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**DOPPLER BROADENING OF THE
LOW ENERGY TOTAL NEUTRON CROSS SECTION
OF Pu-241**

O. D. Simpson
N. H. Marshall

August 4, 1961

**PHILLIPS
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ATOMIC ENERGY DIVISION

**NATIONAL REACTOR TESTING STATION
US ATOMIC ENERGY COMMISSION**

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Atomic Energy Division

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U. S. ATOMIC ENERGY COMMISSION

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SUMMARY

The low energy total neutron cross section of Pu-241 has been measured from 0.02 ev to 2 kev with the use of the Materials Testing Reactor (MTR) fast chopper. Curves and tables of the total cross section as a function of energy are given. Pronounced asymmetries are observed in several of the resonances, indicating the existence of interference in fission. The data have been analyzed below 12 ev with the use of the Reich-Moore multilevel formula, under the assumption that the observed resonance asymmetries are due to interference in a small number of fission channels.

A study has been conducted to determine the extent of the Doppler distortion of the resonances below 11 ev, at temperatures ranging from 0 to 2000 degrees centigrade. An estimate of the neutron strength function $\langle \Gamma_n^0/D \rangle$ obtained from the average cross section in the kev energy region is $(0.85 \pm 0.15) \times 10^{-4}$.

* Portions of this work have been accepted for publication; O. D. Simpson and M. S. Moore, Phys. Rev. July (1961), and O. D. Simpson and R. P. Schuman, Nuc. Sci. and Engr., (1961). Much of the work to be published in these articles is also contained in the present report for completeness.

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DOPPLER BROADENING OF THE
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I. INTRODUCTION

Energy dependent neutron cross section studies of fissile nuclei are limited to a relatively small number of isotopes. Therefore, it is of interest to measure the Pu²⁴¹ total cross section in order to provide additional information for the understanding of the fission process. In addition, knowledge of the low energy total cross section of Pu²⁴¹ is of practical importance to the U²³⁸ - Pu²³⁹ breeding cycle. A review of the total and fission cross section studies of the plutonium isotopes made before October, 1959, has been made by B. R. Leonard, Jr. ⁽¹⁾. Previous Pu²⁴¹ total cross section measurements had been made using a 62% Pu²⁴¹ sample. ⁽²⁾ Recently a sufficient quantity of more highly enriched Pu²⁴¹ has become available to justify remeasuring the cross section. Transmission measurements of samples of this 81% enriched material have been made with the Materials Testing Reactor (MTR) fast chopper, ⁽³⁾ and the total neutron cross section has been calculated from 0.02 ev to 2 kev.

In the energy region from 0.02 to 12 ev, the resonance structure is sufficiently well resolved to permit shape analysis of the data. The cross section of Pu²⁴¹ shows a strong fission component, ⁽¹⁾ and is thus expected to exhibit much the same resonance characteristics as the other fissionable nuclei, U²³³, U²³⁵, and Pu²³⁹. For these nuclei, strong asymmetries have been observed in the resonance shapes, which are attributed to interference in fission. ^(4, 5, 6) Pronounced asymmetries are observed in several of the resonances of Pu²⁴¹ which cannot be described by the single level Breit-Wigner formula. It is reasonable to assume that these asymmetries are evidence for interference in fission. A multilevel formula which adequately describes such interference has been developed by Reich and Moore, ⁽⁷⁾ and has been used in the analysis ⁽⁴⁾ of the slow neutron cross sections of U²³³. In the present analysis, the same assumption was made which had been found to obtain for U²³³: that fission proceeds through either one or two channels. This assumption is supported by the observed large fluctuation in the sizes of the fission widths, which, according to Porter and Thomas, ⁽⁸⁾ implies that the number of channels available to the process is small.

II. SAMPLE PREPARATION

The Pu^{241} used for the transmission measurements was obtained as PuO_2 from the Oak Ridge National Laboratory (ORNL). It had been electromagnetically enriched in Pu^{241} , and then chemically separated from the americium daughter and impurities. The feed material for electromagnetic separation was irradiated at Chalk River and represented joint efforts of Canada, the United Kingdom, and the United States, and is now sponsored by the Tripartite Nuclear Cross-section Committee. The isotopic composition of the plutonium, as measured by ORNL on October 14, 1959, is given in Table I. The total amount of material available for sample fabrication was 354 mg of PuO_2 . Because of the wide variation of the cross section as a function of neutron energy, two samples were used, 527 barns/atom of Pu^{241} and 1042 barns/atom of Pu^{241} .

Before the PuO_2 was loaded into the sample holder, it was ignited at 800°C in order to remove absorbed water. The Pu^{241} sample when it was originally loaded was essentially free from Am^{241} . However, during the eleven months that cross section measurements were being made, sufficient Am^{241} (11.8 mg) had been formed by Pu^{241} beta decay to necessitate the repurification of the material. The PuO_2 sample was therefore unloaded, repurified to remove Am^{241} , and about one-half of it reloaded for additional cross section measurements. The Am^{241} was removed by selective elution with conc. HCl from a Dowex-1 anion column. The plutonium was subsequently eluted from the column with conc. HCl + 1% HI, then converted to oxalate and ignited to PuO_2 .

The repurified PuO_2 was similar in appearance to the original PuO_2 received from ORNL. The calculated isotopic composition of the material at the time of repurification, September 7, 1960, is also shown in Table I. (2)

III. EXPERIMENTAL DATA

The total neutron cross section of Pu^{241} , shown in Figs. 1 and 2, was determined from the measured neutron transmission of the PuO_2 samples. The MTR fast chopper is well suited for measuring the neutron transmission of small samples while retaining moderately high intensities. The rotor used for the present measurements was basically the divergent beam design of Seidl (10), in which the beam is collimated to a rectangle of width 0.011 inches and height 1.000 inches. The sample to be run need have only a slightly larger cross sectional area. The present MTR rotor, which was also designed and constructed at Brookhaven National Laboratory, differs from the original design in that it contains a K-Monel center section in order to reduce fast neutron leakage through the rotor.

Two flight stations were used, 16 and 45 meters. The transmission data were taken over the entire energy region at the 16 meter flight station; in addition, in order to improve instrumental resolution, data were taken over the 10-20 ev energy region at the 45 meter flight station.

The same detector system (11) was used at both flight stations and consisted of an array of B^{10}F_3 proportional counters with an effective thickness (12) of 2 inches and an efficiency of $\sim 25\%$ at 1 ev. The energies of the neutrons were obtained from the time-of-flight as measured with a 1024-channel time analyzer (13). The sample data were stored in the first 512 channels of the analyzer and the open beam data in the second 512 channels. The Pu^{241} sample and the open beam matched sample holder were cycled alternately at 10 minute intervals into the chopper beam. Backgrounds were monitored by cycling a beam block into and out of the chopper beam in sequence with the sample and open beam measurements. In order to facilitate data processing, the data were transferred from the 1024-channel analyzer to IBM cards, and the cross sections were extracted from the data using an IBM-650 data processing machine.

The Pu^{241} total cross section below 12 ev was determined from the 16 meter flight path data; in the region from 12 ev to 20 ev, the cross section values over the resonance peaks were determined from the higher resolution 45 meter flight path data while the valleys were determined from the statistically more accurate 16 meter flight path data; the 45 meter data between resonances are also shown in the figures by the dashed curve. All data above 20 ev were taken at the 16 meter flight path.

The contributions of the Pu^{239} , Pu^{240} , Pu^{242} , Am^{241} , and oxygen contaminants were removed from the raw data below 0.5 ev in order to obtain the Pu^{241} total cross section. From 1.5 to 20 ev, the data were corrected for the contaminant cross sections except in the regions where resonances appeared in the contaminant data. The resonance structure due to the contaminants was not removed because of the differences in the instrumental resolution and sample thickness between the Pu^{241} measurements and the measurements reported for the contaminants (14). The resonances due to contaminants are identified on the figures. In the region from 0.5 to 1.5 ev, the effect of the 1.06 ev resonance of Pu^{240} was so strong that the Pu^{241} cross section could not be measured. The levels at 3.95 and 5.4 ev are due to Am^{241} since their sizes increased as the Am^{241} grew into the sample. The cross section in Figs. 1 and 2 is given in barns per Pu^{241} atom for the region up to 20 ev. Because of the close level spacing of the contaminant resonances, it was difficult to identify many of the Pu^{241} resonances above 20 ev. Therefore, the cross section above 20 ev, as shown in Fig. 1, is given as barns per Pu atom for the sample used.

The errors in the cross section arise from uncertainties in the following: counting statistics, backgrounds, sample thickness and uniformity, isotopic analysis, contaminant cross sections, coherent scattering, flight path, rotor speed, analyzer deadtime, timing of counts, initial delay, and channel widths. All of the above sources of error have been investigated and in general the major errors arise from counting statistics and from uncertainties in the sample thickness and uniformity. The accuracy of the cross section below 0.5 ev is limited primarily by the uncertainty in the sample thickness and uniformity. A maximum uncertainty of $\pm 5\%$ in cross section may exist at the peak of the 0.264 ev resonance as a result of possible non-uniformity. Above 1.5 ev the accuracy is limited mainly by counting statistics in the regions between

resonances, and by the uncertainty in the sample thickness and uniformity at the peaks of the larger resonances. The error bars shown on Figs. 1 and 2 represent standard deviations and give an indication of the accuracy of the cross sections.

IV. ANALYSIS AND DISCUSSION

The fit to the Pu^{241} total cross section data below 12 ev is shown as the solid line in Fig. 3. In the application of the multilevel formula (7) to these data, the assumptions were made that in each of the two possible spin states formed by the addition of an s-wave neutron to Pu^{241} , there exists one neutron channel, two fission channels, and an essentially infinite number of radiative capture channels. Since only total cross section data were available for analysis, it was not possible to detect variations from resonance to resonance in the radiative capture widths. It was thus assumed that the radiative capture widths are constant, and are equal to 0.040 ev. The parameters obtained from the multilevel analysis are shown in Table II.

The following procedure was used in obtaining the fit to the data:

- (1) Trial parameters of E_λ , $\Gamma_{\lambda n}^0$, $\Gamma_{\lambda \gamma}$, $\Gamma_{\lambda f1}$, and $\Gamma_{\lambda f2}$ were selected, where E_λ is the characteristic energy of the resonance (not necessarily the energy at the maximum cross section), $\Gamma_{\lambda n}^0 = \Gamma_{\lambda n} E^{-1/2}$ is the reduced neutron width, $\Gamma_{\lambda \gamma}$ is the radiative capture width (assumed to be 0.040 ev), and $\Gamma_{\lambda f1}$ and $\Gamma_{\lambda f2}$ are the fission widths in the two possible fission channels.
- (2) A trial curve of σ_T as a function of energy was computed with the use of the multilevel formula.
- (3) This theoretical curve $\sigma_T(E)$ was converted to velocity space, and Doppler broadening corrections were made by the numerical convolution technique described in Appendix A.
- (4) The multilevel Doppler-corrected cross section curve was then converted to transmission as a function of time-of-flight, and instrumental resolution broadening corrections were made by a similar numerical convolution.
- (5) The curve was then converted to $\sigma_T E^{1/2}$ as a function of energy, and compared to the experimental data shown in Fig. 3.
- (6) The initial trial parameters were modified and the above steps were repeated as necessary until the solid curve shown in Fig. 3 was obtained.

The following features of the fit should be emphasized:

- (1) The 0.264-ev resonance requires interference which is constructive below and destructive above the resonance energy. The energy variation of the interference required shows that it cannot be due to any positive energy resonance. The parameters of a negative energy resonance, shown in Fig. 3 as the dashed line, were selected to give the proper amount of interference and to give a value of 1020 barns for the fission cross section at 2200 m/sec.

- (2) Although no experimental data were obtained between 0.5 and 1.5 ev the calculated fit agrees well with the data below 0.5 and above 1.5 ev. It is therefore thought unlikely that any large resonance in Pu^{241} exists in this region.
- (3) In the region of 4.8 ev, strong destructive interference is required, which has the effect of tilting the wide resonance near 6 ev. Complete interference is required between the 4.56 and the 5.91 ev resonance to describe these data.
- (4) In the region of 8 ev, strong constructive interference is required, and only the wide resonances at 5.91 and 10.20 ev are of sufficient strength to provide this amount of interference.
- (5) It is not possible to allow any of the narrow resonances between 6 and 10 ev to interfere to any large extent with the wide ones; any attempt to do so leads to the prediction of wild distortions which are not observed.

A further restriction was possible as a result of the above considerations. The parameters shown in Table II are those of a two-fission-channel analysis. However, the fit was achieved without mixing the channels, i.e., each resonance has a fission width which lies completely in one of the two possible channels. For no resonance is it required that the fission width have an amplitude in both channels. The above analysis has assumed for simplicity that all resonances belong to the same spin state and that two possible fission channels exist in this spin state. A more reasonable explanation is that the resonances belong to two spin states, each with but a single fission channel. ⁽¹⁵⁾ It may be pointed out, however, that the success in fitting the data with the assumption of a single fission channel does not necessarily limit the number to one, especially when so few levels are involved.

The fit to the Pu-241 cross section data in Fig. 3 is extremely good, but it is certainly not unique. Although the fission data ⁽¹⁾ which have been obtained for Pu-241 are not in disagreement with the above analysis they do not permit detailed fitting over this energy region. Since only total cross section data were used in the present analysis, it is not surprising that a fit was achieved without requiring any variation in the radiative capture widths. Indeed, Pattenden and Harvey ⁽¹⁶⁾ have demonstrated that a reasonable fit to the total cross section of U-233 can be obtained without varying $\Gamma_{\gamma\gamma}$ from level to level. But Moore and Reich ⁽⁴⁾ have found that if the fit is required to describe both the total and fission data for U-233 , the radiative capture widths must be allowed to vary by more than a factor of two. For U-235 , multilevel analyses of both total and fission data by Vogt ⁽¹⁷⁾ and by Shore and Sailor ⁽⁵⁾ also indicate a surprisingly large variation in the radiative capture widths.

A certain lack of uniqueness is also expected from the lack of knowledge of the spin states to which the resonances belong. The approach which was taken in the present analysis was guided somewhat by previous work on U-233 , ⁽⁴⁾ where the analysis also indicated that wide and narrow levels may belong to different spin states. The lack of uniqueness precludes the assignment of any error limits to the parameters.

The wide resonances near 6 and 10 ev must interfere strongly and must of necessity be in the same spin state, in order to account for the large cross section at 8 ev. The narrow resonances between 6 and 10 ev cannot interfere strongly with the wide ones, so it seems reasonable to assume that they are of the other spin state. One of the two resonances of the doublet near 4.5 ev must interfere with the wide resonances. The present analysis assumes that it is the wider of the two, at 4.56 ev. The two resonances near zero neutron energy pose a somewhat different problem. They can be put in either spin state without affecting the fit. They must, of course, be in the same spin state, since they interfere with one another. It may be noted that fission fragment mass ratio studies on Pu^{241} by Regier et al.⁽¹⁸⁾ are in agreement with this conclusion. It may also be of interest to note that the parameters of the negative energy resonance required to fit these data are in no sense anomalous, unlike those required for U^{235} and Pu^{239} .⁽¹⁷⁾

Since so few levels are represented in these averages, the size of the difference may not be significant. It is, however, significant that in Pu^{241} as well as in U^{233} , two types of resonances are observed, one type having large fission widths, the other having narrow widths, and that there is no appreciable interference between the two types. In Fig. 4, the results of the analysis are displayed with the contributions from the two assumed spin states separated for clarity. No Doppler or resolution corrections have been applied to these curves. The lower curve shows the wide resonances, presumably of one spin state, $\langle \Gamma_f \rangle = 0.847$ ev; the upper curve shows the narrow resonances of the other spin state $\langle \Gamma_f \rangle = 0.074$ ev.

If the levels are assumed to be equally divided among the two possible spin states of the compound nucleus, a level spacing of $D = 2.6$ ev/spin state is determined from the resonances below 20 ev. Combining this level spacing with the resonance parameters below 12 ev (as determined from the multilevel fit of the data) yields an average neutron strength function of $\Gamma_n^0/D = 1.0 \times 10^{-4}$. The lack of uniqueness of the parameters from the multilevel analysis of the data precludes the assignment of any error to the strength function.

The neutron strength function was also determined using the technique described by Simpson, et. al.⁽¹⁹⁾ in the kev energy region, and by assuming a potential scattering cross section of 11.5 ± 1.0 barns. It was found to be $(0.85 \pm 0.15) \times 10^{-4}$ for the sample being measured which is in good agreement with the value quoted above. The difference in this value and that which would be expected for a pure Pu^{241} sample should be small since the contaminant isotopes all have strength functions of the order of 1×10^{-4} .

The cross sections shown in Figs. 1 and 2 (also listed in Appendix B) are derived from experimental transmission measurements made at an ambient temperature of $\sim 300^\circ\text{K}$. Thus, the thermal motions of the target nuclei need to be taken into account. These have the effect of broadening the resonances as seen by a perfect resolution variable energy spectrometer, and the measured cross section (as defined by $\sigma_{\text{meas}} = 1/n \ln 1/T_{\text{meas}}$) becomes a function of the sample temperature. In the practical case

where the instrument resolution is no longer small compared to the widths of the levels, the σ_{meas} as defined above becomes a function of the instrumental resolution and sample thickness in addition to temperature. These features should be kept in mind when using the σ_{meas} presented in Figs. 1 and 2. In some applications for reactor calculations it is desirable to use cross section values where instrument resolution effects have been removed. If the data are to be applied to calculations where the sample temperature is different from room temperature then Doppler corrections could also be important.

A study has been conducted to determine the extent of the Doppler effect on the cross section of Pu^{241} . This was done by using the parameters in Table II to compute the calculated cross section as a function of neutron energy, Fig. 6 curve A. This cross section was then convoluted with Doppler functions corresponding to various sample temperatures. The results are shown in the other curves of Fig. 6, which are tabulated in Appendix C. The Doppler functions for the various sample temperatures were obtained by utilizing the Debye temperature correction as discussed in Appendix A. For temperatures where the sample temperature was greater than 500°C the effective temperature was assumed to be equal to the sample temperature. The calculated cross section curves in Fig. 6 do not include instrumental resolution effects, and are thus not directly comparable to the cross section data shown in Figs. 1 and 2. It may be pointed out that the curves in Fig. 6 correspond to the cross sections which should be used to describe reactor behavior at the temperature indicated.

Measurements of the average cross section at the higher energy regions, where the instrumental resolution becomes greater than the level spacing, can be significantly in error unless the sample is thin (i.e., where $\exp(-n\sigma) = 1 - n\sigma$ is a good approximation). Since the strength function $\langle \Gamma_n^0/D \rangle$ determined from the average cross section in the higher energy regions agrees well with that determined from the resonance parameters, it is probable that the average cross section at higher energies are reasonably accurate, of the order of $\pm 10\%$.

V. ACKNOWLEDGMENTS

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TABLE I

Isotopic Composition of Pu-241 Sample

Isotope	Measured Percentage Abundance on 10-14-59	Calculated Percentage Abundance on 9-7-60
Pu-239	7.74% $\pm$ 0.06	8.04% $\pm$ 0.06
Pu-240	10.42% $\pm$ 0.10	10.83% $\pm$ 0.10
Pu-241 (13.15 year)	81.31% $\pm$ 0.08	80.58% $\pm$ 0.08
Pu-242	0.53% $\pm$ 0.05	0.55% $\pm$ 0.05

TABLE II

Multilevel parameters for the resonances in Pu²⁴¹. These parameters correspond to the fit to the data shown by the solid curve in Fig. 3. The quantity $\Gamma_{\lambda fi}$ in the last column refers to either $\Gamma_{\lambda f1}$ or $\Gamma_{\lambda f2}$ as is appropriate. In the analysis, $\Gamma_{\lambda \gamma}$ is assumed to have the value 40×10^{-3} ev, and g was assumed to be $1/2$ for all resonances. Although a two-fission-channel, one-spin-state analysis was carried out, the results hold equally well for two spin states with a single fission channel in each. In this case, $\Gamma_{\lambda f1}$ and $\Gamma_{\lambda f2}$ are the fission widths in the first and second spin states, respectively, as discussed in the text. The relative signs of $(\Gamma_{\lambda n} \Gamma_{\lambda fi})^{1/2}$ are those which correctly describe the interference in a single-fission-channel multilevel analysis, as described by Moore and Reich.⁽⁴⁾

Level (λ)	E_{λ} (ev)	$2g\Gamma_{\lambda n}^0$ (10^{-3} ev)	$\Gamma_{\lambda f1}$ (10^{-3} ev)	$\Gamma_{\lambda f2}$ (10^{-3} ev)	$\Gamma_{\lambda \gamma}$ (10^{-3} ev)	Relative signs of $(\Gamma_{\lambda n} \Gamma_{\lambda fi})^{1/2}$
1	-0.160	0.0725	0	60	40	+
2	0.264	0.101	0	72	40	-
3	4.28	0.255	0	45	40	-
4	4.56	0.194	190	0	40	+
5	5.91	1.020	1350	0	40	+
6	6.94	0.218	0	95	40	+
7	8.60	0.268	0	70	40	+
8	9.56	0.035	0	100	40	-
9	10.20	0.400	1000	0	40	-

Figure 1

The total neutron cross section of Pu^{241} from 0.02 ev to 2 kev. The cross section was determined using the 527 barns per atom of Pu^{241} sample, except over the 0.264 ev resonance where the 1024 barns per atom of Pu^{241} sample was used. The cross section below 20 ev is given as barns per atom of Pu^{241} ; the cross section above 20 ev is given as barns per atom of Pu for the sample used. The data which are shown by a dashed curve from 2 to 20 ev are given in Fig. 2 on an expanded energy scale.

Figure 2

The total neutron cross section of Pu^{241} from 2 to 20 eV. The cross section is given as barns per atom of Pu^{241} .

Figure 3

The total cross section of Pu^{241} , multiplied by the square root of the neutron energy, as a function of neutron energy below 12 eV. The solid line shows the multilevel fit to the data. Doppler and resolution broadening corrections have been applied to the fit. The dashed line below zero neutron energy shows the negative energy level which was postulated in order to give a fit to the data below 0.5 eV. Resonances which are due to known contaminants are indicated. The strong resonance in Pu^{240} at 1.06 eV precluded the measurement of the Pu^{241} cross section in this region.

Figure 4

The multilevel fit to the total cross section of Pu^{241} . Curve A shows those resonances which have been ascribed to one of the two possible spin states; curve B shows those which have been ascribed to the other. No Doppler or resolution broadening corrections have been applied to these curves.

Figure 5

Comparison of the fast chopper resolution function with a Gaussian distribution. The solid curve shows the idealized fast chopper resolution as a function of time. The dashed curve shows the Gaussian distribution which was used to represent the resolution function in making the necessary instrument resolution broadening corrections. The idealized chopper resolution function was obtained by the convolution of a symmetric triangle of appropriate width to represent the neutron burst, block functions to represent the channel widths and the counter thickness, and a Gaussian distribution to represent the uncertainty of detector pulse collection time. Both functions shown in this figure are normalized to unit area.

Figure 6

The total neutron cross section from 0.02 to 11 eV as a function of sample temperature. Curve A represents the calculated cross section obtained by using the multilevel parameters in Table II. This cross section was then convoluted with Doppler functions having widths corresponding to the various sample temperatures.

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APPENDIX A

It is very important that detailed Doppler and resolution broadening corrections be made to the calculated total cross section curve. For example, the corrected peak cross section of the 8.6 ev resonance was only 2/3 of the uncorrected value. At neutron energies greater than 0.01 ev the Doppler corrected cross section $\sigma(v_n)$, i.e., that which would be measured with perfect instrumental resolution is related to the true cross section $\sigma(v)$ by the expression

$$v_n \sigma(v_n) = \left[\frac{m}{2\pi kT} \right]^{1/2} \int_{-\infty}^{\infty} v \sigma(v) e^{-\frac{m(v_n - v)^2}{2kT}} dv \quad (1)$$

where m is the reduced mass of the neutron, k is the Boltzmann constant, v_n is the velocity of the neutron in the laboratory system, v is the relative velocity of the neutron with respect to the target, ($v_n - v = v_A$) is the velocity of the target nucleus, and T is the effective temperature of the sample. (See below)

In performing this convolution numerically, the integral was replaced by the summation

$$v_n \sigma_T(v_n) = \sum_j v_j \sigma_T(v_j) P(v_n - v_j) \quad (2)$$

where $P(v_A)$ is a step-function approximation to the normalized Gaussian function. For Doppler broadening corrections, this function $P(v_A)$ is a constant (i.e., does not depend on v_n). It is thus convenient to perform a four-point LaGrange interpolation of the calculated curve $\sigma(E)$ at energies E_j given by the expression

$$E_j = (E_0)^{1/2} + jk)^2 \quad (3)$$

where E_0 is the initial energy under consideration, and k is a constant which is determined by the spacing of the points E_j and the width of the function $P(v_A)$.

Plutonium oxide has a Debye temperature of $403 \pm 8^\circ\text{K}$ (20) at room temperature. Correcting the ambient temperature T by the Debye temperature, (21) one calculates the effective temperature of the sample to be $\sim 375^\circ\text{K}$.

The correction of the calculated curve for instrumental resolution broadening was done by first converting the cross section to the transmission X by the expression

$$X(E_j) = e^{-N\sigma(E_j)} \quad (4)$$

where N is the number of atoms/cm² for the sample which was used in the experimental measurement. A change of variable from energy to time-of-flight is convenient, since the measured transmission $X(t_n)$ at any flight time t_n is related to that which would be observed with perfect

instrumental resolution by the expression

$$X(t_n) = \sum_{j'} X(t_n - t_{j'}) R(t_{j'}) \quad (5)$$

where $R(t_{j'})$ is the observed instrumental resolution function, normalized to unit area. The function $R(t_{j'})$ is a convolution in time space of functions representing the channel width, fast chopper burst width, time jitter of the gating pulse and collection time uncertainties in the detector system. The computed resolution function $R(t_{j'})$ for the operating conditions under which the data above 4 ev were collected is shown as the dashed curve in Fig. 5. The solid curve in Fig. 5 is a Gaussian function. Since the two curves agree very closely and since the idealized resolution function should include an additional small wing correction at these energies, a Gaussian representation was used as the function $R(t_{j'})$ in making the correction described.

The conversion of the calculated curve $X(E_j)$ given in Eq. 4 to time space is convenient since the function $R(t_{j'})$ is then approximately a constant. This was done by interpolating the curve $X(E_j)$ at energies $E_{j'}$ given by $E_{j'} = (E_0 - 1/2 - j'k')^{-2}$, where again E_0 is the initial energy and k' is a constant determined by the spacing of the points and the width of the curve $R(t_{j'})$.

It may be noted that if the cross sections below 0.01 ev are to be Doppler corrected, the proper form of the integral given in Eq. (1) is as follows:

$$v_n \sigma(v_n) = \left[\frac{m}{2\pi kT} \right]^{1/2} \int_{-\infty}^{\infty} v \sigma(v) \left[e^{-\frac{m(v_n-v)^2}{2kT}} - e^{-\frac{m(v_n+v)^2}{2kT}} \right] dv$$

The term $e^{-\frac{m(v_n+v)^2}{2kT}}$ has negligible contribution above 0.01 ev. We are indebted to Dr. R. C. Young for deriving the above expression. The treatment is equivalent to that of A. W. Solbrig, Jr. (22, 23).

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 985

One inch B^{10}F_3 detector thickness.

Flight path of 16 meters.

Rotor speed of 400 rev./min.

Channel width of 32 μsec .

These data were obtained by averaging the cross sections determined from the transmission measurements of two different samples having thicknesses of 527 barns/atom of Pu^{241} and 1024 barns/atom of Pu^{241} . The columns of transmission, open minus background, and sample minus background have been deleted since they would be meaningless.

INSTRUMENT RESOLUTION * (Full width at half-maximum)

E (ev)	Width (μsec)
0.02	39
0.50	38

The data are quoted as barns/atom of Pu^{241} .

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	02	011861	985	9155.0		.01596	1686.08	213.008	4.137-	7.430		
94241000	02	011861	985	9123.0		.01608	1740.97	220.767	4.130-	7.462		
94241000	02	011861	985	9091.0		.01619	1727.10	219.756	4.123-	7.454		
94241000	02	011861	985	9059.0		.01630	1823.68	232.833	4.116-	7.508		
94241000	02	011861	985	9027.0		.01642	1717.86	220.128	4.109-	7.448		
94241000	02	011861	985	8995.0		.01654	1785.53	229.634	4.101-	7.487		
94241000	02	011861	985	8963.0		.01666	1785.75	230.494	4.094-	7.487		
94241000	02	011861	985	8931.0		.01678	1767.64	228.977	4.087-	7.477		
94241000	02	011861	985	8899.0		.01690	1853.76	240.990	4.080-	7.524		
94241000	02	011861	985	8867.0		.01702	1697.95	221.517	4.073-	7.437		
94241000	02	011861	985	8835.0		.01714	1696.19	222.065	4.066-	7.436		
94241000	02	011861	985	8803.0		.01727	1631.74	214.436	4.058-	7.397		
94241000	02	011861	985	8771.0		.01739	1700.56	224.255	4.051-	7.438		
94241000	02	011861	985	8739.0		.01752	1589.40	210.378	4.044-	7.371		
94241000	02	011861	985	8707.0		.01765	1763.14	234.239	4.037-	7.474		
94241000	02	011861	985	8675.0		.01778	1603.38	213.797	4.029-	7.379		
94241000	02	011861	985	8643.0		.01791	1805.04	241.565	4.022-	7.498		
94241000	02	011861	985	8611.0		.01805	1769.49	237.732	4.014-	7.478		
94241000	02	011861	985	8579.0		.01818	1687.09	227.477	4.007-	7.430		
94241000	02	011861	985	8547.0		.01832	1615.18	218.618	3.999-	7.387		
94241000	02	011861	985	8515.0		.01845	1613.10	219.109	3.992-	7.385		
94241000	02	011861	985	8483.0		.01859	1610.69	219.610	3.985-	7.384		
94241000	02	011861	985	8451.0		.01874	1661.37	227.432	3.977-	7.415		
94241000	02	011861	985	8419.0		.01888	1590.18	218.498	3.969-	7.371		
94241000	02	011861	985	8387.0		.01902	1585.82	218.706	3.962-	7.368		
94241000	02	011861	985	8355.0		.01917	1627.05	225.275	3.954-	7.394		
94241000	02	011861	985	8323.0		.01932	1510.01	209.387	3.946-	7.319		
94241000	02	011861	985	8291.0		.01947	1594.07	222.429	3.938-	7.374		
94241000	02	011861	985	8259.0		.01962	1562.53	218.367	3.931-	7.354		
94241000	02	011861	985	8227.0		.01977	1620.73	227.384	3.923-	7.390		
94241000	02	011861	985	8195.0		.01992	1581.24	223.174	3.916-	7.365		
94241000	02	011861	985	8163.0		.02008	1594.67	225.971	3.908-	7.374		
94241000	02	011861	985	8131.0		.02024	1523.40	216.731	3.900-	7.328		
94241000	02	011861	985	8099.0		.02040	1553.07	221.823	3.892-	7.347		
94241000	02	011861	985	8067.0		.02056	1480.88	212.340	3.884-	7.300		

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open - Bgd.)	(Sample - Bgd.)
94241000	02	011861	985	8035.0		•02073	1535.40	221.066	3.876-	7.336		
94241000	02	011861	985	8003.0		•02089	1509.08	218.114	3.868-	7.319		
94241000	02	011861	985	7971.0		•02106	1567.62	227.495	3.860-	7.357		
94241000	02	011861	985	7939.0		•02123	1498.59	218.353	3.852-	7.312		
94241000	02	011861	985	7907.0		•02140	1543.20	225.751	3.844-	7.341		
94241000	02	011861	985	7875.0		•02158	1474.15	216.555	3.835-	7.295		
94241000	02	011861	985	7843.0		•02175	1512.53	223.066	3.828-	7.321		
94241000	02	011861	985	7811.0		•02193	1498.55	221.918	3.819-	7.312		
94241000	02	011861	985	7779.0		•02211	1493.05	222.009	3.811-	7.308		
94241000	02	011861	985	7747.0		•02229	1450.24	216.520	3.803-	7.279		
94241000	02	011861	985	7715.0		•02248	1490.61	223.492	3.795-	7.306		
94241000	02	011861	985	7683.0		•02267	1484.67	223.542	3.786-	7.302		
94241000	02	011861	985	7651.0		•02286	1467.93	221.944	3.778-	7.291		
94241000	02	011861	985	7619.0		•02305	1442.20	218.959	3.770-	7.273		
94241000	02	011861	985	7587.0		•02325	1463.98	223.227	3.761-	7.288		
94241000	02	011861	985	7555.0		•02344	1440.64	220.565	3.753-	7.272		
94241000	02	011861	985	7523.0		•02364	1401.53	215.490	3.744-	7.245		
94241000	02	011861	985	7491.0		•02384	1440.16	222.365	3.736-	7.272		
94241000	02	011861	985	7459.0		•02405	1425.24	221.027	3.727-	7.262		
94241000	02	011861	985	7427.0		•02426	1415.27	220.438	3.718-	7.255		
94241000	02	011861	985	7395.0		•02447	1423.77	222.719	3.710-	7.261		
94241000	02	011861	985	7363.0		•02468	1422.35	223.450	3.701-	7.260		
94241000	02	011861	985	7331.0		•02490	1425.03	224.867	3.692-	7.261		
94241000	02	011861	985	7299.0		•02512	1382.78	219.162	3.684-	7.231		
94241000	02	011861	985	7267.0		•02534	1382.53	220.079	3.675-	7.231		
94241000	02	011861	985	7235.0		•02556	1398.21	223.539	3.666-	7.242		
94241000	02	011861	985	7203.0		•02579	1365.09	219.224	3.657-	7.218		
94241000	02	011861	985	7171.0		•02602	1374.33	221.690	3.648-	7.225		
94241000	02	011861	985	7139.0		•02625	1357.52	219.943	3.640-	7.213		
94241000	02	011861	985	7107.0		•02649	1343.70	218.698	3.630-	7.203		
94241000	02	011861	985	7075.0		•02673	1330.58	217.541	3.621-	7.193		
94241000	02	011861	985	7043.0		•02697	1326.81	217.897	3.613-	7.190		
94241000	02	011861	985	7011.0		•02722	1314.82	216.925	3.603-	7.181		
94241000	02	011861	985	6979.0		•02747	1322.14	219.134	3.594-	7.187		
94241000	02	011861	985	6947.0		•02773	1325.50	220.727	3.585-	7.189		

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	02	011861	985	6915.0		.02798	1317.67	220.410	3.576-	7.183		
94241000	02	011861	985	6883.0		.02824	1303.45	219.042	3.567-	7.172		
94241000	02	011861	985	6851.0		.02851	1323.01	223.390	3.557-	7.187		
94241000	02	011861	985	6819.0		.02878	1292.95	219.346	3.548-	7.164		
94241000	02	011861	985	6787.0		.02905	1284.20	218.880	3.538-	7.157		
94241000	02	011861	985	6755.0		.02932	1289.52	220.806	3.529-	7.162		
94241000	02	011861	985	6723.0		.02960	1279.84	220.193	3.519-	7.154		
94241000	02	011861	985	6691.0		.02989	1268.45	219.300	3.510-	7.145		
94241000	02	011861	985	6659.0		.03018	1257.71	218.495	3.500-	7.137		
94241000	02	011861	985	6627.0		.03047	1276.86	222.885	3.491-	7.152		
94241000	02	011861	985	6595.0		.03076	1249.03	219.062	3.481-	7.130		
94241000	02	011861	985	6563.0		.03106	1259.57	221.985	3.471-	7.138		
94241000	02	011861	985	6531.0		.03137	1245.17	220.540	3.461-	7.127		
94241000	02	011861	985	6499.0		.03168	1231.92	219.268	3.452-	7.116		
94241000	02	011861	985	6467.0		.03199	1237.38	221.316	3.442-	7.120		
94241000	02	011861	985	6435.0		.03231	1225.26	220.241	3.432-	7.110		
94241000	02	011861	985	6403.0		.03264	1222.02	220.778	3.422-	7.108		
94241000	02	011861	985	6371.0		.03297	1222.66	222.007	3.412-	7.108		
94241000	02	011861	985	6339.0		.03330	1197.51	218.525	3.402-	7.088		
94241000	02	011861	985	6307.0		.03364	1200.23	220.138	3.392-	7.090		
94241000	02	011861	985	6275.0		.03398	1185.53	218.538	3.381-	7.077		
94241000	02	011861	985	6243.0		.03433	1189.69	220.432	3.371-	7.081		
94241000	02	011861	985	6211.0		.03469	1185.67	220.835	3.361-	7.078		
94241000	02	011861	985	6179.0		.03505	1166.53	218.395	3.350-	7.061		
94241000	02	011861	985	6147.0		.03541	1163.05	218.859	3.340-	7.058		
94241000	02	011861	985	6115.0		.03578	1160.55	219.526	3.330-	7.056		
94241000	02	011861	985	6083.0		.03616	1155.82	219.789	3.319-	7.052		
94241000	02	011861	985	6051.0		.03654	1146.47	219.154	3.309-	7.044		
94241000	02	011861	985	6019.0		.03693	1143.19	219.690	3.298-	7.041		
94241000	02	011861	985	5987.0		.03733	1134.02	219.105	3.287-	7.033		
94241000	02	011861	985	5955.0		.03773	1132.76	220.030	3.277-	7.032		
94241000	02	011861	985	5923.0		.03814	1130.51	220.784	3.266-	7.030		
94241000	02	011861	985	5891.0		.03856	1116.94	219.331	3.255-	7.018		
94241000	02	011861	985	5859.0		.03898	1103.08	217.787	3.244-	7.005		
94241000	02	011861	985	5827.0		.03941	1107.54	219.869	3.233-	7.009		

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	02	011861	985	5795.0		.03984	1094.21	218.405	3.222	6.997		
94241000	02	011861	985	5763.0		.04029	1105.07	221.815	3.211	7.007		
94241000	02	011861	985	5731.0		.04074	1086.43	219.287	3.200	6.990		
94241000	02	011861	985	5699.0		.04120	1087.49	220.737	3.189	6.991		
94241000	02	011861	985	5667.0		.04166	1071.17	218.635	3.178	6.976		
94241000	02	011861	985	5635.0		.04214	1072.91	220.248	3.166	6.978		
94241000	02	011861	985	5603.0		.04262	1067.96	220.476	3.155	6.973		
94241000	02	011861	985	5571.0		.04311	1059.60	220.005	3.144	6.965		
94241000	02	011861	985	5539.0		.04361	1062.04	221.787	3.132	6.967		
94241000	02	011861	985	5507.0		.04412	1040.10	218.471	3.120	6.947		
94241000	02	011861	985	5475.0		.04464	1047.58	221.336	3.109	6.954		
94241000	02	011861	985	5443.0		.04516	1037.10	220.394	3.097	6.944		
94241000	02	011861	985	5411.0		.04570	1020.66	218.193	3.085	6.928		
94241000	02	011861	985	5379.0		.04625	1028.57	221.204	3.073	6.935		
94241000	02	011861	985	5347.0		.04680	1022.18	221.133	3.061	6.929		
94241000	02	011861	985	5315.0		.04737	1020.92	222.201	3.049	6.928		
94241000	02	011861	985	5283.0		.04794	1000.93	219.157	3.037	6.908		
94241000	02	011861	985	5251.0		.04853	1004.92	221.380	3.025	6.912		
94241000	02	011861	985	5219.0		.04912	992.86	220.049	3.013	6.900		
94241000	02	011861	985	5187.0		.04973	985.97	219.874	3.001	6.893		
94241000	02	011861	985	5155.0		.05035	983.95	220.788	2.988	6.891		
94241000	02	011861	985	5123.0		.05098	978.80	221.002	2.976	6.886		
94241000	02	011861	985	5091.0		.05163	979.08	222.470	2.963	6.886		
94241000	02	011861	985	5059.0		.05228	968.78	221.510	2.951	6.876		
94241000	02	011861	985	5027.0		.05295	973.05	223.907	2.938	6.880		
94241000	02	011861	985	4995.0		.05363	957.17	221.664	2.925	6.863		
94241000	02	011861	985	4963.0		.05432	964.37	224.763	2.912	6.871		
94241000	02	011861	985	4931.0		.05503	943.48	221.326	2.899	6.849		
94241000	02	011861	985	4899.0		.05575	939.63	221.862	2.886	6.845		
94241000	02	011861	985	4867.0		.05649	936.89	222.677	2.873	6.842		
94241000	02	011861	985	4835.0		.05724	930.26	222.564	2.860	6.835		
94241000	02	011861	985	4803.0		.05800	930.28	224.042	2.847	6.835		
94241000	02	011861	985	4771.0		.05878	922.55	223.669	2.833	6.827		
94241000	02	011861	985	4739.0		.05958	923.32	225.375	2.820	6.827		
94241000	02	011861	985	4707.0		.06039	918.98	225.835	2.806	6.823		

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	02	011861	985	4675.0		.06122	913.57	226.042	2.793-	6.817		
94241000	02	011861	985	4643.0		.06207	903.87	225.190	2.779-	6.806		
94241000	02	011861	985	4611.0		.06293	903.99	226.774	2.765-	6.806		
94241000	02	011861	985	4579.0		.06382	896.79	226.555	2.751-	6.798		
94241000	02	011861	985	4547.0		.06472	888.46	226.027	2.737-	6.789		
94241000	02	011861	985	4515.0		.06564	889.58	227.915	2.723-	6.790		
94241000	02	011861	985	4483.0		.06658	880.29	227.143	2.709-	6.780		
94241000	02	011861	985	4451.0		.06754	880.22	228.757	2.695-	6.780		
94241000	02	011861	985	4419.0		.06852	870.67	227.910	2.680-	6.769		
94241000	02	011861	985	4387.0		.06952	869.19	229.178	2.666-	6.767		
94241000	02	011861	985	4355.0		.07055	864.05	229.504	2.651-	6.761		
94241000	02	011861	985	4323.0		.07160	861.25	230.457	2.636-	6.758		
94241000	02	011861	985	4291.0		.07267	859.79	231.778	2.621-	6.756		
94241000	02	011861	985	4259.0		.07377	856.28	232.574	2.606-	6.752		
94241000	02	011861	985	4227.0		.07489	843.88	230.938	2.591-	6.738		
94241000	02	011861	985	4195.0		.07603	848.90	234.074	2.576-	6.743		
94241000	02	011861	985	4163.0		.07721	837.18	232.626	2.561-	6.730		
94241000	02	011861	985	4131.0		.07841	841.81	235.724	2.545-	6.735		
94241000	02	011861	985	4099.0		.07964	830.54	234.384	2.530-	6.722		
94241000	02	011861	985	4067.0		.08090	834.03	237.223	2.514-	6.726		
94241000	02	011861	985	4035.0		.08218	827.53	237.228	2.498-	6.718		
94241000	02	011861	985	4003.0		.08350	826.71	238.891	2.482-	6.717		
94241000	02	011861	985	3971.0		.08485	821.69	239.353	2.466-	6.711		
94241000	02	011861	985	3939.0		.08624	810.00	237.872	2.450-	6.697		
94241000	02	011861	985	3907.0		.08766	819.26	242.564	2.434-	6.708		
94241000	02	011861	985	3875.0		.08911	822.89	245.644	2.417-	6.712		
94241000	02	011861	985	3843.0		.09060	808.88	243.472	2.401-	6.695		
94241000	02	011861	985	3811.0		.09213	809.38	245.673	2.384-	6.696		
94241000	02	011861	985	3779.0		.09370	816.07	249.804	2.367-	6.704		
94241000	02	011861	985	3747.0		.09530	813.62	251.172	2.350-	6.701		
94241000	02	011861	985	3715.0		.09695	807.31	251.372	2.333-	6.693		
94241000	02	011861	985	3683.0		.09864	807.02	253.461	2.316-	6.693		
94241000	02	011861	985	3651.0		.10038	804.12	254.768	2.298-	6.689		
94241000	02	011861	985	3619.0		.10216	810.86	259.172	2.281-	6.698		
94241000	02	011861	985	3587.0		.10399	804.73	259.507	2.263-	6.690		

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241001	01	011861	985	2430.0		.22660	2068.58	984.699	1.484-	7.634		
94241000	01	011861	985	2398.0		.23269	2202.32	1062.355	1.458-	7.697		
94241000	01	011861	985	2366.0		.23902	2313.38	1131.007	1.431-	7.746		
94241000	01	011861	985	2334.0		.24562	2390.58	1184.776	1.403-	7.779		
94241000	01	011861	985	2302.0		.25250	2457.35	1234.804	1.376-	7.806		
94241000	01	011861	985	2270.0		.25967	2380.19	1212.894	1.348-	7.774		
94241000	01	011861	985	2238.0		.26715	2286.72	1181.930	1.319-	7.734		
94241000	01	011861	985	2206.0		.27495	2095.14	1098.602	1.291-	7.647		
94241000	01	011861	985	2174.0		.28311	1914.59	1018.717	1.261-	7.557		
94241000	01	011861	985	2142.0		.29163	1663.21	898.184	1.232-	7.416		
94241000	01	011861	985	2110.0		.30054	1397.98	766.395	1.202-	7.242		
94241000	01	011861	985	2078.0		.30987	1195.82	665.668	1.171-	7.086		
94241000	01	011861	985	2046.0		.31964	970.86	548.896	1.140-	6.878		
94241000	01	011861	985	2014.0		.32988	797.25	457.903	1.109-	6.681		
94241000	01	011861	985	1982.0		.34062	654.73	382.121	1.076-	6.484		
94241000	01	011861	985	1950.0		.35189	521.30	309.237	1.044-	6.256		
94241000	01	011861	985	1918.0		.36373	422.24	254.658	1.011-	6.045		
94241000	01	011861	985	1886.0		.37617	356.48	218.640	.977-	5.876		
94241000	01	011861	985	1854.0		.38927	298.67	186.348	.943-	5.699		
94241000	01	011861	985	1822.0		.40307	258.64	164.207	.908-	5.555		
94241000	01	011861	985	1790.0		.41761	218.38	141.124	.873-	5.386		
94241000	01	011861	985	1758.0		.43295	192.51	126.673	.837-	5.260		
94241000	01	011861	985	1726.0		.44915	181.66	121.747	.800-	5.202		
94241000	01	011861	985	1694.0		.46628	145.23	99.175	.762-	4.978		
94241000	01	011861	985	1662.0		.48441	118.28	82.327	.724-	4.773		

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	02	011861	985	3555.0		.10587	816.47	265.653	2.245-	6.705		
94241000	02	011861	985	3523.0		.10781	816.15	267.979	2.227-	6.704		
94241000	02	011861	985	3491.0		.10979	816.76	270.631	2.209-	6.705		
94241000	02	011861	985	3459.0		.11183	812.51	271.712	2.190-	6.700		
94241000	02	011861	985	3427.0		.11393	823.17	277.852	2.172-	6.713		
94241000	02	011861	985	3395.0		.11609	825.78	281.362	2.153-	6.716		
94241000	02	011861	985	3363.0		.11831	828.78	285.070	2.134-	6.719		
94241000	02	011861	985	3331.0		.12059	827.50	287.361	2.115-	6.718		
94241000	02	011861	985	3299.0		.12294	831.10	291.409	2.096-	6.722		
94241000	02	011861	985	3267.0		.12536	840.27	297.510	2.076-	6.733		
94241000	02	011861	985	3235.0		.12786	858.38	306.938	2.056-	6.755		
94241000	02	011861	985	3203.0		.13042	861.55	311.140	2.036-	6.758		
94241000	02	011861	985	3171.0		.13307	857.94	312.968	2.016-	6.754		
94241000	02	011861	985	3139.0		.13580	868.78	320.156	1.996-	6.767		
94241000	02	011861	985	3107.0		.13861	887.29	330.343	1.976-	6.788		
94241000	02	011861	985	3075.0		.14151	900.40	338.714	1.955-	6.802		
94241000	02	011861	985	3043.0		.14450	911.87	346.634	1.934-	6.815		
94241000	02	011861	985	3011.0		.14759	930.49	357.474	1.913-	6.835		
94241000	02	011861	985	2979.0		.15078	946.51	367.537	1.891-	6.852		
94241000	02	011861	985	2947.0		.15407	976.57	383.323	1.870-	6.884		
94241000	02	011861	985	2915.0		.15747	997.38	395.786	1.848-	6.905		
94241000	02	011861	985	2883.0		.16098	1015.94	407.622	1.826-	6.923		
94241000	02	011861	985	2851.0		.16462	1040.74	422.266	1.804-	6.947		
94241000	02	011861	985	2819.0		.16838	1069.19	438.736	1.781-	6.974		
94241000	02	011861	985	2787.0		.17227	1109.43	460.474	1.758-	7.011		
94241000	02	011861	985	2755.0		.17629	1152.44	483.875	1.735-	7.049		
94241000	02	011861	985	2723.0		.18046	1197.78	508.826	1.712-	7.088		
94241000	02	011861	985	2691.0		.18478	1270.68	546.216	1.688-	7.147		
94241000	02	011861	985	2659.0		.18925	1325.70	576.718	1.664-	7.189		
94241000	02	011861	985	2627.0		.19339	1401.24	617.010	1.640-	7.245		
94241000	02	011861	985	2595.0		.19870	1473.37	656.769	1.615-	7.295		
94241000	02	011861	985	2563.0		.20369	1560.55	704.310	1.591-	7.352		
94241000	02	011861	985	2531.0		.20888	1656.17	756.923	1.565-	7.412		
94241000	01	011861	985	2494.0		.21512	1839.83	853.336	1.536-	7.517		
94241000	01	011861	985	2462.0		.22075	1951.90	917.082	1.510-	7.576		

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 808

Two inch effective B^{10}F_3 detector thickness.

Flight path of 16 meters.

Rotor speed of 3000 rev/minute.

Channel width of 1 μsec .

SAMPLE THICKNESS

Isotope	barns/atom
Pu-239	5,404
Pu-240	4,014
Pu-241	526.5
Pu-242	78,927
Am-241	22,365
Oxygen	209.1

INSTRUMENT RESOLUTION * (Full width at half-maximum)

E (ev)	Width (μsec)
1.5	3.7
4.0	3.3

The data are quoted as barns/atom of Pu^{241} .

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	07	032560	808	944.5	.906	1.49992	51.68	63.294	.405	3.945	25387	21279
94241000	07	032560	808	937.5	.923	1.52240	42.02	51.856	.420	3.738	25451	21817
94241000	07	032560	808	930.5	.933	1.54540	33.45	41.587	.435	3.510	25839	22596
94241000	07	032560	808	923.5	.972	1.56891	14.56	18.249	.450	2.678	24764	22523
94241000	07	032560	808	916.5	.940	1.59297	32.30	40.767	.465	3.475	26531	23405
94241000	07	032560	808	909.5	.929	1.61759	38.47	48.928	.480	3.649	26946	23559
94241000	07	032560	808	902.5	.943	1.64278	30.50	39.096	.496	3.417	27158	24169
94241000	07	032560	808	895.5	.934	1.66856	35.89	46.360	.511	3.580	27614	24383
94241000	07	032560	808	888.5	.947	1.69495	28.36	36.932	.527	3.345	28038	25167
94241000	07	032560	808	881.5	.945	1.72198	29.49	38.703	.543	3.384	28263	25356
94241000	07	032560	808	874.5	.951	1.74966	25.96	34.344	.559	3.256	28633	25894
94241000	07	032560	808	867.5	.947	1.77801	28.21	37.621	.575	3.339	29145	26280
94241000	07	032560	808	860.5	.952	1.80705	25.87	34.783	.591	3.253	29291	26564
94241000	07	032560	808	853.5	.947	1.83682	28.42	38.526	.608	3.347	29961	27071
94241000	07	032560	808	846.5	.940	1.85732	32.42	44.303	.624	3.478	30285	27189
94241000	07	032560	808	839.5	.914	1.89859	46.80	64.498	.641	3.846	30652	26806
94241000	07	032560	808	832.5	.907	1.93065	51.11	71.022	.657	3.934	30799	26739
94241000	07	032560	808	825.5	.930	1.96353	38.09	53.382	.674	3.640	31426	27990
94241000	07	032560	808	818.5	.940	1.99726	32.13	45.410	.691	3.469	32188	29019
94241000	07	032560	808	811.5	.940	2.03187	32.52	46.354	.708	3.482	32794	29567
94241000	07	032560	808	804.5	.938	2.06738	33.58	48.285	.726	3.513	33040	29750
94241000	07	032560	808	797.5	.967	2.10383	17.21	24.964	.743	2.845	32985	30660
94241000	07	032560	808	790.5	.952	2.14126	25.60	37.466	.761	3.242	33785	30930
94241000	07	032560	808	783.5	.959	2.17969	21.99	32.479	.779	3.090	33960	31326
94241000	07	032560	808	776.5	.940	2.21917	32.36	48.211	.797	3.477	34665	31369
94241000	07	032560	808	769.5	.941	2.25972	31.57	47.459	.815	3.452	34718	31476
94241000	07	032560	808	762.5	.933	2.30140	36.13	54.824	.833	3.587	35087	31547
94241000	07	032560	808	755.5	.904	2.34425	52.89	80.981	.851	3.968	36153	31501
94241000	07	032560	808	748.5	.914	2.38330	46.79	72.316	.870	3.845	36528	32207
94241000	07	032560	808	741.5	.920	2.43361	43.33	67.596	.889	3.768	36928	32789
94241000	07	032560	808	734.5	.935	2.48021	35.12	55.316	.908	3.558	36950	33336
94241000	07	032560	808	727.5	.899	2.52817	56.02	89.033	.927	4.025	37994	32951
94241000	07	032560	808	720.5	.867	2.57754	74.94	120.319	.946	4.316	38169	31943
94241000	01	032560	808	716.5	.831	2.60640	96.97	156.553	.957	4.574	5498	4413
94241000	01	032560	808	715.5	.839	2.61369	91.85	148.495	.960	4.520	5521	4475

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	032560	808	714.5	.804	2.62101	114.67	185.657	.963	4.742	5466	4243
94241000	01	032560	808	713.5	.784	2.62836	127.78	207.174	.966	4.850	5637	4268
94241000	01	032560	808	712.5	.770	2.63574	137.52	223.275	.969	4.923	5515	4099
94241000	01	032560	808	711.5	.708	2.64316	181.20	294.598	.971	5.199	5511	3770
94241000	01	032560	808	710.5	.669	2.65060	211.09	343.669	.974	5.352	5482	3544
94241000	01	032560	808	709.5	.653	2.65808	223.87	364.992	.977	5.411	5502	3471
94241000	01	032560	808	708.5	.633	2.66559	240.57	392.775	.980	5.483	5523	3376
94241000	01	032560	808	707.5	.584	2.67313	282.35	461.649	.983	5.643	5651	3191
94241000	01	032560	808	706.5	.610	2.68070	259.94	425.609	.986	5.560	5540	3264
94241000	01	032560	808	705.5	.624	2.68831	247.52	405.844	.988	5.511	5510	3324
94241000	01	032560	808	704.5	.639	2.69594	235.73	387.059	.991	5.462	5618	3466
94241000	01	032560	808	703.5	.695	2.70361	190.84	313.797	.994	5.251	5518	3708
94241000	01	032560	808	702.5	.716	2.71132	175.52	289.023	.997	5.167	5544	3835
94241000	01	032560	808	701.5	.731	2.71905	164.63	271.471	1.000	5.103	5749	4060
94241000	01	032560	808	700.5	.774	2.72682	134.21	221.629	1.003	4.899	5683	4253
94241000	01	032560	808	699.5	.841	2.73462	90.94	150.400	1.005	4.510	5609	4557
94241000	01	032560	808	698.5	.836	2.74246	93.88	155.475	1.008	4.542	5681	4590
94241000	C5	032560	808	695.5	.902	2.76617	53.82	89.521	1.017	3.985	28159	24553
94241000	C5	032560	808	690.5	.907	2.80637	51.09	85.589	1.031	3.933	28747	25200
94241000	C5	032560	808	685.5	.928	2.84746	39.11	66.006	1.046	3.666	28430	25500
94241000	C5	032560	808	680.5	.945	2.88946	29.77	50.606	1.061	3.393	28389	25925
94241000	C5	032560	808	675.5	.913	2.93239	47.87	81.977	1.075	3.868	28989	25583
94241000	C5	032560	808	670.5	.925	2.97629	40.77	70.343	1.090	3.708	28913	25868
94241000	C5	032560	808	665.5	.927	3.02118	39.79	69.163	1.105	3.683	29215	26191
94241000	C5	032560	808	660.5	.904	3.06709	52.63	92.178	1.120	3.963	29521	25831
94241000	C5	032560	808	655.5	.906	3.11406	51.90	91.590	1.135	3.949	29832	26143
94241000	C5	032560	808	650.5	.916	3.16212	45.94	81.692	1.151	3.827	29902	26506
94241000	C5	032560	808	645.5	.897	3.21130	57.11	102.358	1.166	4.045	30468	26444
94241000	C5	032560	808	640.5	.923	3.26163	42.17	76.163	1.182	3.741	30511	27248
94241000	C5	032560	808	635.5	.920	3.31315	43.87	79.860	1.197	3.781	30762	27387
94241000	C5	032560	808	630.5	.916	3.36591	45.76	83.961	1.213	3.823	31069	27564
94241000	C5	032560	808	625.5	.893	3.41994	59.55	110.128	1.229	4.086	31880	27555
94241000	C5	032560	808	620.5	.898	3.47528	56.27	104.903	1.245	4.030	31928	27773
94241000	C5	032560	808	615.5	.895	3.53197	58.11	109.209	1.261	4.062	32263	27971
94241000	C5	032560	808	610.5	.882	3.59006	65.69	124.477	1.278	4.185	32635	27893

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	05	032560	808	605.5	.890	3.64959	61.00	116.543	1.294	4.110	32688	28190
94241000	05	032560	808	600.5	.876	3.71062	69.62	134.115	1.311	4.243	32981	27985
94241000	05	032560	808	595.5	.853	3.77320	83.55	162.303	1.327	4.425	33385	27592
94241000	03	032560	808	591.5	.853	3.82440	83.16	162.646	1.341	4.420	20151	16669
94241000	03	032560	808	588.5	.849	3.86349	85.56	168.188	1.351	4.449	20263	16686
94241000	03	032560	808	585.5	.816	3.90318	106.75	210.904	1.361	4.670	20201	15981
94241000	03	032560	808	582.5	.803	3.94349	114.84	228.058	1.372	4.743	20295	15811
94241000	03	032560	808	579.5	.768	3.98443	138.30	276.071	1.382	4.929	20653	15389
94241000	03	032560	808	576.5	.754	4.02600	148.35	297.681	1.392	4.999	20415	14924
94241000	03	032560	808	573.5	.715	4.06823	176.41	355.816	1.403	5.172	20467	14188
94241000	01	032560	808	571.5	.671	4.09676	209.85	424.758	1.410	5.346	6886	4480
94241000	01	032560	808	570.5	.646	4.11113	230.00	466.348	1.413	5.438	6763	4235
94241000	01	032560	808	569.5	.617	4.12558	254.13	516.195	1.417	5.537	6834	4087
94241000	01	032560	808	568.5	.597	4.14011	270.91	551.238	1.420	5.601	6714	3890
94241000	01	032560	808	567.5	.508	4.15471	355.54	724.713	1.424	5.873	6881	3394
94241000	01	032560	808	566.5	.448	4.16940	421.58	860.835	1.427	6.044	6756	2940
94241000	01	032560	808	565.5	.386	4.18415	500.88	1024.574	1.431	6.216	6873	2573
94241000	01	032560	808	564.5	.297	4.19899	637.30	1305.932	1.434	6.457	6923	2000
94241000	01	032560	808	563.5	.229	4.21391	775.44	1591.811	1.438	6.653	6723	1494
94241000	01	032560	808	562.5	.136	4.22890	1050.18	2159.629	1.441	6.956	6801	897
94241000	01	032560	808	561.5	.104	4.24398	1189.10	2449.658	1.445	7.080	6768	685
94241000	01	032560	808	560.5	.073	4.25914	1376.69	2841.180	1.449	7.227	6822	484
94241000	01	032560	808	559.5	.051	4.27438	1558.56	3222.275	1.452	7.351	6837	343
94241000	01	032560	808	558.5	.045	4.28970	1625.52	3366.725	1.456	7.393	6909	305
94241000	01	032560	808	557.5	.064	4.30510	1446.50	3001.315	1.459	7.276	7087	440
94241000	01	032560	808	556.5	.094	4.32059	1243.47	2584.680	1.463	7.125	6910	631
94241000	01	032560	808	555.5	.133	4.33615	1059.40	2206.048	1.466	6.965	6794	880
94241000	01	032560	808	554.5	.189	4.35181	875.75	1826.904	1.470	6.775	6783	1246
94241000	01	032560	808	553.5	.246	4.36755	737.17	1540.593	1.474	6.602	7067	1689
94241000	01	032560	808	552.5	.314	4.38337	609.52	1276.132	1.477	6.412	6930	2111
94241000	01	032560	808	551.5	.352	4.39928	549.03	1151.573	1.481	6.308	7117	2432
94241000	01	032560	808	550.5	.400	4.41528	481.67	1012.119	1.485	6.177	7146	2775
94241000	01	032560	808	549.5	.415	4.43136	462.13	972.820	1.488	6.135	7066	2848
94241000	01	032560	808	548.5	.406	4.44754	473.54	998.670	1.492	6.160	7216	2846
94241000	01	032560	808	547.5	.421	4.46380	454.39	960.039	1.496	6.118	7091	2900

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	032560	808	546.5	.431	4.48015	442.84	937.333	1.499	6.093	7104	2970
94241000	01	032560	808	545.5	.386	4.49659	500.68	1061.719	1.503	6.215	7194	2695
94241000	01	032560	808	544.5	.381	4.51312	506.99	1077.068	1.506	6.228	7134	2641
94241000	01	032560	808	543.5	.366	4.52975	528.29	1124.390	1.510	6.269	7164	2547
94241000	01	032560	808	542.5	.364	4.54646	531.70	1133.726	1.514	6.276	7227	2552
94241000	01	032560	808	541.5	.361	4.56327	534.95	1142.752	1.518	6.282	7070	2482
94241000	01	032560	808	540.5	.358	4.58017	539.57	1154.769	1.521	6.290	7269	2529
94241000	01	032560	808	539.5	.372	4.59716	520.12	1115.208	1.525	6.254	7145	2580
94241000	01	032560	808	538.5	.402	4.61425	479.68	1030.396	1.529	6.173	7323	2855
94241000	01	032560	808	537.5	.454	4.63144	414.71	892.493	1.532	6.027	7284	3213
94241000	01	032560	808	536.5	.505	4.64872	359.63	775.394	1.536	5.885	7194	3524
94241000	01	032560	808	535.5	.593	4.66610	274.63	593.241	1.540	5.615	7198	4143
94241000	01	032560	808	534.5	.651	4.68358	225.64	488.321	1.544	5.418	7266	4591
94241000	01	032560	808	533.5	.719	4.70115	173.62	376.456	1.547	5.156	7147	4984
94241000	01	032560	808	532.5	.761	4.71882	143.25	311.199	1.551	4.964	7282	5380
94241000	01	032560	808	531.5	.787	4.73660	125.43	272.985	1.555	4.831	7405	5660
94241000	01	032560	808	530.5	.805	4.75447	114.08	248.766	1.559	4.736	7462	5828
94241000	01	032560	808	529.5	.861	4.77245	78.69	171.917	1.562	4.365	7324	6118
94241000	01	032560	808	528.5	.867	4.79052	75.12	164.426	1.566	4.319	7346	6178
94241000	01	032560	808	527.5	.880	4.80870	67.02	146.973	1.570	4.205	7319	6251
94241000	01	032560	808	526.5	.862	4.82699	77.54	170.578	1.574	4.352	7460	6244
94241000	01	032560	808	525.5	.888	4.84538	62.13	136.769	1.578	4.129	7464	6435
94241000	01	032560	808	524.5	.907	4.86387	51.22	112.964	1.581	3.936	7280	6408
94241000	01	032560	808	523.5	.852	4.88247	84.01	185.647	1.585	4.431	7382	6105
94241000	01	032560	808	522.5	.871	4.90118	72.37	160.228	1.589	4.281	7411	6266
94241000	01	032560	808	521.5	.859	4.91999	79.79	176.983	1.593	4.379	7437	6200
94241000	01	032560	808	520.5	.859	4.93891	79.79	177.325	1.597	4.379	7508	6260
94241000	01	032560	808	519.5	.863	4.95795	77.20	171.910	1.600	4.346	7345	6154
94241000	01	032560	808	518.5	.817	4.97709	106.00	236.482	1.604	4.663	7632	6054
94241000	01	032560	808	517.5	.865	4.99634	75.84	169.539	1.608	4.328	7400	6216
94241000	01	032560	808	516.5	.840	5.01571	91.71	205.398	1.612	4.518	7530	6138
94241000	01	032560	808	515.5	.809	5.03519	110.92	248.907	1.616	4.708	7642	6006
94241000	01	032560	808	514.5	.833	5.05478	95.63	215.015	1.620	4.560	7446	6025

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 908

Two inch effective B^{10}F_3 detector thickness.

Flight path of 16 meters.

Rotor speed of 3000 rev/min.

Channel width of 1 μsec .

SAMPLE THICKNESS

Isotope	barns/atom
Pu-239	5,404
Pu-240	4,014
Pu-241	538.8
Pu-242	78,927
Am-241	11,381
Oxygen	209.1

INSTRUMENT RESOLUTION * (Full width at half-maximum)

E (ev)	Width (μsec)
1.5	3.7
8.0	3.1

The data are quoted as barns/atom of Pu^{241} .

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241066	05	083160	908	626.0	.891	3.41447	62.11	114.782	1.228	4.129	24318	20915
94241066	05	083160	908	621.0	.898	3.46968	57.58	107.258	1.244	4.053	24586	21328
94241066	05	083160	908	616.0	.892	3.52623	61.01	114.576	1.260	4.111	24854	21428
94241066	05	083160	908	611.0	.885	3.58418	65.79	124.559	1.276	4.186	25124	21473
94241066	05	083160	908	606.0	.890	3.64357	62.43	119.184	1.292	4.134	25397	21845
94241066	05	083160	908	601.0	.879	3.70445	68.90	132.611	1.309	4.232	25675	21826
94241066	05	083160	908	596.0	.869	3.76686	75.37	146.289	1.326	4.322	25952	21802
94241066	03	083160	908	592.0	.846	3.81794	89.76	175.399	1.339	4.497	15704	12846
94241066	03	083160	908	589.0	.851	3.85693	86.92	170.718	1.349	4.465	15806	13000
94241066	03	083160	908	586.0	.813	3.89652	111.47	220.037	1.360	4.713	15908	12502
94241066	03	083160	908	583.0	.762	3.93673	146.24	290.172	1.370	4.985	16011	11799
94241066	03	083160	908	580.0	.563	3.97756	308.68	615.630	1.380	5.732	16115	8786
94241066	03	083160	908	577.0	.739	4.01903	162.55	325.876	1.391	5.090	16219	11599
94241066	03	083160	908	574.0	.727	4.06115	171.26	345.138	1.401	5.143	16324	11488
94241066	01	083160	908	572.0	.692	4.08960	197.67	399.743	1.408	5.286	5464	3661
94241066	01	083160	908	571.0	.662	4.10393	222.11	449.970	1.411	5.403	5476	3507
94241066	01	083160	908	570.0	.622	4.11835	255.75	519.026	1.415	5.544	5488	3302
94241066	01	083160	908	569.0	.599	4.13283	275.55	560.194	1.418	5.618	5500	3190
94241066	01	083160	908	568.0	.550	4.14740	321.41	654.563	1.422	5.772	5511	2936
94241066	01	083160	908	567.0	.475	4.16204	400.57	817.218	1.426	5.992	5523	2540
94241066	01	083160	908	566.0	.408	4.17676	482.85	986.819	1.429	6.179	5535	2185
94241066	01	083160	908	565.0	.325	4.19156	605.20	1239.061	1.433	6.405	5547	1745
94241066	01	083160	908	564.0	.236	4.20644	777.13	1593.871	1.436	6.655	5559	1271
94241066	01	083160	908	563.0	.148	4.22139	1029.07	2114.348	1.440	6.936	5571	798
94241066	01	083160	908	562.0	.106	4.23643	1207.23	2484.806	1.443	7.096	5583	575
94241066	01	083160	908	561.0	.077	4.25155	1377.39	2840.082	1.447	7.227	5594	420
94241066	01	083160	908	560.0	.051	4.26674	1597.63	3300.081	1.450	7.376	5606	280
94241066	01	083160	908	559.0	.061	4.28202	1503.35	3110.895	1.454	7.315	5618	334
94241066	01	083160	908	558.0	.072	4.29738	1414.13	2931.515	1.458	7.254	5630	395
94241066	01	083160	908	557.0	.096	4.31283	1261.26	2619.322	1.461	7.139	5642	525
94241066	01	083160	908	556.0	.128	4.32836	1105.92	2300.843	1.465	7.008	5654	703
94241066	01	083160	908	555.0	.170	4.34397	952.71	1985.667	1.468	6.859	5667	936
94241066	01	083160	908	554.0	.213	4.35966	831.73	1736.644	1.472	6.723	5679	1174
94241066	01	083160	908	553.0	.273	4.37545	698.35	1460.783	1.476	6.548	5691	1507
94241066	01	083160	908	552.0	.326	4.39131	603.10	1263.826	1.479	6.402	5703	1802

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241066	01	083160	908	551.0	.386	4.40727	512.15	1075.201	1.483	6.238	5715	2138
94241066	01	083160	908	550.0	.398	4.42331	495.15	1041.398	1.486	6.204	5728	2212
94241066	01	083160	908	549.0	.426	4.43944	459.15	967.447	1.490	6.129	5740	2369
94241066	01	083160	908	548.0	.412	4.45565	477.27	1007.456	1.494	6.168	5752	2296
94241066	01	083160	908	547.0	.426	4.47196	459.55	971.823	1.497	6.130	5763	2377
94241066	01	083160	908	546.0	.411	4.48836	478.15	1013.016	1.501	6.169	5776	2302
94241066	01	083160	908	545.0	.400	4.50484	493.27	1045.965	1.505	6.201	5788	2243
94241066	01	083160	908	544.0	.392	4.52142	503.30	1070.207	1.508	6.221	5800	2206
94241066	01	083160	908	543.0	.348	4.53809	568.17	1210.380	1.512	6.342	5813	1960
94241066	01	083160	908	542.0	.340	4.55485	579.76	1237.346	1.516	6.362	5825	1923
94241066	01	083160	908	541.0	.358	4.57170	552.34	1181.001	1.519	6.314	5837	2027
94241066	01	083160	908	540.0	.383	4.58865	516.02	1105.391	1.523	6.246	5850	2174
94241066	01	083160	908	539.0	.387	4.60569	510.78	1096.185	1.527	6.235	5863	2200
94241066	01	083160	908	538.0	.422	4.62283	464.16	997.982	1.531	6.140	5874	2403
94241066	01	083160	908	537.0	.487	4.64006	387.28	834.232	1.534	5.959	5887	2778
94241066	01	083160	908	536.0	.567	4.65739	305.34	658.971	1.538	5.721	5899	3241
94241066	01	083160	908	535.0	.606	4.67482	269.07	581.767	1.542	5.594	5912	3475
94241066	01	083160	908	534.0	.683	4.69235	205.39	444.919	1.545	5.324	5925	3919
94241066	01	083160	908	533.0	.731	4.70997	168.69	366.116	1.549	5.128	5937	4204
94241066	01	083160	908	532.0	.791	4.72769	125.71	273.343	1.553	4.834	5949	4563
94241066	01	083160	908	531.0	.809	4.74552	113.89	248.113	1.557	4.735	5962	4674
94241066	01	083160	908	530.0	.848	4.76344	88.70	193.606	1.560	4.485	5975	4909
94241066	01	083160	908	529.0	.853	4.78147	85.53	187.040	1.564	4.448	5988	4949
94241066	01	083160	908	528.0	.849	4.79960	87.91	192.602	1.568	4.476	5998	4935
94241066	01	083160	908	527.0	.855	4.81783	84.23	184.899	1.572	4.433	6011	4980
94241066	01	083160	908	526.0	.850	4.83616	87.39	192.197	1.576	4.470	6024	4962
94241066	01	083160	908	525.0	.869	4.85461	75.17	165.623	1.579	4.319	6036	5086
94241066	01	083160	908	524.0	.843	4.87315	91.94	202.977	1.583	4.521	6049	4941
94241066	01	083160	908	523.0	.831	4.89181	99.26	219.553	1.587	4.597	6062	4885
94241066	01	083160	908	522.0	.824	4.91057	103.97	230.413	1.591	4.644	6074	4852
94241066	01	083160	908	521.0	.839	4.92943	94.26	209.292	1.595	4.546	6087	4951
94241066	01	083160	908	520.0	.825	4.94841	103.36	229.933	1.599	4.638	6101	4879
94241066	01	083160	908	519.0	.817	4.96750	108.82	242.552	1.602	4.689	6113	4840
94241066	01	083160	908	518.0	.801	4.98670	119.00	265.738	1.606	4.779	6126	4760
94241066	01	083160	908	517.0	.831	5.00601	99.37	222.347	1.610	4.598	6139	4947

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241066	01	083160	908	516.0	.793	5.02543	124.38	278.840	1.614	4.823	6151	4732
94241066	01	083160	908	515.0	.809	5.04496	114.03	256.141	1.618	4.736	6165	4834
94241066	01	083160	908	514.0	.791	5.06461	125.66	282.805	1.622	4.833	6177	4740
94241066	01	083160	908	513.0	.796	5.08438	122.84	277.002	1.626	4.810	6190	4775
94241066	01	083160	908	512.0	.805	5.10426	116.37	262.928	1.630	4.756	6203	4843
94241066	01	083160	908	511.0	.772	5.12426	139.39	315.553	1.633	4.937	6216	4650
94241066	01	083160	908	510.0	.800	5.14437	119.90	271.961	1.637	4.786	6230	4833
94241066	01	083160	908	509.0	.797	5.16460	122.24	277.800	1.641	4.805	6242	4821
94241066	01	083160	908	508.0	.783	5.18496	131.19	298.731	1.645	4.876	6256	4752
94241066	01	083160	908	507.0	.765	5.20543	143.66	327.771	1.649	4.967	6268	4653
94241066	01	083160	908	506.0	.744	5.22603	159.30	364.189	1.653	5.070	6282	4530
94241066	01	083160	908	505.0	.737	5.24674	163.77	375.141	1.657	5.098	6295	4501
94241066	01	083160	908	504.0	.727	5.26758	171.10	392.702	1.661	5.142	6307	4449
94241066	01	083160	908	503.0	.717	5.28855	178.55	410.618	1.665	5.184	6321	4398
94241066	01	083160	908	502.0	.697	5.30964	194.34	447.820	1.669	5.269	6334	4280
94241066	01	083160	908	501.0	.667	5.33086	218.12	503.621	1.673	5.385	6347	4103
94241066	01	083160	908	500.0	.632	5.35220	246.50	570.280	1.677	5.507	6360	3901
94241066	01	083160	908	499.0	.602	5.37368	273.32	633.589	1.681	5.610	6374	3720
94241066	01	083160	908	498.0	.584	5.39528	289.65	672.799	1.685	5.668	6387	3616
94241066	01	083160	908	497.0	.569	5.41701	303.75	706.978	1.689	5.716	6400	3530
94241066	01	083160	908	496.0	.588	5.43888	286.03	667.079	1.693	5.656	6414	3656
94241066	01	083160	908	495.0	.577	5.46087	295.39	690.289	1.697	5.688	6426	3600
94241066	01	083160	908	494.0	.602	5.48301	273.20	639.723	1.701	5.610	6439	3759
94241066	01	083160	908	493.0	.582	5.50527	291.59	684.174	1.705	5.675	6453	3640
94241066	01	083160	908	492.0	.600	5.52767	274.42	645.208	1.709	5.614	6467	3766
94241066	01	083160	908	491.0	.594	5.55021	280.52	660.886	1.713	5.636	6480	3732
94241066	01	083160	908	490.0	.584	5.57289	289.29	682.945	1.717	5.667	6494	3679
94241066	01	083160	908	489.0	.587	5.59571	286.33	677.328	1.722	5.657	6506	3706
94241066	01	083160	908	488.0	.584	5.61866	289.10	685.279	1.726	5.666	6519	3695
94241066	01	083160	908	487.0	.562	5.64176	310.33	737.122	1.730	5.737	6532	3559
94241066	01	083160	908	486.0	.558	5.66500	313.69	746.634	1.734	5.748	6546	3545
94241066	01	083160	908	485.0	.549	5.68839	323.01	770.392	1.738	5.777	6560	3491
94241066	01	083160	908	484.0	.535	5.71192	336.79	804.920	1.742	5.819	6573	3410
94241066	01	083160	908	483.0	.515	5.73559	356.87	854.678	1.746	5.877	6586	3292
94241066	01	083160	908	482.0	.500	5.75942	372.89	894.908	1.750	5.921	6601	3203

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241066	01	083160	908	481.0	.508	5.78339	364.10	875.612	1.754	5.897	6614	3262
94241066	01	083160	908	480.0	.473	5.80751	402.69	970.453	1.759	5.998	6628	3043
94241066	01	083160	908	479.0	.490	5.83179	383.70	926.615	1.763	5.949	6641	3158
94241066	01	083160	908	478.0	.475	5.85621	399.00	965.572	1.767	5.988	6654	3076
94241066	01	083160	908	477.0	.463	5.88079	414.24	1004.553	1.771	6.026	6668	2996
94241066	01	083160	908	476.0	.470	5.90553	406.46	987.763	1.775	6.007	6683	3047
94241066	01	083160	908	475.0	.459	5.93042	418.94	1020.239	1.780	6.037	6696	2983
94241066	01	083160	908	474.0	.440	5.95547	442.05	1078.776	1.784	6.091	6710	2864
94241066	01	083160	908	473.0	.441	5.98068	440.00	1076.046	1.788	6.086	6723	2880
94241066	01	083160	908	472.0	.439	6.00604	442.75	1085.079	1.792	6.093	6737	2871
94241066	01	083160	908	471.0	.428	6.03157	456.57	1121.319	1.797	6.123	6751	2805
94241066	01	083160	908	470.0	.451	6.05727	428.69	1055.071	1.801	6.060	6765	2960
94241066	01	083160	908	469.0	.434	6.08313	449.67	1109.086	1.805	6.108	6778	2852
94241066	01	083160	908	468.0	.433	6.10915	449.87	1111.942	1.809	6.108	6792	2857
94241066	01	083160	908	467.0	.432	6.13534	451.71	1118.886	1.814	6.113	6806	2853
94241066	01	083160	908	466.0	.417	6.16170	471.26	1169.798	1.818	6.155	6820	2757
94241066	01	083160	908	465.0	.438	6.18823	444.31	1105.277	1.822	6.096	6834	2905
94241066	01	083160	908	464.0	.448	6.21493	432.44	1078.070	1.826	6.069	6848	2975
94241066	01	083160	908	463.0	.455	6.24181	423.11	1057.087	1.831	6.047	6862	3034
94241066	01	083160	908	462.0	.457	6.26886	421.11	1054.385	1.835	6.042	6876	3051
94241066	01	083160	908	461.0	.462	6.29609	414.90	1041.075	1.839	6.028	6890	3093
94241066	01	083160	908	460.0	.474	6.32349	401.99	1010.871	1.844	5.996	6904	3174
94241066	01	083160	908	459.0	.494	6.35107	379.89	957.378	1.848	5.939	6918	3314
94241066	01	083160	908	458.0	.492	6.37884	381.21	962.821	1.852	5.943	6931	3312
94241066	01	083160	908	457.0	.503	6.40678	369.21	934.551	1.857	5.911	6945	3393
94241066	01	083160	908	456.0	.521	6.43492	350.65	889.507	1.861	5.859	6959	3520
94241066	01	083160	908	455.0	.509	6.46323	363.82	924.535	1.866	5.896	6974	3442
94241066	01	083160	908	454.0	.509	6.49174	363.08	925.093	1.870	5.894	6988	3454
94241066	01	083160	908	453.0	.532	6.52043	339.54	867.025	1.874	5.827	7001	3615
94241066	01	083160	908	452.0	.531	6.54931	340.55	871.523	1.879	5.830	7016	3616
94241066	01	083160	908	451.0	.531	6.57839	340.75	873.989	1.883	5.831	7030	3622
94241066	01	083160	908	449.0	.541	6.63712	330.85	852.361	1.892	5.801	7059	3704
94241066	01	083160	908	448.0	.500	6.66679	373.08	963.315	1.897	5.921	7073	3432
94241066	01	083160	908	447.0	.509	6.69665	363.15	939.758	1.901	5.894	7087	3502
94241066	01	083160	908	446.0	.510	6.72671	361.83	938.447	1.906	5.891	7101	3518

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241066	01	083160	908	445.0	.485	6.75698	389.14	1011.538	1.910	5.963	7116	3351
94241066	01	083160	908	444.0	.424	6.78745	461.78	1203.087	1.915	6.135	7130	2934
94241066	01	083160	908	443.0	.377	6.81813	525.13	1371.217	1.919	6.263	7145	2614
94241066	01	083160	908	442.0	.321	6.84901	610.85	1598.632	1.924	6.414	7159	2234
94241066	01	083160	908	441.0	.265	6.88011	715.49	1876.743	1.928	6.572	7173	1843
94241066	01	083160	908	440.0	.236	6.91142	776.83	2042.264	1.933	6.655	7188	1649
94241066	01	083160	908	439.0	.227	6.94294	796.91	2099.825	1.937	6.680	7202	1591
94241066	01	083160	908	438.0	.252	6.97468	741.36	1957.917	1.942	6.608	7217	1768
94241066	01	083160	908	437.0	.297	7.00664	652.76	1727.870	1.946	6.481	7231	2088
94241066	01	083160	908	436.0	.365	7.03882	542.10	1438.239	1.951	6.295	7245	2569
94241066	01	083160	908	435.0	.452	7.07121	427.76	1137.510	1.956	6.058	7260	3183
94241066	01	083160	908	434.0	.520	7.10384	351.90	937.941	1.960	5.863	7275	3672
94241066	01	083160	908	433.0	.584	7.13669	289.51	773.425	1.965	5.668	7289	4130
94241066	01	083160	908	432.0	.639	7.16977	240.68	644.458	1.969	5.483	7303	4531
94241066	01	083160	908	431.0	.650	7.20308	231.61	621.632	1.974	5.445	7318	4617
94241066	01	083160	908	430.0	.682	7.23662	205.93	553.985	1.979	5.327	7332	4852
94241066	01	083160	908	429.0	.686	7.27039	202.53	546.100	1.983	5.310	7347	4893
94241066	01	083160	908	428.0	.730	7.30441	169.41	457.883	1.988	5.132	7361	5213
94241066	01	083160	908	427.0	.734	7.33866	166.52	451.105	1.993	5.115	7376	5252
94241066	01	083160	908	426.0	.729	7.37315	169.88	461.290	1.997	5.135	7392	5231
94241066	01	083160	908	425.0	.748	7.40789	155.73	423.860	2.002	5.048	7406	5380
94241066	01	083160	908	424.0	.748	7.44288	155.75	424.923	2.007	5.048	7421	5391
94241066	01	083160	908	423.0	.753	7.47811	152.71	417.611	2.011	5.028	7435	5432
94241066	01	083160	908	422.0	.764	7.51359	144.71	396.672	2.016	4.974	7451	5525
94241066	01	083160	908	421.0	.591	7.54933	283.35	778.542	2.021	5.646	7465	4279
94241066	01	083160	908	420.0	.777	7.58532	135.66	373.644	2.026	4.910	7480	5640
94241066	01	083160	908	419.0	.744	7.62157	158.77	438.341	2.030	5.067	7495	5414
94241066	01	083160	908	418.0	.721	7.65808	176.02	487.110	2.035	5.170	7510	5254
94241066	01	083160	908	417.0	.717	7.69485	179.01	496.591	2.040	5.187	7524	5235
94241066	01	083160	908	416.0	.675	7.73189	211.71	588.709	2.045	5.355	7540	4937
94241066	01	083160	908	415.0	.665	7.76920	219.71	612.415	2.050	5.392	7555	4874
94241066	01	083160	908	414.0	.640	7.80678	240.14	670.977	2.054	5.481	7569	4702
94241066	01	083160	908	413.0	.675	7.84463	211.23	591.624	2.059	5.352	7585	4971
94241066	01	083160	908	412.0	.674	7.88276	212.43	596.441	2.064	5.358	7599	4969
94241066	01	083160	908	411.0	.707	7.92116	186.19	524.040	2.069	5.226	7615	5229

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241066	01	083160	908	410.0	.743	7.95985	159.96	451.324	2.074	5.074	7630	5500
94241066	01	083160	908	409.0	.752	7.99882	153.33	433.671	2.079	5.032	7643	5578
94241066	01	083160	908	408.0	.793	8.03808	120.95	342.914	2.084	4.795	7659	5936
94241066	01	083160	908	407.0	.785	8.07763	129.09	366.906	2.089	4.860	7674	5858
94241066	01	083160	908	406.0	.783	8.11747	131.57	374.881	2.094	4.879	7689	5843
94241066	01	083160	908	405.0	.792	8.15760	125.23	357.690	2.098	4.830	7705	5924
94241066	01	083160	908	404.0	.757	8.19804	149.65	428.496	2.103	5.008	7719	5672
94241066	01	083160	908	403.0	.772	8.23877	139.12	399.328	2.108	4.935	7734	5796
94241066	01	083160	908	402.0	.756	8.27981	150.61	433.398	2.113	5.014	7750	5685
94241066	01	083160	908	401.0	.728	8.32116	170.75	492.556	2.118	5.140	7765	5487
94241066	01	083160	908	400.0	.688	8.36282	201.15	581.711	2.123	5.304	7780	5196
94241066	01	083160	908	399.0	.680	8.40479	207.14	600.534	2.128	5.333	7795	5149
94241066	01	083160	908	398.0	.595	8.44708	279.57	812.547	2.133	5.633	7811	4510
94241066	01	083160	908	397.0	.475	8.48968	400.28	1166.316	2.138	5.992	7826	3612
94241066	01	083160	908	396.0	.397	8.53262	497.62	1453.504	2.143	6.209	7842	3021
94241066	01	083160	908	395.0	.304	8.57587	641.45	1878.483	2.148	6.463	7857	2318
94241066	01	083160	908	394.0	.276	8.61946	692.06	2031.813	2.154	6.539	7872	2114
94241066	01	083160	908	393.0	.295	8.66338	657.51	1935.305	2.159	6.488	7888	2259
94241066	01	083160	908	392.0	.387	8.70764	510.94	1507.730	2.164	6.236	7904	2971
94241066	01	083160	908	391.0	.518	8.75224	353.89	1046.961	2.169	5.868	7919	3984
94241066	01	083160	908	390.0	.593	8.79718	281.19	834.031	2.174	5.639	7934	4568
94241066	01	083160	908	389.0	.694	8.84246	196.58	584.559	2.179	5.281	7949	5355

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 948

Two inch B^{10}F_3 detector thickness.

Flight path of 16 meters.

Rotor speed of 3000 rev/minute.

Channel width of 2 μsec .

SAMPLE THICKNESS

Isotope	barns/atom
Pu-239	5,404
Pu-240	4,014
Pu-241	516.6
Pu-242	78,927
Am-241	119,628
Oxygen	209.1

INSTRUMENT RESOLUTION* (Full width at half-maximum)

E (ev)	Width (μsec)
1.5	4.0
8.0	3.5

The data are quoted as barns/atom of Pu^{241} .

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	08	111359	948	820.0	.942	1.97606	30.54	42.942	.681	3.419	53240	47623
94241000	08	111359	948	812.0	.942	2.01519	30.77	43.689	.700	3.426	53948	48168
94241000	08	111359	948	804.0	.936	2.05549	34.14	48.958	.720	3.530	54562	48440
94241000	08	111359	948	796.0	.936	2.09701	33.99	49.223	.740	3.526	55073	48950
94241000	08	111359	948	788.0	.941	2.13981	31.01	45.363	.760	3.434	54941	49153
94241000	08	111359	948	780.0	.940	2.18393	31.49	46.544	.781	3.449	55660	49790
94241000	08	111359	948	772.0	.941	2.22942	31.30	46.741	.801	3.443	55768	49941
94241000	08	111359	948	764.0	.932	2.27636	36.12	54.498	.822	3.586	56625	50276
94241000	08	111359	948	756.0	.937	2.32479	33.33	50.831	.843	3.506	56772	50714
94241000	08	111359	948	748.0	.931	2.37478	36.58	56.383	.864	3.599	57228	50836
94241000	08	111359	948	740.0	.928	2.42641	38.24	59.572	.886	3.643	57725	51146
94241000	08	111359	948	732.0	.931	2.47973	36.59	57.628	.908	3.599	58035	51624
94241000	08	111359	948	724.0	.912	2.53484	47.20	75.153	.930	3.854	58805	51261
94241000	02	111359	948	719.0	.897	2.57021	56.09	89.926	.943	4.026	14588	12503
94241000	02	111359	948	717.0	.860	2.58457	77.90	125.251	.949	4.355	14794	12155
94241000	02	111359	948	715.0	.880	2.59905	65.76	106.022	.955	4.186	14674	12345
94241000	02	111359	948	713.0	.822	2.61365	100.70	162.808	.960	4.612	14804	11641
94241000	02	111359	948	711.0	.761	2.62838	140.54	227.849	.966	4.945	14938	10874
94241000	02	111359	948	709.0	.697	2.64323	186.04	302.466	.972	5.225	14844	9899
94241000	02	111359	948	707.0	.630	2.65820	238.53	388.902	.977	5.474	14813	8922
94241000	02	111359	948	705.0	.600	2.67331	263.26	430.448	.983	5.573	14862	8535
94241000	02	111359	948	703.0	.638	2.68854	231.45	379.505	.988	5.444	14879	9086
94241000	02	111359	948	701.0	.713	2.70390	174.32	286.649	.994	5.160	14626	9978
94241000	02	111359	948	699.0	.762	2.71940	140.25	231.289	1.000	4.943	14973	10910
94241000	06	111359	948	695.0	.858	2.75079	78.95	130.953	1.011	4.368	44803	36772
94241000	06	111359	948	689.0	.907	2.79891	50.39	84.316	1.029	3.919	44917	38964
94241000	06	111359	948	683.0	.913	2.84830	46.95	79.244	1.046	3.849	45383	39644
94241000	06	111359	948	677.0	.910	2.89901	48.40	82.422	1.064	3.879	45635	39757
94241000	06	111359	948	671.0	.919	2.95109	43.44	74.636	1.082	3.771	45449	39988
94241000	06	111359	948	665.0	.911	3.00458	48.01	83.223	1.100	3.871	46107	40213
94241000	06	111359	948	659.0	.916	3.05954	44.96	78.656	1.118	3.805	46050	40413
94241000	06	111359	948	653.0	.924	3.11602	40.31	71.162	1.136	3.696	46052	40791
94241000	06	111359	948	647.0	.916	3.17409	45.18	80.493	1.155	3.810	46477	40789
94241000	06	111359	948	641.0	.904	3.23378	51.59	92.780	1.173	3.943	46893	40658
94241000	06	111359	948	635.0	.895	3.29518	56.87	103.241	1.192	4.040	47137	40463

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	06	111359	948	629.0	.906	3.35835	50.46	92.483	1.211	3.921	46944	40807
94241000	06	111359	948	623.0	.900	3.42335	54.40	100.656	1.230	3.996	47102	40644
94241000	06	111359	948	617.0	.889	3.49025	60.43	112.898	1.249	4.101	47937	40896
94241000	06	111359	948	611.0	.892	3.55914	58.98	111.285	1.269	4.077	47513	40658
94241000	06	111359	948	605.0	.873	3.63008	69.68	132.765	1.289	4.243	48143	40357
94241000	06	111359	948	599.0	.873	3.70317	69.95	134.613	1.309	4.247	48057	40275
94241000	04	111359	948	594.0	.852	3.76577	82.40	159.906	1.325	4.411	32190	26344
94241000	04	111359	948	590.0	.854	3.81701	81.46	159.162	1.339	4.400	32154	26364
94241000	04	111359	948	586.0	.820	3.86930	101.89	200.429	1.353	4.623	32608	25702
94241000	04	111359	948	582.0	.813	3.92266	106.47	210.887	1.366	4.667	32471	25375
94241000	04	111359	948	578.0	.789	3.97715	122.41	244.120	1.380	4.807	32355	24519
94241000	04	111359	948	574.0	.746	4.03277	151.17	303.588	1.394	5.018	32514	23307
94241000	02	111359	948	571.0	.685	4.07526	195.07	393.799	1.404	5.273	16232	10689
94241000	02	111359	948	569.0	.655	4.10396	218.16	441.964	1.411	5.385	15836	9975
94241000	02	111359	948	567.0	.569	4.13296	290.68	590.955	1.418	5.672	15881	8694
94241000	02	111359	948	565.0	.452	4.16227	410.16	836.812	1.426	6.016	15837	6882
94241000	02	111359	948	563.0	.287	4.19189	643.47	1317.453	1.433	6.466	15978	4420
94241000	02	111359	948	561.0	.134	4.22184	1034.69	2126.004	1.440	6.941	15814	2051
94241000	02	111359	948	559.0	.057	4.25210	1477.24	3046.173	1.447	7.297	15848	872
94241000	02	111359	948	557.0	.046	4.28269	1588.92	3288.224	1.454	7.370	16011	711
94241000	02	111359	948	555.0	.079	4.31361	1310.34	2721.484	1.461	7.178	16135	1228
94241000	02	111359	948	553.0	.170	4.34487	913.56	1904.257	1.468	6.817	16254	2666
94241000	02	111359	948	551.0	.292	4.37647	635.83	1330.164	1.476	6.454	16394	4601
94241000	02	111359	948	549.0	.382	4.40841	496.40	1042.254	1.483	6.207	16411	6036
94241000	02	111359	948	547.0	.400	4.44071	472.73	996.184	1.490	6.158	16510	6358
94241000	02	111359	948	545.0	.399	4.47336	474.21	1002.978	1.498	6.161	16560	6358
94241000	02	111359	948	543.0	.368	4.50638	516.24	1095.895	1.505	6.246	16456	5825
94241000	02	111359	948	541.0	.345	4.53976	549.54	1170.891	1.512	6.309	16581	5505
94241000	02	111359	948	539.0	.346	4.57351	547.34	1170.535	1.520	6.305	16401	5467
94241000	02	111359	948	537.0	.389	4.60764	486.47	1044.245	1.527	6.187	16686	6257
94241000	02	111359	948	535.0	.507	4.64215	350.67	755.561	1.535	5.859	16494	8048
94241000	02	111359	948	533.0	.624	4.67706	243.26	526.104	1.542	5.494	16719	10041
94241000	02	111359	948	531.0	.748	4.71236	149.47	324.486	1.550	5.007	16609	11965
94241000	02	111359	948	529.0	.809	4.74806	109.43	238.466	1.557	4.695	16652	12960
94241000	02	111359	948	527.0	.861	4.78416	77.11	168.678	1.565	4.345	16586	13745

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	02	111359	948	525.0	.866	4.82068	74.07	162.646	1.572	4.305	16693	13918
94241000	02	111359	948	523.0	.890	4.85762	59.77	131.740	1.580	4.090	16456	14108
94241000	01	111359	948	521.0	.841	4.89499	89.12	197.175	1.588	4.489	6513	5212
94241000	02	111359	948	519.0	.842	4.93279	88.79	197.222	1.595	4.486	17033	13807
94241000	01	111359	948	517.0	.835	4.97103	92.53	206.323	1.603	4.527	6573	5227
94241000	02	111359	948	515.0	.826	5.00971	98.29	220.017	1.611	4.588	16725	13310
94241000	01	111359	948	513.0	.809	5.04885	108.98	244.894	1.619	4.691	6493	5001
94241000	01	111359	948	511.0	.781	5.08845	127.58	287.792	1.626	4.848	6617	4917
94241000	01	111359	948	509.0	.779	5.12851	128.99	292.123	1.634	4.859	6535	4842
94241000	01	111359	948	507.0	.770	5.16906	134.55	305.909	1.642	4.901	6485	4754
94241000	01	111359	948	505.0	.764	5.21008	138.87	316.997	1.650	4.933	6516	4737
94241000	01	111359	948	503.0	.737	5.25159	157.08	359.988	1.658	5.056	6476	4545
94241000	01	111359	948	501.0	.697	5.29361	185.82	427.534	1.666	5.224	6481	4303
94241000	01	111359	948	499.0	.695	5.33613	186.91	431.779	1.674	5.230	6568	4351
94241000	01	111359	948	497.0	.665	5.37916	210.28	487.724	1.682	5.348	6576	4163
94241000	01	111359	948	495.0	.644	5.42271	226.89	528.371	1.690	5.424	6524	4001
94241000	01	111359	948	493.0	.612	5.46680	253.55	592.835	1.698	5.535	6595	3841
94241000	01	111359	948	491.0	.596	5.51143	266.75	626.253	1.706	5.586	6568	3728
94241000	01	111359	948	489.0	.583	5.55660	278.20	655.807	1.714	5.628	6549	3636
94241000	01	111359	948	487.0	.576	5.60234	284.23	672.751	1.723	5.649	6364	3493
94241000	01	111359	948	485.0	.526	5.64864	331.42	787.693	1.731	5.803	6610	3311
94241000	01	111359	948	483.0	.512	5.69551	345.57	824.724	1.739	5.845	6530	3183
94241000	01	111359	948	481.0	.488	5.74298	370.60	888.127	1.747	5.915	6598	3064
94241000	01	111359	948	479.0	.473	5.79103	386.73	930.654	1.756	5.957	6450	2903
94241000	01	111359	948	477.0	.450	5.83970	411.48	994.363	1.764	6.019	6751	2896
94241000	01	111359	948	475.0	.459	5.88898	401.76	974.977	1.773	5.995	6536	2857
94241000	01	111359	948	473.0	.430	5.93888	434.80	1059.622	1.781	6.074	6680	2739
94241000	01	111359	948	471.0	.430	5.98943	435.87	1066.733	1.789	6.077	6545	2678
94241000	01	111359	948	469.0	.423	6.04062	443.26	1089.440	1.798	6.094	6769	2730
94241000	01	111359	948	467.0	.419	6.09247	448.29	1106.523	1.807	6.105	6659	2661
94241000	01	111359	948	465.0	.431	6.14499	434.42	1076.888	1.815	6.074	6617	2716
94241000	01	111359	948	463.0	.417	6.19819	451.72	1124.625	1.824	6.113	6677	2650
94241000	01	111359	948	461.0	.454	6.25209	406.91	1017.453	1.832	6.008	6652	2880
94241000	01	111359	948	459.0	.475	6.30669	383.68	963.543	1.841	5.949	6660	3016
94241000	01	111359	948	457.0	.480	6.36202	378.27	954.125	1.850	5.935	6547	2996

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	111359	948	455.0	.494	6.41807	364.06	922.306	1.859	5.897	6430	3025
94241000	01	111359	948	453.0	.489	6.47487	368.55	937.814	1.867	5.909	6776	3160
94241000	01	111359	948	451.0	.517	6.53242	339.90	868.760	1.876	5.828	6760	3332
94241000	01	111359	948	449.0	.515	6.59074	342.20	878.516	1.885	5.835	6664	3270
94241000	01	111359	948	447.0	.501	6.64985	356.80	920.099	1.894	5.877	6464	3084
94241000	01	111359	948	445.0	.489	6.70976	368.68	954.999	1.903	5.909	6696	3122
94241000	01	111359	948	443.0	.431	6.77048	434.40	1130.318	1.912	6.073	6684	2744
94241000	01	111359	948	441.0	.310	6.83203	604.50	1580.075	1.921	6.404	6835	2018
94241000	01	111359	948	439.0	.225	6.89443	768.59	2018.124	1.930	6.644	6672	1435
94241000	01	111359	948	437.0	.228	6.95768	762.85	2012.222	1.939	6.637	6699	1456
94241000	01	111359	948	435.0	.341	7.02180	554.45	1469.241	1.949	6.317	6666	2169
94241000	01	111359	948	433.0	.494	7.08682	363.83	968.576	1.958	5.896	6676	3142
94241000	01	111359	948	431.0	.606	7.15274	258.72	691.945	1.967	5.555	6828	3939
94241000	01	111359	948	429.0	.668	7.21959	208.38	559.918	1.976	5.339	6709	4266
94241000	01	111359	948	427.0	.706	7.28738	179.74	485.232	1.986	5.191	6680	4490
94241000	01	111359	948	425.0	.716	7.35613	172.43	467.676	1.995	5.150	6614	4510
94241000	01	111359	948	423.0	.760	7.42585	141.51	385.621	2.004	4.952	6690	4843
94241000	01	111359	948	421.0	.741	7.49658	154.73	423.668	2.014	5.041	6792	4792
94241000	01	111359	948	419.0	.749	7.56831	148.64	408.925	2.023	5.001	6599	4712
94241000	01	111359	948	417.0	.748	7.64108	149.91	414.397	2.033	5.010	6519	4643
94241000	01	111359	948	415.0	.710	7.71491	176.65	490.667	2.043	5.174	6550	4430
94241000	01	111359	948	413.0	.670	7.78981	206.88	577.418	2.052	5.332	6694	4270
94241000	01	111359	948	411.0	.700	7.86581	183.69	515.186	2.062	5.213	6657	4442
94241000	01	111359	948	409.0	.740	7.94293	154.95	436.718	2.072	5.043	6722	4742
94241000	01	111359	948	407.0	.782	8.02118	126.45	358.136	2.082	4.839	6798	5068
94241000	01	111359	948	405.0	.794	8.10060	119.13	339.068	2.091	4.780	6623	5008
94241000	01	111359	948	403.0	.761	8.18120	140.80	402.730	2.101	4.947	6954	5042
94241000	01	111359	948	401.0	.758	8.26301	142.85	410.646	2.111	4.961	6689	4830
94241000	01	111359	948	399.0	.676	8.34606	201.59	582.405	2.121	5.306	6778	4369
94241000	01	111359	948	397.0	.560	8.43036	298.83	867.661	2.131	5.699	6830	3647
94241000	01	111359	948	395.0	.360	8.51595	527.60	1539.648	2.141	6.268	6842	2346
94241000	01	111359	948	393.0	.272	8.60284	671.76	1970.327	2.152	6.509	6820	1769
94241000	01	111359	948	391.0	.389	8.69108	487.57	1437.402	2.162	6.189	6851	2539
94241000	01	111359	948	389.0	.604	8.78068	260.25	771.202	2.172	5.561	6893	3966
94241000	01	111359	948	387.0	.702	8.87167	182.19	542.683	2.182	5.205	6827	4569

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	111359	948	385.0	.746	8.96408	150.88	451.754	2.193	5.016	6617	4706
94241000	01	111359	948	383.0	.759	9.05794	142.02	427.453	2.203	4.956	6752	4885
94241000	01	111359	948	381.0	.745	9.15329	151.44	458.197	2.214	5.020	6769	4809
94241000	01	111359	948	379.0	.729	9.25015	162.91	495.478	2.224	5.093	6840	4753
94241000	01	111359	948	377.0	.685	9.34855	195.05	596.385	2.235	5.273	6735	4398
94241000	01	111359	948	375.0	.558	9.44854	215.92	653.705	2.245	5.374	6642	4165
94241000	01	111359	948	373.0	.535	9.55013	233.12	720.439	2.256	5.451	6801	4125
94241000	01	111359	948	371.0	.571	9.65338	205.80	639.434	2.267	5.326	6613	4229
94241000	01	111359	948	369.0	.573	9.75831	204.44	638.639	2.278	5.320	6909	4430
94241000	01	111359	948	367.0	.564	9.86495	210.59	662.688	2.288	5.351	6779	4293
94241000	01	111359	948	365.0	.647	9.97336	224.14	707.867	2.299	5.412	6852	4230
94241000	01	111359	948	363.0	.642	10.08356	228.18	724.586	2.310	5.430	6772	4148
94241000	01	111359	948	361.0	.697	10.19560	186.47	595.428	2.321	5.228	6802	4516
94241000	01	111359	948	359.0	.756	10.30952	144.23	463.126	2.333	4.971	6736	4854
94241000	01	111359	948	357.0	.798	10.42535	116.37	375.758	2.344	4.756	6698	5094
94241000	01	111359	948	355.0	.810	10.54315	108.60	352.640	2.355	4.687	6751	5213
94241000	01	111359	948	353.0	.823	10.66296	100.42	327.917	2.366	4.609	6753	5297
94241000	01	111359	948	351.0	.790	10.78482	121.71	359.702	2.378	4.801	6846	5154
94241000	01	111359	948	349.0	.777	10.90878	129.95	429.208	2.389	4.867	6677	4947
94241000	01	111359	948	347.0	.826	11.03489	98.69	327.866	2.401	4.592	6624	5214
94241000	01	111359	948	345.0	.844	11.16321	87.57	292.607	2.412	4.472	6958	5596
94241000	01	111359	948	343.0	.903	11.29377	52.47	176.335	2.424	3.960	6730	5793
94241000	01	111359	948	341.0	.921	11.42664	42.22	142.718	2.435	3.742	6690	5875
94241000	01	111359	948	339.0	.920	11.56186	43.00	145.219	2.447	3.761	6786	5950
94241000	01	111359	948	337.0	.874	11.69950	69.52	237.800	2.459	4.241	6830	5689
94241000	01	111359	948	335.0	.840	11.83961	89.93	309.462	2.471	4.499	6803	5447
94241000	01	111359	948	333.0	.852	11.98226	82.39	285.210	2.483	4.411	6912	5616
94241000	01	111359	948	331.0	.914	12.12750	46.16	160.771	2.495	3.832	6843	5964
94241000	01	111359	948	329.0	.909	12.27539	48.82	171.068	2.507	3.888	6786	5884
94241000	01	111359	948	327.0	.858	12.42601	78.81	277.841	2.519	4.367	6862	5615
94241000	01	111359	948	325.0	.762	12.57941	139.80	495.853	2.532	4.940	6782	4931
94241000	01	111359	948	323.0	.690	12.73568	191.50	683.422	2.544	5.254	6954	4575
94241000	01	111359	948	321.0	.703	12.89487	181.62	652.191	2.556	5.201	6754	4529
94241000	01	111359	948	319.0	.718	13.05707	170.63	616.571	2.569	5.139	6815	4668
94241000	01	111359	948	317.0	.507	13.22235	350.37	1274.067	2.581	5.859	6792	3286

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	111359	948	315.0	.342	13.39079	554.26	2028.242	2.594	6.317	6836	2228
94241000	01	111359	948	313.0	.532	13.56246	325.94	1200.380	2.607	5.786	6732	3414
94241000	01	111359	948	311.0	.817	13.73746	104.40	386.968	2.620	4.648	6607	5146
94241000	01	111359	948	309.0	.856	13.91586	80.02	298.518	2.633	4.382	6871	5610
94241000	01	111359	948	307.0	.831	14.09777	95.33	357.954	2.646	4.557	6937	5499
94241000	01	111359	948	305.0	.703	14.28326	181.70	686.729	2.659	5.202	6839	4586
94241000	01	111359	948	303.0	.435	14.47244	429.25	1632.981	2.672	6.062	6962	2891
94241000	01	111359	948	301.0	.226	14.66541	766.98	2937.214	2.685	6.642	6894	1489
94241000	01	111359	948	299.0	.272	14.86226	671.15	2587.425	2.698	6.509	6845	1780
94241000	01	111359	948	297.0	.531	15.06310	326.76	1268.199	2.712	5.789	6976	3534
94241000	01	111359	948	295.0	.701	15.26803	183.23	715.978	2.725	5.210	6845	4577
94241000	01	111359	948	293.0	.731	15.47718	161.46	635.220	2.739	5.084	6907	4818
94241000	01	111359	948	291.0	.704	15.69066	180.78	716.115	2.753	5.197	6841	4597
94241000	01	111359	948	289.0	.643	15.90858	227.65	907.999	2.766	5.427	6981	4284
94241000	01	111359	948	287.0	.690	16.13108	190.95	766.942	2.780	5.252	6744	4444
94241000	01	111359	948	285.0	.691	16.35827	190.67	771.184	2.794	5.250	6830	4503
94241000	01	111359	948	283.0	.643	16.59030	228.05	928.875	2.808	5.429	6848	4200
94241000	01	111359	948	281.0	.750	16.82730	148.17	607.810	2.823	4.998	6942	4970
94241000	01	111359	948	279.0	.837	17.06942	91.86	379.538	2.837	4.520	7010	5596
94241000	01	111359	948	277.0	.820	17.31680	102.32	425.789	2.851	4.628	6940	5430
94241000	01	111359	948	275.0	.624	17.56960	243.39	1020.200	2.866	5.494	6867	4089
94241000	01	111359	948	273.0	.469	17.82797	390.85	1650.331	2.880	5.968	6864	3072
94241000	01	111359	948	271.0	.679	18.09208	199.73	849.556	2.895	5.296	6705	4345
94241000	01	111359	948	269.0	.860	18.36211	77.82	333.492	2.910	4.354	6607	5421
94241000	01	111359	948	267.0	.951	18.63823	25.56	110.382	2.925	3.241	6627	6016
94241000	01	111359	948	265.0	.966	18.92062	17.34	75.425	2.940	2.853	6574	6064
94241000	01	111359	948	263.0	.940	19.20948	31.81	139.458	2.955	3.460	6914	6201
94241000	01	111359	948	261.0	.953	19.50501	24.64	108.843	2.970	3.204	6912	6287
94241000	01	111359	948	259.0	.972	19.80741	14.28	63.558	2.986	2.658	6785	6296

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 951

Two inch effective B^{10}F_3 detector thickness.

Flight path of 16 meters.

Rotor speed of 6000 rev/min.

Channel width of 1 μsec .

SAMPLE THICKNESS

Isotope	barns/atom
Pu-239	5,404
Pu-240	4,014
Pu-241	526.2
Pu-242	78,927
Am-241	22,964
Oxygen	209.1

INSTRUMENT RESOLUTION * (Full width at half-maximum)

E (ev)	Width (μsec)
4.0	2.1
20.0	1.8

The data are quoted as barns/atom of Pu^{241} .

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	05	032260	951	625.5	.917	3.41994	45.15	83.498	1.229	3.810	10487	9316
94241000	05	032260	951	620.5	.913	3.47528	47.86	89.227	1.245	3.868	11080	9793
94241000	05	032260	951	615.5	.875	3.53197	70.24	132.015	1.261	4.251	11511	9753
94241000	05	032260	951	610.5	.908	3.59006	50.55	95.789	1.278	3.923	11532	10145
94241000	05	032260	951	605.5	.871	3.64959	72.65	138.796	1.294	4.285	11837	9986
94241000	05	032260	951	600.5	.903	3.71062	53.24	102.564	1.311	3.974	11975	10484
94241000	05	032260	951	595.5	.829	3.77320	98.64	191.607	1.327	4.591	12547	10077
94241000	03	032260	951	591.5	.861	3.82440	78.43	153.384	1.341	4.362	7614	6355
94241000	03	032260	951	588.5	.818	3.86349	105.68	207.734	1.351	4.660	7735	6131
94241000	03	032260	951	585.5	.819	3.90318	104.74	206.931	1.361	4.651	7931	6298
94241000	03	032260	951	582.5	.788	3.94349	125.34	248.919	1.372	4.831	8004	6112
94241000	03	032260	951	579.5	.758	3.98443	145.58	290.603	1.382	4.980	7843	5764
94241000	03	032260	951	576.5	.748	4.02600	152.71	306.425	1.392	5.028	8093	5868
94241000	03	032260	951	573.5	.696	4.06823	190.63	384.514	1.403	5.250	8314	5610
94241000	01	032260	951	571.5	.714	4.09676	176.77	357.793	1.410	5.174	2724	1887
94241000	01	032260	951	570.5	.657	4.11113	220.64	447.368	1.413	5.396	2649	1688
94241000	01	032260	951	569.5	.597	4.12558	271.48	551.427	1.417	5.603	2720	1574
94241000	01	032260	951	568.5	.571	4.14011	294.58	599.394	1.420	5.685	2611	1446
94241000	01	032260	951	567.5	.508	4.15471	355.37	725.388	1.424	5.874	2727	1344
94241000	01	032260	951	566.5	.457	4.16940	412.08	841.431	1.427	6.021	2763	1224
94241000	01	032260	951	565.5	.381	4.18415	506.89	1036.864	1.431	6.228	2808	1039
94241000	01	032260	951	564.5	.260	4.19899	708.95	1452.755	1.434	6.563	2830	713
94241000	01	032260	951	563.5	.174	4.21391	917.69	1883.833	1.438	6.821	2641	448
94241000	01	032260	951	562.5	.132	4.22890	1062.68	2185.330	1.441	6.968	2718	350
94241000	01	032260	951	561.5	.085	4.24398	1296.00	2669.882	1.445	7.167	2979	246
94241000	01	032260	951	560.5	.048	4.25914	1589.37	3280.106	1.449	7.371	2744	130
94241000	01	032260	951	559.5	.059	4.27438	1486.12	3072.494	1.452	7.303	2777	160
94241000	01	032260	951	558.5	.076	4.28970	1354.89	2806.211	1.456	7.211	2807	207
94241000	01	032260	951	557.5	.045	4.30510	1628.89	3379.749	1.459	7.395	2980	131
94241000	01	032260	951	556.5	.056	4.32059	1508.70	3135.990	1.463	7.319	2846	157
94241000	01	032260	951	555.5	.119	4.33615	1119.62	2331.441	1.466	7.020	2953	341
94241000	01	032260	951	554.5	.193	4.35181	864.52	1803.493	1.470	6.762	2904	545
94241000	01	032260	951	553.5	.265	4.36755	698.79	1460.383	1.474	6.549	2972	764
94241000	01	032260	951	552.5	.367	4.38337	526.71	1102.763	1.477	6.266	2962	1056
94241000	01	032260	951	551.5	.376	4.39928	513.53	1077.104	1.481	6.241	3024	1105

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	032260	951	550.5	•411	4.41528	467.90	983.184	1.485	6.148	3004	1198
94241000	01	032260	951	549.5	•428	4.43136	445.72	938.289	1.488	6.099	3013	1253
94241000	01	032260	951	548.5	•436	4.44754	436.90	921.399	1.492	6.079	3112	1316
94241000	01	032260	951	547.5	•398	4.46380	484.58	1023.823	1.496	6.183	3161	1221
94241000	01	032260	951	546.5	•4C9	4.48015	469.86	994.523	1.499	6.152	3169	1259
94241000	01	032260	951	545.5	•411	4.49659	467.05	990.394	1.503	6.146	3174	1267
94241000	01	032260	951	544.5	•380	4.51312	509.15	1081.663	1.506	6.232	3120	1150
94241000	01	032260	951	543.5	•360	4.52975	536.46	1141.778	1.510	6.285	3167	1108
94241000	01	032260	951	542.5	•343	4.54646	563.17	1200.817	1.514	6.333	3119	1038
94241000	01	032260	951	541.5	•350	4.56327	551.73	1178.595	1.518	6.313	3186	1083
94241000	01	032260	951	540.5	•384	4.58017	502.91	1076.303	1.521	6.220	3143	1173
94241000	01	032260	951	539.5	•380	4.59716	508.23	1089.710	1.525	6.230	3020	1115
94241000	01	032260	951	538.5	•389	4.61425	496.16	1065.807	1.529	6.206	3162	1195
94241000	01	032260	951	537.5	•463	4.63144	404.57	870.566	1.532	6.002	3125	1405
94241000	01	032260	951	536.5	•514	4.64872	350.09	754.340	1.536	5.858	3267	1629
94241000	01	032260	951	535.5	•577	4.66610	288.62	623.459	1.540	5.665	3272	1834
94241000	01	032260	951	534.5	•661	4.68358	217.61	470.947	1.544	5.382	3228	2071
94241000	01	032260	951	533.5	•761	4.70115	143.29	310.688	1.547	4.964	3143	2322
94241000	01	032260	951	532.5	•790	4.71882	124.02	269.418	1.551	4.820	3168	2428
94241000	01	032260	951	531.5	•777	4.73660	132.40	288.161	1.555	4.885	3359	2534
94241000	01	032260	951	530.5	•827	4.75447	99.66	217.317	1.559	4.601	3206	2574
94241000	01	032260	951	529.5	•863	4.77245	77.08	168.404	1.562	4.344	3274	2743
94241000	01	032260	951	528.5	•878	4.79052	68.33	149.564	1.566	4.224	3261	2778
94241000	01	032260	951	527.5	•868	4.80870	74.06	162.411	1.570	4.304	3421	2883
94241000	01	032260	951	526.5	•865	4.82699	73.75	162.049	1.574	4.300	3373	2844
94241000	01	032260	951	525.5	•832	4.84538	96.37	212.132	1.578	4.568	3455	2791
94241000	01	032260	951	524.5	•906	4.86387	51.89	114.455	1.581	3.949	3238	2846
94241000	01	032260	951	523.5	•893	4.88247	59.18	130.779	1.585	4.080	3357	2911
94241000	01	032260	951	522.5	•854	4.90118	82.79	183.292	1.589	4.416	3305	2740
94241000	01	032260	951	521.5	•848	4.91999	86.61	192.112	1.593	4.461	3388	2788
94241000	01	032260	951	520.5	•854	4.93891	82.78	183.974	1.597	4.416	3326	2757
94241000	01	032260	951	519.5	•818	4.95795	105.61	235.172	1.600	4.659	3548	2817
94241000	01	032260	951	518.5	•840	4.97709	91.18	203.437	1.604	4.512	3395	2770
94241000	01	032260	951	517.5	•842	4.99634	90.39	202.055	1.608	4.504	3454	2823
94241000	01	032260	951	516.5	•820	5.01571	104.07	233.080	1.612	4.645	3406	2712

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	032260	951	515.5	.809	5.03519	111.17	249.457	1.616	4.711	3430	2695
94241000	01	032260	951	514.5	.809	5.05478	111.43	250.533	1.620	4.713	3407	2675
94241000	01	032260	951	513.5	.820	5.07449	104.33	235.027	1.624	4.647	3415	2718
94241000	01	032260	951	512.5	.774	5.09431	134.73	304.107	1.628	4.903	3485	2618
94241000	01	032260	951	511.5	.797	5.11425	119.19	269.554	1.632	4.780	3578	2769
94241000	01	032260	951	510.5	.824	5.13430	101.73	230.517	1.635	4.622	3511	2808
94241000	01	032260	951	509.5	.782	5.15448	129.33	293.645	1.639	4.862	3530	2679
94241000	03	032260	951	505.5	.760	5.23637	144.18	329.938	1.655	4.971	16436	12248
94241000	03	032260	951	504.5	.753	5.25715	149.02	341.698	1.659	5.004	16284	12024
94241000	03	032260	951	503.5	.721	5.27806	171.58	394.204	1.663	5.145	16659	11786
94241000	03	032260	951	502.5	.717	5.29908	174.86	402.532	1.667	5.164	16632	11695
94241000	03	032260	951	501.5	.701	5.32024	186.69	430.633	1.671	5.229	16745	11513
94241000	03	032260	951	500.5	.675	5.34152	206.47	477.192	1.675	5.330	16893	11186
94241000	03	032260	951	499.5	.662	5.36293	216.74	501.943	1.679	5.378	17069	11085
94241000	03	032260	951	498.5	.634	5.38447	239.33	555.362	1.683	5.477	16831	10472
94241000	03	032260	951	497.5	.626	5.40613	245.88	571.709	1.687	5.504	16962	10422
94241000	03	032260	951	496.5	.625	5.42793	246.78	574.955	1.691	5.508	16967	10406
94241000	03	032260	951	495.5	.620	5.44986	251.43	586.964	1.695	5.527	17111	10402
94241000	03	032260	951	494.5	.627	5.47193	245.37	573.992	1.699	5.502	17121	10531
94241000	03	032260	951	493.5	.625	5.49413	246.77	578.432	1.703	5.508	17101	10489
94241000	03	032260	951	492.5	.608	5.51646	261.38	613.919	1.707	5.565	17229	10280
94241000	03	032260	951	491.5	.602	5.53893	266.84	628.013	1.711	5.586	17382	10263
94241000	03	032260	951	490.5	.605	5.56154	264.00	622.608	1.715	5.575	17391	10326
94241000	03	032260	951	489.5	.574	5.58429	291.47	688.776	1.719	5.674	17837	10051
94241000	03	032260	951	488.5	.564	5.60717	301.40	713.708	1.724	5.708	17902	9901
94241000	03	032260	951	487.5	.557	5.63020	307.36	729.322	1.728	5.728	17534	9587
94241000	03	032260	951	486.5	.551	5.65337	313.19	744.668	1.732	5.746	17691	9567
94241000	03	032260	951	485.5	.536	5.67668	327.93	781.333	1.736	5.792	18132	9534
94241000	03	032260	951	484.5	.524	5.70014	340.09	811.973	1.740	5.829	18092	9297
94241000	03	032260	951	483.5	.524	5.72374	339.44	812.093	1.744	5.827	17900	9210
94241000	03	032260	951	482.5	.530	5.74749	333.97	800.671	1.748	5.811	17717	9212
94241000	03	032260	951	481.5	.492	5.77139	372.75	895.503	1.752	5.920	18026	8705
94241000	03	032260	951	480.5	.486	5.79544	379.46	913.506	1.757	5.938	18438	8793
94241000	03	032260	951	479.5	.477	5.81964	388.67	937.634	1.761	5.962	18345	8594
94241000	03	032260	951	478.5	.483	5.84399	382.80	925.396	1.765	5.947	18307	8676

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	477.5	.469	5.86849	398.43	965.215	1.769	5.987	18422	8475
94241000	03	032260	951	476.5	.453	5.89315	416.00	1009.886	1.773	6.030	18419	8194
94241000	03	032260	951	475.5	.462	5.91796	405.54	986.571	1.777	6.005	18491	8391
94241000	03	032260	951	474.5	.450	5.94293	419.90	1023.657	1.782	6.040	18505	8174
94241000	03	032260	951	473.5	.465	5.96806	402.85	984.159	1.786	5.998	18416	8401
94241000	03	032260	951	472.5	.437	5.99335	435.28	1065.642	1.790	6.076	18745	8041
94241000	03	032260	951	471.5	.437	6.01880	435.27	1067.861	1.794	6.075	18893	8105
94241000	03	032260	951	470.5	.468	6.04441	399.48	982.157	1.799	5.990	18525	8506
94241000	03	032260	951	469.5	.438	6.07018	434.31	1070.056	1.803	6.073	18966	8149
94241000	03	032260	951	468.5	.438	6.09612	434.25	1072.200	1.807	6.073	18608	7999
94241000	03	032260	951	467.5	.455	6.12223	413.89	1024.104	1.811	6.025	19028	8501
94241000	03	032260	951	466.5	.451	6.14851	418.79	1038.445	1.816	6.037	19002	8411
94241000	03	032260	951	465.5	.454	6.17495	414.84	1030.857	1.820	6.027	18640	8313
94241000	03	032260	951	464.5	.437	6.20157	435.09	1083.503	1.824	6.075	19483	8361
94241000	03	032260	951	463.5	.454	6.22836	414.93	1035.538	1.829	6.028	19147	8539
94241000	03	032260	951	462.5	.451	6.25532	418.31	1046.228	1.833	6.036	19122	8472
94241000	03	032260	951	461.5	.478	6.28246	388.20	973.024	1.837	5.961	19307	9057
94241000	03	032260	951	460.5	.492	6.30977	373.13	937.290	1.842	5.921	19390	9361
94241000	03	032260	951	459.5	.482	6.33727	383.92	966.493	1.846	5.950	19466	9208
94241000	03	032260	951	458.5	.491	6.36494	373.51	942.337	1.850	5.922	19404	9360
94241000	03	032260	951	457.5	.483	6.39280	382.99	968.372	1.855	5.948	19943	9450
94241000	03	032260	951	456.5	.502	6.42083	362.37	918.245	1.859	5.892	19796	9754
94241000	03	032260	951	455.5	.504	6.44906	359.69	913.453	1.863	5.885	19739	9777
94241000	03	032260	951	454.5	.521	6.47747	343.01	872.998	1.868	5.837	19787	10117
94241000	03	032260	951	453.5	.519	6.50607	344.52	878.770	1.872	5.842	19863	10128
94241000	03	032260	951	452.5	.528	6.53485	335.61	857.955	1.877	5.815	19844	10290
94241000	03	032260	951	451.5	.536	6.56383	328.00	840.343	1.881	5.793	19889	10464
94241000	03	032260	951	450.5	.529	6.59301	334.58	859.114	1.886	5.812	20094	10440
94241000	03	032260	951	449.5	.527	6.62237	336.94	867.093	1.890	5.819	20355	10528
94241000	03	032260	951	448.5	.546	6.65194	317.92	819.979	1.894	5.761	19876	10659
94241000	03	032260	951	447.5	.536	6.68170	327.59	845.787	1.899	5.791	19920	10488
94241000	03	032260	951	446.5	.510	6.71166	353.63	915.145	1.903	5.868	20290	10168
94241000	03	032260	951	445.5	.502	6.74183	362.34	940.835	1.908	5.892	20378	10044
94241000	03	032260	951	444.5	.461	6.77220	407.15	1059.563	1.912	6.009	20470	9265
94241000	03	032260	951	443.5	.427	6.80277	447.35	1165.807	1.917	6.103	20174	8461

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	442.5	.355	6.83355	543.91	1421.862	1.921	6.298	20411	7126
94241000	03	032260	951	441.5	.272	6.86454	683.55	1790.932	1.926	6.527	20793	5567
94241000	03	032260	951	440.5	.228	6.89575	776.63	2039.417	1.930	6.654	20735	4651
94241000	03	032260	951	439.5	.215	6.92716	807.70	2125.844	1.935	6.694	20609	4359
94241000	03	032260	951	438.5	.220	6.95879	795.58	2098.704	1.940	6.679	20806	4503
94241000	03	032260	951	437.5	.274	6.99064	681.32	1801.414	1.944	6.524	20873	5614
94241000	03	032260	951	436.5	.349	7.02271	552.87	1465.151	1.949	6.315	20850	7156
94241000	03	032260	951	435.5	.430	7.05500	443.32	1177.527	1.953	6.094	21125	8929
94241000	03	032260	951	434.5	.508	7.08751	355.87	947.427	1.958	5.874	21232	10596
94241000	03	032260	951	433.5	.565	7.12024	299.93	800.329	1.962	5.703	21363	11858
94241000	03	032260	951	432.5	.606	7.15321	263.41	704.508	1.967	5.573	21602	12851
94241000	03	032260	951	431.5	.650	7.18640	226.56	607.369	1.972	5.423	21392	13650
94241000	03	032260	951	430.5	.669	7.21983	211.13	567.322	1.976	5.352	21476	14111
94241000	03	032260	951	429.5	.687	7.25349	197.34	531.501	1.981	5.284	21683	14624
94241000	03	032260	951	428.5	.703	7.28738	184.85	499.016	1.986	5.219	21828	15076
94241000	03	032260	951	427.5	.697	7.32151	189.46	512.665	1.990	5.244	21980	15048
94241000	03	032260	951	426.5	.729	7.35589	165.85	449.817	1.995	5.111	21594	15462
94241000	03	032260	951	425.5	.731	7.39050	164.76	447.919	2.000	5.104	22065	15834
94241000	03	032260	951	424.5	.747	7.42536	153.23	417.547	2.004	5.031	21742	15945
94241000	03	032260	951	423.5	.744	7.46047	155.21	423.947	2.009	5.044	21820	15943
94241000	03	032260	951	422.5	.764	7.49583	141.12	386.388	2.014	4.949	21980	16496
94241000	03	032260	951	421.5	.774	7.53144	134.47	369.052	2.019	4.901	21797	16568
94241000	03	032260	951	420.5	.769	7.56730	138.00	379.631	2.023	4.927	21694	16379
94241000	03	032260	951	419.5	.759	7.60342	144.48	398.396	2.028	4.973	22131	16503
94241000	03	032260	951	418.5	.760	7.63980	144.37	399.058	2.033	4.972	22020	16426
94241000	03	032260	951	417.5	.729	7.67645	166.00	459.949	2.038	5.112	22549	16145
94241000	03	032260	951	416.5	.723	7.71335	170.72	474.145	2.042	5.140	22182	15738
94241000	03	032260	951	415.5	.709	7.75052	180.43	502.324	2.047	5.195	22078	15380
94241000	03	032260	951	414.5	.636	7.78797	238.22	664.805	2.052	5.473	22569	14088
94241000	03	032260	951	413.5	.648	7.82568	227.99	637.808	2.057	5.429	22323	14207
94241000	03	032260	951	412.5	.658	7.86367	219.69	516.074	2.062	5.392	22760	14718
94241000	03	032260	951	411.5	.715	7.90194	176.07	494.959	2.067	5.170	22719	15959
94241000	03	032260	951	410.5	.764	7.94048	141.60	399.035	2.071	4.953	22640	16978
94241000	03	032260	951	409.5	.774	7.97931	134.67	380.434	2.076	4.902	22898	17401
94241000	03	032260	951	408.5	.783	8.01842	128.34	363.443	2.081	4.854	22951	17653

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	407.5	.776	8.05783	132.93	377.356	2.086	4.889	23233	17715
94241000	03	032260	951	406.5	.789	8.09752	124.31	353.761	2.091	4.822	22995	17821
94241000	03	032260	951	405.5	.790	8.13751	123.69	352.856	2.096	4.817	23513	18245
94241000	03	032260	951	404.5	.783	8.17779	128.33	367.000	2.101	4.854	23161	17814
94241000	03	032260	951	403.5	.793	8.21838	121.80	349.190	2.106	4.802	22999	17910
94241000	03	032260	951	402.5	.777	8.25927	132.61	381.130	2.111	4.887	23080	17608
94241000	03	032260	951	401.5	.752	8.30046	149.70	431.293	2.116	5.008	23517	17369
94241000	03	032260	951	400.5	.743	8.34196	155.81	450.035	2.121	5.048	23414	17095
94241000	03	032260	951	399.5	.693	8.38378	192.69	557.935	2.126	5.261	23808	16204
94241000	03	032260	951	398.5	.647	8.42591	228.65	663.732	2.131	5.432	23685	15058
94241000	03	032260	951	397.5	.554	8.46835	310.30	903.004	2.136	5.737	23896	13008
94241000	03	032260	951	396.5	.422	8.51112	453.26	1322.342	2.141	6.116	23801	9876
94241000	03	032260	951	395.5	.299	8.55422	634.97	1857.152	2.146	6.453	23908	7024
94241000	03	032260	951	394.5	.219	8.59764	798.84	2342.364	2.151	6.683	24174	5202
94241000	03	032260	951	393.5	.241	8.64139	748.04	2198.980	2.156	6.617	23909	5667
94241000	03	032260	951	392.5	.332	8.68548	580.41	1710.549	2.161	6.363	24304	7923
94241000	03	032260	951	391.5	.485	8.72991	380.47	1124.168	2.166	5.941	24071	11471
94241000	03	032260	951	390.5	.614	8.77468	256.75	760.547	2.171	5.548	24428	14723
94241000	03	032260	951	389.5	.690	8.81979	195.02	579.182	2.176	5.273	24480	16591
94241000	03	032260	951	388.5	.715	8.86525	176.23	524.741	2.182	5.171	24480	17193
94241000	03	032260	951	387.5	.749	8.91107	151.50	452.249	2.187	5.020	24619	18119
94241000	03	032260	951	386.5	.739	8.95724	159.00	475.883	2.192	5.068	25028	18163
94241000	03	032260	951	385.5	.761	9.00377	143.26	429.888	2.197	4.964	24338	18198
94241000	03	032260	951	384.5	.746	9.05067	154.05	463.467	2.202	5.037	24905	18245
94241000	03	032260	951	383.5	.750	9.09793	150.89	455.138	2.208	5.016	24929	18372
94241000	03	032260	951	382.5	.720	9.14556	172.31	521.100	2.213	5.149	25333	17926
94241000	03	032260	951	381.5	.735	9.19357	161.94	491.026	2.218	5.087	25081	18100
94241000	03	032260	951	380.5	.727	9.24196	167.35	508.781	2.223	5.120	25126	17946
94241000	03	032260	951	379.5	.712	9.29073	178.33	543.575	2.229	5.183	25327	17718
94241000	03	032260	951	378.5	.723	9.33989	170.59	521.372	2.234	5.139	25082	17806
94241000	03	032260	951	377.5	.703	9.38943	185.42	568.170	2.239	5.222	25154	17361
94241000	03	032260	951	376.5	.676	9.43938	205.61	631.714	2.244	5.325	25440	16899
94241000	03	032260	951	375.5	.656	9.48972	221.89	683.553	2.250	5.402	25224	16246
94241000	03	032260	951	374.5	.641	9.54047	233.76	722.058	2.255	5.454	25469	16037
94241000	03	032260	951	373.5	.624	9.59162	247.42	766.287	2.260	5.511	25756	15805

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	372.5	.662	9.64319	216.71	672.969	2.266	5.378	25869	16824
94241000	03	032260	951	371.5	.698	9.69518	189.21	589.167	2.271	5.242	25783	17671
94241000	03	032260	951	370.5	.709	9.74758	180.95	564.946	2.277	5.198	25896	18028
94241000	03	032260	951	369.5	.710	9.80041	179.84	563.006	2.282	5.192	25463	17762
94241000	03	032260	951	368.5	.668	9.85368	212.26	666.312	2.287	5.357	25807	16928
94241000	03	032260	951	367.5	.664	9.90738	215.14	677.190	2.293	5.371	26090	17020
94241000	03	032260	951	366.5	.678	9.96151	203.84	643.370	2.298	5.317	25421	16943
94241000	03	032260	951	365.5	.654	10.01610	223.22	706.452	2.304	5.408	26232	16855
94241000	03	032260	951	364.5	.663	10.07113	215.72	684.592	2.309	5.373	26102	17010
94241000	03	032260	951	363.5	.690	10.12662	195.11	620.908	2.315	5.273	25978	17604
94241000	03	032260	951	362.5	.708	10.18257	181.32	578.595	2.320	5.200	26219	18239
94241000	03	032260	951	361.5	.713	10.23898	177.62	568.381	2.326	5.179	26473	18543
94241000	03	032260	951	360.5	.743	10.29587	155.69	499.594	2.331	5.047	26491	19348
94241000	03	032260	951	359.5	.766	10.35322	139.91	450.187	2.337	4.941	26054	19608
94241000	03	032260	951	358.5	.780	10.41106	130.69	421.709	2.342	4.872	26321	20158
94241000	03	032260	951	357.5	.813	10.46939	108.33	350.533	2.348	4.685	26343	21052
94241000	03	032260	951	356.5	.831	10.52821	96.89	314.381	2.354	4.573	26696	21803
94241000	03	032260	951	355.5	.857	10.58752	81.20	264.225	2.359	4.396	26589	22370
94241000	03	032260	951	354.5	.834	10.64734	95.14	310.454	2.365	4.555	27094	22201
94241000	03	032260	951	353.5	.830	10.70766	97.61	319.411	2.370	4.581	26977	22000
94241000	03	032260	951	352.5	.826	10.76850	100.17	328.728	2.376	4.606	26897	21827
94241000	03	032260	951	351.5	.771	10.82986	136.69	449.830	2.382	4.917	27491	20813
94241000	03	032260	951	350.5	.748	10.89174	152.16	502.191	2.388	5.024	27362	20118
94241000	03	032260	951	349.5	.728	10.95416	166.70	551.735	2.393	5.116	26949	19274
94241000	03	032260	951	348.5	.778	11.01712	131.77	437.395	2.399	4.881	26989	20626
94241000	03	032260	951	347.5	.816	11.08061	106.92	355.934	2.405	4.672	27069	21689
94241000	03	032260	951	346.5	.869	11.14466	73.50	245.373	2.410	4.297	27187	23208
94241000	03	032260	951	345.5	.876	11.20927	69.41	232.417	2.416	4.240	27398	23574
94241000	03	032260	951	344.5	.911	11.27444	48.69	163.505	2.422	3.885	27276	24412
94241000	03	032260	951	343.5	.918	11.34018	44.72	150.595	2.428	3.800	27331	24648
94241000	03	032260	951	342.5	.917	11.40650	45.19	152.643	2.434	3.811	27517	24791
94241000	03	032260	951	341.5	.930	11.47340	37.73	127.824	2.440	3.630	27465	25097
94241000	03	032260	951	340.5	.937	11.54089	34.03	115.627	2.445	3.527	27167	24998
94241000	03	032260	951	339.5	.932	11.60898	36.73	125.174	2.451	3.603	27310	25001
94241000	03	032260	951	338.5	.919	11.67767	43.96	150.230	2.457	3.783	27171	24536

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	337.5	.885	11.74697	64.07	219.603	2.463	4.160	27486	23892
94241000	03	032260	951	336.5	.839	11.81690	92.15	316.733	2.469	4.523	27367	22549
94241000	03	032260	951	335.5	.795	11.88744	120.30	414.733	2.475	4.790	27508	21484
94241000	03	032260	951	334.5	.818	11.95863	105.60	355.206	2.481	4.659	27836	22357
94241000	03	032260	951	333.5	.893	12.03045	59.02	204.714	2.487	4.077	27455	24091
94241000	03	032260	951	332.5	.916	12.10292	45.89	159.658	2.493	3.826	27584	24817
94241000	03	032260	951	331.5	.936	12.17605	34.68	121.034	2.499	3.546	27443	25221
94241000	03	032260	951	330.5	.916	12.24985	45.68	159.911	2.505	3.821	27750	24974
94241000	03	032260	951	329.5	.922	12.32431	42.25	148.330	2.511	3.743	27746	25133
94241000	03	032260	951	328.5	.899	12.39946	55.63	195.907	2.517	4.018	28296	24988
94241000	03	032260	951	327.5	.859	12.47530	79.56	281.023	2.523	4.376	28700	24216
94241000	03	032260	951	326.5	.829	12.55183	98.63	349.446	2.529	4.591	28414	23123
94241000	03	032260	951	325.5	.753	12.62908	148.92	529.237	2.536	5.003	28501	21082
94241000	03	032260	951	324.5	.675	12.70703	206.50	726.116	2.542	5.330	28996	19225
94241000	03	032260	951	323.5	.637	12.78572	236.77	846.625	2.548	5.467	28771	18009
94241000	03	032260	951	322.5	.650	12.86513	226.23	811.442	2.554	5.421	28737	18352
94241000	03	032260	951	321.5	.714	12.94529	177.26	637.802	2.560	5.177	29012	20332
94241000	03	032260	951	320.5	.772	13.02619	136.02	450.928	2.566	4.912	29278	22190
94241000	03	032260	951	319.5	.796	13.10786	119.89	434.081	2.573	4.786	28951	22623
94241000	03	032260	951	318.5	.710	13.19030	179.94	653.543	2.579	5.192	29253	20392
94241000	03	032260	951	317.5	.513	13.27352	351.09	1279.135	2.585	5.861	29449	14831
94241000	03	032260	951	316.5	.263	13.35753	702.06	2565.908	2.592	6.554	29283	7572
94241000	03	032260	951	315.5	.176	13.44234	912.27	3344.732	2.598	6.815	29828	5174
94241000	03	032260	951	314.5	.335	13.52796	574.49	2112.996	2.604	6.353	29664	9776
94241000	03	032260	951	313.5	.613	13.61440	257.61	950.525	2.611	5.551	29897	17985
94241000	03	032260	951	312.5	.797	13.70167	119.33	441.731	2.617	4.781	30186	23611
94241000	03	032260	951	311.5	.859	13.78979	79.73	296.082	2.623	4.378	30145	25422
94241000	03	032260	951	310.5	.869	13.87875	61.36	228.599	2.630	4.116	30146	26324
94241000	03	032260	951	309.5	.891	13.96858	60.74	227.032	2.636	4.106	30343	26526
94241000	03	032260	951	308.5	.887	14.05929	62.89	235.833	2.643	4.141	30092	26200
94241000	03	032260	951	307.5	.828	14.15088	92.70	348.746	2.649	4.529	30623	25190
94241000	03	032260	951	306.5	.752	14.24337	122.71	463.139	2.656	4.809	30407	23625
94241000	03	032260	951	305.5	.722	14.33677	170.96	647.322	2.662	5.141	30468	21604
94241000	03	032260	951	304.5	.627	14.43109	236.79	899.528	2.669	5.467	30268	18935
94241000	03	032260	951	303.5	.439	14.52634	432.93	1650.053	2.675	6.070	31068	13389

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	302.5	.226	14.62255	782.66	2992.875	2.682	6.662	30780	6825
94241000	03	032260	951	301.5	.109	14.71971	1163.62	4464.403	2.689	7.059	30928	3329
94241000	03	032260	951	300.5	.117	14.81784	1127.37	4339.727	2.695	7.027	31041	3579
94241000	03	032260	951	299.5	.250	14.91695	729.30	2816.748	2.702	6.592	30934	7596
94241000	03	032260	951	298.5	.440	15.01707	431.27	1671.279	2.709	6.066	31152	13469
94241000	03	032260	951	297.5	.604	15.11819	265.31	1031.616	2.715	5.580	31361	18584
94241000	03	032260	951	296.5	.705	15.22034	183.39	715.472	2.722	5.211	31250	21633
94241000	03	032260	951	295.5	.758	15.32353	145.24	568.558	2.729	4.978	31154	23185
94241000	03	032260	951	294.5	.762	15.42777	142.79	560.881	2.736	4.961	31285	23390
94241000	03	032260	951	293.5	.755	15.53308	147.44	581.099	2.742	4.993	31426	23287
94241000	03	032260	951	292.5	.752	15.63947	149.98	593.130	2.749	5.010	31344	23110
94241000	03	032260	951	291.5	.688	15.74696	196.32	779.050	2.756	5.279	31982	21596
94241000	03	032260	951	290.5	.650	15.85556	226.12	900.420	2.763	5.421	31863	20330
94241000	03	032260	951	289.5	.641	15.96529	233.54	933.162	2.770	5.453	31366	19730
94241000	03	032260	951	288.5	.654	16.07616	223.12	894.630	2.777	5.407	31688	20332
94241000	03	032260	951	287.5	.693	16.18819	192.46	774.370	2.784	5.259	32266	21945
94241000	03	032260	951	286.5	.728	16.30139	166.78	673.390	2.791	5.116	32086	22910
94241000	03	032260	951	285.5	.711	16.41579	179.38	726.791	2.798	5.189	32215	22454
94241000	03	032260	951	284.5	.641	16.53139	233.31	948.615	2.805	5.452	32483	20437
94241000	03	032260	951	283.5	.604	16.64822	265.24	1082.267	2.812	5.580	31696	18768
94241000	03	032260	951	282.5	.632	16.76629	240.84	986.180	2.819	5.484	32286	20023
94241000	03	032260	951	281.5	.744	16.88562	155.48	638.908	2.826	5.046	32521	23719
94241000	03	032260	951	280.5	.854	17.00624	82.84	341.629	2.833	4.416	32524	27228
94241000	03	032260	951	279.5	.910	17.12814	49.54	205.052	2.840	3.902	32718	29175
94241000	03	032260	951	278.5	.929	17.25137	38.71	160.785	2.847	3.656	32341	29437
94241000	03	032260	951	277.5	.887	17.37593	62.81	261.820	2.855	4.140	32949	28644
94241000	03	032260	951	276.5	.820	17.50184	104.04	435.291	2.862	4.644	32701	26284
94241000	03	032260	951	275.5	.623	17.62913	248.46	1043.210	2.869	5.515	32718	19987
94241000	03	032260	951	274.5	.366	17.75781	528.80	2228.385	2.876	6.270	33192	11901
94241000	03	032260	951	273.5	.298	17.88790	636.41	2691.676	2.884	6.455	33354	9748
94241000	03	032260	951	272.5	.554	18.01943	310.63	1318.615	2.891	5.738	32782	17789
94241000	03	032260	951	271.5	.779	18.15241	131.18	558.922	2.898	4.876	32790	25011
94241000	03	032260	951	270.5	.846	18.28687	87.65	374.832	2.906	4.473	33203	27505
94241000	03	032260	951	269.5	.919	18.42284	44.12	189.371	2.913	3.786	32700	29415
94241000	03	032260	951	268.5	.952	18.56032	25.55	110.091	2.921	3.240	32584	30351

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	03	032260	951	267.5	.970	18.69935	15.74	68.086	2.928	2.756	31967	30331
94241000	03	032260	951	266.5	.975	18.83995	13.00	56.435	2.935	2.565	31644	30178
94241000	03	032260	951	265.5	.981	18.98213	10.06	43.852	2.943	2.309	32209	30879
94241000	03	032260	951	264.5	.971	19.12594	15.03	65.735	2.951	2.710	32859	31195
94241000	03	032260	951	263.5	.978	19.27138	11.49	50.440	2.958	2.441	33115	31643
94241000	03	032260	951	262.5	.974	19.41849	13.84	60.997	2.966	2.627	33445	31807
94241000	03	032260	951	261.5	.983	19.56729	8.53	37.741	2.973	2.143	33650	32316

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 900

Two inch effective B^{10}F_3 detector thickness.

Flight path of 44.77 meters.

Rotor speed of 6000 rev/minute.

Channel width of 1 μsec .

SAMPLE THICKNESS

Isotope	barns/atom
Pu-239	5,404
Pu-240	4,014
Pu-241	538.0
Pu-242	78,927
Am-241	11,744
Oxygen	209.1

INSTRUMENT RESOLUTION * (Full width at half-maximum)

E (ev)	Width (μsec)
10	1.9
30.0	1.8

The data are quoted as barns/atom of Pu^{241} .

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	1086.5	.825	8.87448	103.50	30.832	2.183	4.639	2511	2010
94241061	01	081860	900	1085.5	.811	8.89084	112.40	33.529	2.185	4.722	2407	1895
94241061	01	081860	900	1084.5	.811	8.90724	112.40	33.545	2.186	4.722	2399	1889
94241061	01	081860	900	1083.5	.816	8.92369	109.00	32.564	2.188	4.691	2543	2015
94241061	01	081860	900	1082.5	.811	8.94019	112.40	33.616	2.190	4.722	2483	1955
94241061	01	081860	900	1081.5	.828	8.95673	101.30	30.343	2.192	4.618	2368	1903
94241061	01	081860	900	1080.5	.883	8.97331	66.70	19.980	2.194	4.200	2345	2010
94241061	01	081860	900	1079.5	.791	8.98994	125.50	37.632	2.196	4.832	2410	1852
94241061	01	081860	900	1078.5	.821	9.00662	105.80	31.778	2.197	4.662	2458	1959
94241061	01	081860	900	1077.5	.751	9.02335	153.50	46.121	2.199	5.033	2484	1812
94241061	01	081860	900	1076.5	.810	9.04012	112.70	33.912	2.201	4.725	2524	1986
94241061	01	081860	900	1075.5	.805	9.05694	116.60	35.096	2.203	4.758	2359	1843
94241061	01	081860	900	1074.5	.691	9.07381	198.50	59.817	2.205	5.291	2653	1780
94241061	01	081860	900	1073.5	.812	9.09072	111.90	33.744	2.207	4.717	2459	1938
94241061	01	081860	900	1072.5	.752	9.10768	153.30	46.267	2.209	5.032	2424	1769
94241061	01	081860	900	1071.5	.692	9.12469	197.50	59.662	2.210	5.285	2505	1684
94241061	01	081860	900	1070.5	.763	9.14174	145.40	43.983	2.212	4.979	2501	1852
94241061	01	081860	900	1069.5	.805	9.15885	116.30	35.214	2.214	4.756	2496	1951
94241061	01	081860	900	1068.5	.740	9.17600	161.30	48.882	2.216	5.083	2466	1773
94241061	01	081860	900	1067.5	.760	9.19320	147.10	44.616	2.218	4.991	2586	1909
94241061	01	081860	900	1066.5	.813	9.21044	111.20	33.747	2.220	4.711	2457	1939
94241061	01	081860	900	1065.5	.806	9.22774	115.60	35.140	2.222	4.750	2429	1901
94241061	01	081860	900	1064.5	.727	9.24509	170.90	51.990	2.224	5.141	2536	1791
94241061	01	081860	900	1063.5	.715	9.26248	179.90	54.757	2.225	5.192	2505	1740
94241061	01	081860	900	1062.5	.728	9.27992	170.10	51.841	2.227	5.136	2511	1776
94241061	01	081860	900	1061.5	.736	9.29742	164.20	50.079	2.229	5.101	2542	1818
94241061	01	081860	900	1060.5	.752	9.31496	153.00	46.702	2.231	5.030	2450	1789
94241061	01	081860	900	1059.5	.758	9.33255	148.90	45.512	2.233	5.003	2403	1768
94241061	01	081860	900	1058.5	.777	9.35019	135.40	41.408	2.235	4.908	2289	1727
94241061	01	081860	900	1057.5	.755	9.36789	151.20	46.287	2.237	5.018	2495	1828
94241061	01	081860	900	1056.5	.724	9.38563	173.50	53.177	2.239	5.156	2524	1774
94241061	01	081860	900	1055.5	.692	9.40342	197.80	60.655	2.241	5.287	2521	1694
94241061	01	081860	900	1054.5	.683	9.42126	204.80	62.864	2.242	5.322	2551	1692
94241061	01	081860	900	1053.5	.684	9.43916	204.00	62.703	2.244	5.318	2486	1651
94241061	01	081860	900	1052.5	.757	9.45710	149.50	45.981	2.246	5.007	2366	1739

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barne)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	1051.5	.705	9.47510	188.10	57.906	2.248	5.237	2419	1655
94241061	01	081860	900	1050.5	.654	9.49315	228.10	70.282	2.250	5.429	2590	1645
94241061	01	081860	900	1049.5	.683	9.51125	204.50	63.080	2.252	5.320	2509	1665
94241061	01	081860	900	1048.5	.646	9.52940	234.80	72.509	2.254	5.459	2535	1590
94241061	01	081860	900	1047.5	.750	9.54760	154.40	47.714	2.256	5.039	2367	1724
94241061	01	081860	900	1046.5	.631	9.56586	247.70	76.632	2.258	5.512	2598	1591
94241061	01	081860	900	1045.5	.666	9.58416	218.30	67.585	2.260	5.385	2452	1586
94241061	01	081860	900	1044.5	.647	9.60252	233.80	72.456	2.262	5.454	2487	1563
94241061	01	081860	900	1043.5	.657	9.62094	226.00	70.121	2.263	5.420	2613	1666
94241061	01	081860	900	1042.5	.645	9.63940	235.90	73.240	2.265	5.463	2503	1567
94241061	01	081860	900	1041.5	.758	9.65792	148.80	46.249	2.267	5.002	2496	1837
94241061	01	081860	900	1040.5	.783	9.67650	131.10	40.784	2.269	4.876	2419	1840
94241061	01	081860	900	1039.5	.745	9.69512	157.80	49.162	2.271	5.061	2512	1818
94241061	01	081860	900	1038.5	.780	9.71380	133.20	41.514	2.273	4.891	2460	1864
94241061	01	081860	900	1037.5	.778	9.73254	134.90	42.112	2.275	4.905	2471	1866
94241061	01	081860	900	1036.5	.715	9.75133	180.00	56.230	2.277	5.193	2599	1805
94241061	01	081860	900	1035.5	.795	9.77017	122.90	38.433	2.279	4.811	2454	1895
94241061	01	081860	900	1034.5	.760	9.78907	147.10	46.030	2.281	4.991	2576	1902
94241061	01	081860	900	1033.5	.725	9.80802	172.50	54.045	2.283	5.150	2485	1750
94241061	01	081860	900	1032.5	.686	9.82703	202.30	63.429	2.285	5.309	2542	1694
94241061	01	081860	900	1031.5	.701	9.84609	191.10	59.980	2.287	5.253	2506	1705
94241061	01	081860	900	1030.5	.693	9.86521	197.10	61.907	2.289	5.283	2522	1697
94241061	01	081860	900	1029.5	.692	9.88438	197.40	62.070	2.290	5.285	2510	1688
94241061	01	081860	900	1028.5	.741	9.90362	160.80	50.613	2.292	5.080	2448	1762
94241061	01	081860	900	1027.5	.663	9.92290	220.40	69.427	2.294	5.395	2694	1736
94241061	01	081860	900	1026.5	.726	9.94224	172.20	54.306	2.296	5.148	2520	1776
94241061	01	081860	900	1025.5	.666	9.96164	218.40	68.953	2.298	5.386	2675	1730
94241061	01	081860	900	1024.5	.716	9.98110	179.70	56.772	2.300	5.191	2600	1807
94241061	01	081860	900	1023.5	.682	10.00061	205.60	65.040	2.302	5.326	2659	1761
94241061	01	081860	900	1022.5	.645	10.02018	235.10	74.448	2.304	5.460	2675	1677
94241061	01	081860	900	1021.5	.703	10.03981	189.10	59.939	2.306	5.242	2485	1697
94241061	01	081860	900	1020.5	.690	10.05950	199.30	63.214	2.308	5.294	2692	1804
94241061	01	081860	900	1019.5	.657	10.07924	225.40	71.569	2.310	5.418	2572	1642
94241061	01	081860	900	1018.5	.691	10.09904	198.50	63.097	2.312	5.291	2612	1753
94241061	01	081860	900	1017.5	.662	10.11891	221.80	70.561	2.314	5.401	2656	1707

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	1016.5	.674	10.13882	211.50	67.370	2.316	5.354	2728	1787
94241061	01	081860	900	1015.5	.727	10.15880	171.10	54.556	2.318	5.142	2566	1812
94241061	01	081860	900	1014.5	.708	10.17884	185.60	59.230	2.320	5.223	2591	1781
94241061	01	081860	900	1013.5	.700	10.19894	191.70	61.240	2.322	5.256	2547	1731
94241061	01	081860	900	1012.5	.702	10.21909	190.20	60.830	2.324	5.248	2568	1750
94241061	01	081860	900	1011.5	.754	10.23931	151.20	48.401	2.326	5.019	2507	1837
94241061	01	081860	900	1010.5	.723	10.25958	174.50	55.912	2.328	5.162	2625	1842
94241061	01	081860	900	1009.5	.754	10.27992	151.60	48.628	2.330	5.021	2599	1903
94241061	01	081860	900	1008.5	.824	10.30032	103.90	33.355	2.332	4.643	2552	2042
94241061	01	081860	900	1007.5	.796	10.32077	122.70	39.418	2.334	4.809	2490	1924
94241061	01	081860	900	1006.5	.796	10.34129	122.60	39.451	2.336	4.809	2632	2034
94241061	01	081860	900	1005.5	.755	10.36187	150.90	48.597	2.338	5.017	2627	1926
94241061	01	081860	900	1004.5	.783	10.38251	131.30	42.323	2.340	4.877	2542	1933
94241061	01	081860	900	1003.5	.789	10.40322	126.90	40.930	2.342	4.843	2585	1982
94241061	01	081860	900	1002.5	.803	10.42398	117.90	38.075	2.344	4.770	2618	2041
94241061	01	081860	900	1001.5	.843	10.44481	91.50	29.587	2.346	4.516	2610	2137
94241061	01	081860	900	1000.5	.851	10.46570	86.20	27.892	2.348	4.456	2594	2145
94241061	01	081860	900	999.5	.872	10.48665	73.10	23.698	2.350	4.292	2618	2218
94241061	01	081860	900	998.5	.826	10.50767	102.70	33.297	2.352	4.632	2666	2138
94241061	01	081860	900	997.5	.880	10.52874	68.40	22.210	2.354	4.226	2574	2200
94241061	01	081860	900	996.5	.882	10.54989	67.50	21.950	2.356	4.213	2585	2213
94241061	01	081860	900	995.5	.876	10.57109	71.10	23.126	2.358	4.264	2588	2201
94241061	01	081860	900	994.5	.880	10.59236	68.50	22.297	2.360	4.226	2697	2305
94241061	01	081860	900	993.5	.917	10.61370	46.50	15.155	2.362	3.839	2570	2288
94241061	01	081860	900	992.5	.851	10.63509	86.60	28.241	2.364	4.461	2620	2165
94241061	01	081860	900	991.5	.908	10.65656	51.30	16.769	2.366	3.939	2642	2331
94241061	01	081860	900	990.5	.842	10.67809	92.10	30.112	2.368	4.523	2740	2241
94241061	01	081860	900	989.5	.870	10.69968	74.90	24.513	2.370	4.316	2636	2226
94241061	01	081860	900	988.5	.865	10.72134	77.60	25.438	2.372	4.352	2716	2282
94241061	01	081860	900	987.5	.860	10.74306	80.80	26.490	2.374	4.392	2562	2140
94241061	01	081860	900	986.5	.901	10.76486	55.90	18.370	2.376	4.025	2571	2249
94241061	01	081860	900	985.5	.825	10.78671	103.20	33.910	2.378	4.637	2641	2116
94241061	01	081860	900	984.5	.789	10.80864	126.80	41.713	2.380	4.843	2659	2039
94241061	01	081860	900	983.5	.800	10.83063	119.90	39.472	2.382	4.786	2679	2081
94241061	01	081860	900	982.5	.770	10.85269	140.00	46.143	2.384	4.942	2709	2027

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	981.5	.805	10.87481	116.30	38.362	2.386	4.756	2587	2023
94241061	01	081860	900	980.5	.688	10.89701	200.70	66.258	2.388	5.301	2712	1813
94241061	01	081860	900	979.5	.673	10.91927	212.90	70.381	2.390	5.361	2750	1797
94241061	01	081860	900	978.5	.723	10.94160	174.30	57.684	2.392	5.161	2621	1840
94241061	01	081860	900	977.5	.714	10.96400	181.10	59.979	2.394	5.199	2706	1876
94241061	01	081860	900	976.5	.698	10.98646	193.30	64.070	2.396	5.264	2750	1864
94241061	01	081860	900	975.5	.781	11.00900	132.50	43.983	2.398	4.887	2674	2029
94241061	01	081860	900	974.5	.820	11.03161	106.60	35.412	2.400	4.669	2601	2071
94241061	01	081860	900	973.5	.825	11.05428	103.40	34.401	2.402	4.639	2597	2080
94241061	01	081860	900	972.5	.798	11.07703	121.10	40.308	2.404	4.796	2748	2130
94241061	01	081860	900	971.5	.837	11.09984	95.30	31.773	2.406	4.557	2750	2236
94241061	01	081860	900	970.5	.884	11.12273	66.10	22.068	2.408	4.192	2698	2316
94241061	01	081860	900	969.5	.869	11.14569	75.10	25.072	2.411	4.318	2775	2343
94241061	01	081860	900	968.5	.917	11.16871	46.30	15.473	2.413	3.835	2718	2421
94241061	01	081860	900	967.5	.910	11.19181	50.30	16.840	2.415	3.918	2700	2387
94241061	01	081860	900	966.5	.956	11.21498	24.00	8.054	2.417	3.180	2679	2487
94241061	01	081860	900	965.5	.885	11.23823	65.10	21.850	2.419	4.177	2750	2365
94241061	01	081860	900	964.5	.938	11.26154	34.10	11.453	2.421	3.530	2655	2419
94241061	01	081860	900	963.5	.966	11.28493	18.10	6.110	2.423	2.900	2715	2548
94241061	01	081860	900	962.5	1.012	11.30839	6.50	2.206	2.425	1.880	2659	2613
94241061	01	081860	900	961.5	.906	11.33193	53.00	17.841	2.427	3.970	2819	2480
94241061	01	081860	900	960.5	.960	11.35554	21.80	7.352	2.429	3.082	2758	2571
94241061	01	081860	900	959.5	.946	11.37922	29.70	10.042	2.431	3.393	2749	2525
94241061	01	081860	900	958.5	.937	11.40298	34.50	11.653	2.433	3.541	2748	2502
94241061	01	081860	900	957.5	.951	11.42681	26.90	9.099	2.435	3.292	2769	2557
94241061	01	081860	900	956.5	.947	11.45071	28.90	9.779	2.438	3.363	2676	2462
94241061	01	081860	900	955.5	.938	11.47469	34.20	11.588	2.440	3.532	2697	2457
94241061	01	081860	900	954.5	.980	11.49875	10.50	3.584	2.442	2.358	2684	2555
94241061	01	081860	900	953.5	.935	11.52288	35.90	12.213	2.444	3.582	2804	2546
94241061	01	081860	900	952.5	.959	11.54709	22.00	7.503	2.446	3.094	2740	2553
94241061	01	081860	900	951.5	.956	11.57137	23.90	8.150	2.448	3.176	2758	2561
94241061	01	081860	900	950.5	.964	11.59573	19.50	6.653	2.450	2.972	2743	2568
94241061	01	081860	900	949.5	.941	11.62017	32.40	11.044	2.452	3.478	2782	2543
94241061	01	081860	900	948.5	.919	11.64468	44.80	15.315	2.454	3.803	2798	2499
94241061	01	081860	900	947.5	.928	11.66928	39.70	13.575	2.456	3.682	2778	2505

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	946.5	.887	11.69395	64.00	21.916	2.459	4.160	2866	2470
94241061	01	081860	900	945.5	.897	11.71870	58.20	19.937	2.461	4.064	2766	2410
94241061	01	081860	900	944.5	.952	11.74353	26.30	9.026	2.463	3.271	2648	2448
94241061	01	081860	900	943.5	.879	11.76843	69.20	23.766	2.465	4.238	2780	2373
94241061	01	081860	900	942.5	.967	11.79342	17.50	6.040	2.467	2.867	2668	2507
94241061	01	081860	900	941.5	.863	11.81848	79.10	27.224	2.469	4.371	2685	2250
94241061	01	081860	900	940.5	.851	11.84363	86.50	29.792	2.471	4.460	2745	2269
94241061	01	081860	900	939.5	.823	11.86886	104.30	35.953	2.473	4.647	2771	2216
94241061	01	081860	900	938.5	.827	11.89416	101.70	35.101	2.476	4.622	2785	2238
94241061	01	081860	900	937.5	.851	11.91955	86.50	29.870	2.478	4.460	2649	2190
94241061	01	081860	900	936.5	.832	11.94502	98.30	33.994	2.480	4.588	2755	2228
94241061	01	081860	900	935.5	.824	11.97057	103.60	35.871	2.482	4.641	2806	2247
94241061	01	081860	900	934.5	.909	11.99620	51.20	17.754	2.484	3.936	2762	2438
94241061	01	081860	900	933.5	.885	12.02192	65.40	22.700	2.486	4.181	2822	2426
94241061	01	081860	900	932.5	.973	12.04772	14.30	4.994	2.488	2.666	2705	2557
94241061	01	081860	900	931.5	1.029	12.07360	15.60	5.451	2.491	2.753	2638	2637
94241061	01	081860	900	930.5	.994	12.09956	2.90	1.026	2.493	1.081	2705	2612
94241061	01	081860	900	929.5	.920	12.12561	44.50	15.495	2.495	3.795	2884	2578
94241061	01	081860	900	928.5	.938	12.15174	33.90	11.817	2.497	3.523	2841	2590
94241061	01	081860	900	927.5	.892	12.17796	61.30	21.423	2.499	4.117	2774	2403
94241061	01	081360	900	926.5	.938	12.20426	34.10	11.937	2.501	3.531	2760	2515
94241061	01	081360	900	925.5	.981	12.23065	10.10	3.553	2.503	2.318	2689	2562
94241061	01	081360	900	924.5	.991	12.25712	4.40	1.540	2.506	1.481	2732	2631
94241061	01	081360	900	923.5	.943	12.28368	31.20	10.966	2.508	3.443	2789	2555
94241061	01	081360	900	922.5	.918	12.31033	45.90	16.129	2.510	3.827	2910	2594
94241061	01	081360	900	921.5	.971	12.33706	15.60	5.486	2.512	2.748	2816	2656
94241061	01	081360	900	920.5	.972	12.36388	14.80	5.232	2.514	2.700	2719	2568
94241061	01	081360	900	919.5	.957	12.39079	23.40	8.244	2.516	3.153	2698	2508
94241061	01	081360	900	918.5	.955	12.41778	24.50	3.651	2.519	3.200	2820	2616
94241061	01	081360	900	917.5	.918	12.44487	45.50	16.082	2.521	3.819	2836	2530
94241061	01	081360	900	916.5	.869	12.47204	75.20	26.578	2.523	4.320	2799	2363
94241061	01	081360	900	915.5	.881	12.49930	67.70	23.963	2.525	4.216	2897	2480
94241061	01	081360	900	914.5	.855	12.52665	83.90	29.698	2.527	4.429	2872	2386
94241061	01	081860	900	913.5	.852	12.55409	86.10	30.513	2.530	4.455	2787	2306
94241061	01	081860	900	912.5	.843	12.58162	91.40	32.444	2.532	4.516	2832	2320

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma\sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	911.5	.862	12.60924	79.80	28.354	2.534	4.380	2892	2421
94241061	01	081860	900	910.5	.805	12.63696	116.40	41.392	2.536	4.757	2827	2211
94241061	01	081860	900	909.5	.710	12.66476	183.80	65.424	2.538	5.214	2868	1979
94241061	01	081860	900	908.5	.702	12.69266	189.80	67.644	2.541	5.246	2865	1955
94241061	01	081860	900	907.5	.661	12.72065	222.40	79.335	2.543	5.404	2882	1851
94241061	01	081860	900	906.5	.633	12.74873	245.60	87.717	2.545	5.503	2822	1736
94241061	01	081860	900	905.5	.615	12.77690	261.30	93.408	2.547	5.565	2979	1780
94241061	01	081860	900	904.5	.628	12.80517	250.20	89.557	2.549	5.522	2848	1737
94241061	01	081860	900	903.5	.607	12.83353	267.90	96.000	2.552	5.590	2884	1702
94241061	01	081860	900	902.5	.648	12.86199	233.00	83.583	2.554	5.451	2863	1803
94241061	01	081860	900	901.5	.662	12.89054	221.90	79.676	2.556	5.402	2862	1840
94241061	01	081860	900	900.5	.731	12.91918	168.10	60.442	2.558	5.124	2836	2015
94241061	01	081860	900	899.5	.680	12.94792	207.50	74.668	2.560	5.335	3024	1997
94241061	01	081860	900	898.5	.794	12.97676	123.80	44.596	2.563	4.818	2941	2269
94241061	01	081860	900	897.5	.814	13.00569	110.70	39.929	2.565	4.707	2797	2211
94241061	01	081860	900	896.5	.808	13.03472	114.70	41.418	2.567	4.742	2888	2266
94241061	01	081860	900	895.5	.753	13.06385	152.50	55.123	2.569	5.027	2893	2116
94241061	01	081860	900	894.5	.837	13.09308	95.70	34.642	2.572	4.561	2880	2341
94241061	01	081860	900	893.5	.786	13.12240	129.20	46.809	2.574	4.861	2904	2218
94241061	01	081860	900	892.5	.816	13.15182	109.40	39.678	2.576	4.695	2823	2237
94241061	01	081860	900	891.5	.687	13.18135	201.40	73.146	2.578	5.305	3068	2049
94241061	01	081860	900	890.5	.719	13.21097	176.80	64.279	2.581	5.175	2865	2003
94241061	01	081860	900	889.5	.666	13.24069	218.60	79.547	2.583	5.387	2883	1865
94241061	01	081860	900	888.5	.492	13.27051	381.60	139.012	2.585	5.944	2892	1382
94241061	01	081860	900	887.5	.410	13.30043	479.60	174.919	2.587	6.173	2877	1146
94241061	01	081860	900	886.5	.266	13.33045	711.30	259.712	2.590	6.567	2892	749
94241061	01	081860	900	885.5	.169	13.36058	955.20	349.167	2.592	6.861	2953	486
94241061	01	081860	900	884.5	.111	13.39081	1181.60	432.417	2.594	7.074	2905	314
94241061	01	081860	900	883.5	.098	13.42114	1250.00	457.939	2.596	7.130	2815	268
94241061	01	081860	900	882.5	.115	13.45157	1163.80	426.843	2.599	7.059	2962	331
94241061	01	081860	900	881.5	.154	13.48211	1004.70	368.916	2.601	6.912	3017	453
94241061	01	081860	900	880.5	.223	13.51275	806.70	296.540	2.603	6.692	2950	640
94241061	01	081860	900	879.5	.415	13.54349	472.40	173.868	2.605	6.157	2824	1140
94241061	01	081860	900	878.5	.547	13.57435	323.90	119.350	2.608	5.780	2940	1564
94241061	01	081860	900	877.5	.643	13.60530	237.60	87.658	2.610	5.470	2924	1826

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	876.5	.792	13.63636	125.40	45.310	2.612	4.831	2869	2207
94241061	01	081860	900	875.5	.775	13.66753	136.60	50.525	2.615	4.917	3037	2288
94241061	01	081860	900	874.5	.807	13.69881	115.30	42.700	2.617	4.748	3071	2407
94241061	01	081860	900	873.5	.852	13.73019	79.30	29.413	2.619	4.374	3024	2534
94241061	01	081860	900	872.5	.864	13.76168	78.50	29.128	2.621	4.363	2969	2492
94241061	01	081860	900	871.5	.864	13.79328	78.50	29.169	2.624	4.363	2987	2507
94241061	01	081860	900	870.5	.871	13.82499	73.80	27.444	2.626	4.301	3014	2552
94241061	01	081860	900	869.5	.878	13.85681	69.70	25.971	2.628	4.245	3002	2561
94241061	01	081860	900	868.5	.910	13.88874	50.40	18.782	2.631	3.919	2932	2593
94241061	01	081860	900	867.5	.912	13.92078	49.00	18.315	2.633	3.893	2969	2632
94241061	01	081860	900	866.5	.899	13.95293	56.70	21.209	2.635	4.039	2983	2607
94241061	01	081860	900	865.5	.881	13.98519	68.00	25.433	2.637	4.219	3012	2578
94241061	01	081860	900	864.5	.965	14.01756	18.60	6.990	2.640	2.926	2874	2696
94241061	01	081860	900	863.5	.924	14.05005	42.20	15.844	2.642	3.744	2888	2593
94241061	01	081860	900	862.5	.948	14.08265	28.60	10.747	2.644	3.354	2843	2618
94241061	01	081860	900	861.5	.867	14.11536	76.20	28.658	2.647	4.334	2972	2505
94241061	01	081860	900	860.5	.880	14.14818	68.50	25.765	2.649	4.226	2983	2551
94241061	01	081860	900	859.5	.827	14.18112	102.20	38.490	2.651	4.627	3054	2453
94241061	01	081860	900	858.5	.829	14.21418	100.40	37.886	2.654	4.610	2997	2415
94241061	01	081860	900	857.5	.860	14.24735	81.10	30.615	2.656	4.395	2988	2496
94241061	01	081860	900	856.5	.757	14.28064	149.70	56.575	2.658	5.008	3031	2229
94241061	01	081860	900	855.5	.705	14.31405	187.70	71.014	2.661	5.234	3117	2136
94241061	01	081860	900	854.5	.763	14.34757	145.20	55.010	2.663	4.978	2964	2198
94241061	01	081860	900	853.5	.709	14.38121	184.60	70.024	2.665	5.218	3008	2073
94241061	01	081860	900	852.5	.673	14.41497	212.30	80.626	2.668	5.358	3002	1965
94241061	01	081860	900	851.5	.596	14.44885	277.80	105.600	2.670	5.626	3045	1765
94241061	01	081860	900	850.5	.552	14.48284	319.20	121.475	2.672	5.765	3102	1665
94241061	01	081860	900	849.5	.472	14.51696	402.90	153.520	2.675	5.998	3028	1391
94241061	01	081860	900	848.5	.371	14.55120	532.40	203.120	2.677	6.277	2891	1044
94241061	01	081860	900	847.5	.229	14.58556	791.10	302.137	2.680	6.673	3067	685
94241061	01	081860	900	846.5	.148	14.62004	1024.90	391.893	2.682	6.932	2945	426
94241061	01	081860	900	845.5	.093	14.65464	1277.10	438.914	2.684	7.152	3016	273
94241061	01	081860	900	844.5	.061	14.68937	1501.20	575.364	2.687	7.314	3199	191
94241061	01	081860	900	843.5	.037	14.72422	1760.90	675.702	2.689	7.473	3012	111
94241061	01	081860	900	842.5	.048	14.75919	1629.90	626.196	2.691	7.396	3063	144

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	841.5	.061	14.79429	1497.20	575.896	2.694	7.311	3043	183
94241061	01	081860	900	840.5	.082	14.82952	1342.60	517.054	2.696	7.202	2982	239
94241061	01	081860	900	839.5	.120	14.86487	1140.10	439.592	2.699	7.038	2963	346
94241061	01	081860	900	838.5	.202	14.90034	860.30	332.091	2.701	6.757	2948	579
94241061	01	081860	900	837.5	.308	14.93595	633.20	244.744	2.703	6.450	2915	873
94241061	01	081860	900	836.5	.420	14.97168	466.10	180.384	2.706	6.144	3021	1234
94241061	01	081860	900	835.5	.455	15.00754	422.60	163.744	2.708	6.046	3168	1403
94241061	01	081860	900	834.5	.529	15.04353	341.80	132.570	2.710	5.834	3093	1592
94241061	01	081860	900	833.5	.597	15.07965	277.20	107.655	2.713	5.624	3057	1774
94241061	01	081860	900	832.5	.609	15.11590	266.80	103.749	2.715	5.586	3247	1921
94241061	01	081860	900	831.5	.677	15.15228	209.30	81.487	2.718	5.343	3073	2023
94241061	01	081860	900	830.5	.728	15.18879	170.70	66.553	2.720	5.140	2962	2095
94241061	01	081860	900	829.5	.769	15.22543	141.00	55.041	2.722	4.949	3044	2275
94241061	01	081860	900	828.5	.778	15.26221	135.00	52.748	2.725	4.905	3063	2315
94241061	01	081860	900	827.5	.753	15.29912	152.30	59.578	2.727	5.025	3107	2274
94241061	01	081860	900	826.5	.798	15.33616	120.90	47.361	2.730	4.795	3038	2357
94241061	01	081860	900	825.5	.825	15.37334	103.30	40.518	2.732	4.638	3061	2454
94241061	01	081860	900	824.5	.754	15.41066	151.80	59.591	2.735	5.022	3198	2343
94241061	01	081860	900	823.5	.786	15.44811	129.10	50.776	2.737	4.861	3086	2358
94241061	01	081860	900	822.5	.810	15.48569	113.00	44.495	2.739	4.728	3023	2380
94241061	01	081860	900	821.5	.739	15.52342	162.30	63.973	2.742	5.089	3182	2286
94241061	01	081860	900	820.5	.779	15.56128	134.20	52.970	2.744	4.899	3114	2357
94241061	01	081860	900	819.5	.793	15.59928	124.20	49.081	2.747	4.822	2958	2281
94241061	01	081860	900	818.5	.754	15.63742	151.60	59.952	2.749	5.021	3194	2341
94241061	01	081860	900	817.5	.729	15.67570	170.00	67.323	2.752	5.136	3150	2231
94241061	01	081860	900	816.5	.689	15.71412	200.30	79.420	2.754	5.300	3128	2094
94241061	01	081860	900	815.5	.716	15.75268	179.30	71.191	2.757	5.189	3116	2169
94241061	01	081860	900	814.5	.708	15.79139	185.50	73.730	2.759	5.223	3050	2099
94241061	01	081860	900	813.5	.694	15.83023	196.00	78.002	2.761	5.278	3094	2088
94241061	01	081860	900	812.5	.644	15.86922	236.60	94.284	2.764	5.466	3041	1903
94241061	01	081860	900	811.5	.662	15.90836	221.30	88.266	2.766	5.399	3005	1935
94241061	01	081860	900	810.5	.640	15.94764	239.90	95.810	2.769	5.480	3167	1970
94241061	01	081860	900	809.5	.590	15.98707	283.70	113.458	2.771	5.648	3312	1899
94241061	01	081860	900	808.5	.619	16.02664	257.40	103.081	2.774	5.550	3219	1938
94241061	01	081860	900	807.5	.677	16.06636	209.80	84.129	2.776	5.346	3109	2045

Ident.	Avg. Pis.	Date	Run No.	Time-Of- Flight	Trcns.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	806.5	.689	16.10622	200.10	80.341	2.779	5.299	3070	2056
94241061	01	081860	900	805.5	.684	16.14624	203.70	81.867	2.781	5.316	3122	2077
94241061	01	081860	900	804.5	.726	16.18640	172.00	69.227	2.784	5.147	3217	2270
94241061	01	081860	900	803.5	.695	16.22672	195.00	78.578	2.786	5.273	3313	2240
94241061	01	081860	900	802.5	.682	16.26718	205.60	82.923	2.789	5.325	3276	2172
94241061	01	081860	900	801.5	.698	16.30780	192.80	77.878	2.791	5.261	3236	2197
94241061	01	081860	900	800.5	.726	16.34857	171.80	69.492	2.794	5.146	3193	2254
94241061	01	081860	900	799.5	.734	16.38949	166.20	67.308	2.796	5.113	3216	2294
94241061	01	081860	900	798.5	.653	16.43057	228.50	92.654	2.799	5.431	3359	2134
94241061	01	081860	900	797.5	.694	16.47180	196.50	79.778	2.801	5.281	3159	2130
94241061	01	081860	900	796.5	.632	16.51319	246.50	100.176	2.804	5.507	3188	1959
94241061	01	081860	900	795.5	.661	16.55473	222.30	90.480	2.806	5.404	3129	2011
94241061	01	081860	900	794.5	.574	16.59643	297.90	121.372	2.809	5.696	3187	1780
94241061	01	081860	900	793.5	.549	16.63829	322.20	131.437	2.811	5.775	3218	1718
94241061	01	081860	900	792.5	.604	16.68030	270.40	110.468	2.814	5.600	3049	1792
94241061	01	081860	900	791.5	.581	16.72248	291.80	119.338	2.816	5.676	3213	1815
94241061	01	081860	900	790.5	.583	16.76481	289.60	118.580	2.819	5.668	3339	1894
94241061	01	081860	900	789.5	.706	16.80731	186.80	76.606	2.821	5.230	3184	2186
94241061	01	081860	900	788.5	.801	16.84997	119.20	48.934	2.824	4.780	3224	2510
94241061	01	081860	900	787.5	.807	16.89279	115.20	47.385	2.826	4.747	3179	2493
94241061	01	081860	900	786.5	.858	16.93577	75.80	31.202	2.829	4.328	3145	2654
94241061	01	081860	900	785.5	.905	16.97892	53.30	21.999	2.831	3.977	3211	2825
94241061	01	081860	900	784.5	.929	17.02223	39.30	16.213	2.834	3.671	3200	2890
94241061	01	081860	900	783.5	.896	17.06571	59.00	24.389	2.837	4.078	3223	2806
94241061	01	081860	900	782.5	.926	17.10936	41.20	17.045	2.839	3.718	3279	2951
94241061	01	081860	900	781.5	.977	17.15317	12.40	5.164	2.842	2.523	3198	3036
94241061	01	081860	900	780.5	.974	17.19716	14.10	5.855	2.844	2.647	3230	3057
94241061	01	081860	900	779.5	.941	17.24131	32.60	13.540	2.847	3.484	3297	3015
94241061	01	081860	900	778.5	.868	17.28563	75.60	31.439	2.849	4.325	3268	2759
94241061	01	081860	900	777.5	.927	17.33012	40.60	16.939	2.852	3.705	3268	2944
94241061	01	081860	900	776.5	.959	17.37479	22.30	9.332	2.855	3.108	3281	3058
94241061	01	081860	900	775.5	.898	17.41963	57.50	24.007	2.857	4.052	3318	2897
94241061	01	081860	900	774.5	.912	17.46464	49.20	20.573	2.860	3.896	3213	2849
94241061	01	081860	900	773.5	.813	17.50983	111.20	46.556	2.862	4.711	3236	2557
94241061	01	081860	900	772.5	.778	17.55519	134.70	56.475	2.865	4.903	3181	2406

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	771.5	.695	17.60073	195.50	82.031	2.867	5.275	3228	2181
94241061	01	081860	900	770.5	.583	17.64644	290.20	121.935	2.870	5.670	3207	1817
94241061	01	081860	900	769.5	.481	17.69234	393.20	165.388	2.873	5.974	3246	1519
94241061	01	081860	900	768.5	.321	17.73841	611.00	257.334	2.875	6.415	3222	1006
94241061	01	081860	900	767.5	.175	17.78467	937.40	395.319	2.878	6.843	3207	546
94241061	01	081860	900	766.5	.161	17.83110	982.20	414.765	2.880	6.889	3243	508
94241061	01	081860	900	765.5	.188	17.87772	896.90	379.253	2.883	6.799	3193	586
94241061	01	081860	900	764.5	.273	17.92452	698.40	295.722	2.886	6.548	3312	879
94241061	01	081860	900	763.5	.409	17.97150	480.60	203.765	2.888	6.175	3356	1335
94241061	01	081860	900	762.5	.602	18.01867	272.90	115.841	2.891	5.609	3327	1947
94241061	01	081860	900	761.5	.759	18.06603	147.70	62.808	2.894	4.995	3337	2464
94241061	01	081860	900	760.5	.793	18.11357	124.20	52.893	2.896	4.822	3297	2543
94241061	01	081860	900	759.5	.852	18.16130	85.70	36.547	2.899	4.451	3208	2658
94241061	01	081860	900	758.5	.830	18.20922	99.90	42.642	2.901	4.604	3322	2681
94241061	01	081860	900	757.5	.859	18.25733	81.10	34.687	2.904	4.396	3249	2715
94241061	01	081860	900	756.5	.867	18.30563	76.40	32.717	2.907	4.336	3229	2722
94241061	01	081860	900	755.5	.917	18.35412	46.40	19.900	2.909	3.838	3323	2962
94241061	01	081860	900	754.5	.948	18.40280	28.40	12.196	2.912	3.347	3283	3026
94241061	01	081860	900	753.5	.943	18.45168	31.30	13.449	2.915	3.443	3257	2986
94241061	01	081860	900	752.5	.895	18.50076	59.40	25.579	2.917	4.085	3317	2886
94241061	01	081860	900	751.5	.989	18.55003	5.60	2.429	2.920	1.729	3230	3106
94241061	01	081860	900	750.5	.956	18.59949	24.10	10.423	2.923	3.185	3212	2984
94241061	01	081860	900	749.5	1.028	18.64916	15.20	6.594	2.925	2.725	3145	3144
94241061	01	081860	900	748.5	.962	18.69902	20.70	8.964	2.928	3.031	3185	2978
94241061	01	081860	900	747.5	.994	18.74909	3.20	1.385	2.931	1.163	3178	3070
94241061	01	081860	900	746.5	.963	18.79935	20.10	8.715	2.933	3.000	3147	2946
94241061	01	081860	900	745.5	.951	18.84982	26.50	11.540	2.936	3.280	3263	3018
94241061	01	081860	900	744.5	.990	18.90049	4.80	2.121	2.939	1.585	3218	3099
94241061	01	081860	900	743.5	.981	18.95137	10.00	4.370	2.941	2.306	3226	3077
94241061	01	081860	900	742.5	.946	19.00245	29.30	12.811	2.944	3.380	3331	3065
94241061	01	081860	900	741.5	.985	19.05374	8.00	3.518	2.947	2.086	3282	3142
94241061	01	081860	900	740.5	1.003	19.10523	1.70	.778	2.949	.576	3239	3158
94241061	01	081860	900	739.5	1.018	19.15694	9.70	4.254	2.952	2.274	3328	3293
94241061	01	081860	900	738.5	.964	19.20885	19.50	8.568	2.955	2.972	3355	3144
94241061	01	081860	900	737.5	.985	19.26098	7.80	3.423	2.958	2.054	3319	3179

Ident.	Avg. Pts.	Date	Run No.	Time-Of-Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	736.5	.985	19.31332	8.00	3.555	2.960	2.090	3445	3298
94241061	01	081860	900	735.5	1.011	19.36587	6.20	2.768	2.963	1.838	3344	3288
94241061	01	081860	900	734.5	.970	19.41864	15.90	7.028	2.966	2.769	3359	3169
94241061	01	081860	900	733.5	1.003	19.47163	1.70	.754	2.968	.536	3310	3227
94241061	01	081860	900	732.5	1.039	19.52483	20.70	9.164	2.971	3.032	3200	3232
94241061	01	081860	900	731.5	.930	19.57825	38.80	17.181	2.974	3.659	3548	3208
94241061	01	081860	900	730.5	.981	19.63189	10.20	4.546	2.977	2.328	3373	3216
94241061	01	081860	900	729.5	1.050	19.68575	26.40	11.722	2.979	3.274	3374	3444
94241061	01	081860	900	728.5	.960	19.73983	21.40	9.516	2.982	3.064	3464	3235
94241061	01	081860	900	727.5	.964	19.79413	19.40	8.635	2.985	2.965	3404	3191
94241061	01	081860	900	726.5	1.004	19.84866	2.30	1.060	2.988	.867	3440	3358
94241061	01	081860	900	725.5	1.029	19.90342	15.60	6.990	2.990	2.751	3418	3420
94241061	01	081860	900	724.5	1.000	19.95840	,	.022	2.993	2.995	3389	3294
94241061	01	081860	900	723.5	.952	20.01361	26.10	11.694	2.996	3.263	3424	3170
94241061	01	081860	900	722.5	.987	20.06905	6.60	2.961	2.999	1.888	3403	3267
94241061	01	081860	900	721.5	.966	20.12472	18.10	8.133	3.001	2.897	3399	3194
94241061	01	081860	900	720.5	.996	20.18062	2.00	.920	3.004	.717	3391	3283
94241061	01	081860	900	719.5	.944	20.23676	30.70	13.842	3.007	3.426	3447	3164
94241061	01	081860	900	718.5	.824	20.29313	104.10	46.926	3.010	4.646	3490	2795
94241061	01	081860	900	717.5	.776	20.34973	135.90	61.341	3.013	4.912	3484	2630
94241061	01	081860	900	716.5	.661	20.40657	222.30	100.425	3.015	5.404	3437	2210
94241061	01	081860	900	715.5	.654	20.46366	228.10	103.225	3.018	5.430	3352	2132
94241061	01	081860	900	714.5	.652	20.52098	230.00	104.212	3.021	5.438	3466	2197
94241061	01	081860	900	713.5	.760	20.57854	147.20	66.793	3.024	4.992	3429	2535
94241061	01	081860	900	712.5	.769	20.63634	140.80	63.970	3.027	4.947	3550	2656
94241061	01	081860	900	711.5	.782	20.69439	131.70	59.925	3.029	4.880	3480	2648
94241061	01	081860	900	710.5	.812	20.75269	111.50	50.798	3.032	4.714	3515	2777
94241061	01	081860	900	709.5	.856	20.81123	83.20	37.955	3.035	4.421	3431	2857
94241061	01	081860	900	708.5	.923	20.87002	42.50	19.438	3.038	3.750	3492	3136
94241061	01	081860	900	707.5	.913	20.92905	48.70	22.284	3.041	3.885	3531	3135
94241061	01	081860	900	706.5	.907	20.98834	52.10	23.891	3.043	3.954	3480	3070
94241061	01	081860	900	705.5	.946	21.04788	29.40	13.524	3.046	3.383	3419	3146
94241061	01	081860	900	704.5	.966	21.10768	18.30	8.416	3.049	2.907	3418	3211
94241061	01	081860	900	703.5	.998	21.16773	.60	.285	3.052	.478	3398	3299
94241061	01	081860	900	702.5	.943	21.22804	31.50	14.550	3.055	3.452	3441	3154

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	701.5	.998	21.28860	.80	.387	3.058	.174-	3353	3254
94241061	01	081860	900	700.5	.973	21.34943	14.30	6.630	3.061	2.663	3545	3355
94241061	01	081860	900	699.5	.921	21.41051	44.00	20.378	3.063	3.785	3496	3131
94241061	01	081860	900	698.5	.925	21.47186	41.50	19.267	3.066	3.727	3530	3176
94241061	01	081860	900	697.5	1.058	21.53347	30.70-	14.264	3.069	3.425	3399	3498
94241061	01	081860	900	696.5	.985	21.59535	8.00	3.750	3.072	2.088	3487	3339
94241061	01	081860	900	695.5	.963	21.65749	19.90	9.293	3.075	2.994	3517	3294
94241061	01	081860	900	694.5	.981	21.71991	10.30	4.809	3.078	2.334	3489	3327
94241061	01	081860	900	693.5	.955	21.78259	24.60	11.481	3.081	3.202	3474	3226
94241061	01	081860	900	692.5	.920	21.84555	44.50	20.813	3.083	3.796	3498	3130
94241061	01	081860	900	691.5	.893	21.90878	60.40	28.271	3.086	4.100	3385	2941
94241061	01	081860	900	690.5	.915	21.97228	47.50	22.298	3.089	3.862	3521	3133
94241061	01	081860	900	689.5	.902	22.03606	55.30	25.959	3.092	4.012	3524	3091
94241061	01	081860	900	688.5	.858	22.10012	82.10	38.605	3.095	4.408	3589	2995
94241061	01	081860	900	687.5	.838	22.16446	94.50	44.522	3.098	4.549	3570	2911
94241061	01	081860	900	686.5	.789	22.22908	127.40	60.085	3.101	4.847	3517	2698
94241061	01	081860	900	685.5	.826	22.29398	102.80	48.576	3.104	4.633	3511	2819
94241061	01	081860	900	684.5	.848	22.35917	88.10	41.691	3.107	4.479	3535	2917
94241061	01	081860	900	683.5	.876	22.42464	70.60	33.460	3.110	4.257	3566	3040
94241061	01	081860	900	682.5	.907	22.49040	52.40	24.854	3.113	3.959	3580	3157
94241061	01	081860	900	681.5	.947	22.55645	28.70	13.649	3.116	3.358	3531	3254
94241061	01	081860	900	680.5	.945	22.62279	29.90	14.259	3.118	3.400	3613	3322
94241061	01	081860	900	679.5	.902	22.68943	55.30	26.374	3.121	4.014	3522	3089
94241061	01	081860	900	678.5	.864	22.75636	78.10	37.280	3.124	4.358	3484	2929
94241061	01	081860	900	677.5	.875	22.82359	71.40	34.125	3.127	4.268	3483	2965
94241061	01	081860	900	676.5	.764	22.89111	144.50	69.145	3.130	4.973	3641	2706
94241061	01	081860	900	675.5	.720	22.95894	176.40	84.546	3.133	5.173	3551	2487
94241061	01	081860	900	674.5	.772	23.02706	139.20	66.797	3.136	4.935	3576	2684
94241061	01	081860	900	673.5	.795	23.09550	123.30	59.298	3.139	4.815	3515	2717
94241061	01	081860	900	672.5	.820	23.16423	106.60	51.315	3.142	4.669	3579	2854
94241061	01	081860	900	671.5	.821	23.23328	105.90	51.064	3.145	4.662	3517	2808
94241061	01	081860	900	670.5	.816	23.30263	109.30	52.776	3.148	4.694	3553	2819
94241061	01	081860	900	669.5	.856	23.37229	83.00	40.164	3.151	4.419	3637	3030
94241061	01	081860	900	668.5	.866	23.44227	76.80	37.208	3.154	4.341	3677	3099
94241061	01	081860	900	667.5	.902	23.51256	55.30	26.814	3.157	4.012	3616	3172

Ident.	Avg. Pts.	Dcte	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	666.5	.904	23.58317	54.00	26.262	3.160	3.990	3502	3079
94241061	01	081860	900	665.5	.863	23.65410	78.70	38.285	3.163	4.365	3609	3031
94241061	01	081860	900	664.5	.843	23.72534	91.70	44.670	3.166	4.518	3564	2922
94241061	01	081860	900	663.5	.853	23.79691	85.50	41.728	3.169	4.448	3597	2983
94241061	01	081860	900	662.5	.771	23.86881	139.40	68.129	3.172	4.937	3636	2728
94241061	01	081860	900	661.5	.668	23.94103	216.50	105.942	3.175	5.377	3662	2381
94241061	01	081860	900	660.5	.657	24.01358	225.90	110.728	3.178	5.420	3467	2215
94241061	01	081860	900	659.5	.569	24.08646	303.40	148.922	3.181	5.715	3543	1960
94241061	01	081860	900	658.5	.594	24.15967	280.10	137.710	3.184	5.635	3651	2109
94241061	01	081860	900	657.5	.751	24.23321	153.70	75.677	3.187	5.035	3620	2645
94241061	01	081860	900	656.5	.850	24.30709	87.20	43.006	3.190	4.468	3550	2935
94241061	01	081860	900	655.5	.906	24.38131	52.90	26.135	3.193	3.968	3593	3166
94241061	01	081860	900	654.5	.954	24.45587	24.70	12.259	3.196	3.210	3620	3361
94241061	01	081860	900	653.5	.914	24.53078	47.90	23.763	3.199	3.870	3713	3302
94241061	01	081860	900	652.5	.971	24.60603	15.60	7.782	3.202	2.753	3536	3339
94241061	01	081860	900	651.5	.988	24.68162	6.20	3.110	3.206	1.834	3514	3377
94241061	01	081860	900	650.5	.915	24.75756	47.70	23.754	3.209	3.865	3736	3324
94241061	01	081860	900	649.5	.913	24.83386	48.60	24.244	3.212	3.884	3766	3345
94241061	01	081860	900	648.5	1.043	24.91051	23.00	11.479	3.215	3.135	3546	3598
94241061	01	081860	900	647.5	.923	24.98751	42.70	21.349	3.218	3.754	3709	3331
94241061	01	081360	900	646.5	.961	25.06487	21.20	10.638	3.221	3.056	3731	3487
94241061	01	081360	900	645.5	.960	25.14259	21.70	10.901	3.224	3.079	3625	3385
94241061	01	081360	900	644.5	.937	25.22067	34.80	17.521	3.227	3.552	3686	3359
94241061	01	081360	900	643.5	.938	25.29912	34.10	17.171	3.230	3.530	3762	3433
94241061	01	081360	900	642.5	.963	25.37793	19.90	10.030	3.233	2.991	3744	3508
94241061	01	081860	900	641.5	.979	25.45711	11.10	5.520	3.236	2.410	3716	3539
94241061	01	081860	900	640.5	.978	25.53667	11.50	5.831	3.240	2.445	3559	3387
94241061	01	081860	900	639.5	.919	25.61660	45.40	22.983	3.243	3.815	3676	3285
94241061	01	081860	900	638.5	.902	25.69690	55.10	27.951	3.246	4.009	3653	3206
94241061	01	081860	900	637.5	.884	25.77758	66.10	33.590	3.249	4.192	3746	3221
94241061	01	081860	900	636.5	.895	25.85864	59.40	30.215	3.252	4.084	3720	3239
94241061	01	081860	900	635.5	.838	25.94008	94.50	48.130	3.255	4.548	3761	3068
94241061	01	081860	900	634.5	.770	26.02191	140.00	71.452	3.258	4.942	3689	2765
94241061	01	081860	900	633.5	.641	26.10413	239.20	122.222	3.262	5.477	3744	2334
94241061	01	081860	900	632.5	.560	26.18674	311.80	159.582	3.265	5.742	3802	2071

Ident.	Avg. Pis.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barne)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	631.5	.484	26.26974	389.90	199.870	3.268	5.966	3672	1730
94241061	01	081860	900	630.5	.417	26.35314	469.50	241.055	3.271	6.151	3748	1523
94241061	01	081860	900	629.5	.352	26.43693	561.20	288.566	3.274	6.330	3802	1303
94241061	01	081860	900	628.5	.407	26.52112	482.80	248.666	3.277	6.179	3819	1514
94241061	01	081860	900	627.5	.531	26.60572	339.90	175.322	3.281	5.828	3862	1997
94241061	01	081860	900	626.5	.635	26.69072	243.50	125.846	3.284	5.495	3839	2374
94241061	01	081860	900	625.5	.870	26.77613	74.40	38.498	3.287	4.309	3597	3046
94241061	01	081860	900	624.5	.915	26.86196	47.70	24.768	3.290	3.866	3664	3260
94241061	01	081860	900	623.5	.928	26.94819	39.60	20.593	3.293	3.680	3682	3326
94241061	01	081860	900	622.5	.938	27.03484	33.90	17.647	3.297	3.524	3723	3399
94241061	01	081860	900	621.5	.965	27.12191	19.00	9.915	3.300	2.946	3746	3516
94241061	01	081860	900	620.5	.973	27.20940	14.40	7.521	3.303	2.668	3715	3517
94241061	01	081860	900	619.5	.992	27.29731	4.20	2.210	3.306	1.442	3664	3535
94241061	01	081860	900	618.5	.932	27.38565	37.40	19.608	3.310	3.623	3721	3375
94241061	01	081860	900	617.5	.985	27.47442	7.70	4.078	3.313	2.051	3613	3463
94241061	01	081860	900	616.5	.950	27.56363	27.50	14.443	3.316	3.314	3631	3355
94241061	01	081860	900	615.5	.910	27.65326	50.10	26.393	3.319	3.915	3784	3352
94241061	01	081860	900	614.5	.951	27.74334	26.50	13.973	3.322	3.278	3646	3375
94241061	01	081860	900	613.5	.959	27.83386	22.30	11.786	3.326	3.106	3756	3504
94241061	01	081860	900	612.5	.904	27.92482	53.80	28.445	3.329	3.985	3889	3422
94241061	01	081860	900	611.5	.915	28.01622	47.60	25.216	3.332	3.863	3803	3385
94241061	01	081860	900	610.5	.851	28.10808	86.40	45.838	3.336	4.459	3864	3200
94241061	01	081860	900	609.5	.865	28.20039	78.00	41.437	3.339	4.357	3842	3232
94241061	01	081860	900	608.5	.844	28.29315	90.60	48.223	3.342	4.507	3735	3069
94241061	01	081860	900	607.5	.812	28.38638	111.70	59.517	3.345	4.715	3894	3077
94241061	01	081860	900	606.5	.749	28.48006	155.20	82.867	3.349	5.045	3871	2821
94241061	01	081860	900	605.5	.697	28.57421	193.50	103.467	3.352	5.265	3804	2582
94241061	01	081860	900	604.5	.656	28.66883	226.70	121.420	3.355	5.423	3794	2421
94241061	01	081860	900	603.5	.614	28.76391	262.10	140.590	3.359	5.568	3844	2297
94241061	01	081860	900	602.5	.542	28.85947	329.30	176.924	3.362	5.797	3849	2030
94241061	01	081860	900	601.5	.593	28.95551	280.60	150.991	3.365	5.636	3838	2216
94241061	01	081860	900	600.5	.646	29.05203	234.30	126.314	3.369	5.456	3757	2364
94241061	01	081860	900	599.5	.641	29.14903	238.60	128.852	3.372	5.475	3869	2415
94241061	01	081860	900	598.5	.687	29.24652	201.40	108.955	3.375	5.305	3841	2569
94241061	01	081860	900	597.5	.646	29.34450	234.40	127.024	3.379	5.457	3890	2447

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241061	01	081860	900	596.5	.688	29.44297	200.80	108.984	3.382	5.302	3781	2532
94241061	01	081860	900	595.5	.736	29.54194	164.80	89.616	3.385	5.105	3872	2772
94241061	01	081860	900	594.5	.787	29.64141	128.60	70.020	3.389	4.856	3950	3025
94241061	01	081860	900	593.5	.885	29.74138	65.20	35.584	3.392	4.178	3863	3328
94241061	01	081860	900	592.5	.827	29.84185	101.80	55.616	3.395	4.623	3958	3186
94241061	01	081860	900	591.5	.913	29.94284	48.80	26.719	3.399	3.888	3963	3520
94241061	01	081860	900	590.5	1.007	30.04434	3.80	2.132	3.402	1.358	3729	3653
94241061	01	081860	900	589.5	.935	30.14636	35.70	19.650	3.406	3.577	3845	3499
94241061	01	081860	900	588.5	.938	30.24890	22.70	12.512	3.409	3.124	3872	3610
94241061	01	081860	900	587.5	.951	30.35196	26.80	14.775	3.412	3.289	3842	3555
94241061	01	081860	900	586.5	.971	30.45555	15.30	8.454	3.416	2.729	3746	3541
94241061	01	081860	900	585.5	.903	30.55967	54.40	30.089	3.419	3.996	3820	3358
94241061	01	081860	900	584.5	.884	30.66433	66.20	36.708	3.423	4.194	3848	3309
94241061	01	081860	900	583.5	.802	30.76953	118.30	65.638	3.426	4.773	3898	3043
94241061	01	081860	900	582.5	.676	30.87526	210.10	116.743	3.429	5.347	4015	2643
94241061	01	081860	900	581.5	.653	30.98155	228.60	127.252	3.433	5.432	3739	2378
94241061	01	081860	900	580.5	.609	31.08838	266.70	148.703	3.436	5.586	4008	2375
94241061	01	081860	900	579.5	.684	31.19576	203.90	113.925	3.440	5.318	3965	2640

APPENDIX B

TABULATION OF THE TOTAL NEUTRON CROSS SECTION OF Pu^{241}

OPERATING CONDITIONS FOR IBM RUN NUMBER 915

Two inch effective B^{10}F_3 detector thickness.

Flight path of 16 meters.

Rotor speed of 6000 rev/minute.

Channel width of 1 μsec .

SAMPLE THICKNESS

Isotope	barns/atom
Pu-239	5,404
Pu-240	4,014
Pu-241	538.8
Pu-242	78,927
Am-241	11,381
Oxygen	209.1

INSTRUMENT RESOLUTION * (Full width at half-maximum)

E (ev)	Width (μsec)
20	1.8
2000	1.6

The data are quoted as barns/atom of Pu in the sample used (418 barns/atom of Pu).

* The difference in the resolution at the two energies quoted is due to the detector thickness.

Ident.	Avg. Pts.	Dcte	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barne)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	09C160	915	258.0	.935	20.10172	26.05	116.804	3.000	3.260	8875	8211
94241000	01	09C160	915	257.0	.857	20.25845	64.14	288.708	3.008	4.161	8875	7496
94241000	01	09C160	915	256.0	.713	20.41703	140.92	636.777	3.016	4.948	9036	6352
94241000	01	09C160	915	255.0	.734	20.57748	129.04	585.388	3.024	4.860	8866	6413
94241000	01	09C160	915	254.0	.80E	20.73983	88.65	403.739	3.032	4.484	8894	7085
94241000	01	090160	915	253.0	.89C	20.90410	48.52	221.870	3.039	3.882	8945	7843
94241000	01	090160	915	252.0	.920	21.07034	34.78	155.685	3.047	3.549	9058	8207
94241000	01	090160	915	251.0	.960	21.23856	16.66	76.783	3.055	2.813	8910	8431
94241000	01	090160	915	250.0	.963	21.40881	15.34	71.019	3.063	2.731	9074	8613
94241000	01	090160	915	249.0	.961	21.58111	16.50	76.652	3.071	2.803	9047	8564
94241000	01	090160	915	248.0	.928	21.75551	31.11	145.143	3.079	3.437	9120	8336
94241000	01	090160	915	247.0	.892	21.93202	47.47	222.343	3.087	3.860	9085	7986
94241000	01	090160	915	246.0	.871	22.11069	57.35	263.676	3.096	4.049	9130	7839
94241000	01	090160	915	245.0	.847	22.29156	69.40	327.684	3.104	4.239	9201	7675
94241000	01	090160	915	244.0	.838	22.47465	49.27	233.595	3.112	3.897	9249	8096
94241000	01	090160	915	243.0	.856	22.66000	59.89	285.092	3.120	4.092	9286	7923
94241000	01	090160	915	242.0	.810	22.84766	88.08	421.030	3.128	4.478	9346	7455
94241000	01	090160	915	241.0	.789	23.03767	98.74	473.971	3.137	4.592	9243	7187
94241000	01	090160	915	240.0	.809	23.23005	88.35	425.845	3.145	4.481	9378	7476
94241000	01	090160	915	239.0	.853	23.42485	66.12	320.054	3.153	4.191	9367	7874
94241000	01	090160	915	238.0	.820	23.62211	82.57	401.346	3.162	4.413	9465	7650
94241000	01	090160	915	237.0	.769	23.82187	109.46	534.258	3.170	4.695	9362	7095
94241000	01	090160	915	236.0	.697	24.02418	150.95	739.908	3.179	5.016	9538	6546
94241000	01	090160	915	235.0	.757	24.22907	116.05	571.263	3.187	4.754	9392	7008
94241000	01	090160	915	234.0	.876	24.43660	55.32	273.480	3.196	4.013	9418	8125
94241000	01	090160	915	233.0	.935	24.64681	27.89	138.501	3.204	3.328	9499	8750
94241000	01	090160	915	232.0	.949	24.85974	21.78	108.624	3.213	3.081	9594	8968
94241000	01	090160	915	231.0	.927	25.07544	31.39	157.187	3.221	3.446	9694	8856
94241000	01	090160	915	230.0	.929	25.29396	30.37	152.760	3.230	3.413	9721	8902
94241000	01	090160	915	229.0	.909	25.51535	39.50	195.556	3.239	3.676	9596	8597
94241000	01	090160	915	228.0	.875	25.73966	55.54	281.809	3.248	4.017	9656	8325
94241000	01	090160	915	227.0	.795	25.96694	95.75	487.946	3.256	4.561	9597	7516
94241000	01	090160	915	226.0	.606	26.19725	209.01	1065.822	3.265	5.342	9775	5838
94241000	01	090160	915	225.0	.527	26.43063	267.34	1374.435	3.274	5.588	9828	5108
94241000	01	090160	915	224.0	.660	26.66714	173.31	895.008	3.283	5.155	9800	6376

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barne)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	G1	090160	915	223.0	.839	26.90685	72.97	378.509	3.292	4.290	9662	7991
94241000	G1	090160	915	222.0	.924	27.14980	32.67	170.234	3.301	3.486	9754	8883
94241000	G1	090160	915	221.0	.931	27.39605	29.74	155.710	3.310	3.392	9874	9055
94241000	G1	090160	915	220.0	.940	27.64567	25.45	133.814	3.319	3.236	9756	9039
94241000	G1	090160	915	219.0	.910	27.89872	39.21	207.104	3.328	3.668	9799	8785
94241000	G1	090160	915	218.0	.871	28.15526	57.56	305.438	3.337	4.052	9884	8482
94241000	G1	090160	915	217.0	.775	28.41535	106.47	567.598	3.346	4.667	9934	7582
94241000	G1	090160	915	216.0	.665	28.67907	170.06	910.725	3.356	5.136	10131	6643
94241000	G1	090160	915	215.0	.625	28.94647	196.01	1054.588	3.365	5.278	10019	6174
94241000	G1	090160	915	214.0	.671	29.21763	166.76	901.415	3.374	5.116	10193	6737
94241000	G1	090160	915	213.0	.744	29.49262	123.20	669.112	3.384	4.813	10130	7430
94241000	G1	090160	915	212.0	.833	29.77151	76.28	416.209	3.393	4.334	10094	8283
94241000	G1	090160	915	211.0	.900	30.05437	43.60	239.051	3.403	3.775	10069	8933
94241000	G1	090160	915	210.0	.881	30.34128	52.87	291.245	3.412	3.967	10306	8943
94241000	G1	090160	915	209.0	.819	30.63233	83.26	460.815	3.422	4.421	10331	8336
94241000	G1	090160	915	208.0	.726	30.92758	133.67	743.407	3.431	4.895	10278	7352
94241000	G1	090160	915	207.0	.737	31.22711	127.30	711.401	3.441	4.846	10406	7557
94241000	G1	090160	915	206.0	.856	31.53103	64.66	363.093	3.450	4.169	10310	8698
94241000	G1	090160	915	205.0	.915	31.83940	37.13	209.511	3.460	3.614	10264	9248
94241000	G1	090160	915	204.0	.917	32.15231	35.94	203.796	3.470	3.581	10455	9447
94241000	G1	090160	915	203.0	.926	32.46986	32.13	183.084	3.480	3.469	10385	9469
94241000	G1	090160	915	202.0	.934	32.79214	28.21	161.583	3.490	3.339	10376	9551
94241000	G1	090160	915	201.0	.924	33.11925	32.62	187.749	3.500	3.485	10287	9369
94241000	G1	090160	915	200.0	.889	33.45127	49.02	283.535	3.510	3.892	10487	9184
94241000	G1	090160	915	199.0	.870	33.78830	58.11	337.809	3.520	4.062	10521	9016
94241000	G1	090160	915	198.0	.881	34.13046	52.78	308.388	3.530	3.966	10558	9163
94241000	G1	090160	915	197.0	.888	34.47784	49.26	289.256	3.540	3.897	10475	9169
94241000	G1	090160	915	196.0	.843	34.83056	70.96	418.788	3.550	4.262	10675	8871
94241000	G1	090160	915	195.0	.878	35.18871	54.26	321.871	3.560	3.993	10511	9091
94241000	G1	090160	915	194.0	.912	35.55241	38.12	227.306	3.571	3.640	10571	9502
94241000	G1	090160	915	193.0	.943	35.92179	24.11	144.533	3.581	3.182	10601	9853
94241000	G1	090160	915	192.0	.937	36.29695	26.88	161.968	3.591	3.291	10777	9952
94241000	G1	090160	915	191.0	.937	36.67801	26.88	162.822	3.602	3.291	10664	9846
94241000	G1	090160	915	190.0	.939	37.06511	26.17	159.375	3.612	3.264	10696	9893
94241000	G1	090160	915	189.0	.944	37.45838	23.70	145.076	3.623	3.165	10598	9861

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	090160	915	188.0	.817	37.85793	84.49	519.894	3.633	4.436	10823	8707
94241000	01	090160	915	187.0	.681	38.26391	160.09	990.307	3.644	5.075	10696	7182
94241000	01	090160	915	186.0	.743	38.67645	124.06	771.565	3.655	4.820	10810	7913
94241000	01	090160	915	185.0	.813	39.09571	86.50	540.905	3.666	4.460	10917	8741
94241000	01	090160	915	184.0	.784	39.52182	101.31	635.924	3.676	4.618	10918	8437
94241000	01	090160	915	183.0	.785	39.95493	100.75	635.865	3.687	4.612	10981	8498
94241000	01	090160	915	182.0	.826	40.39520	79.68	505.456	3.698	4.378	11113	9044
94241000	01	090160	915	181.0	.849	40.84279	68.10	435.274	3.709	4.221	10992	9196
94241000	01	090160	915	180.0	.750	41.29786	119.89	770.467	3.720	4.786	11029	8153
94241000	01	090160	915	179.0	.718	41.76058	138.27	893.560	3.731	4.929	10908	7717
94241000	01	090160	915	178.0	.846	42.23111	69.82	453.735	3.743	4.245	11030	9192
94241000	01	090160	915	177.0	.937	42.70965	26.88	175.694	3.754	3.291	11050	10203
94241000	01	090160	915	176.0	.945	43.19637	23.48	154.359	3.765	3.156	11060	10296
94241000	01	090160	915	175.0	.941	43.69145	25.05	165.626	3.777	3.221	11039	10237
94241000	01	090160	915	174.0	.914	44.19509	37.56	249.750	3.788	3.626	11104	9994
94241000	01	090160	915	173.0	.915	44.70749	37.13	248.285	3.800	3.614	11040	9946
94241000	01	090160	915	172.0	.948	45.22886	22.02	148.150	3.811	3.092	11089	10359
94241000	01	090160	915	171.0	.933	45.75940	28.69	194.136	3.823	3.356	11263	10355
94241000	01	090160	915	170.0	.909	46.29933	39.70	270.194	3.835	3.681	11194	10024
94241000	01	090160	915	169.0	.872	46.84887	57.09	390.760	3.846	4.044	11175	9600
94241000	01	090160	915	168.0	.839	47.40826	73.18	503.933	3.858	4.293	11311	9349
94241000	01	090160	915	167.0	.776	47.97772	105.78	732.737	3.870	4.661	11159	8532
94241000	01	090160	915	166.0	.798	48.55751	93.84	653.928	3.882	4.541	11378	8952
94241000	01	090160	915	165.0	.881	49.14786	52.81	370.262	3.894	3.966	11581	10051
94241000	01	090160	915	164.0	.928	49.74906	30.84	217.573	3.906	3.429	11335	10368
94241000	01	090160	915	163.0	.901	50.36135	43.35	307.651	3.919	3.769	11516	10223
94241000	01	090160	915	162.0	.937	50.98501	27.18	194.104	3.931	3.302	11520	10629
94241000	01	090160	915	161.0	.957	51.62033	18.15	130.410	3.943	2.898	11489	10832
94241000	01	090160	915	160.0	.902	52.26760	43.12	311.778	3.956	3.764	11645	10343
94241000	01	090160	915	159.0	.905	52.92712	41.31	300.585	3.968	3.721	11661	10403
94241000	01	090160	915	158.0	.960	53.59921	16.98	124.372	3.981	2.832	11480	10854
94241000	01	090160	915	157.0	.959	54.28417	17.33	127.728	3.994	2.852	11525	10888
94241000	01	090160	915	156.0	.958	54.98236	17.91	132.803	4.007	2.885	11760	11094
94241000	01	090160	915	155.0	.955	55.69409	19.17	143.100	4.019	2.953	11759	11060
94241000	01	090160	915	154.0	.963	56.41974	15.71	118.010	4.032	2.754	11798	11189

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ell n E$	$\ell n \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	090160	915	153.0	.917	57.15967	36.00	272.220	4.045	3.583	11831	10688
94241000	01	090160	915	152.0	.909	57.91424	39.52	300.768	4.058	3.676	14272	12808
94241000	01	090160	915	151.0	.875	58.68386	55.48	425.022	4.072	4.016	11759	10140
94241000	01	090160	915	150.0	.848	59.46892	68.68	529.656	4.085	4.229	11845	9898
94241000	01	090160	915	149.0	.839	60.26984	72.98	566.633	4.098	4.290	11964	9894
94241000	01	090160	915	148.0	.849	61.08704	68.45	535.040	4.112	4.226	11901	9950
94241000	01	090160	915	147.0	.871	61.92099	57.61	453.332	4.125	4.053	11928	10234
94241000	01	090160	915	146.0	.863	62.77212	61.34	486.053	4.139	4.116	11917	10133
94241000	01	090160	915	145.0	.890	63.64093	48.72	388.665	4.153	3.886	12067	10576
94241000	01	090160	915	144.0	.874	64.52790	56.08	450.511	4.167	4.026	12167	10477
94241000	01	090160	915	143.0	.769	65.43355	109.80	888.183	4.181	4.698	12117	9176
94241000	01	090160	915	142.0	.662	66.35839	172.15	1402.370	4.195	5.148	12239	7985
94241000	01	090160	915	141.0	.775	67.30298	106.25	871.682	4.209	4.665	12083	9229
94241000	01	090160	915	140.0	.897	68.26789	45.23	373.735	4.223	3.811	12115	10707
94241000	01	090160	915	139.0	.922	69.25369	33.61	279.773	4.237	3.515	12260	11140
94241000	01	090160	915	138.0	.927	70.26101	31.33	262.631	4.252	3.444	12288	11227
94241000	01	090160	915	137.0	.925	71.29046	32.15	271.505	4.266	3.470	12255	11174
94241000	01	090160	915	136.0	.874	72.34270	56.09	477.079	4.281	4.026	12277	10572
94241000	01	090160	915	135.0	.855	73.41841	65.41	560.497	4.296	4.180	12369	10415
94241000	01	090160	915	134.0	.865	74.51830	60.26	520.197	4.311	4.098	12452	10616
94241000	01	090160	915	133.0	.822	75.64309	81.91	712.431	4.326	4.405	12570	10176
94241000	01	090160	915	132.0	.856	76.79354	64.61	566.216	4.341	4.168	12329	10403
94241000	01	090160	915	131.0	.887	77.97043	49.99	441.469	4.356	3.911	12460	10887
94241000	01	090160	915	130.0	.897	79.17459	45.28	402.920	4.371	3.812	12473	11022
94241000	01	090160	915	129.0	.822	80.40686	81.62	731.886	4.387	4.402	12690	10280
94241000	01	090160	915	128.0	.813	81.66813	86.30	779.897	4.402	4.457	12512	10023
94241000	01	090160	915	127.0	.821	82.95930	82.35	750.124	4.418	4.411	12755	10314
94241000	01	090160	915	126.0	.855	84.28134	65.26	599.174	4.434	4.178	12734	10727
94241000	01	090160	915	125.0	.810	85.63524	88.03	814.661	4.450	4.477	13033	10398
94241000	01	090160	915	124.0	.804	87.02202	91.10	849.860	4.466	4.511	13083	10362
94241000	01	090160	915	123.0	.871	88.44277	57.65	542.211	4.482	4.054	12983	11138
94241000	01	090160	915	122.0	.875	89.89859	55.43	525.606	4.498	4.015	12888	11116
94241000	01	090160	915	121.0	.897	91.39066	45.04	430.652	4.515	3.807	12730	11255
94241000	01	090160	915	120.0	.938	92.92018	26.62	256.681	4.531	3.281	12790	11817
94241000	01	090160	915	119.0	.941	94.48843	25.17	244.675	4.548	3.225	12754	11825

Ident.	Avg. Pfs.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open -Bgd.)	(Sample -Bgd.)
94241000	01	090160	915	118.0	.910	96.09671	39.38	386.077	4.565	3.673	12851	11517
94241000	01	090160	915	117.0	.900	97.74641	43.66	431.712	4.582	3.776	12779	11336
94241000	01	090160	915	116.0	.895	99.43896	46.00	458.758	4.599	3.828	12777	11271
94241000	01	090160	915	115.0	.901	101.17585	43.16	434.190	4.616	3.765	13052	11592
94241000	01	090160	915	114.0	.915	102.95865	36.78	373.262	4.634	3.605	12921	11652
94241000	01	090160	915	113.0	.872	104.78899	57.15	585.117	4.651	4.045	12869	11053
94241000	01	090160	915	112.0	.897	106.66857	45.00	464.824	4.669	3.806	13104	11587
94241000	01	090160	915	111.0	.936	108.59919	27.25	283.975	4.687	3.305	13078	12065
94241000	01	090160	915	110.0	.942	110.58269	24.84	261.255	4.705	3.212	13090	12146
94241000	01	090160	915	109.0	.963	112.62104	15.48	164.353	4.724	2.740	13148	12477
94241000	01	090160	915	108.0	.946	114.71627	23.14	247.939	4.742	3.141	13166	12266
94241000	01	090160	915	107.0	.914	116.87052	37.33	403.605	4.761	3.619	13313	11990
94241000	01	090160	915	106.0	.921	119.08603	34.30	374.326	4.779	3.535	12978	11773
94241000	01	090160	915	105.0	.914	121.36513	37.55	413.728	4.798	3.625	12819	11539
94241000	01	090160	915	104.0	.905	123.71030	41.32	459.604	4.817	3.721	12744	11368
94241000	01	090160	915	103.0	.927	126.12410	31.70	356.007	4.837	3.456	12329	11255
94241000	01	090160	915	102.0	.916	128.60925	36.67	415.951	4.856	3.602	11671	10526
94241000	01	090160	915	101.0	.878	131.16857	54.04	618.994	4.876	3.989	11284	9765
94241000	01	090160	915	100.0	.875	133.80506	55.42	641.089	4.896	4.014	11787	10166
94241000	01	090160	915	99.0	.905	136.52184	41.47	484.616	4.916	3.725	12307	10975
94241000	01	090160	915	98.0	.897	139.32222	45.35	535.323	4.936	3.814	12727	11244
94241000	01	090160	915	97.0	.901	142.20965	43.29	516.276	4.957	3.767	12985	11529
94241000	01	090160	915	96.0	.904	145.18778	41.89	504.845	4.978	3.735	13301	11850
94241000	01	090160	915	95.0	.917	148.26045	36.05	439.014	4.998	3.585	13462	12161
94241000	01	090160	915	94.0	.921	151.43171	34.32	422.395	5.020	3.535	13528	12271
94241000	01	090160	915	93.0	.908	154.70582	39.96	497.026	5.041	3.687	13640	12207
94241000	01	090160	915	92.0	.929	158.08726	30.40	382.303	5.063	3.414	13832	12665
94241000	01	090160	915	91.0	.925	161.58080	32.57	414.126	5.085	3.483	13690	12470
94241000	01	090160	915	90.0	.927	165.19143	31.60	406.158	5.107	3.453	13795	12595
94241000	01	090160	915	89.0	.925	168.92445	32.24	419.065	5.129	3.473	13800	12581
94241000	01	090160	915	88.0	.921	172.78546	34.21	449.736	5.152	3.532	13672	12405
94241000	01	090160	915	87.0	.908	176.78037	40.31	535.983	5.174	3.696	13853	12388
94241000	01	090160	915	86.0	.909	180.91544	39.58	532.478	5.198	3.678	14061	12595
94241000	01	090160	915	85.0	.935	185.19731	27.91	379.887	5.221	3.329	13876	12781
94241000	01	090160	915	84.0	.917	189.63302	35.87	493.970	5.245	3.579	13881	12545

Ident.	Avg. Pts.	Date	Run No.	Time-Of- Flight	Trans.	E (ev)	σ (barns)	$\sigma \sqrt{E}$	$\ln E$	$\ln \sigma$	(Open - Bgd.)	(Sample - Bgd.)
94241000	01	090160	915	83.0	.898	194.23002	44.76	623.832	5.269	3.801	13940	12333
94241000	01	090160	915	82.0	.895	198.99622	46.30	653.249	5.293	3.835	14043	12378
94241000	01	090160	915	81.0	.885	203.94004	50.74	724.620	5.317	3.926	14117	12313
94241000	01	090160	915	80.0	.908	209.07041	40.13	580.250	5.342	3.692	14328	12818
94241000	01	090160	915	79.0	.921	214.39683	34.09	499.171	5.367	3.529	14077	12776
94241000	01	090160	915	78.0	.920	219.92942	34.51	511.858	5.393	3.541	14176	12853
94241000	01	090160	915	77.0	.926	225.67897	31.98	480.513	5.419	3.465	14056	12823
94241000	01	090160	915	76.0	.897	231.65696	45.28	689.250	5.445	3.812	14343	12674
94241000	01	090160	915	75.0	.907	237.87566	40.78	629.051	5.471	3.708	14216	12697
94241000	01	090160	915	74.0	.899	244.34817	44.36	693.560	5.498	3.792	14236	12606
94241000	03	090160	915	72.0	.918	258.11161	35.47	569.984	5.553	3.568	42626	38559
94241000	03	090160	915	69.0	.922	281.04402	33.61	563.551	5.638	3.515	40797	37069
94241000	03	090160	915	66.0	.924	307.17415	32.92	577.004	5.727	3.494	34635	31522
94241000	03	090160	915	63.0	.928	337.12537	31.08	570.751	5.820	3.436	20716	18939
94241000	03	090160	915	60.0	.930	371.68072	30.18	581.976	5.918	3.407	35167	32218
94241000	05	090160	915	56.0	.921	426.67430	34.03	702.948	6.056	3.527	71476	64880
94241000	05	090160	915	51.0	.937	514.43699	26.86	609.353	6.243	3.290	75489	69706
94241000	05	090160	915	46.0	.943	632.34905	24.43	614.506	6.449	3.196	78983	73359
94241000	05	090160	915	41.0	.949	795.98489	21.63	610.421	6.679	3.074	82624	77255
94241000	05	090160	915	36.0	.948	1032.44700	21.91	704.199	6.939	3.087	81186	75861
94241000	05	090160	915	31.0	.956	1392.35200	18.71	698.224	7.238	2.929	83918	78981
94241000	05	090160	915	26.0	.950	1979.36500	21.32	948.661	7.590	3.059	64857	60523

APPENDIX C

Tables of the Calculated Total Neutron Cross Section from
0.02 ev to 11 ev for different sample temperatures.

The parameters in Table II were used to compute the calculated cross section, σ (param.). This cross section was then convoluted with Doppler functions corresponding to various sample temperatures. The results are tabulated in this Appendix.

E (ev)	σ (param.)	σ (27°C)	σ (100°C)	σ (500°C)	σ (1000°C)	σ (2000°C)
.020	1567.51	1567.68	1567.71	1567.91	1568.17	1568.67
.021	1527.63	1527.81	1527.85	1528.07	1528.35	1528.87
.022	1490.57	1490.76	1490.82	1491.05	1491.35	1491.44
.023	1456.04	1456.25	1456.30	1456.55	1456.88	1457.52
.024	1423.76	1423.99	1424.04	1424.31	1424.66	1425.34
.025	1393.53	1393.77	1393.82	1394.11	1394.48	1395.20
.026	1365.14	1365.39	1365.45	1365.75	1366.14	1366.90
.027	1338.42	1338.69	1338.75	1339.06	1339.47	1340.27
.028	1313.24	1313.52	1313.57	1313.90	1314.33	1315.16
.029	1289.45	1289.74	1289.80	1290.14	1290.59	1291.46
.030	1266.95	1267.25	1267.32	1267.67	1268.13	1269.04
.031	1245.63	1245.95	1246.01	1246.38	1246.86	1247.80
.032	1225.41	1225.74	1225.80	1226.19	1226.68	1227.65
.033	1206.20	1206.54	1206.61	1207.00	1207.51	1208.52
.034	1187.94	1188.28	1188.35	1188.76	1189.29	1190.32
.035	1170.55	1170.90	1170.97	1171.39	1171.94	1173.00
.036	1153.97	1154.34	1154.41	1154.84	1155.40	1156.49
.037	1138.16	1138.54	1138.62	1139.06	1139.63	1140.75
.038	1123.07	1123.45	1123.53	1123.98	1124.57	1125.72
.039	1108.65	1109.04	1109.12	1109.58	1110.19	1111.37
.040	1094.86	1095.25	1095.35	1095.82	1096.44	1097.64
.041	1081.66	1082.07	1082.16	1082.64	1083.27	1084.51
.042	1069.03	1069.45	1069.53	1070.03	1070.67	1071.94
.043	1056.92	1057.35	1057.44	1057.95	1058.59	1059.90
.044	1045.32	1045.76	1045.85	1046.37	1047.00	1048.29
.045	1034.19	1034.65	1034.74	1035.26	1035.95	1037.30
.046	1023.52	1023.97	1024.07	1024.61	1025.32	1026.69
.047	1013.27	1013.73	1013.84	1014.39	1015.11	1016.51
.048	1003.43	1003.91	1004.01	1004.57	1005.31	1006.74
.049	993.98	994.47	994.57	995.14	995.89	997.35
.050	984.91	985.40	985.51	986.09	986.85	988.34
.055	944.54	945.08	945.20	945.83	946.67	948.30
.060	911.36	911.95	912.08	912.78	913.69	915.48
.065	884.14	884.78	884.92	885.68	886.67	888.63
.070	861.96	862.66	862.81	863.64	864.72	866.86
.075	844.14	844.90	845.06	845.97	847.15	849.48
.080	830.16	830.99	831.17	832.16	833.45	836.00
.085	819.63	820.54	820.73	821.81	823.23	826.03
.090	812.26	813.26	813.47	814.66	816.21	819.28
.095	807.83	808.93	809.16	810.47	812.17	815.55

E (ev)	$\sigma(\text{param.})$	$\sigma (27^{\circ}\text{C})$	$\sigma (100^{\circ}\text{C})$	$\sigma(500^{\circ}\text{C})$	$\sigma (1000^{\circ}\text{C})$	$\sigma (2000^{\circ}\text{C})$
.100	806.19	807.40	807.66	809.09	810.98	814.71
.105	807.24	808.58	808.86	810.44	812.52	816.65
.110	810.92	812.39	812.70	814.46	816.76	821.34
.115	817.21	818.84	819.18	821.13	823.69	828.78
.120	826.13	827.95	828.33	830.49	833.34	839.01
.125	837.74	839.76	840.19	842.60	845.77	852.10
.130	852.13	854.39	854.86	857.56	861.10	868.19
.135	869.43	871.95	872.48	875.50	879.47	887.41
.140	889.79	892.62	893.22	896.59	901.05	909.95
.145	913.42	916.59	917.26	921.04	926.04	936.03
.150	940.54	944.10	944.85	949.10	954.71	965.93
.155	971.42	975.42	976.27	981.05	987.35	999.92
.160	1006.40	1010.89	1011.83	1017.20	1024.27	1038.34
.165	1045.79	1050.84	1051.90	1057.92	1065.83	1081.51
.170	1090.03	1095.67	1096.86	1103.59	1112.41	1129.77
.175	1139.50	1145.81	1147.14	1154.62	1164.39	1183.46
.180	1194.67	1201.68	1203.16	1211.43	1222.17	1242.83
.185	1256.02	1263.74	1265.35	1274.40	1286.05	1308.07
.190	1323.92	1332.36	1334.12	1343.87	1356.29	1379.19
.195	1398.90	1407.89	1409.76	1420.06	1432.95	1455.97
.200	1480.97	1490.49	1492.42	1502.98	1515.87	1537.91
.205	1570.18	1580.06	1581.98	1592.35	1604.56	1624.13
.210	1666.93	1676.17	1677.97	1687.41	1697.97	1713.21
.215	1770.05	1777.81	1779.32	1786.90	1794.57	1803.33
.220	1877.37	1883.27	1884.26	1888.78	1892.11	1892.08
.225	1988.00	1989.94	1990.14	1990.20	1987.66	1976.65
.230	2096.85	2094.17	2093.32	2087.46	2077.59	2053.82
.235	2200.89	2191.31	2189.14	2176.13	2157.82	2120.26
.240	2292.98	2275.84	2272.17	2251.25	2224.05	2172.74
.245	2367.02	2341.88	2336.65	2307.85	2272.16	2208.35
.250	2416.91	2383.70	2377.08	2341.42	2298.61	2224.80
.255	2434.68	2396.71	2389.09	2348.55	2300.91	2220.64
.260	2419.94	2378.14	2370.07	2327.43	2277.88	2195.40
.265	2367.46	2327.64	2319.77	2278.15	2229.89	2149.65
.270	2283.85	2247.42	2240.33	2202.71	2158.72	2084.93
.275	2170.93	2141.86	2136.07	2104.78	2067.49	2003.61
.280	2037.81	2017.00	2012.73	1989.24	1960.24	1908.65
.285	1894.85	1879.45	1876.77	1861.49	1841.45	1803.39
.290	1740.08	1735.66	1734.48	1726.98	1715.68	1691.33
.295	1590.06	1591.35	1591.45	1590.65	1587.20	1575.56

E (ev)	$\sigma(\text{param.})$	$\sigma (27^{\circ}\text{C})$	$\sigma (100^{\circ}\text{C})$	$\sigma(500^{\circ}\text{C})$	$\sigma (1000^{\circ}\text{C})$	$\sigma (2000^{\circ}\text{C})$
.300	1444.50	1450.98	1452.05	1456.59	1459.70	1459.28
.305	1308.64	1317.79	1319.51	1327.95	1336.11	1344.99
.310	1182.51	1193.79	1195.94	1206.93	1218.67	1234.73
.315	1068.19	1080.03	1082.39	1094.80	1108.81	1129.98
.320	964.74	976.81	979.21	992.16	1007.36	1031.80
.325	872.30	883.87	886.25	899.11	914.63	940.79
.330	789.76	800.70	802.93	815.30	830.53	857.19
.335	716.42	726.50	728.60	740.19	754.74	780.97
.340	651.31	660.49	662.40	673.10	686.72	711.88
.345	593.50	601.81	603.54	613.29	625.85	649.53
.350	542.22	549.65	551.21	560.03	571.48	593.45
.355	496.60	503.27	504.67	512.59	522.95	543.11
.360	456.07	461.99	463.24	470.33	479.65	498.00
.365	419.90	425.19	426.31	432.64	440.99	457.59
.370	387.65	392.34	393.33	398.97	406.45	421.39
.375	358.42	362.95	363.83	368.86	375.54	388.96
.380	332.90	336.61	337.40	341.88	347.84	359.87
.385	309.62	312.95	313.65	317.64	322.96	333.74
.390	288.70	291.65	292.27	295.84	300.59	310.24
.395	269.79	272.43	273.00	276.19	280.43	289.07
.400	252.71	255.07	255.57	258.42	262.23	269.96
.405	237.21	239.33	239.78	242.34	245.75	252.69
.410	223.14	225.05	225.45	227.75	230.81	237.04
.415	210.33	212.05	212.41	214.48	217.24	222.84
.420	198.66	200.20	200.53	202.39	204.87	209.92
.425	187.98	189.38	189.67	191.36	193.60	198.15
.430	178.21	179.48	179.74	181.26	183.29	187.40
.435	169.24	170.39	170.64	172.02	173.85	177.57
.440	161.01	162.05	162.27	163.52	165.19	168.57
.445	153.42	154.37	154.57	155.71	157.23	160.29
.450	146.43	147.30	147.48	148.52	149.90	152.69
.460	134.00	134.72	134.87	135.74	136.89	139.21
.470	123.32	123.93	124.06	124.79	125.76	127.70
.480	114.11	114.62	114.73	115.35	116.16	117.80
.490	106.10	106.54	106.63	107.16	107.85	109.25
.500	99.12	99.49	99.57	100.02	100.61	101.80
.520	87.59	87.87	87.93	88.26	88.70	89.58
.540	78.57	78.78	78.82	79.08	79.41	80.08
.560	71.39	71.56	71.59	71.79	72.04	72.56
.580	65.60	65.73	65.76	65.91	66.12	66.52

E (ev)	$\sigma(\text{param.})$	$\sigma (27^{\circ}\text{C})$	$\sigma (100^{\circ}\text{C})$	$\sigma(500^{\circ}\text{C})$	$\sigma (1000^{\circ}\text{C})$	$\sigma (2000^{\circ}\text{C})$
.600	60.88	60.98	61.00	61.12	61.28	61.60
.700	46.65	46.69	46.70	46.74	46.80	46.92
.800	40.01	40.03	40.04	40.06	40.09	40.14
.900	36.47	36.48	36.48	36.49	36.50	36.53
1.000	34.41	34.41	34.41	34.42	34.43	34.45
1.200	32.42	32.42	32.42	32.43	32.43	32.44
1.400	31.81	31.81	31.81	31.81	31.82	31.83
1.600	31.92	31.93	31.93	31.93	31.93	31.94
1.800	32.54	32.54	32.54	32.54	32.55	32.56
2.000	33.57	33.57	33.57	33.58	33.58	33.59
2.200	35.02	35.03	35.03	35.04	35.04	35.05
2.400	36.95	36.95	36.95	36.96	36.97	36.98
2.600	39.43	39.44	39.44	39.45	39.46	39.48
2.800	42.64	42.65	42.65	42.66	42.68	42.71
3.000	46.82	46.83	46.84	46.86	46.88	46.93
3.100	49.40	49.41	49.42	49.44	49.47	49.53
3.200	52.39	52.42	52.42	52.45	52.49	52.56
3.300	55.92	55.95	55.96	56.00	56.05	56.14
3.400	60.13	60.17	60.18	60.23	60.29	60.42
3.500	65.24	65.29	65.31	65.38	65.47	65.65
3.600	71.60	71.68	71.70	71.80	71.94	72.21
3.700	79.81	79.95	79.98	80.15	80.37	80.82
3.800	91.02	91.27	91.32	91.63	92.04	92.90
3.820	93.79	94.08	94.14	94.50	94.97	95.98
3.840	96.81	97.15	97.22	97.63	98.18	99.38
3.860	100.11	100.50	100.58	101.06	101.72	103.15
3.880	103.72	104.18	104.28	104.85	105.63	107.39
3.900	107.74	108.27	108.39	109.06	110.01	112.20
3.920	112.26	112.83	112.97	113.78	114.94	117.76
3.940	117.26	117.95	118.12	119.11	120.57	124.33
3.960	122.79	123.76	123.97	125.20	127.10	132.30
3.980	129.23	130.39	130.65	132.26	134.83	142.21
4.000	136.90	138.04	138.40	140.62	144.20	154.81
4.020	144.82	147.12	147.64	150.77	155.90	171.19
4.040	154.83	158.27	158.99	163.43	171.04	192.97
4.060	167.88	172.33	173.33	179.73	191.25	222.20
4.080	184.95	190.38	191.82	201.46	218.96	261.24
4.100	205.12	214.11	216.31	231.51	257.82	312.46
4.120	232.34	246.54	250.08	274.56	312.62	377.70
4.140	270.49	293.03	298.96	337.67	388.53	457.77

E (ev)	$\sigma(\text{param.})$	$\sigma(27^{\circ}\text{C})$	$\sigma(100^{\circ}\text{C})$	$\sigma(500^{\circ}\text{C})$	$\sigma(1000^{\circ}\text{C})$	$\sigma(2000^{\circ}\text{C})$
4.160	324.02	363.01	372.93	430.11	489.62	551.53
4.180	404.55	472.36	487.67	560.44	616.37	655.12
4.190	461.51	548.59	566.35	641.00	687.79	708.63
4.200	533.28	642.89	661.94	730.92	762.95	761.89
4.210	627.32	756.92	774.95	828.18	839.66	813.79
4.220	750.26	889.99	903.66	929.63	915.57	863.05
4.230	912.61	1037.92	1043.20	1030.92	987.92	908.48
4.240	1123.96	1192.12	1185.26	1126.68	1053.83	948.93
4.250	1386.32	1339.82	1318.53	1211.28	1110.46	983.12
4.260	1679.39	1465.50	1430.21	1279.31	1155.27	1010.48
4.270	1938.98	1554.00	1508.21	1326.05	1186.41	1029.88
4.280	2064.46	1594.00	1543.71	1348.42	1202.32	1041.41
4.290	1994.93	1580.82	1533.11	1345.36	1202.92	1044.59
4.300	1774.28	1517.62	1478.95	1317.74	1188.27	1039.85
4.310	1501.30	1414.68	1389.16	1268.27	1159.78	1027.42
4.320	1248.70	1286.49	1275.20	1201.30	1119.33	1008.01
4.330	1042.57	1148.30	1149.64	1122.22	1069.30	982.63
4.340	883.49	1013.24	1023.90	1036.52	1012.53	952.22
4.350	763.68	890.62	906.71	949.42	951.84	918.07
4.360	674.35	785.45	803.56	865.52	889.98	881.35
4.370	607.30	699.17	716.89	788.13	829.28	843.19
4.380	557.46	630.88	646.79	719.45	771.99	804.85
4.400	493.25	539.05	550.25	612.15	672.79	731.08
4.420	460.87	490.54	497.96	543.77	598.97	666.17
4.440	449.19	470.36	475.40	507.37	550.67	613.38
4.460	453.13	469.28	472.83	494.22	523.90	573.12
4.480	469.29	481.58	483.93	496.33	512.57	543.53
4.500	495.54	502.69	503.60	506.61	509.90	521.46
4.510	511.62	514.93	514.90	512.70	509.76	512.09
4.520	528.96	527.17	526.06	518.29	509.39	503.22
4.530	546.68	538.40	536.05	522.53	508.12	494.41
4.540	563.56	547.44	543.78	524.62	505.37	485.22
4.550	577.92	553.03	548.10	523.83	500.56	475.40
4.560	587.62	553.96	547.91	519.54	493.38	464.53
4.570	590.23	549.15	542.31	511.26	483.49	452.57
4.580	583.39	537.84	530.66	498.77	470.75	439.25
4.590	565.37	519.71	512.72	482.01	455.20	424.61
4.600	535.75	494.96	488.73	461.19	436.90	408.64
4.610	495.77	464.36	459.35	436.73	416.19	391.43
4.620	448.76	429.12	425.73	409.27	393.37	373.20

E (ev)	σ (param.)	σ (27°C)	σ (100°C)	σ (500°C)	σ (1000°C)	σ (2000°C)
4.640	345.32	351.00	350.99	348.53	343.36	334.12
4.660	252.73	273.50	276.19	285.82	291.02	293.39
4.680	182.06	206.53	210.50	227.41	240.47	253.04
4.700	133.24	154.57	158.58	177.65	195.01	215.00
4.720	101.34	117.50	120.86	138.41	156.73	180.79
4.740	81.28	92.74	95.27	109.56	126.42	151.45
4.760	69.43	77.14	78.93	89.68	103.80	127.42
4.780	62.69	67.96	69.20	76.90	87.95	108.67
4.800	59.47	63.17	64.01	69.38	77.62	94.81
4.820	59.25	61.33	61.91	65.61	71.57	85.21
4.840	59.36	61.48	61.89	64.46	68.70	79.16
4.860	60.95	63.02	63.31	65.12	68.11	75.95
4.880	64.01	65.54	65.75	67.04	69.15	74.94
4.900	68.32	68.75	68.89	69.83	71.35	75.60
4.950	78.16	78.59	78.68	79.18	79.93	81.96
5.000	89.88	90.10	90.15	90.49	90.97	92.13
5.050	102.41	102.65	102.70	102.99	103.38	104.24
5.100	115.81	116.06	116.11	116.41	116.80	117.58
5.150	130.09	130.36	130.41	130.72	131.13	131.93
5.200	145.29	145.58	145.64	145.97	146.41	147.25
5.250	161.48	161.78	161.85	162.21	162.67	163.55
5.300	178.72	179.04	179.10	179.48	179.95	180.87
5.350	197.04	197.36	197.43	197.81	198.29	199.21
5.400	216.44	216.76	216.82	217.19	217.66	218.54
5.450	236.87	237.17	237.23	237.56	237.99	238.77
5.500	258.21	258.46	258.51	258.78	259.13	259.76
5.550	280.24	280.42	280.45	280.64	280.87	281.27
5.600	302.66	302.73	302.75	302.81	302.89	302.98
5.650	325.06	325.00	324.98	324.89	324.77	324.48
5.700	346.91	346.69	346.64	346.37	346.01	345.28
5.750	367.61	367.22	367.13	366.66	366.04	364.82
5.800	386.52	385.93	385.81	385.13	384.25	382.55
5.850	402.96	402.20	402.04	401.16	400.04	397.90
5.900	416.33	415.43	415.25	414.21	412.88	410.38
5.950	426.18	425.18	424.97	423.83	422.37	419.62
6.000	432.21	431.17	430.96	429.76	428.25	425.40
6.050	434.36	433.34	433.13	431.96	430.47	427.68
6.100	432.77	431.83	431.64	430.55	429.17	426.57
6.150	427.82	427.00	426.83	425.88	424.68	422.40
6.200	419.99	419.33	419.19	418.42	417.43	415.56

E (ev)	σ (param.)	σ (27°C)	σ (100°C)	σ (500°C)	σ (1000°C)	σ (2000°C)
6.250	409.90	409.41	409.31	408.74	408.01	406.61
6.300	398.21	397.90	397.84	397.48	397.01	396.13
6.350	385.58	385.45	385.42	385.28	385.09	384.77
6.400	372.65	372.70	372.72	372.79	372.91	373.21
6.450	360.06	360.32	360.38	360.71	361.16	362.23
6.500	348.50	349.01	349.11	349.75	350.66	352.86
6.550	338.78	339.59	339.78	340.88	342.50	346.66
6.600	331.89	333.29	333.60	335.50	338.45	346.25
6.620	330.33	332.04	332.43	334.83	338.67	348.63
6.640	329.60	331.78	332.28	335.37	340.41	353.02
6.660	330.06	332.77	333.41	337.47	344.12	359.85
6.680	331.68	335.36	336.20	341.61	350.38	369.57
6.700	335.22	340.04	341.17	348.47	359.93	382.57
6.720	341.16	347.51	349.04	358.96	373.61	399.19
6.740	349.89	358.74	360.86	374.25	392.32	419.53
6.760	362.94	375.16	378.11	395.79	416.82	443.43
6.780	381.43	398.79	402.84	425.09	447.55	470.48
6.800	407.78	432.34	437.62	463.31	484.27	499.73
6.820	445.81	478.91	485.12	510.70	525.86	529.80
6.840	500.39	540.98	546.91	565.74	569.95	559.03
6.850	535.94	577.89	582.86	595.01	592.14	572.72
6.860	578.31	618.11	621.40	624.58	613.52	585.46
6.870	628.44	660.63	661.49	653.55	633.68	597.01
6.880	686.74	703.93	701.65	680.96	652.06	607.08
6.890	752.36	746.00	740.07	705.80	668.10	615.51
6.900	823.37	784.46	774.66	727.04	681.34	622.07
6.910	894.03	816.76	803.29	743.72	691.21	626.54
6.920	955.62	840.48	824.00	755.01	697.49	628.90
6.930	997.16	853.61	835.20	760.38	699.75	628.97
6.940	1008.84	854.89	835.89	759.32	698.01	626.71
6.950	986.60	843.95	825.76	751.89	692.10	622.22
6.960	934.49	821.37	805.32	738.24	682.25	615.39
6.970	862.60	788.63	775.76	718.85	668.58	606.41
6.980	782.40	747.91	738.83	694.47	651.49	595.43
6.990	703.01	701.74	696.60	665.93	631.39	582.50
7.000	629.95	652.69	651.23	634.29	608.78	567.91
7.010	565.76	603.15	604.79	600.57	584.20	551.89
7.020	510.63	555.07	559.09	565.82	558.20	534.62
7.030	463.93	509.89	515.52	530.93	531.36	516.40
7.040	424.64	468.53	475.04	496.79	504.19	497.48

E (ev)	$\sigma(\text{param.})$	$\sigma (27^{\circ}\text{C})$	$\sigma (100^{\circ}\text{C})$	$\sigma(500^{\circ}\text{C})$	$\sigma (1000^{\circ}\text{C})$	$\sigma (2000^{\circ}\text{C})$
7.060	363.67	398.71	405.34	433.10	450.75	458.48
7.080	319.87	345.39	350.94	378.16	400.98	419.53
7.100	287.74	305.60	309.81	333.05	356.82	382.13
7.120	263.47	275.91	278.94	297.21	319.13	347.46
7.140	244.68	253.43	255.58	269.26	287.90	316.33
7.160	229.79	236.03	237.55	247.56	262.56	288.99
7.180	217.72	222.23	223.33	230.60	242.23	265.46
7.200	207.61	211.03	211.84	217.14	225.98	245.57
7.220	199.13	201.74	202.34	206.27	212.91	228.92
7.240	191.83	193.88	194.35	197.30	202.29	215.09
7.260	185.36	187.13	187.49	189.77	193.53	203.62
7.280	179.98	181.24	181.52	183.31	186.19	194.08
7.300	174.99	176.03	176.26	177.69	179.93	186.09
7.350	164.58	165.24	165.39	166.26	167.55	170.93
7.400	156.22	156.67	156.77	157.35	158.18	160.17
7.450	149.27	149.60	149.67	150.09	150.66	151.96
7.500	143.36	143.61	143.67	143.98	144.41	145.34
7.550	138.24	138.45	138.50	138.75	139.09	139.80
7.600	133.78	133.96	133.99	134.20	134.48	135.06
7.650	129.86	130.02	130.05	130.23	130.47	130.96
7.700	126.41	126.55	126.58	126.74	126.96	127.40
7.750	123.39	123.52	123.54	123.70	123.90	124.31
7.800	120.75	120.88	120.90	121.05	121.25	121.65
7.850	118.49	118.62	118.64	118.80	119.00	119.41
7.900	116.60	116.74	116.77	116.93	117.15	117.60
7.950	115.11	115.26	115.29	115.47	115.72	116.25
8.000	114.04	114.22	114.25	114.47	114.78	115.44
8.050	113.46	113.69	113.74	114.02	114.41	115.33
8.100	113.50	113.80	113.87	114.26	114.82	116.22
8.150	114.34	114.77	114.87	115.45	116.32	118.80
8.200	116.31	117.00	117.15	118.08	119.60	124.43
8.250	120.03	121.17	121.43	123.12	126.13	135.73
8.300	126.59	128.73	129.23	132.68	139.37	157.79
8.320	130.50	133.30	133.98	138.77	148.00	171.18
8.340	135.44	139.21	140.15	146.96	159.61	187.90
8.360	141.72	146.96	148.30	158.11	175.14	208.35
8.380	150.06	157.33	159.29	173.42	195.67	232.84
8.400	160.70	171.49	174.42	194.53	222.31	261.50
8.420	175.12	191.32	195.71	223.44	255.96	294.08
8.440	194.61	219.65	226.10	262.23	297.12	330.15

E (ev)	σ (param.)	σ (27°C)	σ (100°C)	σ (500°C)	σ (1000°C)	σ (2000°C)
8.460	223.00	260.59	269.53	312.58	345.56	368.60
8.480	263.04	319.30	330.43	374.95	400.01	408.09
8.500	323.38	400.57	412.05	447.78	458.00	446.95
8.520	416.10	505.67	513.54	526.74	515.92	483.22
8.530	480.30	565.44	569.63	566.37	543.50	499.78
8.540	560.13	627.76	627.02	604.68	569.37	514.99
8.550	658.15	690.06	683.42	640.46	592.90	528.54
8.560	774.21	749.20	736.19	672.57	613.61	540.25
8.570	903.40	801.71	782.47	699.79	630.92	550.03
8.580	1031.92	844.17	819.59	721.26	644.40	557.61
8.590	1135.15	873.66	845.33	735.98	653.84	562.90
8.600	1185.25	888.13	858.10	743.66	658.78	565.92
8.610	1167.48	886.66	857.09	743.80	659.39	566.58
8.620	1090.40	869.57	842.64	736.72	655.49	564.83
8.630	978.90	838.39	815.93	722.58	647.33	560.84
8.640	858.36	795.62	778.84	702.16	635.16	554.63
8.650	745.16	744.45	733.78	676.24	619.25	546.20
8.660	646.48	688.20	683.48	645.91	600.19	535.87
8.670	563.82	630.03	630.58	612.25	578.38	523.80
8.680	496.00	572.70	577.43	576.46	554.42	510.10
8.700	395.43	468.37	477.90	502.67	502.32	478.98
8.720	327.84	384.19	394.48	431.99	448.22	444.41
8.740	281.31	320.95	329.78	369.38	395.84	408.23
8.760	248.07	275.17	281.88	317.16	347.91	372.09
8.780	223.98	242.34	247.13	275.55	306.05	337.53
8.800	205.97	218.61	221.93	243.47	270.86	305.51
8.820	192.25	201.15	203.46	219.24	242.19	276.79
8.840	181.48	188.05	189.68	201.09	219.40	251.72
8.860	173.37	178.03	179.22	187.45	201.62	230.29
8.880	166.58	170.25	171.13	177.15	187.93	212.37
8.900	161.15	164.14	164.82	169.30	177.45	197.66
8.920	156.97	159.32	159.85	163.27	169.42	185.80
8.940	153.82	155.50	155.92	158.59	163.27	176.37
8.960	151.01	152.47	152.82	154.95	158.56	168.98
8.980	148.77	150.09	150.38	152.13	154.97	163.26
9.000	147.09	148.25	148.49	149.96	152.26	158.89
9.020	145.90	146.87	147.08	148.32	150.23	155.60
9.040	145.13	145.88	146.06	147.14	148.77	153.17
9.060	144.51	145.22	145.38	146.35	147.77	151.46
9.080	144.17	144.87	145.02	145.90	147.17	150.37

E (ev)	σ (param.)	σ (27°C)	σ (100°C)	σ (500°C)	σ (1000°C)	σ (2000°C)
9.100	144.12	144.79	144.93	145.75	146.92	149.79
9.120	144.36	144.97	145.11	145.88	146.99	149.67
9.140	144.85	145.40	145.53	146.28	147.37	149.96
9.160	145.47	146.06	146.19	146.94	148.04	150.64
9.180	146.32	146.95	147.08	147.86	149.01	151.70
9.200	147.42	148.08	148.22	149.05	150.28	153.14
9.220	148.79	149.46	149.61	150.52	151.89	154.97
9.240	150.45	151.11	151.28	152.31	153.86	157.21
9.260	152.21	153.06	153.26	154.45	156.24	159.88
9.280	154.30	155.35	155.58	157.00	159.08	162.98
9.300	156.79	158.05	158.32	160.04	162.45	166.52
9.320	159.78	161.23	161.57	163.66	166.40	170.49
9.340	163.31	165.01	165.44	167.97	170.98	174.85
9.360	167.22	169.54	170.07	173.08	176.20	179.55
9.380	171.98	175.01	175.68	179.08	182.03	184.50
9.400	177.85	181.67	182.46	186.00	188.39	189.58
9.420	184.90	189.76	190.61	193.73	195.08	194.66
9.440	193.81	199.40	200.13	202.06	201.87	199.58
9.460	205.08	210.42	210.77	210.55	208.42	204.16
9.480	219.42	222.16	221.80	218.60	214.38	208.26
9.500	236.99	233.30	232.00	225.53	219.38	211.72
9.520	255.82	242.09	239.89	230.67	223.10	214.45
9.540	269.50	246.82	244.12	233.50	225.37	216.33
9.560	269.10	246.52	243.93	233.81	226.04	217.41
9.580	253.75	241.43	239.56	231.74	225.27	217.68
9.600	233.29	232.94	232.13	227.73	223.23	217.26
9.620	216.25	223.06	223.27	222.50	220.27	216.23
9.640	204.83	213.70	214.60	216.79	216.76	214.78
9.660	198.04	206.08	207.27	211.33	213.10	213.04
9.680	194.46	200.68	201.85	206.62	209.63	211.19
9.700	192.98	197.40	198.37	202.99	206.61	209.37
9.720	192.87	195.84	196.58	200.51	204.21	207.71
9.740	193.62	195.56	196.07	199.12	202.51	206.27
9.760	194.93	196.14	196.47	198.65	201.48	205.13
9.780	196.57	197.27	197.47	198.90	201.06	204.29
9.800	198.42	198.73	198.83	199.65	201.13	203.73
9.850	203.12	202.80	202.75	202.55	202.62	203.31
9.900	207.02	206.29	206.14	205.34	204.48	203.43
9.950	209.25	208.15	207.93	206.73	205.29	203.00
10.000	208.99	207.67	207.40	205.93	204.15	201.14

E (ev)	$\sigma(\text{param.})$	$\sigma (27^{\circ}\text{C})$	$\sigma (100^{\circ}\text{C})$	$\sigma(500^{\circ}\text{C})$	$\sigma (1000^{\circ}\text{C})$	$\sigma (2000^{\circ}\text{C})$
10.050	205.79	204.36	204.07	202.49	200.58	197.28
10.100	199.41	198.04	197.76	196.25	194.42	191.21
10.150	190.04	188.88	188.65	187.36	185.79	183.00
10.200	178.18	177.35	177.18	176.24	175.07	172.92
10.250	164.61	164.15	164.05	163.51	162.80	161.43
10.300	150.15	150.05	150.02	149.86	149.62	149.03
10.350	135.60	135.79	135.83	135.99	136.14	136.27
10.400	121.59	121.98	122.06	122.47	122.92	123.62
10.450	108.54	109.05	109.16	109.71	110.37	111.48
10.500	96.69	97.25	97.37	98.00	98.77	100.12
10.550	86.13	86.70	86.82	87.47	88.27	89.73
10.600	76.81	77.39	77.50	78.13	78.92	80.38
10.650	68.72	69.27	69.37	69.95	70.69	72.09
10.700	61.78	62.23	62.32	62.85	63.52	64.81
10.750	55.77	56.16	56.24	56.70	57.30	58.46
10.800	50.59	50.94	51.01	51.41	51.94	52.96
10.850	46.15	46.45	46.51	46.86	47.31	48.21
10.900	42.33	42.59	42.64	42.94	43.33	44.11
10.950	39.05	39.27	39.31	39.57	39.91	40.57
11.000	36.22	36.41	36.44	36.66	36.95	37.53

**PHILLIPS
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