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LOW ENERGY TIME-OF-FLIGHT SPECTRA
FROM SPHERES PULSED BY 14-MeV NEUTRONS

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MASTER

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ABSTRACT

The neutron emission spectra from spheres of Be, N, O, C, Pb, ^{235}U , ^{238}U , ^{239}Pu , H_2O , and CH_2 pulsed at the center by 14-MeV neutrons were measured over the energy range of 10 eV to 1 MeV, using sphere transmission and time-of-flight techniques. The neutron source was obtained by the $\text{T(d,n)}^4\text{He}$ reaction with a pulsed 400-keV deuteron beam produced by the Livermore ICT accelerator. The neutron detector was a thick ^6Li loaded glass scintillator calibrated against a ^{235}U fission chamber.

INTRODUCTION

Increased interest in the hybrid CTR fusion-fission reactor has generated the requirement for an accurate description of the transported neutron spectrum from a 14-MeV source through materials typical of those postulated for a fusion reactor blanket.

The low energy range ($E' < 1$ MeV) of the neutron emission spectra has been measured for many of the materials studied in the Livermore pulsed sphere program.¹ Results for carbon, iron, and concrete have been published^{2,3,4}, but the majority of the data has been documented only in internal LLL reports.

Therefore, the experimental time-of-flight emission spectra for spheres of Be, N, O, C, Pb, ^{235}U , ^{238}U , ^{239}Pu , H_2O , and CH_2 obtained before the advent of the on-line computer data system at the ICT facility were converted to punched cards, and a computer processing code was written to convert the raw data to a form which is more useful for comparison with theoretical nuclear models and neutron transport calculations.

EXPERIMENTAL METHOD

Spherical assemblies of the target materials were pulsed by a central source of 14-MeV neutrons produced at the Livermore ICT accelerator by the $\text{T(d,n)}^4\text{He}$ reaction. Pulsed operation was achieved by use of an arc-pulsed duo-plasmatron ion source. After acceleration to 400 keV, the pulse width of the deuteron beam was reduced to between 25 ns and 1.0 μs by a vertical multiplate sweeper. The nominal ICT burst frequency was 1 kHz. In a few

experiments, burst rates up to 10 kHz were used, with negligible overlap effects.

The neutron production rate was monitored at the tritium target by counting the associated alpha particles with a solid state detector located at an angle of 174° from the deuteron beam line. The absolute neutron production rate per alpha count was determined with a scintillation detector calibrated at 14 MeV against a proton recoil detector of known efficiency.

Standard time-of-flight techniques were used to measure the emission spectra over the equivalent energy range of 10 eV to 1 MeV using a ^6Li -loaded glass scintillator. The time-dependent gamma ray background was simultaneously measured with an identical detector in which the ^6Li was replaced by ^7Li .

The experimental geometry (Fig. 1) was identical to that used in the high energy pulsed sphere experiments. A detailed description of the ICT neutron source, the neutron detector, and the associated electronics are given in the Livermore Pulsed Sphere Program Summary¹; however, the ^6Li detector efficiency has been revised since publication of the summary report. Significant changes were made due to re-evaluation of the reference ^{235}U fission cross section and to corrections applied to the time analyzer data to account for long period drift in the zero time calibration of the time analyzer. The current values for the efficiency of the ^6Li glass detector as a function of neutron energy are given in Table 1. The estimated uncertainty in the absolute values for the efficiency is 10 to 15% except where noted otherwise in the tabulated data.

The dimensions and material compositions of the target spheres are shown in Figs. 2 through 14. Several of the figures are reproduced from Ref. 1 for completeness.

EXPERIMENTAL RESULTS

Time calibration of the analyzer data, background subtraction, and conversion of counts/channel to counts/ μs per source neutron are described in detail in Ref. 1.

Measurements were conducted for each target sphere at different combinations of time channel width, burst width, and burst frequency to optimize energy resolution and counting statistics. The data from each run were reduced separately to counts/ μs per 4π source neutrons and then combined to form a composite time-of-flight spectrum for each sphere. The final results are

presented graphically in Figs. 15 through 28 and in tabular form in Tables 2 through 15. The error bars represent the combined effects of counting statistics and uncertainties resulting from subtraction of the neutron and gamma ray background counts. The effective time resolution for each experiment is given in terms of the full width at half maximum (FWHM) of an equivalent Gaussian time resolution function.

Quantitative comparisons between the experimental data and transport calculations should be carried out using the measured time-of-flight spectra (counts/ μ s vs time).

As a convenience in comparing these data with other experiments and calculations, the neutron time of arrival was converted to an equivalent energy, assuming a constant flight path equal to the separation between the neutron source and detector. For neutrons of energy less than 100 keV, the error introduced by this approximation is negligible since the transit time across the target sphere is small relative to the total flight time. The equivalent energy is given in column 2 of the tabulated data, and the differential count rate (counts/ ΔE) is given in column 4.

The detector efficiency was folded into the above count rate spectra to obtain a differential neutron emission energy spectrum. The resulting spectra (neutrons/ ΔE vs energy) are given in column 5 of the data tables. The experimental uncertainty in the time-of-flight spectra must be combined with the uncertainty in the detector efficiency to give the total error. This procedure also introduces artificial structure into most of the energy emission spectra near the sharp resonance in the ^6Li (n, α) reaction cross section at 250 keV since the detector calibration experiments were conducted with an energy resolution which was finer than the pulsed sphere experiments. Additional error is introduced into the time-to-energy conversion near the ^6Li (n, α) resonance peak for the multiplying fissionable targets since the secondary neutron production time is comparable to the time resolution of the measurements.

COMPARISON WITH CALCULATIONS

Detailed comparisons between the measured and calculated time-of-flight spectra will be the subject of a subsequent report. However, the general method of calculating these experiments is as follows: perform a neutron transport calculation using the geometry appropriate to the actual experiment

and normalize the calculated flux to $N(E,t) = 4\pi R^2 \cdot \phi(E,t)/N_0$ (neutrons/ μ s/
source neutron). The time-of-flight spectrum is then given by

$$C(t) = N(E,t)\eta(E) \frac{\Delta\Omega}{4\pi} \quad (\text{counts}/\mu\text{s})$$

where

$\eta(E)$ = detector efficiency at energy E

$\Delta\Omega$ = acceptance solid angle of the detector

with E and t in units of MeV and μ s, respectively. For energy-group-averaged transport codes, $N(E,t)$ is the number of 4π neutrons in an energy group and $\eta(E)$ is the corresponding group-averaged detector efficiency.

In all the experiments, the detector view of the target spheres was tightly collimated. Therefore, a very accurate representation of the acceptance angle, $\Delta\Omega$, is obtained by

$$\Delta\Omega = 2\pi R^2 (1 - \cos \Theta)$$

where R is the flight path and $\cos \Theta = R/\sqrt{r_s^2 + R^2}$ with r_s equal to the outer radius of the target sphere.

The target room air between the sphere and the detector should be included in the calculation of the time-of-flight spectrum.

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Fig. 1. Pulsed sphere geometry.

Mass = 11,144 g
99.99% Be

Fig. 2. Beryllium — 0.8 mfp. (All dimensions in Figs. 2 - 14 in cm.)

Zone	Density (g/cm ³)	Material	At.%
1	0.808	Liquid N ₂	100.0
2	7.9	Fe	68.6
		Cr	20.0
		Ni	8.4
		Si	2.0
		Mn	1.0

Fig. 3. Nitrogen - 3.1 mfp.

Zone	Density (g/cm ³)	Material	At. %
1	1.14	Liquid oxygen	100
2	7.9	Fe	68.6
		Cr	20.0
		Ni	8.4
		Si	2.0
		Mn	1.0

or:

1	1.00	H	66.7
		O	33.3
2	7.9	Steel	Same as above

Fig. 4. Oxygen and H₂O.

Mass = 7,656 g
99.995% C
Density = 1.764 g/cm³

Fig. 5. Carbon - 1.3 mfp.

Mass = 71,118 g
 99.995% C
 Density = 1.83 g/cm³

Fig. 6. Carbon - 3 mfp.

Zone	Density (g/cm ³)	Material	At.%
1	11.35	Pb	100.0
2	7.90	Fe	68.6
		Cr	20.0
		Ni	8.4
		Si	2.0
		Mn	1.0

Fig. 7. Lead.

Zone	Density (g/cm ³)	Material	At. %
1	18.7	²³⁵ U ²³⁸ U	93.5 6.5
2	8.62	Cd	100.0

Fig. 8. ²³⁵U - 0.7 mfp.

Zone	Density (g/cm ³)	Material	At. %
1	18.7	²³⁵ U ²³⁸ U	93.5 6.5
2	2.70	Al	100
3	8.65	Cd	100

Fig. 9. ²³⁵U - 1.5 mfp.

Density g/cm ³	Material	At. %
19.04	²³⁸ U	99
	C + Si	1

Fig. 10. ²³⁸U - 0.8 mfp.

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Zone	Density (g/cm ³)	Material	At. %
1	15.76	²³⁹ Pu	90.5
		²⁴⁰ Pu	6.1
		Gd	3.4
2	7.90	Fe	68.6
		Cr	20.0
		Ni	8.4
		Si	2.0
		Mn	1.0
3	8.65	Cd	100

Fig. 12. Plutonium — 0.7 mfp.

Density (g/cm ³)	Material	At. %
0.92	H	66.7
	C	33.3

Fig. 13. Polyethylene — 1 mfp.

Density (g/cm ³)	Material	At. %
0.92	H	66.7
	C	33.3

Fig. 14. Polyethylene - 3 mfp.

Fig. 15. Beryllium time-of-flight spectrum. Flight path = 980 cm.

Fig. 16. Nitrogen - 3 mfp.

Fig. 17. Oxygen.

Fig. 18. Carbon - 1 mfp.

Fig. 19. Carbon - 3 mfp.

Fig. 20. Lead.

Fig. 21. ^{235}U (small).

Fig. 22. ^{235}U (large).

Fig. 23. ^{238}U (small).

Fig. 24. ^{238}U (large). FWHM = 78 ns.

Fig. 25. ^{239}Pu .

Fig. 26. H_2O .

Fig. 27. CH_2 - 1 mfp.

Fig. 28. CH_2 - 3 mfp.

Table 1. ^6Li glass detector efficiency.

Energy (MeV)	Efficiency (counts per neutron/cm ²)	Energy (MeV)	Efficiency (counts per neutron/cm ²)
0.00001	1.145 ± 30%	0.14	0.0245
.00002	0.873 ± 30%	0.15	.0267
.00004	0.645 ± 25%	0.16	.0305
.00007	0.505 ± 20%	0.17	.0349
.0001	0.432 ± 20%	0.18	.0397
.0002	0.311 ± 15%	0.19	.0449
.0004	0.225	0.200	.0511
.0007	0.174	0.21	.0573
.001	0.146	0.22	.0626
.0015	0.120	0.23	.0657
.002	0.106	0.24	.0664
.0025	0.0938	0.25	.0657
.003	0.0871	0.26	.0639
.004	0.0757	0.27	.0607
.005	0.0676	0.28	.0566
.006	0.0622	0.29	.0527
.007	0.0576	0.30	.0492
.008	0.0539	0.32	.0432
.009	0.0510	0.34	.0383
.010	0.0487	0.36	.0342
.0125	0.0441	0.38	.0305
.015	0.0408	0.4	.0273
.0175	0.0382	0.42	.0243
.020	0.0363	0.44	.0219
.0225	0.0345	0.46	.0196
.025	0.0339	0.48	.0175
.0275	0.0330	0.5	.0160
.030	0.0317	0.52	.0144
.032	0.0305	0.54	.0135
.034	0.0298	0.56	.0127
.036	0.0295	0.58	.0121
.038	0.0292	0.6	.0118
.040	0.0289	0.65	.0110
.045	0.0281	0.7	.0105
.050	0.0274	0.75	.0101
.055	0.0267	0.8	.00976
.060	0.0263	0.9	.00911 ± 15%
.065	0.0256	1.00	.00852 ± 20%
.070	0.0253	1.1	.00805 ± 20%
.075	0.0248	1.2	.00761 ± 25%
.080	0.0247	1.3	.00725 ± 25%
.085	0.0245	1.4	.00693 ± 30%
.090	0.0241	1.5	.00661 ± 30%
.095	0.0237	1.6	.00631 ± 35%
.100	0.0234	1.7	.00589 ± 35%
.110	0.0231	1.8	.00537 ± 35%
.120	0.0229	1.9	.00430 ± 40%
0.13	0.0234	2.0	0.00439 ± 40%

Table 2. Beryllium time-of-flight spectra. Flight path = 980 cm.
FWHM = 140 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
5.545E-01	1.638E+00	3.558E-03	6.018E-04	9.877E-02
6.050E-01	1.375E+00	3.893E-03	8.558E-04	1.223E-01
6.555E-01	1.171E+00	3.974E-03	1.111E-03	1.437E-01
7.060E-01	1.009E+00	3.958E-03	1.384E-03	1.631E-01
7.565E-01	8.788E-01	3.734E-03	1.607E-03	1.738E-01
8.070E-01	7.721E-01	3.356E-03	1.754E-03	1.763E-01
8.575E-01	6.837E-01	3.413E-03	2.140E-03	2.007E-01
9.080E-01	6.096E-01	2.997E-03	2.232E-03	1.918E-01
9.585E-01	5.470E-01	3.066E-03	2.685E-03	2.028E-01
1.009E+00	4.936E-01	3.698E-03	3.779E-03	2.295E-01
1.059E+00	4.476E-01	4.378E-03	5.180E-03	2.466E-01
1.110E+00	4.078E-01	5.083E-03	6.917E-03	2.648E-01
1.160E+00	3.730E-01	5.775E-03	8.982E-03	2.826E-01
1.211E+00	3.425E-01	6.211E-03	1.098E-02	2.901E-01
1.261E+00	3.156E-01	6.783E-03	1.355E-02	3.043E-01
1.312E+00	2.918E-01	7.313E-03	1.644E-02	3.155E-01
1.362E+00	2.706E-01	8.079E-03	2.034E-02	3.377E-01
1.413E+00	2.516E-01	8.504E-03	2.388E-02	3.661E-01
1.463E+00	2.345E-01	8.346E-03	2.604E-02	3.952E-01
1.514E+00	2.191E-01	7.075E-03	2.444E-02	3.952E-01
1.564E+00	2.052E-01	6.032E-03	2.300E-02	4.232E-01
1.640E+00	1.867E-01	4.171E-03	1.830E-02	4.199E-01
1.741E+00	1.656E-01	2.693E-03	1.414E-02	4.260E-01
1.842E+00	1.480E-01	1.988E-03	1.236E-02	4.663E-01
1.943E+00	1.330E-01	1.555E-03	1.135E-02	4.774E-01
2.044E+00	1.202E-01	1.349E-03	1.146E-02	4.982E-01
2.128E+00	1.109E-01	1.208E-03	1.158E-02	5.015E-01
2.245E+00	9.962E-02	1.136E-03	1.278E-02	5.452E-01
2.362E+00	8.999E-02	9.434E-04	1.237E-02	5.134E-01
2.479E+00	8.170E-02	9.074E-04	1.375E-02	5.587E-01
2.596E+00	7.450E-02	8.797E-04	1.531E-02	6.152E-01
2.713E+00	6.821E-02	8.286E-04	1.647E-02	6.483E-01
2.830E+00	6.269E-02	7.512E-04	1.694E-02	6.539E-01
3.181E+00	4.961E-02	6.438E-04	2.052E-02	7.490E-01
3.532E+00	4.024E-02	5.540E-04	2.420E-02	8.400E-01
3.883E+00	3.329E-02	4.982E-04	2.894E-02	9.604E-01
4.234E+00	2.800E-02	4.839E-04	3.646E-02	1.118E+00
4.585E+00	2.388E-02	4.254E-04	4.072E-02	1.193E+00
4.936E+00	2.060E-02	4.097E-04	4.895E-02	1.367E+00
5.813E+00	1.485E-02	3.413E-04	6.630E-02	1.621E+00
6.515E+00	1.182E-02	3.123E-04	8.554E-02	1.892E+00
7.217E+00	9.636E-03	2.789E-04	1.040E-01	2.103E+00
7.919E+00	8.004E-03	2.566E-04	1.265E-01	2.347E+00
8.621E+00	6.753E-03	2.366E-04	1.505E-01	2.568E+00
9.323E+00	5.775E-03	2.095E-04	1.687E-01	2.658E+00
1.003E+01	4.994E-03	1.994E-04	1.997E-01	2.920E+00
1.073E+01	4.362E-03	1.835E-04	2.251E-01	3.067E+00

Table 2. (Continued)

1.143E+01	3.843E-03	1.787E-04	2.652E-01	3.389E+00
1.213E+01	3.411E-03	1.708E-03	3.032E-01	3.635E+00
1.283E+01	3.048E-03	1.618E-04	3.402E-01	3.874E+00
1.336E+01	2.812E-03	1.546E-04	3.641E-01	4.075E+00
1.511E+01	2.197E-03	1.321E-04	4.514E-01	4.472E+00
1.687E+01	1.764E-03	1.128E-04	5.365E-01	4.765E+00
1.862E+01	1.447E-03	1.062E-04	6.803E-01	5.521E+00
2.038E+01	1.209E-03	9.280E-05	7.796E-01	5.767E+00
2.213E+01	1.025E-03	8.297E-05	8.935E-01	6.160E+00
2.389E+01	8.795E-04	7.843E-05	1.062E+00	6.761E+00
2.623E+01	7.293E-04	7.855E-05	1.408E+00	8.242E+00
2.846E+01	6.199E-04	7.412E-05	1.696E+00	9.071E+00
3.067E+01	5.333E-04	7.016E-05	2.013E+00	9.961E+00
3.513E+01	4.069E-04	6.048E-05	2.564E+00	1.141E+01
4.179E+01	2.874E-04	5.430E-05	3.897E+00	1.434E+01
4.845E+01	2.138E-04	4.377E-05	4.913E+00	1.610E+01
5.512E+01	1.652E-04	4.133E-05	6.844E+00	1.945E+01
6.178E+01	1.315E-04	3.572E-05	8.345E+00	2.116E+01
7.178E+01	9.741E-05	3.327E-05	1.217E+01	2.770E+01
8.067E+01	7.713E-05	2.614E-05	1.359E+01	2.791E+01
8.956E+01	6.258E-05	2.575E-05	1.834E+01	3.398E+01
9.845E+01	5.179E-05	2.284E-05	2.162E+01	3.643E+01
1.073E+02	4.357E-05	2.040E-05	2.504E+01	3.975E+01
1.162E+02	3.716E-05	1.768E-05	2.757E+01	4.062E+01
1.251E+02	3.207E-05	1.712E-05	3.330E+01	4.505E+01
1.340E+02	2.795E-05	1.418E-05	3.391E+01	4.316E+01
1.429E+02	2.458E-05	1.327E-05	3.847E+01	4.661E+01
1.584E+02	1.999E-05	1.170E-05	4.591E+01	5.203E+01
1.807E+02	1.538E-05	1.044E-05	6.088E+01	6.059E+01
2.029E+02	1.219E-05	8.792E-06	7.268E+01	6.665E+01
2.252E+02	9.906E-06	7.541E-06	8.527E+01	7.359E+01

Table 3. Nitrogen - 3 mfp. FWHM = 140 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
5.500E-01	1.012E+00	2.934E-03	7.942E-04	9.395E-02
6.000E-01	8.501E-01	2.722E-03	9.574E-04	1.018E-01
6.500E-01	7.244E-01	2.632E-03	1.177E-03	1.144E-01
7.000E-01	6.246E-01	2.511E-03	1.403E-03	1.233E-01
7.500E-01	5.441E-01	2.384E-03	1.639E-03	1.227E-01
8.000E-01	4.782E-01	2.275E-03	1.899E-03	1.069E-01
8.500E-01	4.236E-01	2.220E-03	2.224E-03	9.318E-02
9.000E-01	3.778E-01	2.287E-03	2.719E-03	8.813E-02
9.500E-01	3.391E-01	2.420E-03	3.385E-03	8.787E-02
1.000E+00	3.060E-01	2.638E-03	4.304E-03	9.103E-02
1.050E+00	2.776E-01	2.722E-03	5.143E-03	8.960E-02
1.100E+00	2.529E-01	2.765E-03	6.006E-03	9.258E-02
1.150E+00	2.314E-01	2.722E-03	6.758E-03	1.033E-01
1.200E+00	2.125E-01	2.662E-03	7.508E-03	1.280E-01
1.250E+00	1.959E-01	2.498E-03	7.966E-03	1.636E-01
1.300E+00	1.811E-01	2.269E-03	8.137E-03	2.013E-01
1.350E+00	1.679E-01	1.972E-03	7.922E-03	2.324E-01
1.400E+00	1.561E-01	1.633E-03	7.318E-03	2.515E-01
1.450E+00	1.456E-01	1.258E-03	6.264E-03	2.432E-01
1.500E+00	1.360E-01	1.059E-03	5.834E-03	2.423E-01
1.550E+00	1.274E-01	9.135E-04	5.687E-03	2.453E-01
1.650E+00	1.124E-01	7.078E-04	5.185E-03	2.249E-01
1.750E+00	9.993E-02	5.868E-04	5.130E-03	2.189E-01
1.850E+00	8.942E-02	5.142E-04	5.311E-03	2.201E-01
1.950E+00	8.048E-02	4.477E-04	5.416E-03	2.196E-01
2.050E+00	7.282E-02	4.083E-04	6.047E-03	2.400E-01
2.300E+00	5.785E-02	3.358E-04	6.635E-03	2.513E-01
2.550E+00	4.707E-02	2.813E-04	7.584E-03	2.731E-01
2.800E+00	3.904E-02	2.420E-04	8.644E-03	2.980E-01
3.050E+00	3.290E-02	2.117E-04	1.036E-02	3.363E-01
3.550E+00	2.428E-02	1.724E-04	1.248E-02	3.675E-01
4.050E+00	1.866E-02	1.452E-04	1.564E-02	4.205E-01
4.550E+00	1.478E-02	1.270E-04	1.943E-02	4.738E-01
5.050E+00	1.200E-02	1.125E-04	2.521E-02	5.506E-01
6.050E+00	8.361E-03	9.316E-05	3.325E-02	6.327E-01
7.050E+00	6.157E-03	8.046E-05	4.560E-02	7.458E-01
8.050E+00	4.723E-03	7.078E-05	5.986E-02	8.606E-01
9.050E+00	3.737E-03	6.231E-05	7.500E-02	9.569E-01
1.005E+01	3.030E-03	5.747E-05	1.049E-01	1.179E+00
1.255E+01	1.943E-03	4.961E-05	1.570E-01	1.477E+00
1.505E+01	1.351E-03	4.477E-05	2.459E-01	1.943E+00
1.755E+01	9.936E-04	4.114E-05	3.596E-01	2.449E+00
2.005E+01	7.613E-04	3.781E-05	4.940E-01	2.948E+00
2.255E+01	6.018E-04	3.472E-05	6.465E-01	3.408E+00
2.505E+01	4.877E-04	3.116E-05	7.850E-01	3.761E+00
2.705E+01	4.183E-04	2.813E-05	8.833E-01	4.008E+00
2.805E+01	3.890E-04	2.601E-05	9.374E-01	4.082E+00
2.905E+01	3.627E-04	2.359E-05	9.444E-01	3.920E+00
3.005E+01	3.389E-04	1.966E-05	8.712E-01	3.469E+00
3.105E+01	3.174E-04	2.238E-05	1.094E+00	4.202E+00
3.205E+01	2.979E-04	2.390E-05	1.285E+00	4.779E+00
3.305E+01	2.802E-04	2.450E-05	1.477E+00	5.309E+00
3.505E+01	2.491E-04	2.498E-05	1.773E+00	6.107E+00
3.755E+01	2.171E-04	2.498E-05	2.156E+00	7.109E+00
4.005E+01	1.908E-04	2.390E-05	2.616E+00	7.979E+00
4.505E+01	1.508E-04	2.178E-05	3.233E+00	8.766E+00
5.005E+01	1.222E-04	2.015E-05	4.396E+00	1.072E+01
6.005E+01	8.487E-05	1.730E-05	6.036E+00	1.300E+01
7.005E+01	6.237E-05	1.525E-05	8.474E+00	1.580E+01
8.005E+01	4.776E-05	1.343E-05	1.117E+01	1.842E+01
9.005E+01	3.774E-05	1.210E-05	1.435E+01	2.145E+01
1.001E+02	3.057E-05	1.089E-05	1.961E+01	2.547E+01
1.250E+02	1.957E-05	8.832E-06	2.766E+01	3.123E+01
1.500E+02	1.359E-05	7.471E-06	4.067E+01	3.912E+01

Table 4. Oxygen. FWHM = 126 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
6.430E-01	7.414E-01	1.352E-03	5.797E-04	5.724E-02
7.460E-01	5.506E-01	1.416E-03	9.515E-04	7.138E-02
8.490E-01	4.250E-01	1.203E-03	1.194E-03	5.075E-02
9.520E-01	3.379E-01	1.095E-03	1.535E-03	3.971E-02
1.055E+00	2.751E-01	1.242E-03	2.372E-03	4.119E-02
1.158E+00	2.283E-01	1.208E-03	3.053E-03	4.776E-02
1.261E+00	1.925E-01	9.537E-04	3.114E-03	6.587E-02
1.364E+00	1.646E-01	5.507E-04	2.277E-03	6.920E-02
1.467E+00	1.422E-01	3.237E-04	1.665E-03	6.588E-02
1.570E+00	1.242E-01	2.469E-04	1.557E-03	6.722E-02
1.930E+00	8.213E-02	1.326E-04	1.479E-03	6.109E-02
2.548E+00	4.713E-02	7.251E-05	1.904E-03	6.904E-02
3.166E+00	3.052E-02	4.805E-05	2.445E-03	7.848E-02

Table 5. Carbon (1 mfp). FWHM = 140 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
6.450E-01	7.368E-01	2.582E-03	1.118E-03	1.100E-01
7.475E-01	5.484E-01	2.297E-03	1.552E-03	1.157E-01
8.500E-01	4.240E-01	2.141E-03	2.132E-03	9.009E-02
9.310E-01	3.534E-01	2.278E-03	2.998E-03	8.442E-02
9.810E-01	3.182E-01	2.415E-03	3.721E-03	8.495E-02
1.031E+00	2.881E-01	2.746E-03	4.911E-03	9.189E-02
1.081E+00	2.620E-01	3.003E-03	6.191E-03	9.852E-02
1.131E+00	2.394E-01	2.813E-03	6.643E-03	1.006E-01
1.181E+00	2.195E-01	2.606E-03	7.006E-03	1.131E-01
1.231E+00	2.020E-01	1.982E-03	6.035E-03	1.150E-01
1.281E+00	1.866E-01	1.644E-03	5.643E-03	1.305E-01
1.331E+00	1.729E-01	1.261E-03	4.856E-03	1.337E-01
1.381E+00	1.606E-01	9.968E-04	4.287E-03	1.390E-01
1.481E+00	1.396E-01	6.623E-04	3.497E-03	1.395E-01
1.631E+00	1.151E-01	4.381E-04	3.093E-03	1.341E-01
1.781E+00	9.650E-02	3.797E-04	3.492E-03	1.478E-01
1.881E+00	8.651E-02	3.354E-04	3.635E-03	1.495E-01
2.031E+00	7.420E-02	3.287E-04	4.486E-03	1.799E-01
2.181E+00	6.435E-02	2.716E-04	4.593E-03	1.785E-01
2.331E+00	5.633E-02	2.242E-04	4.630E-03	1.741E-01
2.481E+00	4.972E-02	2.160E-04	5.379E-03	1.962E-01
2.631E+00	4.422E-02	2.024E-04	6.013E-03	2.131E-01
2.706E+00	4.180E-02	1.939E-04	6.238E-03	2.185E-01
3.006E+00	3.387E-02	1.675E-04	7.397E-03	2.468E-01
3.306E+00	2.800E-02	1.256E-04	7.382E-03	2.265E-01
3.606E+00	2.354E-02	1.153E-04	8.803E-03	2.570E-01
4.206E+00	1.730E-02	9.673E-05	1.173E-02	3.054E-01
4.506E+00	1.507E-02	8.697E-05	1.297E-02	3.185E-01
4.806E+00	1.325E-02	8.447E-05	1.529E-02	3.551E-01
5.106E+00	1.174E-02	8.003E-05	1.738E-02	3.823E-01
6.006E+00	8.484E-03	7.029E-05	2.479E-02	4.733E-01
6.500E+00	7.244E-03	6.772E-05	2.987E-02	5.311E-01
7.700E+00	5.162E-03	5.841E-05	4.304E-02	6.429E-01
8.900E+00	3.864E-03	5.480E-05	6.255E-02	8.036E-01
1.010E+01	3.000E-03	4.121E-05	6.889E-02	7.809E-01
1.130E+01	2.397E-03	3.435E-05	8.053E-02	8.214E-01
1.250E+01	1.959E-03	3.309E-05	1.051E-01	9.640E-01
1.370E+01	1.631E-03	2.786E-05	1.166E-01	9.815E-01
1.490E+01	1.379E-03	2.406E-05	1.296E-01	1.003E+00
1.610E+01	1.181E-03	2.167E-05	1.473E-01	1.052E+00

Table 6. Carbon - 3 mfp. FWHM = 160 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
5.000E-01	1.224E+00	3.648E-03	7.413E-04	9.877E-02
5.500E-01	1.012E+00	3.295E-03	8.920E-04	1.055E-01
6.000E-01	8.501E-01	3.036E-03	1.068E-03	1.135E-01
6.500E-01	7.244E-01	2.919E-03	1.306E-03	1.269E-01
7.000E-01	6.246E-01	2.930E-03	1.638E-03	1.439E-01
7.500E-01	5.441E-01	2.966E-03	2.040E-03	1.527E-01
8.000E-01	4.782E-01	3.107E-03	2.594E-03	1.460E-01
8.500E-01	4.236E-01	3.366E-03	3.371E-03	1.413E-01
9.000E-01	3.778E-01	3.825E-03	4.548E-03	1.474E-01
9.500E-01	3.391E-01	4.284E-03	5.992E-03	1.556E-01
1.000E+00	3.060E-01	4.708E-03	7.681E-03	1.625E-01
1.050E+00	2.776E-01	5.061E-03	9.560E-03	1.666E-01
1.100E+00	2.529E-01	5.155E-03	1.120E-02	1.726E-01
1.150E+00	2.314E-01	4.978E-03	1.236E-02	1.090E-01
1.200E+00	2.125E-01	4.143E-03	1.169E-02	1.991E-01
1.250E+00	1.959E-01	3.354E-03	1.069E-02	2.196E-01
1.300E+00	1.811E-01	2.789E-03	1.029E-02	2.647E-01
1.400E+00	1.561E-01	1.954E-03	8.736E-03	2.970E-01
1.500E+00	1.360E-01	1.353E-03	7.268E-03	2.971E-01
1.550E+00	1.274E-01	1.106E-03	6.727E-03	2.889E-01
1.600E+00	1.195E-01	1.000E-03	6.691E-03	2.914E-01
1.650E+00	1.124E-01	9.533E-04	6.993E-03	3.034E-01
1.700E+00	1.059E-01	9.239E-04	7.573E-03	3.255E-01
1.800E+00	9.446E-02	8.768E-04	8.678E-03	3.627E-01
2.000E+00	7.651E-02	8.003E-04	1.152E-02	4.580E-01
2.500E+00	4.897E-02	6.944E-04	1.737E-02	6.343E-01
3.000E+00	3.400E-02	6.179E-04	2.688E-02	8.957E-01
3.500E+00	2.498E-02	5.590E-04	3.876E-02	1.151E+00
4.000E+00	1.913E-02	5.061E-04	5.708E-02	1.517E+00
5.000E+00	1.224E-02	4.413E-04	8.834E-02	1.997E+00
6.000E+00	8.501E-03	3.943E-04	1.372E-01	2.632E+00
7.000E+00	6.246E-03	3.531E-04	1.958E-01	3.226E+00
8.000E+00	4.782E-03	3.236E-04	2.686E-01	3.886E+00
9.000E+00	3.778E-03	3.001E-04	3.552E-01	4.558E+00
1.000E+01	3.060E-03	2.789E-04	5.017E-01	5.664E+00
1.250E+01	1.959E-03	2.424E-04	7.582E-01	7.161E+00
1.500E+01	1.360E-03	2.154E-04	1.171E+00	9.284E+00
1.750E+01	9.993E-04	1.954E-04	1.693E+00	1.156E+01
2.000E+01	7.651E-04	1.789E-04	2.522E+00	1.468E+01
2.500E+01	4.897E-04	1.553E-04	3.887E+00	1.876E+01
3.000E+01	3.400E-04	1.353E-04	5.888E+00	2.377E+01
3.500E+01	2.498E-04	1.200E-04	8.323E+00	2.891E+01
4.000E+01	1.913E-04	1.095E-04	1.234E+01	3.721E+01
5.000E+01	1.224E-04	9.062E-05	1.814E+01	4.531E+01
6.000E+01	8.501E-05	7.767E-05	2.703E+01	5.824E+01
7.000E+01	6.246E-05	6.708E-05	3.721E+01	6.941E+01
8.000E+01	4.782E-05	5.884E-05	4.884E+01	8.061E+01
9.000E+01	3.778E-05	5.178E-05	6.129E+01	9.169E+01
1.000E+02	3.060E-05	4.590E-05	8.256E+01	1.072E+02
1.250E+02	1.959E-05	3.531E-05	1.104E+02	1.247E+02
1.500E+02	1.360E-05	2.825E-05	1.536E+02	1.478E+02

Table 7. Lead. FWHM = 78 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
3.890E-01	2.031E+00	1.090E-02	1.047E-03	2.403E-01
4.130E-01	1.801E+00	1.241E-02	1.426E-03	2.647E-01
4.370E-01	1.608E+00	1.437E-02	1.956E-03	3.125E-01
4.610E-01	1.444E+00	1.341E-02	2.144E-03	3.157E-01
4.850E-01	1.305E+00	1.424E-02	2.651E-03	3.659E-01
5.090E-01	1.184E+00	1.480E-02	3.184E-03	4.141E-01
5.330E-01	1.080E+00	1.454E-02	3.594E-03	4.409E-01
5.690E-01	9.472E-01	1.384E-02	4.151E-03	4.707E-01
6.170E-01	8.053E-01	1.243E-02	4.755E-03	4.895E-01
6.650E-01	6.931E-01	1.064E-02	5.098E-03	4.821E-01
7.130E-01	6.028E-01	1.054E-02	6.229E-03	5.301E-01
7.610E-01	5.291E-01	9.999E-03	7.185E-03	5.092E-01
8.090E-01	4.681E-01	1.030E-02	8.898E-03	4.738E-01
8.570E-01	4.171E-01	1.106E-02	1.136E-02	4.580E-01
9.050E-01	3.740E-01	1.055E-02	1.276E-02	4.037E-01
9.530E-01	3.372E-01	1.056E-02	1.491E-02	3.822E-01
1.001E+00	3.056E-01	1.054E-02	1.726E-02	3.635E-01
1.049E+00	2.783E-01	1.109E-02	2.089E-02	3.651E-01
1.097E+00	2.544E-01	1.065E-02	2.295E-02	3.550E-01
1.145E+00	2.336E-01	9.410E-03	2.306E-02	3.510E-01
1.193E+00	2.151E-01	7.554E-03	2.094E-02	3.491E-01
1.241E+00	1.988E-01	5.398E-03	1.684E-02	3.339E-01
1.289E+00	1.843E-01	3.990E-03	1.395E-02	3.322E-01
1.337E+00	1.713E-01	2.977E-03	1.162E-02	3.264E-01
1.399E+00	1.564E-01	2.508E-03	1.120E-02	3.802E-01
1.492E+00	1.375E-01	1.580E-03	8.561E-03	3.509E-01
1.632E+00	1.149E-01	1.080E-03	7.623E-03	3.300E-01
1.819E+00	9.253E-02	6.826E-04	6.676E-03	2.796E-01
1.959E+00	7.978E-02	5.664E-04	6.884E-03	2.797E-01
2.239E+00	6.107E-02	4.000E-04	7.276E-03	2.795E-01
2.519E+00	4.825E-02	3.004E-04	7.794E-03	2.825E-01
2.798E+00	3.908E-02	2.424E-04	8.637E-03	2.979E-01
2.938E+00	3.545E-02	2.356E-04	9.591E-03	3.237E-01
3.498E+00	2.501E-02	1.767E-04	1.220E-02	3.628E-01
4.058E+00	1.858E-02	1.284E-04	1.389E-02	3.730E-01
4.804E+00	1.326E-02	9.713E-05	1.727E-02	4.039E-01
5.737E+00	9.297E-03	8.322E-05	2.534E-02	5.061E-01
6.670E+00	6.878E-03	7.184E-05	3.450E-02	5.957E-01
7.603E+00	5.294E-03	5.383E-05	3.837E-02	5.794E-01
8.536E+00	4.200E-03	4.892E-05	4.942E-02	6.620E-01
9.468E+00	3.413E-03	4.655E-05	6.427E-02	7.726E-01
1.040E+01	2.828E-03	4.000E-05	7.327E-02	8.080E-01

Table 8. Small ^{235}U . FWHM = 78 ns.

Time (μs)	Energy (MeV)	Counts/ μs	Counts/ MeV	Neutrons/ MeV
4.138E-01	1.794E+00	1.331E-02	1.538E-03	2.836E-01
4.380E-01	1.601E+00	1.480E-02	2.029E-03	3.227E-01
4.622E-01	1.437E+00	1.543E-02	2.486E-03	3.648E-01
4.864E-01	1.297E+00	1.637E-02	3.073E-03	4.227E-01
5.106E-01	1.177E+00	1.646E-02	3.576E-03	4.632E-01
5.469E-01	1.025E+00	1.659E-02	4.417E-03	5.261E-01
5.953E-01	8.652E-01	1.496E-02	5.138E-03	5.512E-01
6.437E-01	7.398E-01	1.456E-02	6.326E-03	6.214E-01
6.921E-01	6.398E-01	1.379E-02	7.451E-03	6.663E-01
7.405E-01	5.588E-01	1.386E-02	9.174E-03	7.149E-01
7.889E-01	4.923E-01	1.458E-02	1.167E-02	7.044E-01
8.373E-01	4.369E-01	1.551E-02	1.485E-02	6.679E-01
8.857E-01	3.905E-01	1.819E-02	1.835E-02	6.375E-01
9.341E-01	3.510E-01	1.726E-02	2.295E-02	6.373E-01
9.825E-01	3.173E-01	1.794E-02	2.776E-02	6.299E-01
1.031E+00	2.881E-01	1.896E-02	3.390E-02	6.345E-01
1.079E+00	2.629E-01	2.017E-02	4.140E-02	6.610E-01
1.128E+00	2.408E-01	2.001E-02	4.684E-02	7.094E-01
1.176E+00	2.214E-01	1.596E-02	4.237E-02	6.755E-01
1.224E+00	2.042E-01	1.220E-02	3.656E-02	6.799E-01
1.273E+00	1.890E-01	8.516E-03	2.868E-02	6.435E-01
1.321E+00	1.754E-01	6.144E-03	2.314E-02	6.164E-01
1.370E+00	1.632E-01	4.810E-03	2.018E-02	6.314E-01
1.418E+00	1.522E-01	3.814E-03	1.776E-02	6.424E-01
1.466E+00	1.423E-01	3.073E-03	1.583E-02	6.315E-01
1.503E+00	1.356E-01	2.636E-03	1.460E-02	6.069E-01
1.575E+00	1.233E-01	2.195E-03	1.401E-02	6.066E-01
1.648E+00	1.127E-01	1.938E-03	1.416E-02	6.143E-01
1.721E+00	1.034E-01	1.586E-03	1.318E-02	5.660E-01
1.793E+00	9.519E-02	1.353E-03	1.274E-02	5.375E-01
1.866E+00	8.793E-02	1.208E-03	1.281E-02	5.282E-01
1.938E+00	8.146E-02	1.031E-03	1.219E-02	4.967E-01
2.156E+00	6.584E-02	8.321E-04	1.356E-02	5.298E-01
2.374E+00	5.431E-02	6.226E-04	1.355E-02	5.054E-01
2.592E+00	4.556E-02	5.287E-04	1.499E-02	5.352E-01
2.810E+00	3.877E-02	4.159E-04	1.502E-02	5.171E-01
3.027E+00	3.339E-02	3.627E-04	1.640E-02	5.455E-01
3.281E+00	2.842E-02	3.381E-04	1.944E-02	6.003E-01
3.572E+00	2.399E-02	2.535E-04	1.881E-02	5.517E-01
3.862E+00	2.052E-02	1.894E-04	1.778E-02	4.956E-01
4.153E+00	1.775E-02	1.913E-04	2.232E-02	5.873E-01
4.443E+00	1.550E-02	1.865E-04	2.666E-02	6.626E-01
4.733E+00	1.366E-02	1.578E-04	2.730E-02	6.420E-01
5.024E+00	1.213E-02	1.457E-04	3.013E-02	6.732E-01
5.605E+00	9.743E-03	1.024E-04	2.935E-02	5.964E-01
6.089E+00	8.255E-03	1.360E-04	5.000E-02	9.418E-01
6.573E+00	7.084E-03	1.188E-04	5.487E-02	9.601E-01
7.057E+00	6.146E-03	8.937E-05	5.119E-02	8.325E-01
7.541E+00	5.382E-03	6.925E-05	4.841E-02	7.349E-01
8.025E+00	4.753E-03	8.204E-05	6.914E-02	9.845E-01
8.509E+00	4.227E-03	8.716E-05	8.758E-02	1.175E+00
8.993E+00	3.784E-03	8.857E-05	1.051E-01	1.331E+00
9.392E+00	3.470E-03	6.988E-05	9.337E-02	1.133E+00

Table 9. Large ^{235}U . FWHM = 78 ns.

Time (μs)	Energy (MeV)	Counts/ μs	Counts/ MeV	Neutrons/ MeV
3.873E-01	2.049E+00	3.554E-02	3.367E-03	7.845E-01
4.116E-01	1.813E+00	4.108E-02	4.672E-03	8.769E-01
4.359E-01	1.616E+00	4.514E-02	6.099E-03	9.789E-01
4.602E-01	1.450E+00	4.825E-02	7.673E-03	1.132E+00
4.845E-01	1.307E+00	5.320E-02	9.872E-03	1.364E+00
5.088E-01	1.185E+00	5.197E-02	1.117E-02	1.453E+00
5.331E-01	1.079E+00	5.145E-02	1.272E-02	1.561E+00
5.574E-01	9.871E-01	5.174E-02	1.462E-02	1.699E+00
5.817E-01	9.062E-01	5.024E-02	1.614E-02	1.778E+00
6.060E-01	8.348E-01	4.958E-02	1.801E-02	1.889E+00
6.303E-01	7.716E-01	4.966E-02	2.030E-02	2.039E+00
6.546E-01	7.153E-01	4.865E-02	2.228E-02	2.146E+00
6.789E-01	6.649E-01	4.856E-02	2.481E-02	2.285E+00
7.032E-01	6.197E-01	4.853E-02	2.758E-02	2.401E+00
7.275E-01	5.790E-01	4.963E-02	3.120E-02	2.557E+00
7.518E-01	5.421E-01	5.116E-02	3.550E-02	2.641E+00
7.761E-01	5.086E-01	5.212E-02	3.979E-02	2.596E+00
8.004E-01	4.782E-01	5.455E-02	4.568E-02	2.568E+00
8.247E-01	4.504E-01	5.668E-02	5.191E-02	2.505E+00
8.490E-01	4.250E-01	5.972E-02	5.968E-02	2.513E+00
8.733E-01	4.016E-01	6.118E-02	6.654E-02	2.456E+00
8.976E-01	3.802E-01	6.283E-02	7.421E-02	2.429E+00
9.219E-01	3.604E-01	6.498E-02	8.315E-02	2.432E+00
9.462E-01	3.421E-01	6.792E-02	9.397E-02	2.477E+00
9.705E-01	3.252E-01	6.914E-02	1.032E-01	2.459E+00
9.948E-01	3.095E-01	7.091E-02	1.140E-01	2.458E+00
1.019E+00	2.949E-01	7.413E-02	1.282E-01	2.511E+00
1.043E+00	2.813E-01	7.544E-02	1.400E-01	2.493E+00
1.068E+00	2.686E-01	7.736E-02	1.538E-01	2.518E+00
1.092E+00	2.568E-01	7.703E-02	1.638E-01	2.542E+00
1.116E+00	2.457E-01	7.554E-02	1.716E-01	2.601E+00
1.141E+00	2.354E-01	7.094E-02	1.719E-01	2.602E+00
1.165E+00	2.256E-01	6.554E-02	1.692E-01	2.630E+00
1.189E+00	2.165E-01	5.870E-02	1.613E-01	2.656E+00
1.213E+00	2.079E-01	5.174E-02	1.510E-01	2.699E+00
1.238E+00	1.998E-01	4.396E-02	1.362E-01	2.671E+00
1.262E+00	1.922E-01	3.689E-02	1.211E-01	2.618E+00
1.286E+00	1.850E-01	3.124E-02	1.086E-01	2.569E+00
1.311E+00	1.782E-01	2.737E-02	1.007E-01	2.592E+00
1.359E+00	1.657E-01	2.050E-02	8.401E-02	2.532E+00
1.432E+00	1.492E-01	1.396E-02	6.692E-02	2.492E+00
1.505E+00	1.351E-01	1.101E-02	6.124E-02	2.551E+00
1.578E+00	1.229E-01	8.892E-03	5.702E-02	2.471E+00
1.651E+00	1.123E-01	7.473E-03	5.488E-02	2.381E+00
1.724E+00	1.030E-01	6.339E-03	5.300E-02	2.274E+00
1.833E+00	9.109E-02	5.208E-03	5.225E-02	2.178E+00
1.979E+00	7.816E-02	4.139E-03	5.227E-02	2.113E+00
2.125E+00	6.780E-02	3.440E-03	5.378E-02	2.116E+00
2.271E+00	5.937E-02	2.966E-03	5.660E-02	2.153E+00
2.416E+00	5.242E-02	2.521E-03	5.801E-02	2.145E+00
2.562E+00	4.662E-02	2.142E-03	5.877E-02	2.110E+00
2.744E+00	4.064E-02	1.843E-03	6.203E-02	2.157E+00
2.963E+00	3.486E-02	1.532E-03	6.494E-02	2.187E+00
3.182E+00	3.023E-02	1.364E-03	7.163E-02	2.276E+00
3.400E+00	2.647E-02	1.152E-03	7.383E-02	2.215E+00
3.619E+00	2.337E-02	1.059E-03	8.188E-02	2.387E+00
3.838E+00	2.078E-02	9.376E-04	8.645E-02	2.421E+00
4.057E+00	1.860E-02	8.773E-04	9.555E-02	2.559E+00
4.275E+00	1.674E-02	7.966E-04	1.016E-01	2.607E+00
4.397E+00	1.583E-02	7.114E-04	9.845E-02	2.470E+00
4.770E+00	1.345E-02	5.957E-04	1.033E-01	2.483E+00
5.143E+00	1.157E-02	5.249E-04	1.164E-01	2.545E+00
5.517E+00	1.006E-02	4.641E-04	1.270E-01	2.614E+00
6.170E+00	8.040E-03	3.934E-04	1.492E-01	2.785E+00
7.103E+00	6.067E-03	3.059E-04	1.775E-01	2.876E+00
8.036E+00	4.740E-03	2.538E-04	2.137E-01	3.046E+00
8.969E+00	3.805E-03	2.096E-04	2.457E-01	3.127E+00
1.037E+01	2.847E-03	1.708E-04	3.060E-01	3.403E+00
1.223E+01	2.045E-03	1.278E-04	3.780E-01	3.558E+00
1.410E+01	1.539E-03	9.177E-05	4.166E-01	3.420E+00
1.597E+01	1.201E-03	6.192E-05	4.089E-01	2.952E+00
1.783E+01	9.624E-04	5.053E-05	4.655E-01	3.035E+00

Table 10. Small ^{238}U . FWHM = 78 ns.

Time (μs)	Energy (MeV)	Counts/ μs	Counts/ MeV	Neutrons/ MeV
4.106E-01	1.822E+00	7.303E-03	8.246E-04	1.560E-01
4.348E-01	1.624E+00	7.081E-03	9.494E-04	1.532E-01
4.590E-01	1.457E+00	8.048E-03	1.270E-03	1.880E-01
4.832E-01	1.314E+00	8.804E-03	1.621E-03	2.247E-01
5.074E-01	1.192E+00	9.393E-03	2.002E-03	2.614E-01
5.316E-01	1.085E+00	9.698E-03	2.378E-03	2.927E-01
5.558E-01	9.928E-01	9.781E-03	2.741E-03	3.197E-01
5.800E-01	9.115E-01	1.035E-02	3.296E-03	3.642E-01
6.042E-01	8.398E-01	1.125E-02	4.051E-03	4.263E-01
6.526E-01	7.197E-01	1.082E-02	4.884E-03	4.729E-01
7.252E-01	5.826E-01	1.083E-02	6.716E-03	5.496E-01
7.978E-01	4.813E-01	1.181E-02	9.760E-03	5.577E-01
8.704E-01	4.043E-01	1.376E-02	1.477E-02	5.566E-01
9.430E-01	3.444E-01	1.438E-02	1.964E-02	5.261E-01
1.016E+00	2.969E-01	1.586E-02	2.707E-02	5.388E-01
1.088E+00	2.586E-01	1.661E-02	3.489E-02	5.510E-01
1.161E+00	2.272E-01	1.512E-02	3.855E-02	6.001E-01
1.233E+00	2.013E-01	1.023E-02	3.129E-02	6.003E-01
1.306E+00	1.795E-01	6.038E-03	2.194E-02	5.524E-01
1.379E+00	1.611E-01	3.904E-03	1.669E-02	5.351E-01
1.451E+00	1.454E-01	2.830E-03	1.411E-02	5.473E-01
1.524E+00	1.318E-01	2.119E-03	1.224E-02	5.171E-01
1.596E+00	1.201E-01	1.684E-03	1.118E-02	4.862E-01
1.705E+00	1.053E-01	1.272E-03	1.027E-02	4.417E-01
1.850E+00	8.939E-02	1.075E-03	1.110E-02	4.601E-01
1.996E+00	7.685E-02	8.117E-04	1.051E-02	4.240E-01
2.141E+00	6.678E-02	6.186E-04	9.895E-03	3.880E-01
2.286E+00	5.857E-02	4.797E-04	9.345E-03	3.543E-01
2.431E+00	5.178E-02	4.411E-04	1.034E-02	3.811E-01
2.676E+00	4.611E-02	3.954E-04	1.103E-02	3.949E-01
2.722E+00	4.132E-02	3.423E-04	1.126E-02	3.926E-01
2.867E+00	3.724E-02	3.087E-04	1.187E-02	4.050E-01
3.012E+00	3.373E-02	2.865E-04	1.278E-02	4.268E-01
3.157E+00	3.070E-02	2.509E-04	1.289E-02	4.125E-01
3.375E+00	2.687E-02	2.150E-04	1.346E-02	4.064E-01
3.665E+00	2.278E-02	1.611E-04	1.292E-02	3.740E-01
3.956E+00	1.956E-02	1.486E-04	1.499E-02	4.097E-01
4.246E+00	1.697E-02	1.393E-04	1.731E-02	4.477E-01
4.730E+00	1.368E-02	1.076E-04	1.851E-02	4.366E-01
5.214E+00	1.126E-02	8.671E-05	2.000E-02	4.323E-01
5.698E+00	9.425E-03	7.677E-05	2.312E-02	4.630E-01
6.182E+00	8.007E-03	6.254E-05	2.407E-02	4.467E-01
6.666E+00	6.887E-03	5.940E-05	2.867E-02	4.937E-01
7.513E+00	5.422E-03	6.488E-05	4.475E-02	6.832E-01
8.239E+00	4.508E-03	5.502E-05	5.008E-02	6.944E-01
8.965E+00	3.808E-03	5.547E-05	6.508E-02	8.278E-01
9.473E+00	3.410E-03	6.139E-05	8.428E-02	1.013E+00

Table 11. Large ^{238}U . FWHM = 78 ns.

Time (μs)	Energy (MeV)	Counts/ μs	Counts/ MeV	Neutrons/ MeV
4.110E-01	1.819E+00	1.292E-02	1.463E-03	2.759E-01
4.352E-01	1.621E+00	1.475E-02	1.983E-03	3.193E-01
4.594E-01	1.455E+00	1.749E-02	2.767E-03	4.093E-01
4.836E-01	1.312E+00	1.868E-02	3.447E-03	4.775E-01
5.078E-01	1.190E+00	2.090E-02	4.466E-03	5.825E-01
5.320E-01	1.084E+00	2.334E-02	5.735E-03	7.053E-01
5.562E-01	9.914E-01	2.597E-02	7.294E-03	8.498E-01
5.804E-01	9.103E-01	2.807E-02	8.957E-03	9.891E-01
6.046E-01	8.387E-01	2.973E-02	1.073E-02	1.128E+00
6.288E-01	7.753E-01	3.213E-02	1.305E-02	1.314E+00
6.530E-01	7.188E-01	3.445E-02	1.566E-02	1.513E+00
6.772E-01	6.683E-01	3.755E-02	1.904E-02	1.759E+00
7.014E-01	6.229E-01	4.135E-02	2.330E-02	2.037E+00
7.256E-01	5.820E-01	4.425E-02	2.760E-02	2.275E+00
7.498E-01	5.450E-01	4.662E-02	3.209E-02	2.409E+00
7.740E-01	5.114E-01	5.155E-02	3.904E-02	2.580E+00
7.982E-01	4.808E-01	5.652E-02	4.693E-02	2.675E+00
8.224E-01	4.529E-01	6.095E-02	5.537E-02	2.709E+00
8.466E-01	4.274E-01	6.299E-02	6.242E-02	2.663E+00
8.829E-01	3.929E-01	6.990E-02	7.848E-02	2.765E+00
9.313E-01	3.531E-01	7.667E-02	1.010E-01	2.841E+00
9.797E-01	3.191E-01	8.359E-02	1.283E-01	2.944E+00
1.028E+00	2.897E-01	9.167E-02	1.626E-01	3.076E+00
1.076E+00	2.642E-01	9.610E-02	1.957E-01	3.144E+00
1.125E+00	2.420E-01	9.198E-02	2.137E-01	3.238E+00
1.173E+00	2.224E-01	7.433E-02	1.960E-01	3.105E+00
1.222E+00	2.051E-01	5.461E-02	1.626E-01	2.991E+00
1.270E+00	1.898E-01	4.149E-02	1.388E-01	3.081E+00
1.318E+00	1.761E-01	3.017E-02	1.129E-01	2.979E+00
1.367E+00	1.639E-01	2.418E-02	1.008E-01	3.127E+00
1.415E+00	1.528E-01	1.868E-02	8.646E-02	3.104E+00
1.476E+00	1.406E-01	1.501E-02	7.873E-02	3.172E+00
1.548E+00	1.277E-01	1.224E-02	7.413E-02	3.177E+00
1.621E+00	1.165E-01	1.073E-02	7.462E-02	3.247E+00
1.694E+00	1.067E-01	9.640E-03	7.644E-02	3.295E+00
1.766E+00	9.813E-02	8.147E-03	7.327E-02	3.116E+00
1.839E+00	9.053E-02	7.136E-03	7.243E-02	3.011E+00
1.948E+00	8.069E-02	6.208E-03	7.473E-02	3.034E+00
2.093E+00	6.988E-02	5.245E-03	7.836E-02	3.104E+00
2.238E+00	6.111E-02	4.587E-03	8.384E-02	3.213E+00
2.383E+00	5.389E-02	3.790E-03	8.367E-02	3.115E+00
2.590E+00	4.564E-02	2.817E-03	7.946E-02	2.841E+00
2.869E+00	3.717E-02	2.120E-03	8.146E-02	2.782E+00
3.149E+00	3.086E-02	1.622E-03	8.244E-02	2.648E+00
3.429E+00	2.603E-02	1.333E-03	8.756E-02	2.617E+00
3.709E+00	2.225E-02	1.086E-03	9.031E-02	2.597E+00
3.989E+00	1.923E-02	9.296E-04	9.617E-02	2.611E+00
4.269E+00	1.679E-02	8.045E-04	1.020E-01	2.623E+00
4.549E+00	1.479E-02	6.740E-04	1.034E-01	2.519E+00
4.829E+00	1.313E-02	6.072E-04	1.115E-01	2.579E+00
5.109E+00	1.173E-02	5.106E-04	1.111E-01	2.442E+00
5.389E+00	1.054E-02	4.498E-04	1.148E-01	2.409E+00
5.628E+00	7.889E-03	3.422E-04	1.339E-01	2.473E+00
5.868E+00	6.126E-03	2.698E-04	1.546E-01	2.514E+00
6.108E+00	4.894E-03	2.102E-04	1.688E-01	2.445E+00
6.347E+00	3.875E-03	1.755E-04	1.997E-01	2.568E+00
6.587E+00	3.056E-03	1.353E-04	2.201E-01	2.515E+00
6.827E+00	2.472E-03	1.166E-04	2.611E-01	2.705E+00
7.067E+00	2.041E-03	9.877E-05	2.951E-01	2.763E+00
7.307E+00	1.713E-03	8.393E-05	3.263E-01	2.804E+00

Table 12. ^{239}Pu . FWHM = 78 ns.

Time (μs)	Energy (MeV)	Counts/ μs	Counts/ MeV	Neutrons/ MeV
4.131E-01	1.800E+00	1.902E-02	2.187E-03	4.056E-01
4.373E-01	1.606E+00	2.049E-02	2.796E-03	4.460E-01
4.615E-01	1.441E+00	2.081E-02	3.338E-03	4.907E-01
4.857E-01	1.301E+00	2.024E-02	3.784E-03	5.213E-01
5.099E-01	1.180E+00	2.130E-02	4.608E-03	5.979E-01
5.341E-01	1.075E+00	2.172E-02	5.400E-03	6.609E-01
5.704E-01	9.425E-01	2.013E-02	6.080E-03	6.874E-01
6.188E-01	8.006E-01	1.864E-02	7.194E-03	7.382E-01
6.672E-01	6.885E-01	1.679E-02	8.127E-03	7.655E-01
7.156E-01	5.984E-01	1.571E-02	9.382E-03	7.927E-01
7.640E-01	5.249E-01	1.602E-02	1.165E-02	8.121E-01
8.124E-01	4.642E-01	1.617E-02	1.414E-02	8.377E-01
8.608E-01	4.134E-01	1.775E-02	1.847E-02	7.300E-01
9.092E-01	3.705E-01	1.871E-02	2.295E-02	7.122E-01
9.576E-01	3.340E-01	1.851E-02	2.653E-02	6.672E-01
1.006E+00	3.026E-01	2.003E-02	3.328E-02	6.870E-01
1.054E+00	2.754E-01	2.093E-02	4.004E-02	6.867E-01
1.103E+00	2.518E-01	2.076E-02	4.544E-02	6.980E-01
1.151E+00	2.310E-01	1.991E-02	4.959E-02	7.590E-01
1.200E+00	2.128E-01	1.587E-02	4.471E-02	7.609E-01
1.248E+00	1.966E-01	1.114E-02	3.536E-02	7.207E-01
1.296E+00	1.822E-01	8.120E-03	2.888E-02	7.058E-01
1.345E+00	1.693E-01	6.074E-03	2.412E-02	6.955E-01
1.393E+00	1.577E-01	4.852E-03	2.142E-02	7.214E-01
1.442E+00	1.473E-01	3.502E-03	1.713E-02	6.546E-01
1.490E+00	1.379E-01	3.246E-03	1.754E-02	7.213E-01
1.538E+00	1.293E-01	2.633E-03	1.565E-02	6.685E-01
1.587E+00	1.216E-01	2.528E-03	1.650E-02	7.171E-01
1.635E+00	1.145E-01	2.269E-03	1.620E-02	7.042E-01
1.684E+00	1.080E-01	1.997E-03	1.556E-02	6.719E-01
1.732E+00	1.020E-01	1.739E-03	1.476E-02	6.323E-01
1.756E+00	9.925E-02	1.685E-03	1.489E-02	6.345E-01
1.853E+00	8.915E-02	1.460E-03	1.515E-02	6.273E-01
1.950E+00	8.051E-02	1.215E-03	1.470E-02	5.960E-01
2.047E+00	7.308E-02	1.022E-03	1.429E-02	5.718E-01
2.143E+00	6.662E-02	9.732E-04	1.564E-02	6.132E-01
2.240E+00	6.099E-02	8.685E-04	1.594E-02	6.098E-01
2.337E+00	5.604E-02	7.931E-04	1.652E-02	6.207E-01
2.434E+00	5.167E-02	7.352E-04	1.730E-02	6.371E-01
2.506E+00	4.872E-02	6.850E-04	1.759E-02	6.383E-01
2.652E+00	4.353E-02	5.734E-04	1.744E-02	6.157E-01
2.797E+00	3.913E-02	5.314E-04	1.897E-02	6.537E-01
2.942E+00	3.536E-02	4.216E-04	1.752E-02	5.921E-01
3.087E+00	3.211E-02	3.665E-04	1.760E-02	5.767E-01
3.208E+00	2.974E-02	3.489E-04	1.861E-02	5.897E-01
3.692E+00	2.245E-02	3.308E-04	2.697E-02	7.763E-01
4.176E+00	1.755E-02	2.582E-04	3.052E-02	8.003E-01
4.660E+00	1.409E-02	2.217E-04	3.646E-02	8.708E-01
5.144E+00	1.157E-02	1.928E-04	4.268E-02	9.343E-01
5.628E+00	9.662E-03	1.656E-04	4.804E-02	9.726E-01
6.112E+00	8.192E-03	1.575E-04	5.858E-02	1.099E+00
6.596E+00	7.034E-03	1.198E-04	5.602E-02	9.750E-01
7.080E+00	6.105E-03	1.222E-04	7.070E-02	1.146E+00
7.564E+00	5.349E-03	1.236E-04	8.721E-02	1.320E+00
8.048E+00	4.725E-03	8.324E-05	7.076E-02	1.004E+00
8.532E+00	4.204E-03	9.410E-05	9.534E-02	1.276E+00
9.016E+00	3.765E-03	1.043E-04	1.247E-01	1.575E+00
9.500E+00	3.391E-03	7.096E-05	9.928E-02	1.187E+00
9.778E+00	3.201E-03	9.923E-05	1.512E-01	1.759E+00

Table 13. H₂O. FWHM = 160 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
5.000E-01	1.224E+00	1.420E-03	2.886E-04	3.845E-02
5.500E-01	1.012E+00	1.320E-03	3.574E-04	4.228E-02
6.000E-01	8.501E-01	1.219E-03	4.286E-04	4.556E-02
6.500E-01	7.244E-01	1.151E-03	5.149E-04	5.002E-02
7.000E-01	6.246E-01	1.117E-03	6.244E-04	5.485E-02
7.500E-01	5.441E-01	1.128E-03	7.755E-04	5.806E-02
8.000E-01	4.782E-01	1.198E-03	9.998E-04	5.627E-02
8.500E-01	4.236E-01	1.304E-03	1.306E-03	5.471E-02
9.000E-01	3.778E-01	1.431E-03	1.701E-03	5.514E-02
9.500E-01	3.391E-01	1.568E-03	2.194E-03	5.695E-02
1.000E+00	3.060E-01	1.685E-03	2.750E-03	5.815E-02
1.050E+00	2.776E-01	1.706E-03	3.223E-03	5.616E-02
1.100E+00	2.529E-01	1.674E-03	3.637E-03	5.607E-02
1.150E+00	2.314E-01	1.484E-03	3.683E-03	5.632E-02
1.200E+00	2.125E-01	1.261E-03	3.557E-03	6.062E-02
1.250E+00	1.959E-01	1.081E-03	3.447E-03	7.078E-02
1.300E+00	1.811E-01	9.432E-04	3.478E-03	8.952E-02
1.400E+00	1.561E-01	7.206E-04	3.222E-03	1.095E-01
1.500E+00	1.360E-01	5.617E-04	3.090E-03	1.276E-01
1.600E+00	1.195E-01	4.387E-04	2.930E-03	1.272E-01
1.700E+00	1.059E-01	3.455E-04	2.768E-03	1.192E-01
1.800E+00	9.446E-02	3.010E-04	2.863E-03	1.206E-01
1.900E+00	8.478E-02	2.692E-04	3.012E-03	1.232E-01
2.000E+00	7.651E-02	2.480E-04	3.237E-03	1.306E-01
2.100E+00	6.940E-02	2.310E-04	3.552E-03	1.401E-01
2.250E+00	6.045E-02	2.098E-04	4.021E-03	1.530E-01
2.500E+00	4.897E-02	1.844E-04	4.684E-03	1.704E-01
2.750E+00	4.047E-02	1.674E-04	5.666E-03	1.969E-01
3.000E+00	3.400E-02	1.537E-04	7.157E-03	2.354E-01
3.500E+00	2.498E-02	1.357E-04	9.405E-03	2.793E-01
4.000E+00	1.913E-02	1.229E-04	1.275E-02	3.464E-01
4.500E+00	1.511E-02	1.134E-04	1.678E-02	4.130E-01
5.000E+00	1.224E-02	1.060E-04	2.306E-02	5.079E-01
6.000E+00	8.501E-03	9.538E-05	3.319E-02	6.366E-01
7.000E+00	6.246E-03	8.902E-05	4.938E-02	8.133E-01
8.000E+00	4.782E-03	8.266E-05	6.861E-02	9.925E-01
9.000E+00	3.778E-03	7.842E-05	9.283E-02	1.191E+00
1.000E+01	3.060E-03	7.546E-05	1.357E-01	1.532E+00
1.250E+01	1.959E-03	6.825E-05	2.134E-01	2.016E+00
1.500E+01	1.360E-03	6.295E-05	3.423E-01	2.714E+00
1.750E+01	9.993E-04	5.829E-05	5.052E-01	3.450E+00
2.000E+01	7.651E-04	5.511E-05	7.769E-01	4.522E+00
2.500E+01	4.897E-04	4.960E-05	1.241E+00	5.988E+00
3.000E+01	3.400E-04	4.515E-05	1.964E+00	7.928E+00
3.500E+01	2.498E-04	4.197E-05	2.910E+00	1.011E+01
4.000E+01	1.913E-04	3.900E-05	4.046E+00	1.259E+01
4.500E+01	1.511E-04	3.667E-05	5.425E+00	1.473E+01
5.000E+01	1.224E-04	3.455E-05	7.517E+00	1.835E+01
6.000E+01	8.501E-05	3.116E-05	1.084E+01	2.336E+01
7.000E+01	6.246E-05	2.819E-05	1.564E+01	2.917E+01
8.000E+01	4.782E-05	2.607E-05	2.164E+01	3.571E+01
9.000E+01	3.778E-05	2.416E-05	2.860E+01	4.278E+01
1.000E+02	3.060E-05	2.247E-05	4.041E+01	5.249E+01
1.250E+02	1.959E-05	1.929E-05	6.032E+01	6.814E+01
1.500E+02	1.360E-05	1.632E-05	8.874E+01	8.539E+01
1.750E+02	9.993E-06	1.399E-05	1.212E+02	1.055E+02
2.000E+02	7.651E-06	1.208E-05	1.703E+02	1.311E+02
2.500E+02	4.897E-06	9.114E-06	2.280E+02	1.520E+02
3.000E+02	3.400E-06	6.952E-06	3.024E+02	1.794E+02
3.500E+02	2.498E-06	5.405E-06	3.747E+02	2.041E+02
4.000E+02	1.913E-06	4.154E-06	4.310E+02	2.215E+02
4.500E+02	1.511E-06	3.285E-06	4.861E+02	2.356E+02
5.000E+02	1.224E-06	2.607E-06	5.298E+02	2.463E+02

Table 14. CH₂ - 1 mfp. FWHM = 140 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
5.500E-01	1.014E+00	1.336E-03	3.568E-04	4.254E-02
6.525E-01	7.199E-01	1.250E-03	5.605E-04	5.436E-02
7.550E-01	5.375E-01	1.296E-03	9.030E-04	6.508E-02
8.575E-01	4.166E-01	1.100E-03	1.125E-03	4.560E-02
9.600E-01	3.323E-01	1.380E-03	1.983E-03	4.959E-02
1.062E+00	2.713E-01	1.281E-03	2.499E-03	4.246E-02
1.165E+00	2.256E-01	1.276E-03	3.282E-03	5.185E-02
1.267E+00	1.906E-01	8.775E-04	2.910E-03	6.310E-02
1.370E+00	1.631E-01	3.991E-04	1.672E-03	5.182E-02
1.472E+00	1.412E-01	4.005E-04	2.084E-03	8.317E-02
1.626E+00	1.157E-01	2.929E-04	2.042E-03	8.825E-02
1.831E+00	9.128E-02	2.453E-04	2.445E-03	1.021E-01
2.036E+00	7.382E-02	2.161E-04	2.966E-03	1.188E-01
2.241E+00	6.093E-02	1.391E-04	2.548E-03	9.770E-02
2.446E+00	5.115E-02	9.555E-05	2.214E-03	8.195E-02
3.061E+00	3.266E-02	1.057E-04	4.854E-03	1.595E-01
3.676E+00	2.265E-02	9.116E-05	7.296E-03	2.106E-01
4.291E+00	1.662E-02	8.232E-05	1.052E-02	2.701E-01
4.906E+00	1.271E-02	7.444E-05	1.425E-02	3.258E-01
6.136E+00	8.128E-03	6.182E-05	2.301E-02	4.321E-01
7.161E+00	5.968E-03	6.163E-05	3.660E-02	5.884E-01
8.186E+00	4.567E-03	6.921E-05	6.155E-02	8.615E-01
9.211E+00	3.607E-03	6.675E-05	8.470E-02	1.049E+00
1.024E+01	2.921E-03	6.012E-05	1.048E-01	1.173E+00
1.126E+01	2.413E-03	6.161E-05	1.432E-01	1.465E+00
1.229E+01	2.027E-03	5.965E-05	1.801E-01	1.680E+00
1.413E+01	1.533E-03	5.742E-05	2.609E-01	2.191E+00
1.653E+01	1.120E-03	5.533E-05	4.040E-01	2.909E+00
1.893E+01	8.540E-04	4.785E-05	5.260E-01	3.316E+00
2.133E+01	6.727E-04	4.691E-05	7.391E-01	4.145E+00
2.373E+01	5.435E-04	4.062E-05	8.822E-01	4.413E+00
2.613E+01	4.482E-04	4.044E-05	1.174E+00	5.426E+00
3.173E+01	3.040E-04	3.847E-05	1.992E+00	7.524E+00
3.573E+01	2.397E-04	3.112E-05	2.305E+00	7.868E+00
3.973E+01	1.939E-04	2.777E-05	2.831E+00	8.880E+00
4.373E+01	1.600E-04	2.648E-05	3.602E+00	1.006E+01
4.773E+01	1.343E-04	2.674E-05	4.734E+00	1.215E+01
5.173E+01	1.144E-04	2.575E-05	5.806E+00	1.402E+01
5.573E+01	9.854E-05	2.247E-05	6.337E+00	1.453E+01
5.773E+01	9.183E-05	2.180E-05	6.788E+00	1.510E+01
6.573E+01	7.084E-05	2.015E-05	9.281E+00	1.840E+01
7.373E+01	5.630E-05	1.898E-05	1.236E+01	2.181E+01
8.173E+01	4.582E-05	1.842E-05	1.635E+01	2.653E+01
8.973E+01	3.801E-05	1.777E-05	2.089E+01	3.134E+01
9.673E+01	3.271E-05	1.615E-05	2.331E+01	3.230E+01

Table 15. CH₂ - 3 mfp. FWHM = 136 ns.

Time (μ s)	Energy (MeV)	Counts/ μ s	Counts/ MeV	Neutrons/ MeV
6.000E-01	8.501E-01	6.738E-04	2.370E-04	2.519E-02
6.500E-01	7.244E-01	6.161E-04	2.756E-04	2.678E-02
7.000E-01	6.246E-01	5.666E-04	3.167E-04	2.782E-02
7.500E-01	5.441E-01	5.281E-04	3.631E-04	2.719E-02
8.000E-01	4.782E-01	5.171E-04	4.317E-04	2.430E-02
8.500E-01	4.236E-01	5.446E-04	5.454E-04	2.285E-02
9.000E-01	3.778E-01	5.913E-04	7.032E-04	2.279E-02
9.500E-01	3.391E-01	6.766E-04	9.464E-04	2.457E-02
1.000E+00	3.060E-01	7.701E-04	1.257E-03	2.658E-02
1.050E+00	2.776E-01	8.031E-04	1.517E-03	2.643E-02
1.100E+00	2.529E-01	7.976E-04	1.733E-03	2.671E-02
1.150E+00	2.314E-01	7.151E-04	1.775E-03	2.714E-02
1.200E+00	2.125E-01	5.831E-04	1.645E-03	2.803E-02
1.250E+00	1.959E-01	4.510E-04	1.438E-03	2.953E-02
1.300E+00	1.811E-01	3.685E-04	1.359E-03	3.498E-02
1.400E+00	1.561E-01	2.695E-04	1.205E-03	4.097E-02
1.500E+00	1.360E-01	2.173E-04	1.195E-03	4.936E-02
1.600E+00	1.195E-01	1.777E-04	1.240E-03	5.378E-02
1.800E+00	9.446E-02	1.337E-04	1.266E-03	5.328E-02
2.000E+00	7.651E-02	1.100E-04	1.456E-03	5.852E-02
2.250E+00	6.045E-02	9.076E-05	1.679E-03	6.429E-02
2.500E+00	4.897E-02	8.031E-05	2.040E-03	7.419E-02
2.750E+00	4.047E-02	7.261E-05	2.457E-03	8.537E-02
3.000E+00	3.400E-02	6.711E-05	3.126E-03	1.028E-01
3.500E+00	2.498E-02	5.996E-05	4.167E-03	1.234E-01
4.000E+00	1.913E-02	5.611E-05	5.821E-03	1.581E-01
4.500E+00	1.511E-02	5.281E-05	7.813E-03	1.923E-01
5.000E+00	1.224E-02	5.006E-05	1.089E-02	2.399E-01
6.000E+00	8.501E-03	4.510E-05	1.570E-02	3.011E-01
7.000E+00	6.246E-03	4.125E-05	2.288E-02	3.769E-01
8.000E+00	4.782E-03	3.795E-05	3.150E-02	4.557E-01
9.000E+00	3.778E-03	3.520E-05	4.167E-02	5.347E-01
1.000E+01	3.060E-03	3.245E-05	5.837E-02	6.590E-01
1.250E+01	1.959E-03	2.805E-05	8.773E-02	8.286E-01
1.500E+01	1.360E-03	2.475E-05	1.346E-01	1.067E+00
1.750E+01	9.993E-04	2.200E-05	1.907E-01	1.302E+00
2.000E+01	7.651E-04	1.980E-05	2.792E-01	1.625E+00
2.500E+01	4.897E-04	1.678E-05	4.197E-01	2.026E+00
3.000E+01	3.400E-04	1.430E-05	6.221E-01	2.511E+00
3.500E+01	2.498E-04	1.265E-05	8.772E-01	3.047E+00
4.000E+01	1.913E-04	1.128E-05	1.170E+00	3.641E+00
4.500E+01	1.511E-04	1.018E-05	1.506E+00	4.087E+00
5.000E+01	1.224E-04	9.186E-06	1.999E+00	4.878E+00
6.000E+01	8.501E-05	7.756E-06	2.699E+00	5.815E+00
7.000E+01	6.246E-05	6.656E-06	3.692E+00	6.887E+00
8.000E+01	4.782E-05	5.776E-06	4.794E+00	7.912E+00

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176-200	7.50	501-525	12.75
201-225	7.75	526-550	13.00
226-250	8.00	551-575	13.50
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