25036.	66.	25050.	95.	25063.	90.	25077.	107.	25091.	113.	25105.	117.		
25119.	103.	25133.	98.	25146.	92.	25160.	92.	25174.	86.	25188.	85.	25202.	91.	25216.	95.		
25230.	109.	25244.	87.	25258.	91.	25272.	100.	25286.	108.	25300.	91.	25314.	84.	25328.	89.		
25342.	77.6	25356.	70.4	25370.	78.9	25384.	86.0	25398.	85.2	25413.	86.9	25427.	82.3	25441.	65.1		
25455.	52.	25469.	85.	25483.	96.	25497.	84.	25512.	80.	25526.	80.	25540.	119.	25554.	124.		
25568.	104.	25583.	121.	25597.	124.	25611.	103.	25626.	101.	25640.	81.	25654.	50.	25668.	44.		
25683.	54.	25697.	78.	25711.	105.	25726.	103.	25740.	91.	25755.	95.	25769.	67.	25783.	69.		
25798.	75.	25812.	96.	25827.	98.	25841.	94.	25856.	98.	25870.	103.	25885.	74.	25899.	82.		
25914.	97.	25928.	88.	25943.	101.	25957.	89.	25972.	108.	25987.	87.	26001.	79.	26016.	100.		
26030.	99.6	26045.	77.5	26060.	78.7	26074.	93.5	26089.	87.2	26104.	84.4	26118.	76.4	26133.	86.1		
26148.	68.	26163.	76.	26177.	98.	26192.	128.	26207.	124.	26222.	113.	26236.	98.	26251.	100.		
26266.	93.	26281.	88.	26296.	93.	26311.	92.	26325.	97.	26340.	103.	26355.	105.	26370.	87.		
26385.	111.	26400.	116.	26415.	104.	26430.	101.	26445.	101.	26460.	82.	26475.	84.	26490.	92.		
26505.	93.	26520.	107.	26535.	84.	26550.	91.	26565.	110.	26580.	85.	26595.	85.	26610.	80.		
26626.	78.	26641.	104.	26656.	100.	26671.	57.	26686.	64.	26701.	76.	26717.	100.	26732.	105.		
26747.	115.	26762.	112.	26778.	122.	26793.	105.	26808.	100.	26823.	118.	26839.	96.	26854.	97.		
26869.	81.	26885.	73.	26900.	79.	26915.	83.	26931.	96.	26946.	100.	26962.	99.	26977.	112.		
26993.	137.	27008.	122.	27024.	98.	27039.	97.	27054.	85.	27070.	103.	27088.	87.	27101.	90.		
27117.	80.8	27132.	74.4	27148.	61.0	27163.	57.2	27179.	70.3	27195.	71.1	27210.	71.0	27226.	73.9		
27241.	77.3	27257.	86.2	27273.	95.9	27289.	90.0	27304.	90.0	27320.	99.7	27336.	90.4	27351.	89.3		
27367.	101.	27383.	127.	27399.	120.	27415.	113.	27430.	85.	27446.	67.	27462.	59.	27478.	59.		
27494.	63.	27510.	76.	27526.	80.	27542.	80.	27557.	101.	27573.	86.	27589.	98.	27605.	101.		
27621.	70.8	27637.	87.0	27653.	79.6	27669.	95.1	27685.	99.6	27701.	95.8	27717.	89.5	27734.	88.7		
27750.	72.6	27766.	67.4	27782.	78.2	27798.	87.4	27814.	99.1	27830.	76.7	27847.	86.2	27863.	91.1		
27879.	94.	27895.	89.	27911.	102.	27928.	85.	27944.	83.	27960.	104.	27976.	103.	27993.	83.		
28009.	100.	28025.	90.	28042.	116.	28058.	107.	28075.	103.	28091.	86.	28107.	76.	28124.	79.		
28140.	67.	28157.	70.	28173.	85.	28190.	89.	28206.	101.	28223.	106.	28239.	126.	28256.	120.		
28272.	105.	28289.	105.	28305.	95.	28322.	85.	28339.	66.	28355.	88.	28372.	103.	28389.	111.		
28405.	124.	28422.	113.	28439.	119.	28455.	98.	28472.	108.	28489.	96.	28506.	91.	28522.	93.		
28539.	105.	28556.	99.	28573.	90.	28590.	98.	28608.	112.	28623.	111.	28640.	139.	28657.	117.		
28674.	120.	28691.	101.	28708.	91.	28725.	83.	28742.	90.	28759.	90.	28776.	96.	28793.	91.		
28810.	97.	28827.	79.	28844.	91.	28861.	109.	28878.	94.	28895.	84.	28912.	80.	28929.	73.		
28946.	81.	28964.	100.	28981.	127.	28998.	108.	29015.	102.	29032.	74.	29050.	60.	29067.	80.		
29084.	80.	29101.	99.	29119.	101.	29136.	91.	29153.	91.	29171.	88.	29188.	77.	29206.	86.		
29223.	94.	29240.	111.	29258.	96.	29275.	70.	29293.	51.	29310.	78.	29328.	95.	29345.	83.		
29363.	101.	29380.	99.	29398.	79.	29415.	92.	29433.	94.	29450.	94.	29468.	82.	29486.	97.		
29503.	99.	29521.	77.	29539.	94.	29556.	88.	29574.	91.	29592.	95.	29610.	102.	29627.	106.		
29645.	88.5	29663.	73.1	29681.	68.0	29699.	70.4	29716.	59.1	29734.	60.4	29752.	83.4	29770.	91.2		
29788.	91.	29806.	92.	29824.	98.	29842.	122.	29860.	105.	29878.	94.	29896.	84.	29914.	74.		
29932.	71.	29950.	84.	29968.	105.	29986.	98.	30004.	95.	30022.	90.	30040.	89.	30058.	73.		
30076.	83.	30095.	86.	30113.	104.	30131.	107.	30149.	116.	30168.	127.	30186.	124.	30204.	106.		
30222.	88.	30241.	97.	30259.	92.	30277.	68.	30296.	114.	30314.	120.	30333.	126.	30351.	105.		
30369.	96.	30388.	122.	30406.	122.	30425.	99.	30443.	108.	30462.	119.	30480.	98.	30499.	91.		
30517.	95.	30536.	83.	30555.	119.	30573.	99.	30592.	97.	30610.	105.	30629.	96.	30648.	97.		
30666.	87.	30685.	87.	30704.	102.	30723.	113.	30741.	111.	30760.	110.	30779.	106.	30798.	103.		
30817.	134.	30836.	119.	30854.	114.	30872.	108.	30892.	97.	30911.	96.	30930.	93.	30949.	93.		
30968.	74.	30987.	61.	31006.	78.	31025.	90.	31044.	100.	31063.	107.	31082.	115.	31101.	111.		
31120.	104.	31140.	87.	31159.	80.	31178.	96.	31197.	110.	31216.	113.	31236.	102.	31255.	98.		
31274.	110.	31293.	100.	31313.	92.	31332.	92.	31351.	122.	31371.	105.	31390.	103.	31409.	81.		
31429.	86.	31448.	105.	31468.	105.	31487.	107.	31506.	106.	31526.	94.	31545.	103.	31565.	95.		
31585.	81.	31604.	84.	31624.	94.	31643.	112.	31663.	127.	31683.	116.	31702.	126.	31722.	122.		
31742.	100.	31761.	88.	31781.	80.	31801.	90.	31821.	78.	31840.	92.	31860.	102.	31880.	97.		
31900.	97.	31920.	111.	31940.	143.	31955.	136.	31979.	112.	31999.	80.	32019.	91.	32039.	80.		
32059.	91.	32079.	100.	32099.	109.	32119.	102.	32139.	98.	32159.	122.	32179.	123.	32200.	116.		
32220.	92.	32240.	96.	32260.	115.	32280.	105.	32300.	105.	32321.	104.	32341.	99.	32361.	99.		

E eV	P/ N/E bev ^{1/2}														
32381.	88.	32402.	76.	32422.	96.	32442.	109.	32463.	124.	32483.	132.	32504.	113.	32524.	101.
32545.	89.	32565.	108.	32585.	98.	32606.	91.	32626.	73.	32647.	70.	32668.	59.	32688.	79.
32709.	80.	32729.	76.	32750.	66.	32771.	89.	32791.	95.	32812.	95.	32833.	116.	32853.	132.
32874.	124.	32895.	111.	32916.	87.	32937.	76.	32957.	91.	32978.	102.	32999.	119.	33020.	99.
33041.	85.	33062.	100.	33083.	89.	33104.	101.	33125.	107.	33146.	97.	33167.	103.	33188.	100.
33209.	93.	33230.	108.	33251.	128.	33272.	98.	33293.	83.	33315.	109.	33336.	108.	33357.	90.
33378.	97.	33400.	97.	33421.	103.	33442.	109.	33463.	84.	33485.	89.	33506.	91.	33527.	98.
33549.	104.	33570.	80.	33592.	99.	33613.	117.	33635.	106.	33656.	113.	33678.	110.	33699.	85.
33721.	72.	33742.	67.	33764.	80.	33786.	93.	33807.	92.	33829.	77.	33851.	91.	33872.	106.
33894.	103.	33916.	110.	33938.	109.	33959.	78.	33981.	69.	34003.	72.	34025.	68.	34047.	84.
34069.	87.	34090.	107.	34112.	88.	34134.	113.	34156.	106.	34178.	98.	34200.	110.	34222.	99.
34245.	77.	34267.	62.	34289.	67.	34311.	67.	34333.	91.	34355.	92.	34377.	117.	34400.	112.
34422.	121.	34444.	99.	34466.	99.	34489.	106.	34511.	98.	34533.	93.	34556.	102.	34578.	80.
34600.	72.2	34623.	64.4	34645.	76.8	34668.	71.5	34690.	74.2	34713.	75.3	34735.	95.6	34758.	95.5
34781.	108.	34803.	137.	34826.	102.	34848.	115.	34871.	90.	34894.	83.	34916.	82.	34939.	81.
34962.	91.	34985.	67.	35008.	81.	35030.	83.	35053.	107.	35076.	88.	35099.	68.	35122.	75.
35145.	85.	35168.	92.	35191.	104.	35214.	112.	35237.	112.	35260.	106.	35283.	71.	35306.	71.
35329.	78.	35352.	83.	35376.	93.	35395.	108.	35422.	93.	35445.	114.	35468.	98.	35492.	108.
35515.	94.	35538.	110.	35562.	84.	35585.	94.	35608.	89.	35632.	107.	35655.	90.	35679.	83.
35702.	88.	35726.	76.	35749.	95.	35773.	81.	35796.	97.	35820.	93.	35844.	113.	35867.	93.
35891.	102.	35915.	118.	35936.	91.	35962.	96.	35986.	65.	36010.	93.	36034.	98.	36057.	103.
36081.	95.7	36105.	92.9	36129.	97.2	36153.	84.3	36177.	85.2	36201.	73.3	36225.	73.3	36249.	83.1
36273.	83.6	36297.	74.6	36321.	72.3	36345.	77.7	36369.	66.6	36394.	88.7	36418.	89.2	36442.	75.4
36466.	77.	36491.	90.	36515.	79.	36539.	90.	36564.	102.	36588.	95.	36612.	86.	36637.	94.
36661.	97.	36686.	92.	36710.	102.	36735.	111.	36759.	104.	36784.	111.	36808.	107.	36833.	97.
36858.	96.	36882.	107.	36907.	115.	36932.	121.	36956.	110.	36981.	105.	37006.	88.	37031.	87.
37056.	102.	37080.	129.	37105.	121.	37130.	114.	37155.	119.	37180.	109.	37205.	83.	37230.	81.
37255.	80.	37280.	91.	37305.	97.	37330.	127.	37355.	121.	37381.	85.	37406.	109.	37431.	98.
37456.	86.	37482.	76.	37507.	64.	37532.	78.	37558.	71.	37583.	76.	37608.	90.	37634.	111.
37659.	101.	37685.	98.	37710.	91.	37736.	93.	37761.	104.	37787.	103.	37812.	117.	37838.	106.
37864.	102.	37889.	96.	37915.	86.	37941.	98.	37967.	94.	37992.	97.	38018.	91.	38044.	97.
38070.	76.6	38096.	91.2	38122.	58.5	38148.	76.3	38174.	83.6	38200.	97.7	38226.	82.7	38252.	63.4
38278.	69.	38304.	90.	38330.	100.	38356.	94.	38382.	88.	38409.	85.	38435.	96.	38461.	110.
38487.	108.	38514.	108.	38540.	77.	38565.	97.	38593.	82.	38619.	96.	38646.	77.	38672.	85.
38699.	89.	38725.	95.	38752.	80.	38778.	87.	38805.	94.	38832.	103.	38858.	101.	38885.	90.
38912.	101.	38938.	101.	38965.	95.	38992.	93.	39019.	82.	39046.	74.	39073.	87.	39099.	109.
39126.	103.	39153.	118.	39180.	103.	39207.	74.	39234.	57.	39262.	59.	39289.	68.	39316.	91.
39343.	84.1	39370.	99.9	39397.	89.7	39425.	77.4	39452.	93.5	39479.	96.7	39507.	95.5	39534.	91.9
39561.	88.	39589.	99.	39616.	113.	39644.	116.	39671.	109.	39699.	110.	39726.	103.	39754.	97.
39782.	100.	39809.	95.	39837.	95.	39865.	88.	39892.	102.	39920.	91.	39948.	92.	39976.	84.
40004.	96.3	40032.	92.0	40059.	95.9	40087.	95.0	40115.	89.9	40143.	97.1	40171.	95.5	40199.	92.3
40228.	105.	40256.	75.	40284.	82.	40312.	65.	40340.	65.	40368.	70.	40397.	66.	40425.	90.
40453.	107.	40482.	116.	40510.	82.	40539.	84.	40567.	87.	40595.	106.	40624.	81.	40652.	81.
40681.	66.	40710.	68.	40738.	90.	40767.	100.	40796.	108.	40824.	89.	40853.	77.	40882.	74.
40911.	92.	40940.	79.	40968.	94.	40997.	120.	41026.	110.	41055.	109.	41084.	99.	41113.	106.
41142.	83.	41171.	91.	41200.	69.	41230.	76.	41259.	100.	41288.	100.	41317.	97.	41347.	87.
41376.	106.	41405.	101.	41435.	107.	41464.	90.	41493.	97.	41523.	108.	41552.	110.	41582.	109.
41611.	111.	41641.	94.	41671.	87.	41700.	99.	41730.	105.	41760.	104.	41789.	82.	41819.	59.
41849.	83.	41879.	89.	41909.	106.	41939.	106.	41968.	112.	41998.	88.	42028.	95.	42058.	121.
42089.	127.	42119.	103.	42149.	111.	42179.	91.	42209.	84.	42239.	73.	42270.	84.	42300.	100.
42330.	116.	42361.	111.	42391.	103.	42421.	90.	42452.	93.	42482.	77.	42513.	85.	42543.	91.
42574.	109.	42605.	94.	42635.	97.	42666.	97.	42697.	123.	42727.	102.	42758.	90.	42789.	88.
42820.	90.	42851.	85.	42882.	106.	42913.	113.	42944.	101.	42975.	107.	43006.	99.	43037.	92.
43068.	90.	43099.	86.	43130.	93.	43161.	78.	43193.	84.	43224.	98.	43255.	97.	43287.	100.
43318.	104.	43349.	107.	43381.	109.	43412.	102.	43444.	104.	43475.	92.	43507.	105.	43539.	108.

E eV	P N/E bev ^{1/2}																
43570.	116.	43602.	105.	43634.	107.	43666.	97.	43697.	88.	43729.	89.	43761.	81.	43793.	93.		
43825.	101.	43857.	109.	43889.	92.	43921.	105.	43953.	97.	43985.	108.	44017.	105.	44050.	126.		
44082.	119.	44114.	94.	44146.	105.	44179.	105.	44211.	95.	44243.	96.	44276.	94.	44308.	102.		
44341.	98.	44373.	112.	44406.	111.	44439.	110.	44471.	110.	44504.	104.	44537.	100.	44569.	106.		
44602.	84.	44635.	92.	44668.	92.	44701.	91.	44734.	111.	44767.	103.	44800.	86.	44833.	74.		
44866.	73.	44899.	85.	44932.	93.	44965.	105.	44999.	105.	45032.	112.	45065.	93.	45098.	97.		
45132.	111.	45165.	81.	45199.	85.	45232.	96.	45266.	110.	45299.	105.	45333.	114.	45367.	112.		
45400.	137.	45434.	103.	45468.	107.	45501.	89.	45535.	73.	45569.	92.	45603.	94.	45637.	93.		
45671.	104.	45705.	93.	45739.	106.	45773.	109.	45807.	87.	45842.	88.	45876.	82.	45910.	78.		
45944.	83.	45979.	92.	46013.	93.	46047.	93.	46082.	104.	46116.	93.	46151.	81.	46185.	82.		
46220.	92.	46255.	96.	46289.	100.	46324.	75.	46359.	97.	46393.	87.	46428.	101.	46463.	89.		
46498.	82.4	46533.	71.9	46568.	74.1	46603.	78.9	46638.	62.3	46673.	80.0	46708.	86.0	46744.	91.6		
46779.	79.9	46814.	87.6	46849.	97.0	46885.	91.7	46920.	79.4	46956.	92.0	46991.	78.6	47026.	74.2		
47062.	75.0	47098.	86.9	47133.	91.5	47169.	94.4	47205.	90.3	47240.	92.7	47276.	94.5	47312.	89.9		
47348.	89.8	47384.	86.7	47420.	84.6	47456.	87.0	47492.	79.1	47528.	89.0	47564.	78.2	47600.	89.4		
47536.	108.	47673.	107.	47709.	86.	47745.	88.	47781.	76.	47818.	95.	47854.	109.	47891.	116.		
47927.	98.	47964.	102.	48001.	85.	48037.	78.	48074.	93.	48111.	83.	48147.	93.	48184.	90.		
48221.	79.9	48258.	82.5	48295.	82.8	48332.	94.3	48369.	91.9	48406.	92.8	48443.	88.6	48480.	83.3		
48518.	90.	48555.	76.	48592.	72.	48629.	82.	48667.	83.	48704.	86.	48742.	103.	48779.	97.		
48817.	104.	48854.	98.	48892.	106.	48930.	80.	48967.	92.	49005.	74.	49043.	73.	49081.	83.		
49119.	98.	49157.	107.	49195.	94.	49233.	95.	49271.	84.	49309.	80.	49347.	80.	49385.	67.		
49424.	74.	49462.	78.	49500.	84.	49539.	68.	49577.	103.	49615.	99.	49654.	116.	49693.	99.		
49731.	102.	49770.	97.	49809.	85.	49847.	82.	49886.	80.	49925.	93.	49964.	111.	50003.	88.		
50042.	107.	50081.	113.	50120.	99.	50159.	83.	50198.	70.	50237.	66.	50276.	67.	50316.	77.		
50355.	72.6	50395.	78.4	50434.	89.6	50473.	80.1	50513.	87.7	50553.	90.0	50592.	80.1	50632.	74.5		
50672.	102.	50711.	93.	50751.	83.	50791.	93.	50831.	93.	50871.	88.	50911.	67.	50951.	69.		
50991.	81.	51031.	93.	51071.	110.	51111.	94.	51152.	96.	51192.	85.	51232.	71.	51273.	76.		
51313.	93.1	51354.	96.3	51394.	90.8	51435.	94.3	51476.	92.7	51516.	85.0	51557.	79.2	51598.	68.3		
51639.	85.2	51680.	66.9	51721.	64.8	51762.	72.8	51803.	91.3	51844.	70.0	51885.	84.8	51926.	75.2		
51967.	82.7	52009.	93.7	52050.	83.6	52091.	69.2	52133.	69.7	52174.	77.5	52218.	86.7	52257.	81.4		
52299.	83.	52341.	86.	52382.	104.	52424.	100.	52466.	91.	52508.	83.	52550.	87.	52592.	78.		
52634.	97.	52676.	107.	52718.	90.	52760.	77.	52803.	86.	52845.	86.	52887.	83.	52930.	82.		
52972.	82.3	53015.	92.8	53057.	91.3	53100.	85.9	53142.	98.6	53185.	97.1	53228.	95.4	53271.	89.3		
53314.	93.1	53356.	69.4	53399.	74.9	53442.	79.2	53485.	72.6	53529.	75.7	53572.	86.2	53615.	97.5		
53658.	86.	53702.	91.	53745.	99.	53788.	101.	53832.	98.	53875.	73.	53919.	86.	53963.	72.		
54006.	82.4	54050.	67.0	54094.	69.6	54138.	91.4	54182.	93.1	54226.	79.0	54270.	95.9	54314.	76.4		
54358.	85.	54402.	91.	54446.	115.	54490.	86.	54535.	77.	54579.	76.	54624.	77.	54668.	77.		
54713.	85.5	54757.	86.1	54802.	98.0	54847.	94.4	54891.	91.0	54936.	75.9	54981.	81.0	55026.	96.9		
55071.	91.3	55116.	84.2	55161.	87.8	55206.	82.3	55252.	75.6	55297.	65.7	55342.	79.3	55388.	82.9		
55433.	92.	55479.	93.	55524.	92.	55570.	101.	55615.	92.	55661.	101.	55707.	98.	55753.	98.		
55799.	87.	55845.	90.	55891.	93.	55937.	102.	55983.	92.	56029.	97.	56075.	104.	56121.	89.		
56168.	84.4	56214.	81.5	56261.	74.0	56307.	88.1	56354.	84.2	56400.	81.7	56447.	85.3	56494.	68.8		
56541.	73.1	56587.	78.8	56634.	96.1	56681.	89.8	56728.	79.9	56775.	88.4	56823.	87.0	56870.	93.9		
56917.	78.9	56964.	78.3	57012.	73.1	57059.	76.8	57107.	82.2	57154.	71.5	57202.	77.6	57250.	84.0		
57297.	80.3	57345.	82.3	57393.	84.2	57441.	85.9	57489.	84.5	57537.	90.9	57585.	89.4	57633.	85.9		
57582.	87.0	57730.	78.2	57778.	78.8	57827.	78.0	57875.	90.8	57924.	86.8	57972.	76.7	58021.	80.2		
58070.	87.9	58118.	98.7	58167.	98.1	58216.	92.4	58265.	76.2	58314.	78.5	58363.	80.7	58412.	83.9		
58462.	91.8	58511.	95.7	58560.	81.5	58610.	85.8	58659.	77.7	58709.	83.1	58758.	74.5	58808.	85.1		
58857.	67.0	58907.	78.1	58957.	89.9	59007.	90.5	59057.	76.4	59107.	84.3	59157.	85.0	59207.	80.0		
59257.	88.3	59308.	89.1	59358.	80.5	59408.	71.1	59459.	67.3	59509.	69.9	59560.	85.7	59611.	70.7		
59661.	69.0	59712.	91.2	59763.	84.6	59814.	84.8	59865.	77.8	59916.	71.9	59967.	79.9	60018.	72.8		
60070.	91.4	60121.	83.9	60172.	73.9	60224.	83.3	60275.	83.9	60327.	95.2	60379.	74.1	60430.	88.5		
60482.	85.4	60534.	79.8	60586.	76.2	60638.	95.1	60690.	86.1	60742.	76.2	60794.	92.2	60846.	89.5		
60899.	100.	60951.	98.	61004.	85.	61056.	105.	61109.	84.	61161.	84.	61214.	78.	61267.	74.		
61320.	76.9	61373.	82.0	61426.	91.0	61479.	96.7	61532.	90.7	61585.	87.9	61638.	82.0	61692.	81.5		

E	P/ N/E																
eV	beV ^{1/2}																
61745.	91.9	61799.	86.6	61852.	97.0	61906.	85.5	61959.	85.4	62013.	83.9	62067.	79.7	62121.	70.3	62121.	70.3
62175.	69.0	62229.	63.1	62283.	77.5	62337.	83.2	62391.	92.1	62446.	99.4	62500.	93.1	62555.	74.4	62555.	74.4
62609.	73.5	62664.	76.4	62719.	91.3	62773.	95.7	62828.	83.2	62883.	91.1	62938.	93.5	62993.	79.4	62993.	79.4
63048.	98.3	63103.	90.4	63159.	93.4	63214.	98.4	63269.	72.9	63325.	74.6	63380.	81.5	63436.	50.6	63436.	50.6
63492.	93.1	63547.	80.9	63633.	85.6	63659.	67.7	63715.	73.7	63771.	94.0	63827.	85.5	63884.	94.4	63884.	94.4
63940.	76.4	63996.	92.1	64053.	88.4	64109.	85.4	64166.	67.6	64222.	80.4	64279.	80.3	64336.	71.5	64336.	71.5
64393.	87.3	64450.	80.9	64507.	81.0	64564.	78.3	64621.	73.6	64678.	85.2	64736.	81.4	64793.	90.3	64793.	90.3
64851.	89.9	64908.	82.5	64966.	81.3	65024.	86.0	65081.	82.9	65139.	82.3	65197.	76.2	65255.	88.8	65255.	88.8
65313.	81.1	65371.	70.1	65430.	82.3	65488.	76.0	65547.	67.4	65605.	78.1	65664.	86.1	65722.	75.5	65722.	75.5
65781.	62.6	65840.	77.2	65899.	74.1	65958.	81.9	66017.	85.1	66076.	85.5	66135.	87.8	66194.	79.4	66194.	79.4
66254.	80.3	66313.	81.2	66373.	80.3	66432.	86.4	66492.	92.1	66552.	70.6	66612.	74.5	66671.	71.1	66671.	71.1
66732.	72.1	66792.	76.4	66852.	88.8	66912.	90.5	66972.	85.9	67033.	65.6	67093.	70.5	67154.	84.9	67154.	84.9
67215.	62.7	67275.	73.6	67336.	79.3	67397.	85.6	67458.	76.8	67519.	84.4	67580.	79.5	67641.	65.8	67641.	65.8
67703.	74.4	67764.	74.1	67826.	73.5	67887.	76.3	67949.	87.5	68011.	92.1	68072.	76.2	68134.	76.9	68134.	76.9
68196.	70.4	68258.	84.7	68321.	80.8	68383.	86.4	68445.	62.1	68508.	64.1	68570.	63.6	68633.	64.7	68633.	64.7
68795.	60.4	68758.	74.2	68821.	83.8	68884.	70.4	68947.	77.3	69010.	68.3	69073.	72.0	69137.	69.2	69137.	69.2
69200.	78.9	69263.	80.1	69327.	82.1	69391.	83.6	69454.	71.5	69518.	71.2	69582.	65.4	69646.	71.9	69646.	71.9
69710.	75.2	69774.	79.6	69838.	73.0	69903.	73.6	69967.	69.3	70032.	78.2	70096.	72.6	70161.	54.8	70161.	54.8
70226.	66.2	70291.	88.3	70356.	79.8	70421.	76.3	70486.	67.9	70551.	75.4	70616.	60.4	70682.	78.4	70682.	78.4
70747.	59.6	70813.	77.3	70879.	73.8	70944.	85.8	71010.	85.2	71076.	72.8	71142.	58.7	71208.	59.2	71208.	59.2
71275.	58.9	71341.	61.3	71407.	68.7	71474.	77.5	71541.	69.7	71607.	77.7	71674.	70.4	71741.	77.0	71741.	77.0
71808.	72.7	71875.	78.7	71942.	54.8	72010.	70.4	72077.	72.9	72144.	59.6	72212.	71.1	72280.	62.3	72280.	62.3
72347.	72.7	72415.	66.8	72483.	74.1	72551.	67.8	72619.	78.5	72687.	76.6	72756.	71.2	72824.	77.0	72824.	77.0
72893.	90.4	72961.	78.4	73030.	79.8	73099.	78.7	73168.	72.1	73237.	71.2	73306.	80.1	73375.	77.3	73375.	77.3
73444.	71.0	73514.	71.1	73583.	62.7	73653.	73.5	73722.	85.3	73792.	78.9	73862.	72.1	73932.	65.6	73932.	65.6
74002.	77.4	74072.	65.0	74142.	52.2	74213.	73.3	74283.	65.2	74354.	64.3	74425.	76.4	74495.	69.5	74495.	69.5
74566.	76.6	74637.	80.3	74708.	77.9	74780.	83.0	74851.	69.8	74922.	82.4	74994.	75.9	75065.	77.2	75065.	77.2
75137.	83.9	75209.	76.2	75231.	84.4	75353.	80.8	75425.	86.3	75497.	89.7	75569.	82.3	75642.	73.1	75642.	73.1
75714.	91.8	75787.	85.8	75860.	74.0	75932.	77.9	76005.	68.9	76078.	77.4	76152.	82.2	76225.	75.3	76225.	75.3
76298.	74.9	76372.	73.9	76445.	78.6	76519.	75.5	76593.	69.9	76667.	72.8	76741.	72.4	76815.	76.8	76815.	76.8
76889.	72.2	76963.	87.0	77038.	71.8	77112.	78.7	77187.	80.8	77262.	75.6	77337.	70.6	77412.	90.4	77412.	90.4
77487.	85.0	77562.	79.4	77637.	80.3	77712.	77.3	77788.	80.7	77854.	79.0	77939.	82.9	78015.	82.5	78015.	82.5
78091.	86.	78167.	83.	78243.	75.	78320.	76.	78396.	84.	78473.	89.	78549.	95.	78626.	102.	78626.	102.
78703.	80.5	78780.	77.5	78857.	70.8	78934.	86.4	79011.	74.2	79089.	70.9	79166.	68.4	79244.	75.2	79244.	75.2
79322.	76.1	79400.	87.0	79478.	84.0	79556.	77.8	79634.	73.3	79712.	75.0	79791.	82.1	79869.	92.3	79869.	92.3
79948.	75.5	80027.	67.7	80106.	73.1	80185.	72.9	80254.	64.2	80343.	72.3	80423.	71.1	80502.	78.9	80502.	78.9
80582.	78.6	80662.	84.2	80741.	82.7	80821.	84.1	80902.	86.5	80982.	95.3	81062.	92.6	81143.	81.4	81143.	81.4
81223.	92.6	81304.	85.4	81385.	85.4	81456.	77.5	81547.	82.0	81628.	68.0	81709.	71.5	81791.	79.7	81791.	79.7
81872.	80.7	81954.	77.3	82036.	88.9	82118.	73.3	82200.	60.6	82282.	80.2	82364.	65.5	82446.	70.7	82446.	70.7
82529.	69.3	82612.	69.4	82694.	67.3	82777.	81.0	82850.	83.4	82943.	69.0	83027.	74.7	83110.	56.9	83110.	56.9
83194.	63.1	83277.	53.7	83361.	63.6	83445.	70.7	83529.	76.9	83613.	77.5	83697.	67.7	83782.	67.2	83782.	67.2
83865.	73.3	83951.	68.5	84036.	73.8	84121.	79.0	84206.	76.1	84291.	75.7	84376.	80.3	84462.	69.3	84462.	69.3
84547.	64.4	84633.	81.0	84719.	77.2	84805.	80.5	84881.	77.1	84977.	69.5	85064.	75.9	85150.	82.8	85150.	82.8
85237.	75.4	85323.	76.0	85410.	72.9	85497.	90.9	85584.	86.0	85672.	72.2	85759.	77.2	85847.	73.6	85847.	73.6
85934.	69.8	86022.	67.6	86110.	73.8	86198.	74.8	86287.	76.0	86375.	72.3	86463.	79.9	86552.	76.7	86552.	76.7
86641.	75.6	86730.	70.7	86819.	83.9	86908.	85.4	86997.	77.0	87087.	69.1	87176.	67.0	87265.	68.5	87265.	68.5
87356.	73.3	87446.	69.8	87536.	73.3	87626.	81.9	87717.	75.7	87807.	73.7	87898.	62.8	87989.	77.5	87989.	77.5
88080.	70.9	88171.	63.8	88252.	72.3	88354.	81.7	88445.	77.1	88537.	68.6	88629.	73.8	88721.	73.8	88721.	73.8
88813.	73.8	88905.	75.8	88998.	69.3	89090.	74.3	89183.	70.2	89276.	80.9	89369.	77.1	89462.	74.5	89462.	74.5
89555.	65.8	89649.	65.7	89742.	73.3	89836.	72.9	89930.	60.5	90024.	59.9	90118.	62.5	90212.	63.9	90212.	63.9
90307.	75.1	90401.	79.2	90496.	78.5	90591.	79.0	90686.	79.0	90781.	76.1	90877.	79.7	90972.	68.9	90972.	68.9
91068.	56.0	91164.	66.4	91250.	80.4	91356.	74.2	91452.	77.1	91548.	62.3	91645.	69.9	91742.	66.8	91742.	66.8
91839.	73.5	91936.	68.1	92033.	78.9	92130.	71.9	92228.	71.2	92325.	74.5	92423.	66.3	92521.	82.9	92521.	82.9
92619.	62.7	92717.	64.7	92816.	73.9	92914.	76.3	93013.	78.9	93112.	77.2	93211.	71.3	93310.	68.5	93310.	68.5
93410.	67.5	93509.	77.8	93609.	73.0	93709.	77.7	93809.	67.7	93909.	74.3	94009.	64.8	94110.	70.1	94110.	70.1

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E eV	$\frac{P}{N}E$ $b\gamma^{1/2}$																
94210.	73.1	94311.	78.6	94412.	73.1	94513.	70.8	94615.	72.6	94716.	60.3	94818.	68.0	94920.	68.0		
95021.	66.6	95124.	64.0	95226.	83.1	95328.	77.6	95431.	69.6	95534.	75.4	95637.	60.7	95740.	81.3		
95843.	57.4	95947.	60.7	96050.	73.6	96154.	69.3	96258.	67.2	96362.	66.8	96466.	81.3	96571.	58.2		
96675.	71.5	96780.	70.5	96885.	64.3	96990.	55.8	97096.	65.8	97201.	63.0	97307.	67.5	97413.	70.7		
97518.	71.2	97625.	80.8	97731.	69.4	97838.	63.5	97944.	67.3	98051.	62.0	98158.	70.6	98265.	71.5		
98373.	71.8	98480.	84.5	98588.	68.0	98696.	64.6	98804.	60.7	98912.	65.3	99021.	69.3	99129.	66.1		
99238.	69.1	99347.	70.5	99456.	73.2	99566.	74.4	99675.	82.2	99785.	86.1	99895.	75.3	100005.	77.7		

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