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LOS ALAMOS SCIENTIFIC LABORATORY
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Evaluated Nuclear Data for Hydrogen in the ENDF/B-II Format

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by

L. Stewart
R. J. LaBauve
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EVALUATED NUCLEAR DATA FOR HYDROGEN IN THE ENDF/B-II FORMAT

by

L. Stewart, R. J. LaBauve, and P. G. Young

ABSTRACT

The following nuclear data are given for hydrogen in the energy range from 1.0×10^{-5} eV to 20.0 MeV.

File 1. The general information file includes a brief description of the data to follow.

File 2. Values for nuclear spin and effective scattering radius are given in the resonance file.

File 3. Smooth cross-section data are given for the total cross section, the free-atom elastic scattering cross section, and the radiative capture cross section; data for $\bar{\mu}$, ξ, and γ are also included.

File 4. The angular distributions for elastic scattering are given as probability vs cosine of the scattering angle.

File 7. The free-atom-scattering cross section is the only information provided at thermal.

File 12. Secondary gamma-ray production multiplicities for capture, which are equal to one, are given in this file.

File 14. Gamma-ray angular distributions are provided for the single radiative capture gamma ray.

INTRODUCTION

This evaluation for hydrogen (MAT = 1148) differs from the previous ENDF/B evaluation (MAT = 1001) in that the elastic scattering data were taken from recent work by Hopkins and Breit[1] and the data for radiative capture were taken from recent work by Horsley.[2] Also, gamma-ray production data, not given in the MAT = 1001 evaluation, are included. A complete listing for MAT = 1148 is given in the Appendix.

FILE 1: GENERAL INFORMATION

A brief summary of the data to follow is given in File 1. The atomic mass for hydrogen was taken to be 1.007825 from the May 1969 "Chart of the Nuclides."[3]

FILE 2: RESONANCE INFORMATION

Nuclear spin and effective scattering radius are given in this file. An effective scattering radius of 1.2756×10^{-12} cm is consistent with a potential scattering cross section of 20.449 b, as determined from $4\pi a^2$. Singlet and triplet scattering radii are not included.

FILE 3: SMOOTH CROSS SECTIONS

Total cross sections (MT = 1) were obtained by adding the elastic scattering and radiative capture cross sections at all energies (1.0×10^{-5} eV to 20.0 MeV). The hydrogen total cross sections are shown in Fig. 1.

The elastic scattering cross sections (MT = 2) were taken from an extensive theoretical treatment of fast neutron measurements by Hopkins and Breit.[1] In this work, a consistent set of cross sections and angular distributions were obtained by using a set of phase shifts previously determined at Yale University.[4] Tabular values of the elastic scattering cross section are given in Ref. 1 for only a

few energies, the two lowest points being 100 and 200 keV. The phase shift program and the Yale phase shifts were provided by Hopkins[1] so that many intermediate points could be calculated. At 0.1 keV, the lowest energy recommended for running this program, the scattering cross section is 20.4488 b. This value is in excellent agreement with the thermal cross section (20.442 ± 0.023 b) derived by Davis and Barschall[5] from a revised value of the effective range obtained by determining the best values of the neutron energies from many experiments below 5 MeV performed since 1950. Therefore, for this evaluation, the free-atom-scattering cross section is assumed to be constant below 100 eV and equal to the value calculated from the Yale phase shifts at 100 eV, giving a thermal cross section of 20.449 b. At higher energies, these theoretical predictions are in excellent agreement with the recent measurements of Davis[6] giving an average value of 0.84 for the square of the deviation for energies below 20.0 MeV. The elastic cross section for hydrogen from 1.0×10^{-5} eV to 20.0 MeV is shown in Fig. 2.

The cross sections for radiative capture (MT = 102) were taken from the 1966 publication of Horsley,[2] where a value of 332 mb was adopted for the thermal value. Deuteron photodisintegration cross sections were also employed in deriving radiative capture in Horsley's report. Although the Nuclear Data article by Horsley[2] was referenced for MAT = 1001, the values were taken from an early version described in AWRE O-23/65, and these were later revised for the Nuclear Data article. The latter report (Ref. 2) has been used for this evaluation, as suggested by Horsley. The radiative capture cross section for MAT = 1148 from 1.0×10^{-5} eV to 20.0 MeV is shown in Fig. 3.

The average value of the cosine in the laboratory system ($\bar{\mu}_L$) for elastic scattering (MT = 251) was derived from the secondary angular distributions in File 4 (MT = 4). Values for $\bar{\mu}_L$ from 1.0×10^{-5} eV to 20.0 MeV are shown in Fig. 4.

Values for ξ, the average logarithmic energy change per collision (MT = 252), and for γ, the Goertzel-Greuling constant (MT = 253), are taken equal to 1 over the range 1.0×10^{-5} eV to 20.0 MeV, following the MT = 1001 evaluation.

FILE 4: SECONDARY ANGULAR DISTRIBUTIONS

Angular distributions of secondary neutrons resulting from elastic scattering are tabulated from 1.0×10^{-5} eV to 20.0 MeV. Distributions at 0.1, 5, 10, 20, and 30 MeV are provided by Ref. 1; additional and intermediate data were calculated by using the Hopkins-Breit phase shift program and the Yale phase shifts. As shown in Figs. 5 through 16, the angular distributions above 100 keV are neither isotropic below 10 MeV, nor are they symmetric about 90° at higher energies as assumed in the earlier version (MAT = 1001). At 100 keV, the angular distributions are assumed to be isotropic because the 180/0° ratio is very nearly unity (1.0011). At 500 keV, this ratio approaches 1.005; therefore, the pointwise normalized probabilities as a function of the cosine of the scattering angle are provided at 1.0×10^{-5} eV (isotropic), 100 keV (isotropic), 500 keV, and at 1-MeV intervals from 1 to 20 MeV.

FILE 5: THERMAL DATA

Free-atom cross sections specified from 1.0×10^{-5} eV to 5 eV are included in this file.

FILE 12: PHOTON PRODUCTION CROSS SECTIONS

A multiplicity representation is used to describe the single hydrogen radiative capture gamma ray from 1.0×10^{-5} eV to 20.0 MeV. The multiplicity is referred to MT = 102 in File 3 and is unity at all neutron energies. To adequately represent the gamma-ray energy for MeV-incident neutrons, the neutron energy region from 0.2 to 20 MeV is divided into 16 different energy bands, and the gamma-ray energy is tabulated for each neutron energy band as

$$\bar{E}_\gamma = 2.225 \times 10^6 + \bar{E}_n/2 \qquad \text{(eV)} ,$$

where $\bar{E}_n$ is the neutron energy at the midpoint of the band in eV. The value 2.225×10^6 eV corresponds to the deuteron binding energy; that is, the small energy change due to the nuclear recoil that accompanies gamma emission has been ignored.

FILE 14: GAMMA-RAY ANGULAR DISTRIBUTIONS

The gamma-ray angular distributions are assumed to be isotropic at all neutron energies from 1.0×10^{-5} eV to 20.0 MeV.

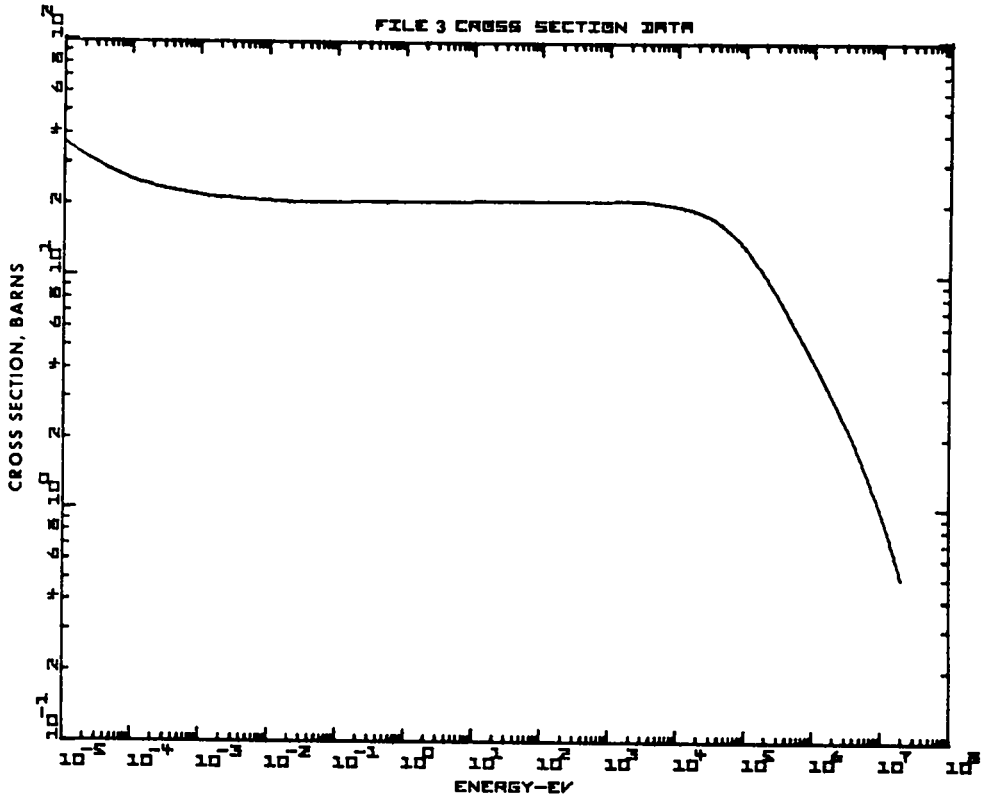

Fig. 1. Total cross section (MT = 1).

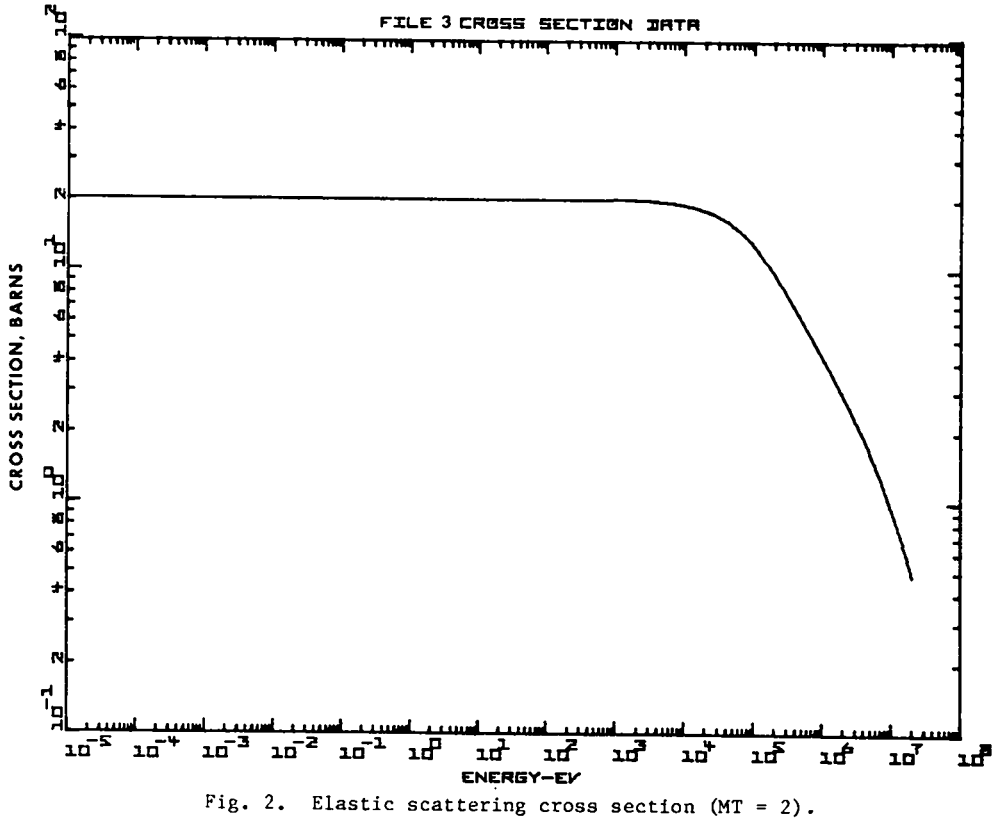

Fig. 2. Elastic scattering cross section (MT = 2).

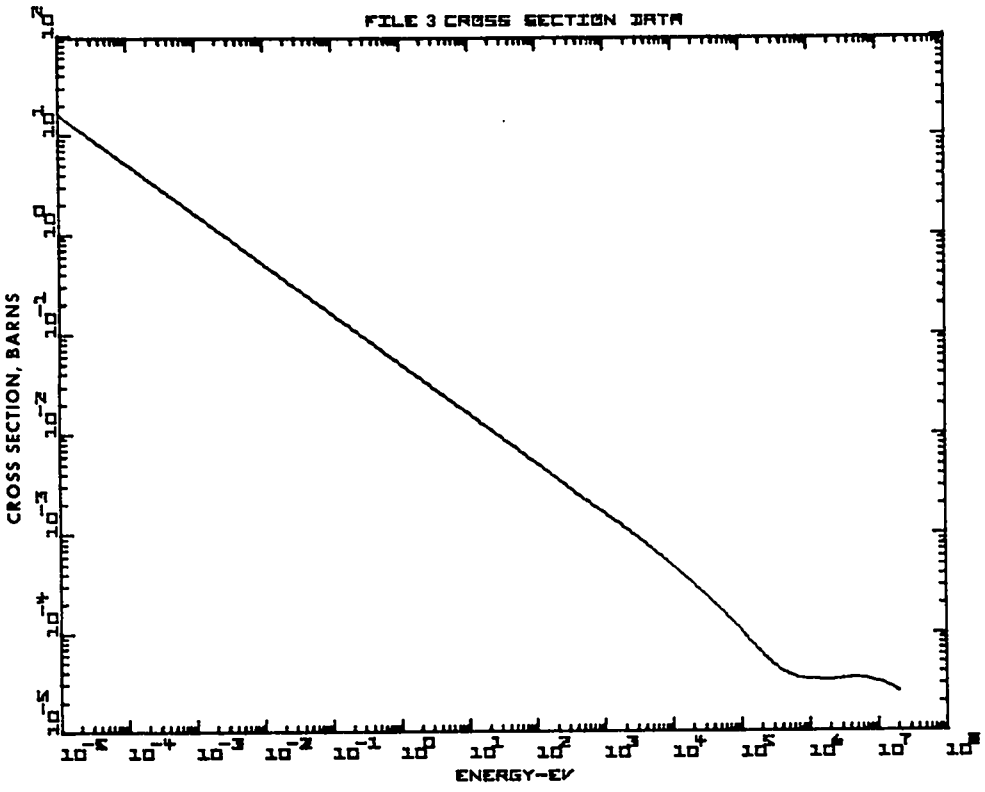

Fig. 3. Radiative capture cross section (MT = 102).

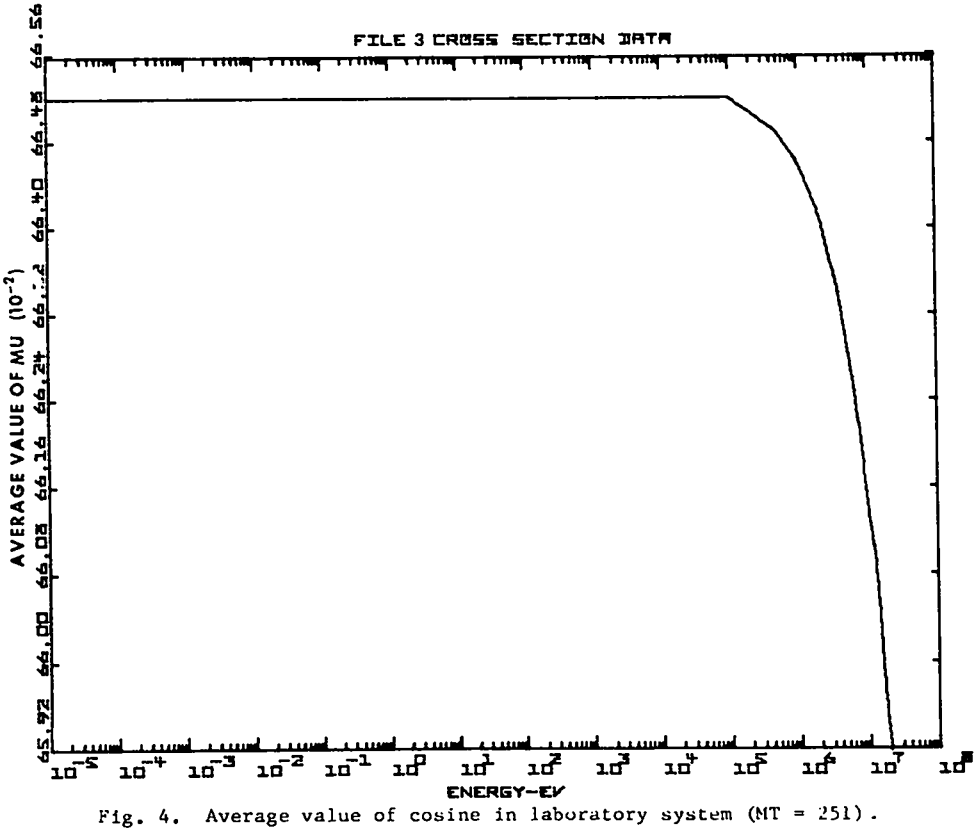

Fig. 4. Average value of cosine in laboratory system (MT = 251).

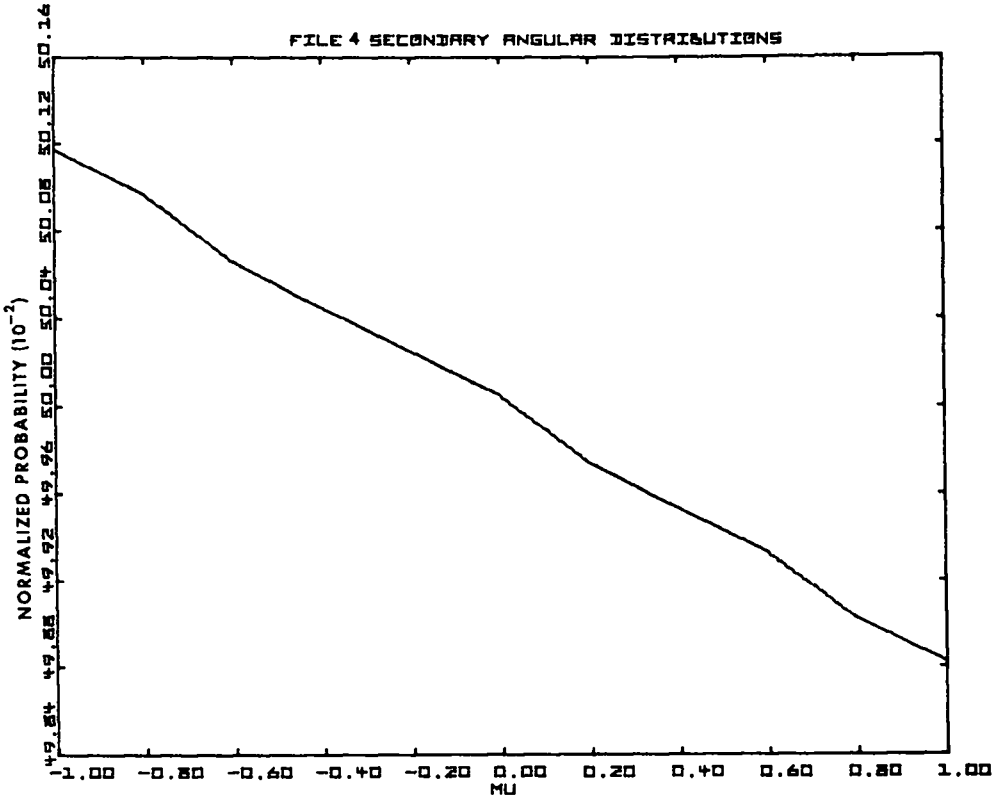

Fig. 5. Angular distribution for 0.5 MeV.

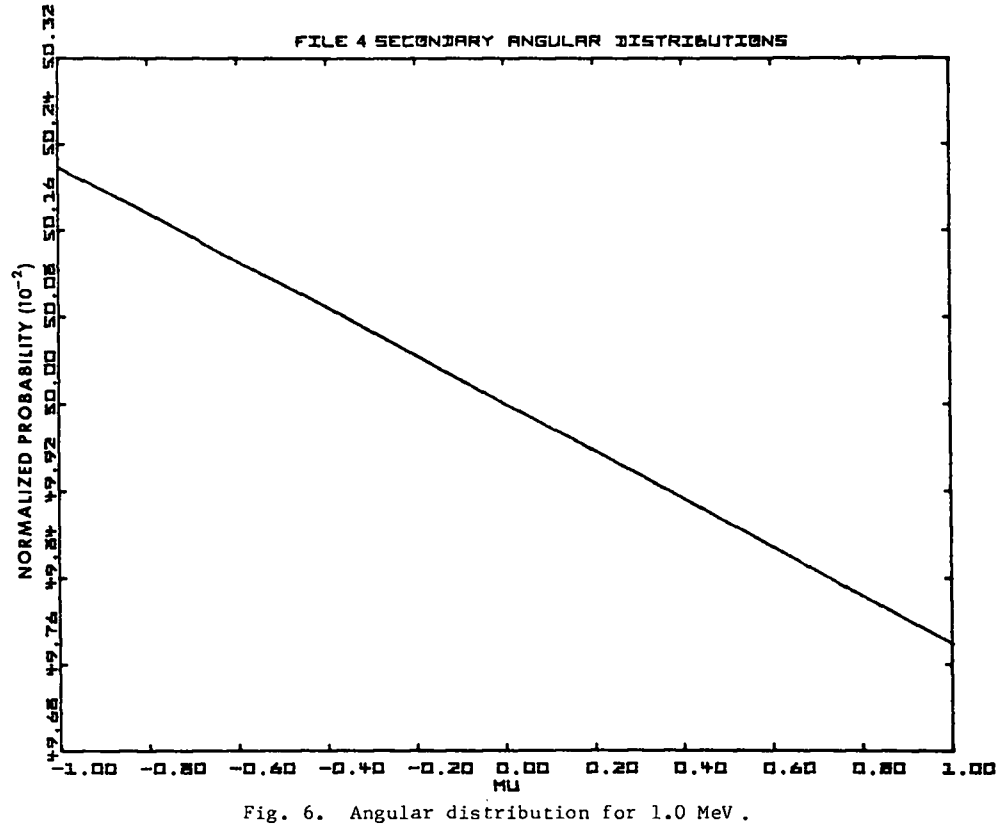

Fig. 6. Angular distribution for 1.0 MeV.

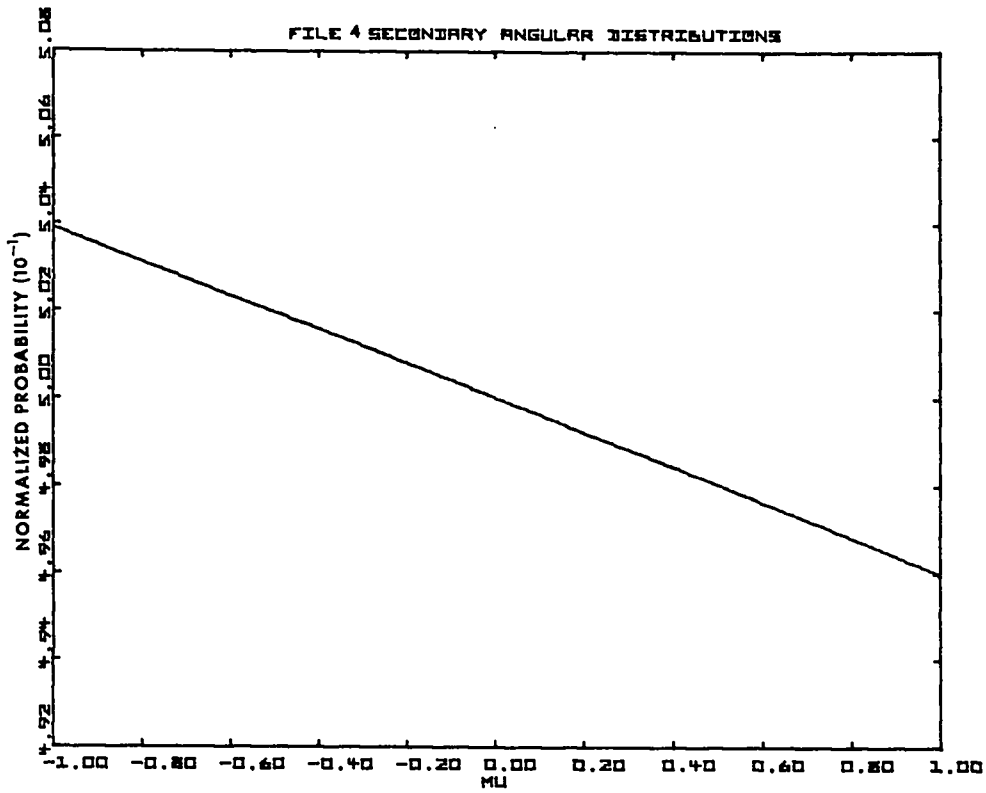

Fig. 7. Angular distribution for 2.0 MeV.

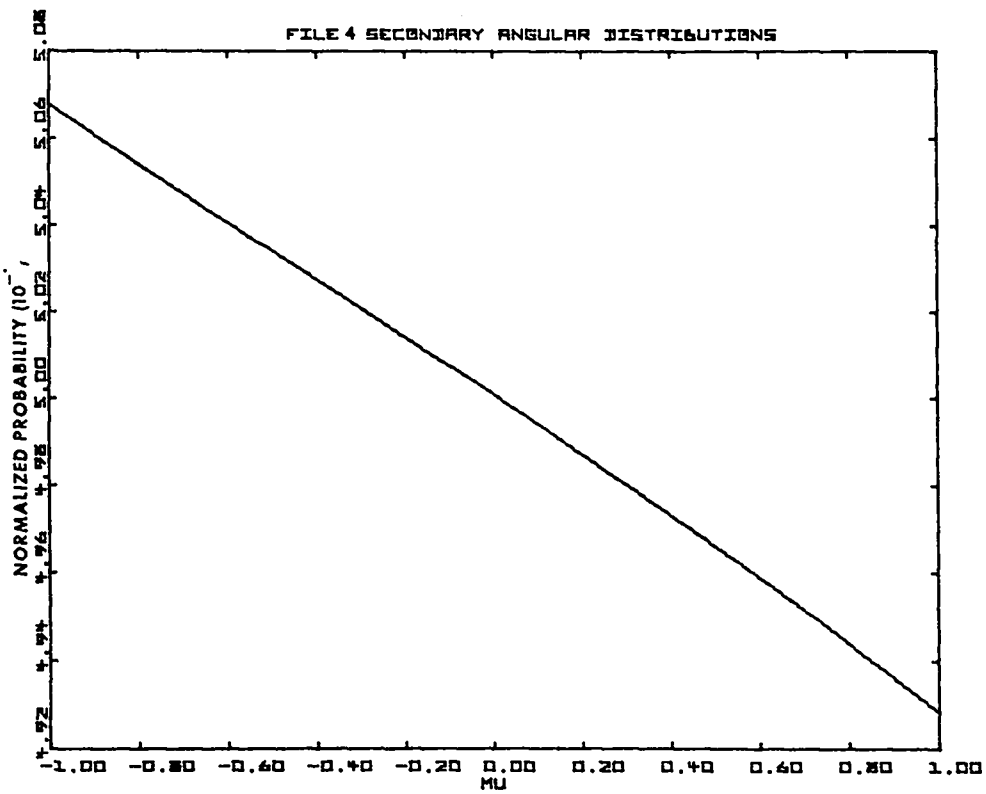

Fig. 8. Angular distribution for 4.0 MeV.

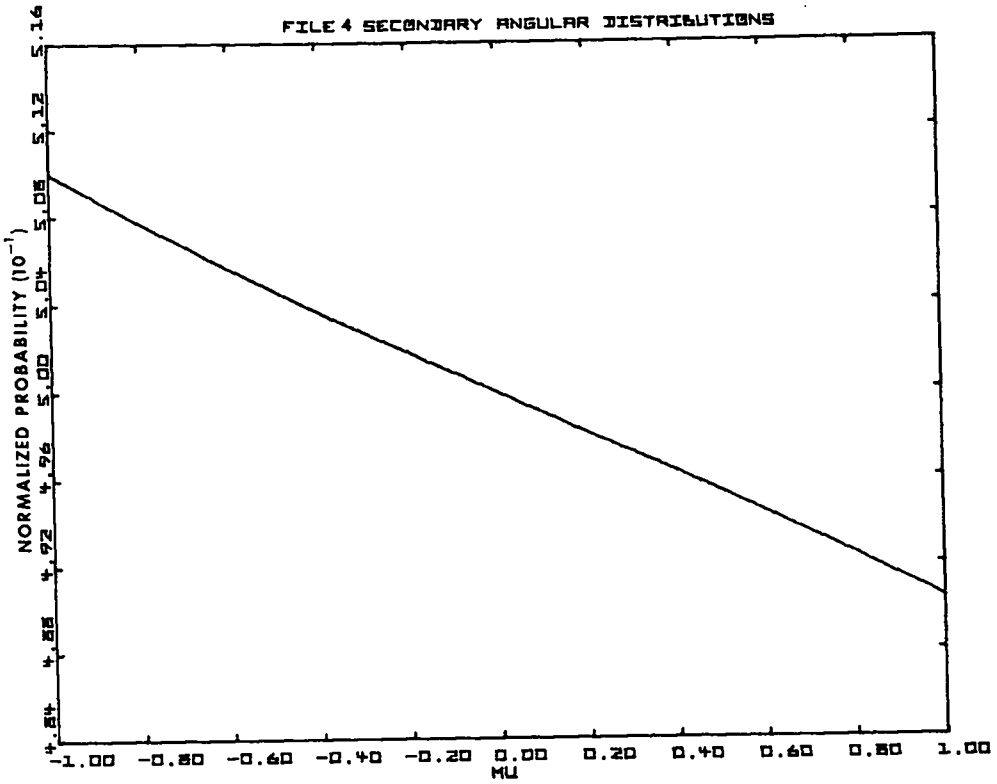

Fig. 9. Angular distribution for 6.0 MeV.

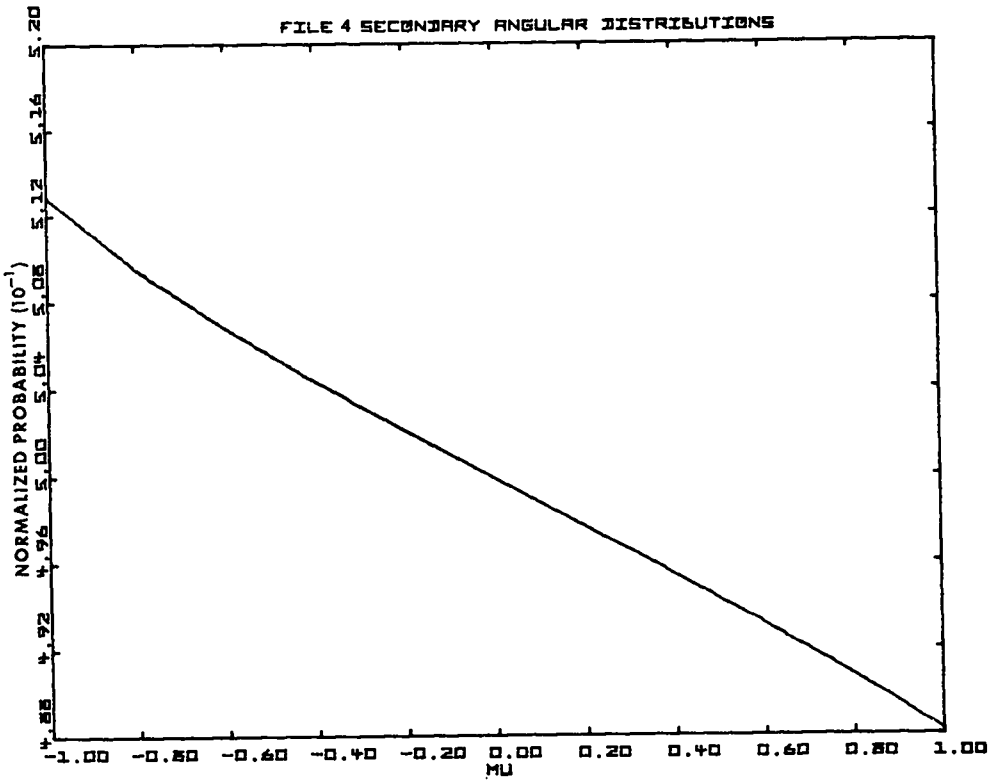

Fig. 10. Angular distribution for 8.0 MeV.

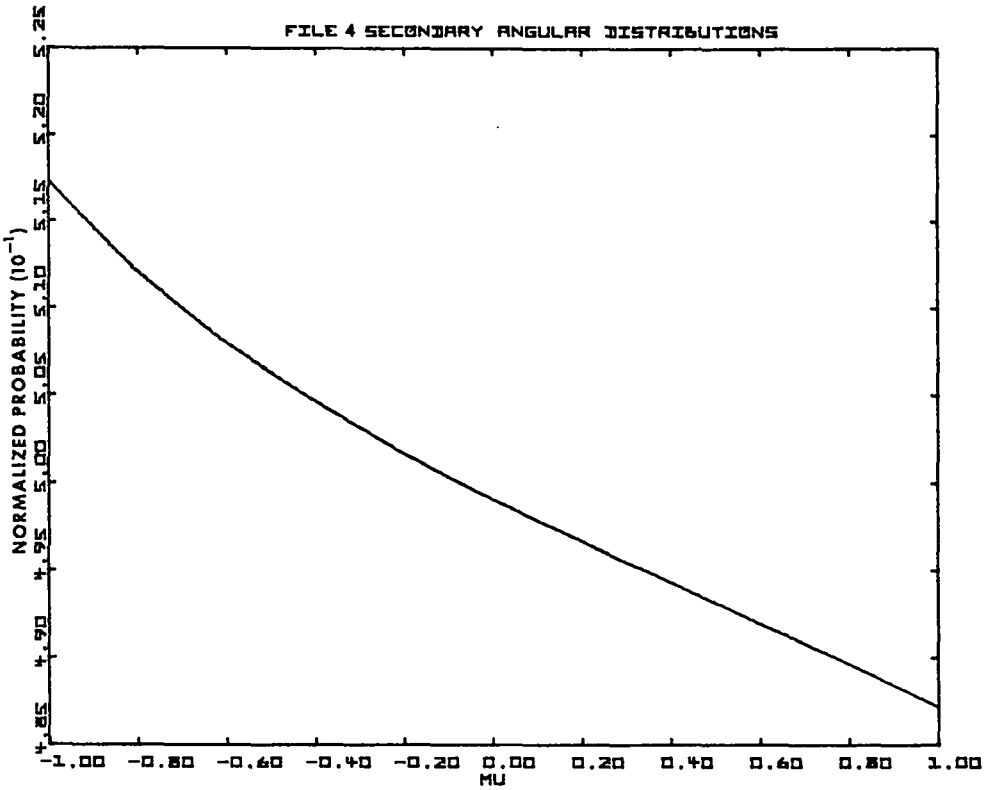

Fig. 11. Angular distribution for 10.0 MeV.

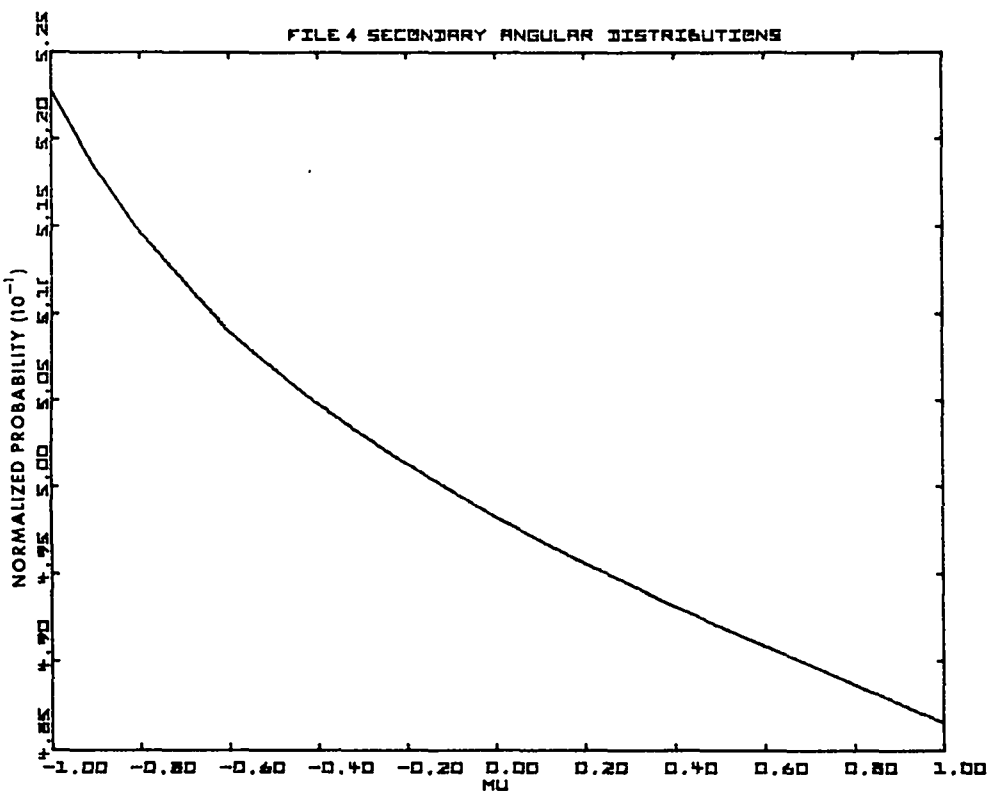

Fig. 12. Angular distribution for 12.0 MeV.

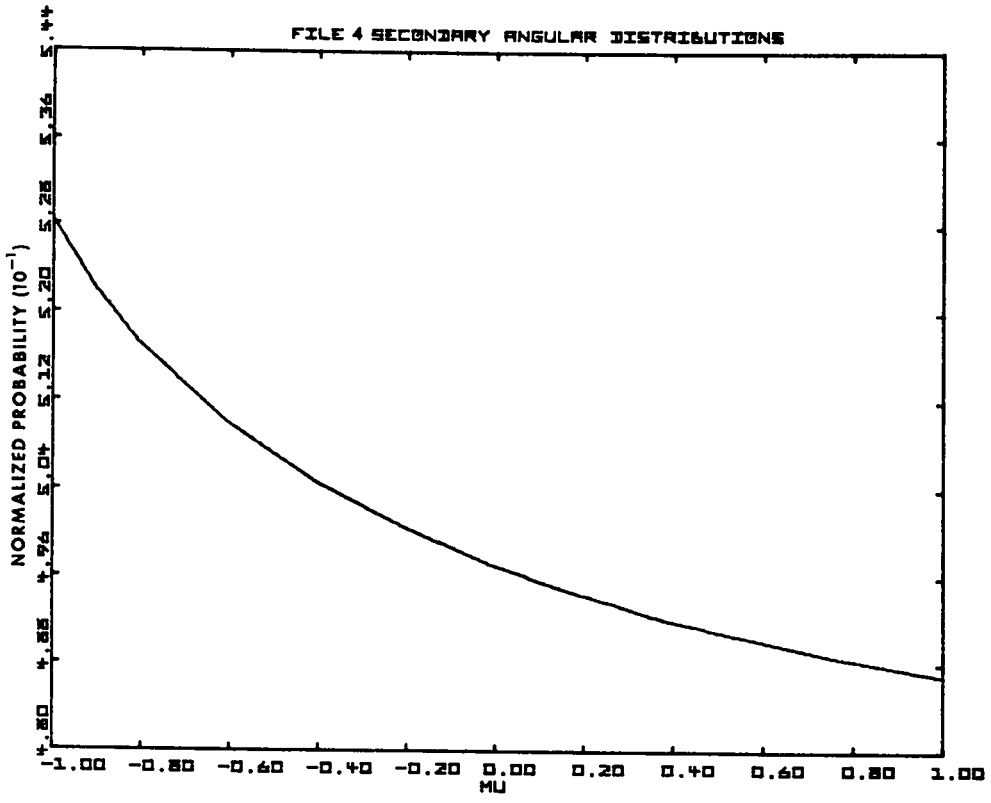

Fig. 13. Angular distribution for 14.0 MeV.

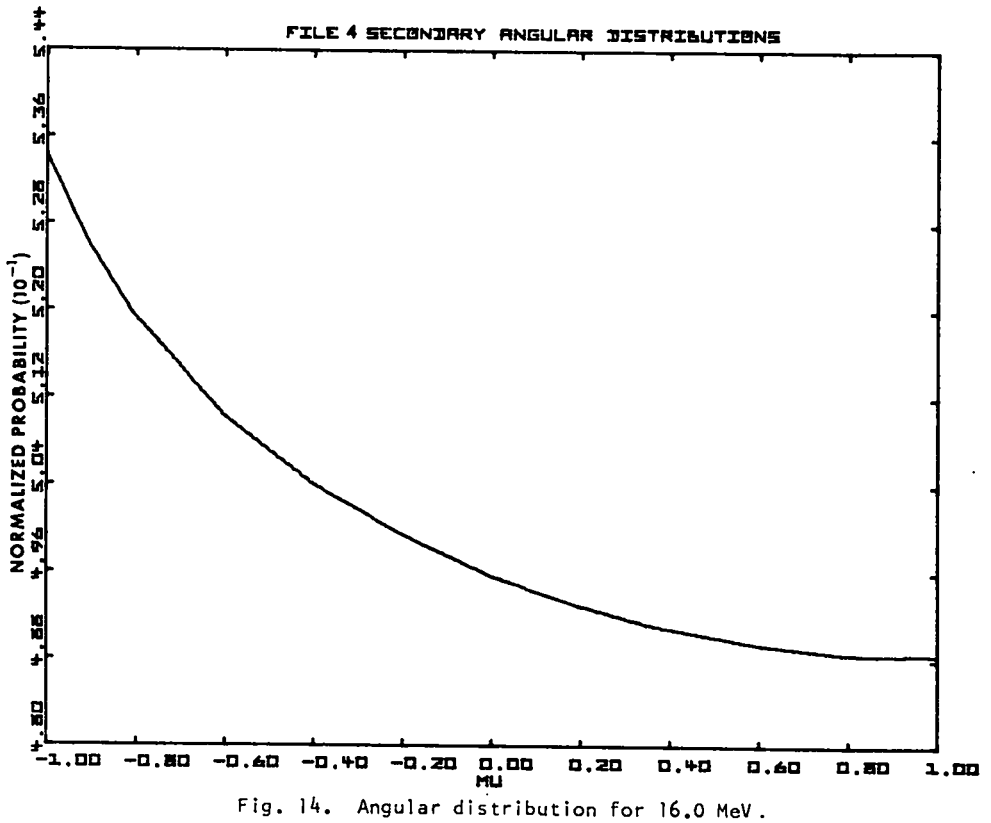

Fig. 14. Angular distribution for 16.0 MeV.

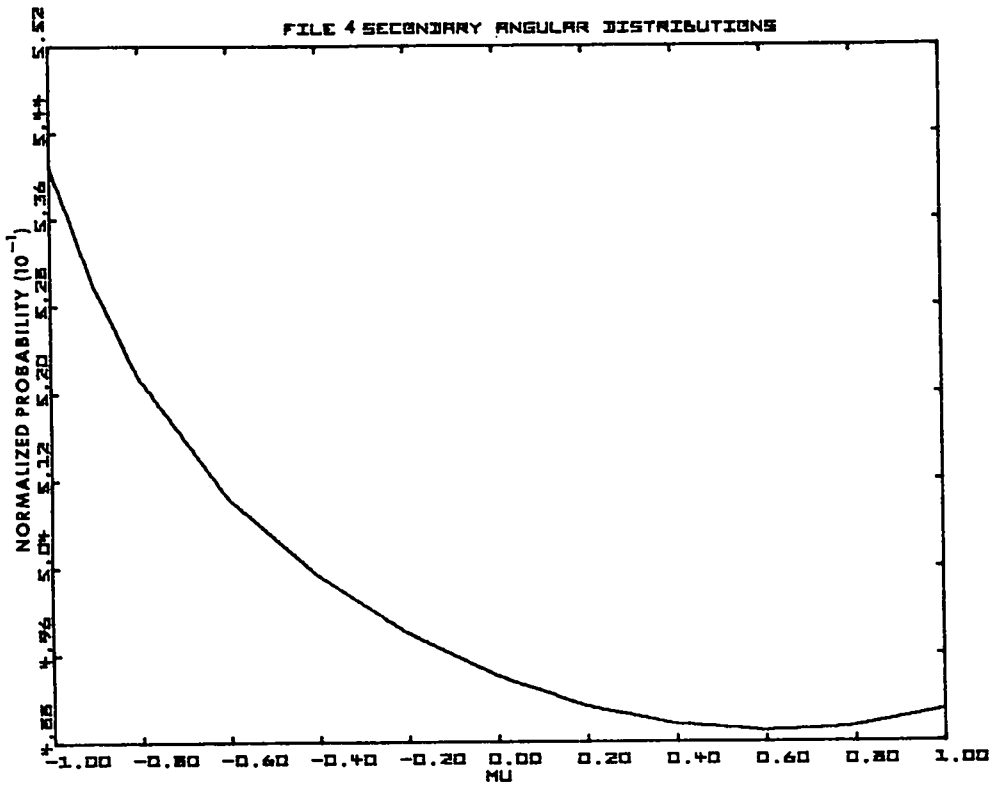

Fig. 15. Angular distribution for 18.0 MeV.

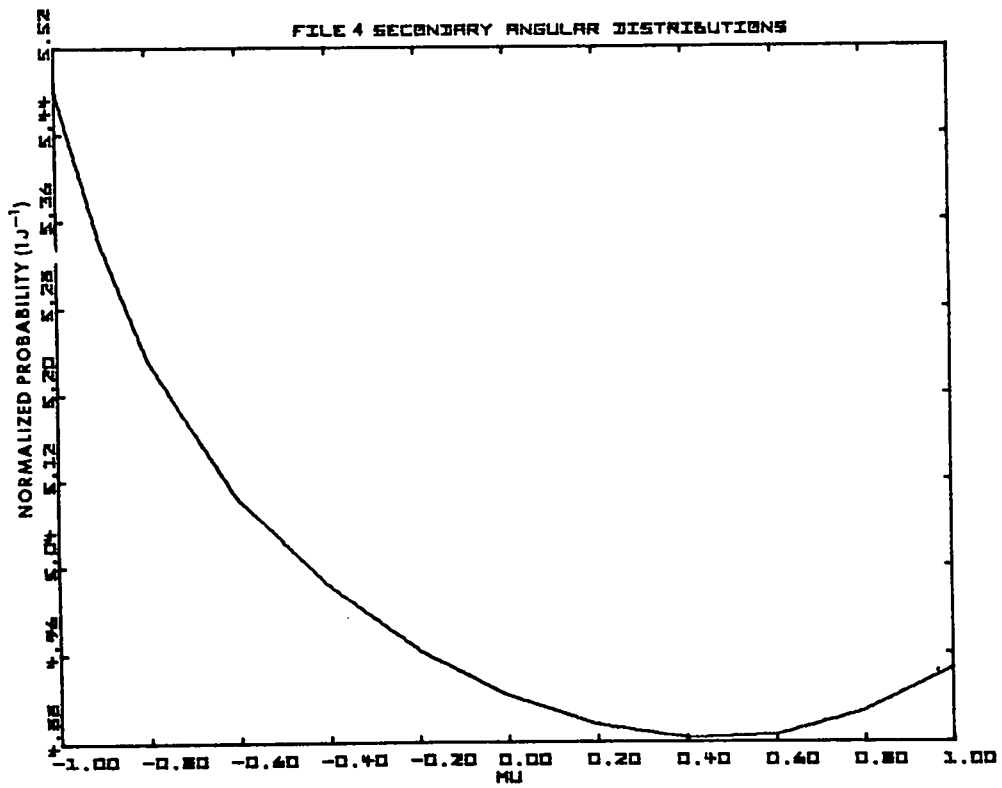

Fig. 16. Angular distrlbution for 20.0 MeV.

REFERENCES

1. J. C. Hopkins and G. Breit, "The H(n,n)H Scattering Observables Required for High Precision Fast-Neutron Measurements," submitted to Nuclear Data for publication; private communication prior to publication (1970).

2. A. Horsley, "Neutron Cross Sections of Hydrogen in the Energy Range 0.001 eV - 20 MeV," Nuclear Data A 2, 243 (1966) and private communication (1970).

3. "Chart of the Nuclides," Battelle Memorial Institute, May 1969.

4. R. E. Seamon, K. A. Friedman, G. Breit, R. D. Haracz, J. M. Holt, and A. Prakash, Phys. Rev. 165, 1579 (1968).

5. J. C. Davis and H. H. Barschall, "Adjustments in the n-p Singlet Effective Range," Phys. Letters 27B, 636 (1968).

6. J. C. Davis, BAPS II 15, 474 (1970) and private communication (1970).

APPENDIX

LISTING OF HYDROGEN EVALUATION

```
      HYDROGEN IN ENDF/B-II FORMAT.  MAT = 1148                    1148-0 -0     0
 1.001 E+03 9.9917E-01          0          0          0          121148 1451     1
0.0         0.0                 0          0         67           01148 1451     2
                                                                   1148 1451     3
   HYDROGEN FREE ATOM CROSS SECTIONS                               1148 1451     4
      ENTRY BY L. STEWART, R.J. LABAUVE, AND P.G. YOUNG            1148 1451     5
      LOS ALAMOS SCIENTIFIC LABORATORY                             1148 1451     6
      LOS ALAMOS,NEW MEXICO 87544                                  1148 1451     7
      OCTOBER 20,1970                                              1148 1451     8
                                                                   1148 1451     9
  MF=1                                                             1148 1451    10
                                                                   1148 1451    11
    MT=451, ATOMIC MASS=1.007825                                   1148 1451    12
                                                                   1148 1451    13
  MF=2                                                             1148 1451    14
                                                                   1148 1451    15
    MT=151, SCATTERING LENGTH=1.2756E-12 CM.                       1148 1451    16
                                                                   1148 1451    17
  MF=3                                                             1148 1451    18
                                                                   1148 1451    19
    MT=  1, TOTAL CROSS SECTIONS --- THE TOTAL CROSS SECTIONS ARE  1148 1451    20
            OBTAINED BY ADDING THE ELASTIC SCATTERING AND          1148 1451    21
            RADIATIVE CAPTURE CROSS SECTIONS AT ALL ENERGIES.      1148 1451    22
             1.0E-05 EV TO 20 MEV.                                 1148 1451    23
                                                                   1148 1451    24
    MT=  2, ELASTIC SCATTERING --- FROM AN EXTENSIVE THEORETICAL   1148 1451    25
            TREATMENT OF FAST NEUTRON MEASUREMENTS                 1148 1451    26
            BY J. C. HOPKINS(LASL) AND G. BREIT(STATE              1148 1451    27
            UNIVERSITY OF NEW YORK).                               1148 1451    28
             1.0E-05 EV TO 20 MEV.                                 1148 1451    29
                                                                   1148 1451    30
    MT=102, RADIATIVE CAPTURE --- THESE CROSS SECTIONS ARE TAKEN   1148 1451    31
            FROM THE 1966 PUBLICATION OF A. HORSLEY WHERE A VALUE  1148 1451    32
            OF 332 MB WAS ADOPTED FOR THE THERMAL VALUE.           1148 1451    33
             1.0E-05 EV TO 20 MEV.                                 1148 1451    34
                                                                   1148 1451    35
    MT=251, AVERAGE VALUE OF COSINE OF SCATTERING ANGLE            1148 1451    36
            IN LAB SYSTEM.                                         1148 1451    37
             1.0E-05 EV TO 20 MEV.                                 1148 1451    38
                                                                   1148 1451    39
    MT=252, AVERAGE LOGARITHMIC ENERGY CHANGE PER COLLISON, TAKEN  1148 1451    40
            AS 1, FROM 1.0E-05 EV TO 20 MEV.                       1148 1451    41
                                                                   1148 1451    42
    MT=253, GAMMA, TAKEN AS 1, FROM 1.0E-05 EV TO 20 MEV.          1148 1451    43
                                                                   1148 1451    44
  MF=4                                                             1148 1451    45
                                                                   1148 1451    46
    MT=  2, NEUTRON ELASTIC SCATTERING ANGULAR DISTRIBUTIONS IN    1148 1451    47
            THE CENTER OF MASS SYSTEM--GIVEN AS NORMALIZED         1148 1451    48
            POINTWISE PROBABILITIES.                               1148 1451    49
```

```
                                                                    1148 1451   50
                                                                    1148 1451   51
  MF=7                                                              1148 1451   52
                                                                    1148 1451   53
    MT=  4, .00001 TO 5 EV FREE GAS SIGMA=20.449 BARNS.             1148 1451   54
                                                                    1148 1451   55
  MF=12                                                             1148 1451   56
                                                                    1148 1451   57
    MT=102, GAMMA RAY MULTIPLICITIES --- MULTIPLICITY, (REFERRED    1148 1451   58
            TO MT=102, MF=3), IS UNITY AT ALL NEUTRON ENERGIES.     1148 1451   59
            SIXTEEN ENERGY BANDS ARE GIVEN FROM .2 MEV TO 20 MEV,   1148 1451   60
            AND THE AVERAGE GAMMA RAY ENERGY, EAG, IS DETERMINED    1148 1451   61
            FROM THE AVERAGE NEUTRON ENERGY, EAN, IN THE BAND BY    1148 1451   62
            EAG=2.225E+06+EAN/2., RECOIL ENERGY IGNORED.            1148 1451   63
                                                                    1148 1451   64
  MF=14                                                             1148 1451   65
                                                                    1148 1451   66
    MT=102, GAMMA RAY ANGULAR DISTRIBUTION --- ASSUMED ISOTROPIC    1148 1451   67



      HYDROGEN IN ENDF/B-II FORMAT.  MAT = 1148                      1148-0 -0    0
 1.001 E+03 9.9917E-01          0           0           0          121148 1451    1
0.0         0.0                 0           0          67           01148 1451    2
                                                                    1148 1451    3
    HYDROGEN FREE ATOM CROSS SECTIONS                               1148 1451    4
       ENTRY BY L. STEWART, R.J. LABAUVE, AND P.G. YOUNG            1148 1451    5
       LOS ALAMOS SCIENTIFIC LABORATORY                             1148 1451    6
       LOS ALAMOS,NEW MEXICO 87544                                  1148 1451    7
       OCTOBER 20,1970                                              1148 1451    8
                                                                    1148 1451    9
  MF=1                                                              1148 1451   10
                                                                    1148 1451   11
    MT=451, ATOMIC MASS=1.007825                                    1148 1451   12
                                                                    1148 1451   13
  MF=2                                                              1148 1451   14
                                                                    1148 1451   15
    MT=151, SCATTERING LENGTH=1.2756E-12 CM.                        1148 1451   16
                                                                    1148 1451   17
  MF=3                                                              1148 1451   18
                                                                    1148 1451   19
    MT=  1, TOTAL CROSS SECTIONS --- THE TOTAL CROSS SECTIONS ARE   1148 1451   20
            OBTAINED BY ADDING THE ELASTIC SCATTERING AND            1148 1451   21
            RADIATIVE CAPTURE CROSS SECTIONS AT ALL ENERGIES.        1148 1451   22
             1.0E-05 EV TO 20 MEV.                                  1148 1451   23
                                                                    1148 1451   24
    MT=  2, ELASTIC SCATTERING --- FROM AN EXTENSIVE THEORETICAL    1148 1451   25
            TREATMENT OF FAST NEUTRON MEASUREMENTS                  1148 1451   26
            BY J. C. HOPKINS(LASL) AND G. BREIT(STATE               1148 1451   27
            UNIVERSITY OF NEW YORK).                                1148 1451   28
             1.0E-05 EV TO 20 MEV.                                  1148 1451   29
                                                                    1148 1451   30
    MT=102, RADIATIVE CAPTURE --- THESE CROSS SECTIONS ARE TAKEN    1148 1451   31
            FROM THE 1966 PUBLICATION OF A. HORSLEY WHERE A VALUE   1148 1451   32
            OF 332 MB WAS ADOPTED FOR THE THERMAL VALUE.            1148 1451   33
             1.0E-05 EV TO 20 MEV.                                  1148 1451   34
                                                                    1148 1451   35
    MT=251, AVERAGE VALUE OF COSINE OF SCATTERING ANGLE             1148 1451   36
            IN LAB SYSTEM.                                          1148 1451   37
             1.0E-05 EV TO 20 MEV.                                  1148 1451   38
                                                                    1148 1451   39
    MT=252, AVERAGE LOGARITHMIC ENERGY CHANGE PER COLLISON, TAKEN   1148 1451   40
            AS 1, FROM 1.0E-05 EV TO 20 MEV.                        1148 1451   41
                                                                    1148 1451   42
    MT=253, GAMMA, TAKEN AS 1, FROM 1.0E-05 EV TO 20 MEV.           1148 1451   43
                                                                    1148 1451   44
  MF=4                                                              1148 1451   45
                                                                    1148 1451   46
    MT=  2, NEUTRON ELASTIC SCATTERING ANGULAR DISTRIBUTIONS IN     1148 1451   47
            THE CENTER OF MASS SYSTEM--GIVEN AS NORMALIZED          1148 1451   48
            POINTWISE PROBABILITIES.                                1148 1451   49
```

```
                                                                      1148 1451   50
                                                                      1148 1451   51
MF=7                                                                  1148 1451   52
                                                                      1148 1451   53
  MT=  4. .00001 TO 5 EV FREE GAS SIGMA=20.449 BARNS.                 1148 1451   54
                                                                      1148 1451   55
MF=12                                                                 1148 1451   56
                                                                      1148 1451   57
  MT=102. GAMMA RAY MULTIPLICITIES --- MULTIPLICITY, (REFERRED        1148 1451   58
          TO MT=102, MF=3), IS UNITY AT ALL NEUTRON ENERGIES.         1148 1451   59
          SIXTEEN ENERGY BANDS ARE GIVEN FROM .2 MEV TO 20 MEV,       1148 1451   60
          AND THE AVERAGE GAMMA RAY ENERGY, EAG, IS DETERMINED        1148 1451   61
          FROM THE AVERAGE NEUTRON ENERGY, EAN, IN THE BAND BY        1148 1451   62
          EAG=2.225E+06*EAN/2., RECOIL ENERGY IGNORED.                1148 1451   63
                                                                      1148 1451   64
MF=14                                                                 1148 1451   65
                                                                      1148 1451   66
  MT=102. GAMMA RAY ANGULAR DISTRIBUTION --- ASSUMED ISOTROPIC        1148 1451   67
          AT ALL NEUTRON ENERGIES.                                    1148 1451   68
                                                                      1148 1451   69
                                    1         451          81         1148 1451   70
                                    2         151           4         1148 1451   71
                                    3           1          48         1148 1451   72
                                    3           2          48         1148 1451   73
                                    3         102          48         1148 1451   74
                                    3         251           8         1148 1451   75
                                    3         252           4         1148 1451   76
                                    3         253           4         1148 1451   77
                                    4           2          88         1148 1451   78
                                    7           4           4         1148 1451   79
                                   12         102          70         1148 1451   80
                                   14         102           1         1148 1451   81
                                                                      1148 1  0    82
                                                                      1148 0  0    83
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1.001 E+03 1.0000E+00          0           0           1          01148 2151   85
1.0   E-05 1.0   E+05          0           0           0          01148 2151   86
5.0   E-01 1.2756E+00          0           0           0          01148 2151   87
0.0        0.0                 0           0           0          01148 2  0    88
0.0        0.0                 0           0           0          01148 0  0    89
1.001 E+03 9.9917E-01          0           0           0          01148 3  1    90
0.0        0.0                 0           0           1        1341148 3  1    91
       134          5                                             1148 3  1    92
1.0000E-05 3.7148E+01 2.0000E-05 3.2257E+01 5.0000E-05 2.7917E+011148 3  1    93
1.0000E-04 2.5730E+01 2.0000E-04 2.4183E+01 5.0000E-04 2.2811E+011148 3  1    94
1.0000E-03 2.2119E+01 2.0000E-03 2.1630E+01 5.0000E-03 2.1196E+011148 3  1    95
1.0000E-02 2.0977E+01 2.5300E-02 2.0780E+01 1.0000E+02 2.0450E+011148 3  1    96
1.0000E+03 2.0330E+01 2.0000E+03 2.0200E+01 3.0000E+03 2.0070E+011148 3  1    97
4.0000E+03 1.9940E+01 5.0000E+03 1.9820E+01 6.0000E+03 1.9690E+011148 3  1    98
8.0000E+03 1.9450E+01 1.0000E+04 1.9210E+01 1.5000E+04 1.8650E+011148 3  1    99
2.0000E+04 1.8130E+01 2.5000E+04 1.7630E+01 3.0000E+04 1.7170E+011148 3  1   100
3.5000E+04 1.6740E+01 4.0000E+04 1.6330E+01 4.5000E+04 1.5940E+011148 3  1   101
5.0000E+04 1.5580E+01 5.5000E+04 1.5230E+01 6.0000E+04 1.4900E+011148 3  1   102
6.5000E+04 1.4590E+01 7.0000E+04 1.4290E+01 7.5000E+04 1.4010E+011148 3  1   103
8.0000E+04 1.3740E+01 8.5000E+04 1.3480E+01 9.0000E+04 1.3240E+011148 3  1   104
9.5000E+04 1.3000E+01 1.0000E+05 1.2770E+01 1.1000E+05 1.2350E+011148 3  1   105
1.2000E+05 1.1960E+01 1.3000E+05 1.1610E+01 1.4000E+05 1.1280E+011148 3  1   106
1.5000E+05 1.0970E+01 1.6000E+05 1.0670E+01 1.7000E+05 1.0400E+011148 3  1   107
1.8000E+05 1.0140E+01 1.9000E+05 9.8980E+00 2.0000E+05 9.6710E+001148 3  1   108
2.2000E+05 9.2580E+00 2.4000E+05 8.8920E+00 2.6000E+05 8.5620E+001148 3  1   109
2.8000E+05 8.2620E+00 3.0000E+05 7.9870E+00 3.2000E+05 7.7340E+001148 3  1   110
3.4000E+05 7.5010E+00 3.6000E+05 7.2840E+00 3.8000E+05 7.0830E+001148 3  1   111
4.0000E+05 6.8970E+00 4.2000E+05 6.7250E+00 4.4000E+05 6.5650E+001148 3  1   112
4.6000E+05 6.4150E+00 4.8000E+05 6.2750E+00 5.0000E+05 6.1430E+001148 3  1   113
5.5000E+05 5.8450E+00 6.0000E+05 5.5840E+00 6.5000E+05 5.3540E+001148 3  1   114
7.0000E+05 5.1480E+00 7.5000E+05 4.9640E+00 8.0000E+05 4.7970E+001148 3  1   115
8.5000E+05 4.6450E+00 9.0000E+05 4.5060E+00 9.5000E+05 4.3780E+001148 3  1   116
1.0000E+06 4.2610E+00 1.1000E+06 4.0510E+00 1.2000E+06 3.8680E+001148 3  1   117
1.3000E+06 3.7060E+00 1.4000E+06 3.5610E+00 1.5000E+06 3.4290E+001148 3  1   118
1.6000E+06 3.3090E+00 1.7000E+06 3.1980E+00 1.8000E+06 3.0970E+001148 3  1   119
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1.9000E+06 3.0030E+00 2.0000E+06 2.9150E+00 2.2000E+06 2.7590E+001148 3  1  120
2.4000E+06 2.6220E+00 2.6000E+06 2.5010E+00 2.8000E+06 2.3920E+001148 3  1  121
3.0000E+06 2.2930E+00 3.2000E+06 2.2030E+00 3.4000E+06 2.1200E+001148 3  1  122
3.6000E+06 2.0430E+00 3.8000E+06 1.9730E+00 4.0000E+06 1.9070E+001148 3  1  123
4.2000E+06 1.8450E+00 4.4000E+06 1.7880E+00 4.6000E+06 1.7340E+001148 3  1  124
4.8000E+06 1.6830E+00 5.0000E+06 1.6350E+00 5.2000E+06 1.5890E+001148 3  1  125
5.4000E+06 1.5470E+00 5.6000E+06 1.5060E+00 5.8000E+06 1.4670E+001148 3  1  126
6.0000E+06 1.4300E+00 6.2000E+06 1.3950E+00 6.4000E+06 1.3620E+001148 3  1  127
6.6000E+06 1.3290E+00 6.8000E+06 1.2990E+00 7.0000E+06 1.2690E+001148 3  1  128
7.5000E+06 1.2010E+00 8.0000E+06 1.1390E+00 8.5000E+06 1.0830E+001148 3  1  129
9.0000E+06 1.0320E+00 9.5000E+06 9.8590E-01 1.0000E+07 9.4320E-011148 3  1  130
1.0500E+07 9.0350E-01 1.1000E+07 8.6650E-01 1.1500E+07 8.3230E-011148 3  1  131
1.2000E+07 8.0050E-01 1.2500E+07 7.7100E-01 1.3000E+07 7.4330E-011148 3  1  132
1.3500E+07 7.1730E-01 1.4000E+07 6.9290E-01 1.4500E+07 6.6980E-011148 3  1  133
1.5000E+07 6.4800E-01 1.5500E+07 6.2740E-01 1.6000E+07 6.0780E-011148 3  1  134
1.6500E+07 5.8930E-01 1.7000E+07 5.7170E-01 1.7500E+07 5.5490E-011148 3  1  135
1.8000E+07 5.3900E-01 1.8500E+07 5.2380E-01 1.9000E+07 5.0930E-011148 3  1  136
1.9500E+07 4.9550E-01 2.0000E+07 4.8230E-01-0.          0.         1148 3  1  137
                                                                   1148 3  0  138
1.001 E+03 9.9917E-01          0          0          0         01148 3  2  139
0.         0.                  0          0          1       1341148 3  2  140
       134           5                                          1148 3  2  141
1.0000E-05 2.0449E+01 2.0000E-05 2.0449E+01 5.0000E-05 2.0449E+011148 3  2  142
1.0000E-04 2.0449E+01 2.0000E-04 2.0449E+01 5.0000E-04 2.0449E+011148 3  2  143
1.0000E-03 2.0449E+01 2.0000E-03 2.0449E+01 5.0000E-03 2.0449E+011148 3  2  144
1.0000E-02 2.0449E+01 2.5300E-02 2.0449E+01 1.0000E+02 2.0449E+011148 3  2  145
1.0000E+03 2.0329E+01 2.0000E+03 2.0198E+01 3.0000E+03 2.0068E+011148 3  2  146
4.0000E+03 1.9941E+01 5.0000E+03 1.9815E+01 6.0000E+03 1.9691E+011148 3  2  147
8.0000E+03 1.9448E+01 1.0000E+04 1.9213E+01 1.5000E+04 1.8651E+011148 3  2  148
2.0000E+04 1.8126E+01 2.5000E+04 1.7634E+01 3.0000E+04 1.7172E+011148 3  2  149
3.5000E+04 1.6737E+01 4.0000E+04 1.6327E+01 4.5000E+04 1.5941E+011148 3  2  150
5.0000E+04 1.5575E+01 5.5000E+04 1.5228E+01 6.0000E+04 1.4900E+011148 3  2  151
6.5000E+04 1.4587E+01 7.0000E+04 1.4291E+01 7.5000E+04 1.4008E+011148 3  2  152
8.0000E+04 1.3738E+01 8.5000E+04 1.3481E+01 9.0000E+04 1.3235E+011148 3  2  153
9.5000E+04 1.2999E+01 1.0000E+05 1.2774E+01 1.1000E+05 1.2351E+011148 3  2  154
1.2000E+05 1.1964E+01 1.3000E+05 1.1607E+01 1.4000E+05 1.1275E+011148 3  2  155
1.5000E+05 1.0965E+01 1.6000E+05 1.0673E+01 1.7000E+05 1.0398E+011148 3  2  156
1.8000E+05 1.0140E+01 1.9000E+05 9.8980E+00 2.0000E+05 9.6710E+001148 3  2  157
2.2000E+05 9.2580E+00 2.4000E+05 8.8920E+00 2.6000E+05 8.5620E+001148 3  2  158
2.8000E+05 8.2620E+00 3.0000E+05 7.9870E+00 3.2000E+05 7.7340E+001148 3  2  159
3.4000E+05 7.5010E+00 3.6000E+05 7.2840E+00 3.8000E+05 7.0830E+001148 3  2  160
4.0000E+05 6.8970E+00 4.2000E+05 6.7250E+00 4.4000E+05 6.5650E+001148 3  2  161
4.6000E+05 6.4150E+00 4.8000E+05 6.2750E+00 5.0000E+05 6.1430E+001148 3  2  162
5.5000E+05 5.8450E+00 6.0000E+05 5.5840E+00 6.5000E+05 5.3540E+001148 3  2  163
7.0000E+05 5.1480E+00 7.5000E+05 4.9640E+00 8.0000E+05 4.7970E+001148 3  2  164
8.5000E+05 4.6450E+00 9.0000E+05 4.5060E+00 9.5000E+05 4.3780E+001148 3  2  165
1.0000E+06 4.2610E+00 1.1000E+06 4.0510E+00 1.2000E+06 3.8680E+001148 3  2  166
1.3000E+06 3.7060E+00 1.4000E+06 3.5610E+00 1.5000E+06 3.4290E+001148 3  2  167
1.6000E+06 3.3090E+00 1.7000E+06 3.1980E+00 1.8000E+06 3.0970E+001148 3  2  168
1.9000E+06 3.0030E+00 2.0000E+06 2.9150E+00 2.2000E+06 2.7590E+001148 3  2  169
2.4000E+06 2.6220E+00 2.6000E+06 2.5010E+00 2.8000E+06 2.3920E+001148 3  2  170
3.0000E+06 2.2930E+00 3.2000E+06 2.2030E+00 3.4000E+06 2.1200E+001148 3  2  171
3.6000E+06 2.0430E+00 3.8000E+06 1.9730E+00 4.0000E+06 1.9070E+001148 3  2  172
4.2000E+06 1.8450E+00 4.4000E+06 1.7880E+00 4.6000E+06 1.7340E+001148 3  2  173
4.8000E+06 1.6830E+00 5.0000E+06 1.6350E+00 5.2000E+06 1.5890E+001148 3  2  174
5.4000E+06 1.5470E+00 5.6000E+06 1.5060E+00 5.8000E+06 1.4670E+001148 3  2  175
6.0000E+06 1.4300E+00 6.2000E+06 1.3950E+00 6.4000E+06 1.3620E+001148 3  2  176
6.6000E+06 1.3290E+00 6.8000E+06 1.2990E+00 7.0000E+06 1.2690E+001148 3  2  177
7.5000E+06 1.2010E+00 8.0000E+06 1.1390E+00 8.5000E+06 1.0830E+001148 3  2  178
9.0000E+06 1.0320E+00 9.5000E+06 9.8590E-01 1.0000E+07 9.4320E-011148 3  2  179
1.0500E+07 9.0350E-01 1.1000E+07 8.6650E-01 1.1500E+07 8.3230E-011148 3  2  180
1.2000E+07 8.0050E-01 1.2500E+07 7.7100E-01 1.3000E+07 7.4330E-011148 3  2  181
1.3500E+07 7.1730E-01 1.4000E+07 6.9290E-01 1.4500E+07 6.6980E-011148 3  2  182
1.5000E+07 6.4800E-01 1.5500E+07 6.2740E-01 1.6000E+07 6.0780E-011148 3  2  183
1.6500E+07 5.8930E-01 1.7000E+07 5.7170E-01 1.7500E+07 5.5490E-011148 3  2  184
1.8000E+07 5.3900E-01 1.8500E+07 5.2380E-01 1.9000E+07 5.0930E-011148 3  2  185
1.9500E+07 4.9550E-01 2.0000E+07 4.8230E-01-0.         -0.         1149 3  2  186
                                                                   1148 3  0  187
1.001 E+03 9.9917E-01          0          0          0         01148 3102 188
0.0        2.2247 E+06         0          0          1       1341148 3102 189
       134           5                                          1148 3102 190
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1.0000E-05 1.6699E+01 2.0000E-05 1.1808E+01 5.0000E-05 7.4682E+001148 3102  191
1.0000E-04 5.2808E+00 2.0000E-04 3.7341E+00 5.0000E-04 2.3616E+001148 3102  192
1.0000E-03 1.6699E+00 2.0000E-03 1.1808E+00 5.0000E-03 7.4682E-011148 3102  193
1.0000E-02 5.2808E-01 2.5300E-02 3.3200E-01 1.0000E+02 5.2770E-031148 3102  194
1.0000E+03 1.6590E-03 2.0000E+03 1.1926E-03 3.0000E+03 9.7008E-041148 3102  195
4.0000E+03 8.3290E-04 5.0000E+03 7.3747E-04 6.0000E+03 6.6619E-041148 3102  196
8.0000E+03 5.6518E-04 1.0000E+04 4.9580E-04 1.5000E+04 3.8782E-041148 3102  197
2.0000E+04 3.2386E-04 2.5000E+04 2.8064E-04 3.0000E+04 2.4909E-041148 3102  198
3.5000E+04 2.2248E-04 4.0000E+04 2.0553E-04 4.5000E+04 1.8970E-041148 3102  199
5.0000E+04 1.7646E-04 5.5000E+04 1.6518E-04 6.0000E+04 1.5544E-041148 3102  200
6.5000E+04 1.4693E-04 7.0000E+04 1.3942E-04 7.5000E+04 1.3273E-041148 3102  201
8.0000E+04 1.2673E-04 8.5000E+04 1.2132E-04 9.0000E+04 1.1640E-041148 3102  202
9.5000E+04 1.1191E-04 1.0000E+05 1.0780E-04 1.1000E+05 1.0019E-041148 3102  203
1.2000E+05 9.3717E-05 1.3000E+05 8.8131E-05 1.4000E+05 8.3256E-051148 3102  204
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1.8000E+05 6.8645E-05 1.9000E+05 6.5853E-05 2.0000E+05 6.3310E-051148 3102  206
2.2000E+05 5.9051E-05 2.4000E+05 5.5591E-05 2.6000E+05 5.2731E-051148 3102  207
2.8000E+05 5.0330E-05 3.0000E+05 4.8290E-05 3.2000E+05 4.6538E-051148 3102  208
3.4000E+05 4.5018E-05 3.6000E+05 4.3691E-05 3.8000E+05 4.2523E-051148 3102  209
4.0000E+05 4.1490E-05 4.2000E+05 4.0607E-05 4.4000E+05 3.9828E-051148 3102  210
4.6000E+05 3.9138E-05 4.8000E+05 3.8525E-05 5.0000E+05 3.7980E-051148 3102  211
5.5000E+05 3.7396E-05 6.0000E+05 3.6870E-05 6.5000E+05 3.6163E-051148 3102  212
7.0000E+05 3.5520E-05 7.5000E+05 3.5167E-05 8.0000E+05 3.4840E-051148 3102  213
8.5000E+05 3.4742E-05 9.0000E+05 3.4650E-05 9.5000E+05 3.4552E-051148 3102  214
1.0000E+06 3.4460E-05 1.1000E+06 3.4440E-05 1.2000E+06 3.4410E-051148 3102  215
1.3000E+06 3.4490E-05 1.4000E+06 3.4360E-05 1.5000E+06 3.4340E-051148 3102  216
1.6000E+06 3.4310E-05 1.7000E+06 3.4290E-05 1.8000E+06 3.4270E-051148 3102  217
1.9000E+06 3.4250E-05 2.0000E+06 3.4230E-05 2.2000E+06 3.4520E-051148 3102  218
2.4000E+06 3.4810E-05 2.6000E+06 3.5100E-05 2.8000E+06 3.5390E-051148 3102  219
3.0000E+06 3.5680E-05 3.2000E+06 3.5800E-05 3.4000E+06 3.5910E-051148 3102  220
3.6000E+06 3.6030E-05 3.8000E+06 3.6140E-05 4.0000E+06 3.6260E-051148 3102  221
4.2000E+06 3.6290E-05 4.4000E+06 3.6320E-05 4.6000E+06 3.6360E-051148 3102  222
4.8000E+06 3.6390E-05 5.0000E+06 3.6420E-05 5.2000E+06 3.6290E-051148 3102  223
5.4000E+06 3.6160E-05 5.6000E+06 3.6040E-05 5.8000E+06 3.5910E-051148 3102  224
6.0000E+06 3.5780E-05 6.2000E+06 3.5670E-05 6.4000E+06 3.5560E-051148 3102  225
6.6000E+06 3.5450E-05 6.8000E+06 3.5340E-05 7.0000E+06 3.5230E-051148 3102  226
7.5000E+06 3.4590E-05 8.0000E+06 3.3940E-05 8.5000E+06 3.3640E-051148 3102  227
9.0000E+06 3.3330E-05 9.5000E+06 3.2960E-05 1.0000E+07 3.2590E-051148 3102  228
1.0500E+07 3.2210E-05 1.1000E+07 3.1820E-05 1.1500E+07 3.1450E-051148 3102  229
1.2000E+07 3.1080E-05 1.2500E+07 3.0630E-05 1.3000E+07 3.0180E-051148 3102  230
1.3500E+07 3.0010E-05 1.4000E+07 2.9830E-05 1.4500E+07 2.9400E-051148 3102  231
1.5000E+07 2.8960E-05 1.5500E+07 2.8630E-05 1.6000E+07 2.8300E-051148 3102  232
1.6500E+07 2.7880E-05 1.7000E+07 2.7450E-05 1.7500E+07 2.7360E-051148 3102  233
1.8000E+07 2.7260E-05 1.8500E+07 2.6730E-05 1.9000E+07 2.6200E-051148 3102  234
1.9500E+07 2.6120E-05 2.0000E+07 2.6040E-05-0.         -0.          1148 3102  235
                                                                    1148 3  0  236
1.001 E+03 9.9917E-01          0           0           0          01148 3251  237
0.0        0.0                 0           0           1         141148 3251  238
        14           3                                             1148 3251  239
1.0   E-056.65213E-01 1.0   E+056.65213E-01 5.0   E+056.64899E-011148 3251  240
1.0   E+066.64620E-01 2.0   E+066.64149E-01 4.0   E+066.63355E-011148 3251  241
6.0   E+066.62628E-01 8.0   E+066.62018E-01 1.0   E+076.61338E-011148 3251  242
1.2   E+076.61045E-01 1.4   E+076.60449E-01 1.6   E+076.59929E-011148 3251  243
1.8   E+076.59540E-01 2.0   E+076.59196E-01                      1148 3251  244
                                                                    1148 3  0  245
1.001 E+03 9.9917E-01          0           0           0          01148 3252  246
0.0        0.0                 0           0           1          21148 3252  247
        2            2                                             1148 3252  248
1.0   E-05 1.0         2.0   E+07 1.0                             1148 3252  249
                                                                    1148 3  0  250
1.001 E+03 9.9917E-01          0           0           0          01148 3253  251
0.0        0.0                 0           0           1          21148 3253  252
        2            2                                             1148 3253  253
1.0   E-05 1.0         2.0   E+07 1.0                             1148 3253  254
                                                                    1148 3  0  255
                                                                    1148 0  0  256
1.001 E+03 9.9917E-01          0           2           0          01148 4  2  257
0.0        0.0                 0           2           0          01148 4  2  258
       0.0          0.0        0           0           1         141148 4  2  259
        14           2                                             1148 4  2  260
```

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        0.0     1.0-05          0          0          1         111148 4  2  261
         11          2                                              1148 4  2  262
       -1.0         .5        -.8         .5        -.6         .51148 4  2  263
       -.4          .5        -.2         .5         0.         .51148 4  2  264
        .2          .5         .4         .5         .6         .51148 4  2  265
        .8          .5        1.0         .5                    1148 4  2  266
        0.0     1.0+05          0          0          1         111148 4  2  267
         11          2                                              1148 4  2  268
       -1.0         .5        -.8         .5        -.6         .51148 4  2  269
       -.4          .5        -.2         .5         0.         .51148 4  2  270
        .2          .5         .4         .5         .6         .51148 4  2  271
        .8          .5        1.0         .5                    1148 4  2  272
        0.0     5.0+05          0          0          1         111148 4  2  273
         11          2                                              1148 4  2  274
-.10000E+01 .50117E+00-.80000E+00 .50097E+00-.60000E+00 .50066E+001148 4  2  275
-.40000E+00 .50045E+00-.20000E+00 .50025E+000.          .50005E+001148 4  2  276
 .20000E+00 .49974E+00 .40000E+00 .49953E+00 .60000E+00 .49933E+001148 4  2  277
 .80000E+00 .49902E+00 .10000E+01 .49882E+00                    1148 4  2  278
        0.0     1.0+06          0          0          1         111148 4  2  279
         11          2                                              1148 4  2  280
-.10000E+01 .50218E+00-.80000E+00 .50176E+00-.60000E+00 .50131E+001148 4  2  281
-.40000E+00 .50089E+00-.20000E+00 .50044E+000.          .50000E+001148 4  2  282
 .20000E+00 .49957E+00 .40000E+00 .49913E+00 .60000E+00 .49869E+001148 4  2  283
 .80000E+00 .49823E+00 .10000E+01 .49779E+00                    1148 4  2  284
        0.0     2.0+06          0          0          1         111148 4  2  285
         11          2                                              1148 4  2  286
-.10000E+01 .50387E+00-.80000E+00 .50311E+00-.60000E+00 .50234E+001148 4  2  287
-.40000E+00 .50158E+00-.20000E+00 .50081E+000.          .50003E+001148 4  2  288
 .20000E+00 .49925E+00 .40000E+00 .49846E+00 .60000E+00 .49764E+001148 4  2  289
 .80000E+00 .49682E+00 .10000E+01 .49598E+00                    1148 4  2  290
        0.0     4.0+06          0          0          1         111148 4  2  291
         11          2                                              1148 4  2  292
-.10000E+01 .50677E+00-.80000E+00 .50542E+00-.60000E+00 .50407E+001148 4  2  293
-.40000E+00 .50275E+00-.20000E+00 .50143E+000.          .50011E+001148 4  2  294
 .20000E+00 .49873E+00 .40000E+00 .49734E+00 .60000E+00 .49589E+001148 4  2  295
 .80000E+00 .49441E+00 .10000E+01 .49283E+00                    1148 4  2  296
        0.0     6.0+06          0          0          1         111148 4  2  297
         11          2                                              1148 4  2  298
-.10000E+01 .50999E+00-.80000E+00 .50770E+00-.60000E+00 .50560E+001148 4  2  299
-.40000E+00 .50362E+00-.20000E+00 .50177E+000.          .49993E+001148 4  2  300
 .20000E+00 .49808E+00 .40000E+00 .49628E+00 .60000E+00 .49439E+001148 4  2  301
 .80000E+00 .49246E+00 .10000E+01 .49040E+00                    1148 4  2  302
        0.0     8.0+06          0          0          1         111148 4  2  303
         11          2                                              1148 4  2  304
-.10000E+01 .51288E+00-.80000E+00 .50952E+00-.60000E+00 .50676E+001148 4  2  305
-.40000E+00 .50434E+00-.20000E+00 .50207E+000.          .49987E+001148 4  2  306
 .20000E+00 .49766E+00 .40000E+00 .49546E+00 .60000E+00 .49314E+001148 4  2  307
 .80000E+00 .49077E+00 .10000E+01 .48818E+00                    1148 4  2  308
        0.0    10.0+06          0          0          1         111148 4  2  309
         11          2                                              1148 4  2  310
-.10000E+01 .51727E+00-.80000E+00 .51201E+00-.60000E+00 .50794E+001148 4  2  311
-.40000E+00 .50461E+00-.20000E+00 .50168E+000.          .49908E+001148 4  2  312
 .20000E+00 .49669E+00 .40000E+00 .49435E+00 .60000E+00 .49202E+001148 4  2  313
 .80000E+00 .48969E+00 .10000E+01 .48716E+00                    1148 4  2  314
        0.0    12.0+06          0          0          1         121148 4  2  315
         12          2                                              1148 4  2  316
-.10000E+01 .52272E+00-.90000E+00 .51825E+00-.80000E+00 .51464E+001148 4  2  317
-.60000E+00 .50898E+00-.40000E+00 .50475E+00-.20000E+00 .50129E+001148 4  2  318
0.          .49823E+00 .20000E+00 .49556E+00 .40000E+00 .49313E+001148 4  2  319
 .60000E+00 .49085E+00 .80000E+00 .48866E+00 .10000E+01 .48654E+001148 4  2  320
        0.0    14.0+06          0          0          1         121148 4  2  321
         12          2                                              1148 4  2  322
-.10000E+01 .52823E+00-.90000E+00 .52188E+00-.80000E+00 .51698E+001148 4  2  323
-.60000E+00 .50982E+00-.40000E+00 .50456E+00-.20000E+00 .50048E+001148 4  2  324
0.          .49703E+00 .20000E+00 .49431E+00 .40000E+00 .49195E+001148 4  2  325
 .60000E+00 .49005E+00 .80000E+00 .48833E+00 .10000E+01 .48688E+001148 4  2  326
        0.0    16.0+06          0          0          1         121148 4  2  327
         12          2                                              1148 4  2  328
-.10000E+01 .53433E+00-.90000E+00 .52575E+00-.80000E+00 .51924E+001148 4  2  329
-.60000E+00 .51024E+00-.40000E+00 .50404E+00-.20000E+00 .49939E+001148 4  2  330
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0.          .49567E+00 .20000E+00 .49288E+00 .40000E+00 .49081E+001148 4  2  331
 .60000E+00 .48936E+00 .80000E+00 .48853E+00 .10000E+01 .48833E+001148 4  2  332
        0.0    18.0+06          0          0          1          121148 4  2  333
         12          2                                                1148 4  2  334
-.10000E+01 .54092E+00-.90000E+00 .52962E+00-.80000E+00 .52134E+001148 4  2  335
-.60000E+00 .51038E+00-.40000E+00 .50327E+00-.20000E+00 .49802E+001148 4  2  336
0.          .49406E+00 .20000E+00 .49126E+00 .40000E+00 .48963E+001148 4  2  337
 .60000E+00 .48905E+00 .80000E+00 .48940E+00 .10000E+01 .49091E+001148 4  2  338
        0.0    20.0+06          0          0          1          121148 4  2  339
         12          2                                                1148 4  2  340
-.10000E+01 .54807E+00-.90000E+00 .53348E+00-.80000E+00 .52332E+001148 4  2  341
-.60000E+00 .51029E+00-.40000E+00 .50221E+00-.20000E+00 .49635E+001148 4  2  342
0.          .49218E+00 .20000E+00 .48958E+00 .40000E+00 .48840E+001148 4  2  343
 .60000E+00 .48866E+00 .80000E+00 .49075E+00 .10000E+01 .49466E+001148 4  2  344
                                                                     1148 4  0  345
                                                                     1148 0  0  346
 1.001 E+03 9.9917E-01          0          0          0           01148 7  4  347
 0.0        0.0                 0          0         12           11148 7  4  348
 0.0        2.0   E+02 9.9917E-01 5.0          0.0          0.0    1148 7  4  349
 1.0        2.0449E+01 9.9917E-01 0.0          0.0          0.0    1148 7  4  350
                                                                     1148 7  0  351
                                                                     1148 0  0  352
 1.0010E+03 9.9917E-01          1          0         17           0114812102 353
 0.         0.                  0          0          1           2114812102 354
         2          2                                                114812102 355
 1.0000E-05 1.0000E+00 2.0000E+07 1.0000E+00                        114812102 356
 1.1725E+07 0.                  0          2          1           3114812102 357
         3          2                                                114812102 358
 1.8000E+07 0.          1.8001E+07 1.0000E+00 2.0000E+07 1.0000E+00114812102 359
 1.0725E+07 0.                  0          2          1           4114812102 360
         4          2                                                114812102 361
 1.6000E+07 0.          1.6001E+07 1.0000E+00 1.8000E+07 1.0000E+00114812102 362
 1.8001E+07 0.                                                      114812102 363
 9.7250E+06 0.                  0          2          1           4114812102 364
         4          2                                                114812102 365
 1.4000E+07 0.          1.4001E+07 1.0000E+00 1.6000E+07 1.0000E+00114812102 366
 1.6001E+07 0.                                                      114812102 367
 8.7250E+06 0.                  0          2          1           4114812102 368
         4          2                                                114812102 369
 1.2000E+07 0.          1.2001E+07 1.0000E+00 1.4000E+07 1.0000E+00114812102 370
 1.4001E+07 0.                                                      114812102 371
 7.7250E+06 0.                  0          2          1           4114812102 372
         4          2                                                114812102 373
 1.0000E+07 0.          1.0001E+07 1.0000E+00 1.2000E+07 1.0000E+00114812102 374
 1.2001E+07 0.                                                      114812102 375
 6.9750E+06 0.                  0          2          1           4114812102 376
         4          2                                                114812102 377
 9.0000E+06 0.          9.0001E+06 1.0000E+00 1.0000E+07 1.0000E+00114812102 378
 1.0001E+07 0.                                                      114812102 379
 6.4750E+06 0.                  0          2          1           4114812102 380
         4          2                                                114812102 381
 8.0000E+06 0.          8.0001E+06 1.0000E+00 9.0000E+06 1.0000E+00114812102 382
 9.0001E+06 0.                                                      114812102 383
 5.9750E+06 0.                  0          2          1           4114812102 384
         4          2                                                114812102 385
 7.0000E+06 0.          7.0001E+06 1.0000E+00 8.0000E+06 1.0000E+00114812102 386
 8.0001E+06 0.                                                      114812102 387
 5.4750E+06 0.                  0          2          1           4114812102 388
         4          2                                                114812102 389
 6.0000E+06 0.          6.0001E+06 1.0000E+00 7.0000E+06 1.0000E+00114812102 390
 7.0001E+06 0.                                                      114812102 391
 4.9750E+06 0.                  0          2          1           4114812102 392
         4          2                                                114812102 393
 5.0000E+06 0.          5.0001E+06 1.0000E+00 6.0000E+06 1.0000E+00114812102 394
 6.0001E+06 0.                                                      114812102 395
 4.4750E+06 0.                  0          2          1           4114812102 396
         4          2                                                114812102 397
 4.0000E+06 0.          4.0001E+06 1.0000E+00 5.0000E+06 1.0000E+00114812102 398
 5.0001E+06 0.                                                      114812102 399
 3.9750E+06 0.                  0          2          1           4114812102 400
```

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         4          2                                                  114812102  401
3.0000E+06 0.         3.0001E+06 1.0000E+00 4.0000E+06 1.0000E+00114812102  402
4.0001E+06 0.                                                        114812102  403
3.4750E+06 0.                    0          2          1           4114812102  404
         4          2                                                  114812102  405
2.0000E+06 0.         2.0001E+06 1.0000E+00 3.0000F+06 1.0000E+00114812102  406
3.0001E+06 0.                                                        114812102  407
2.9750E+06 0.                    0          2          1           4114812102  408
         4          2                                                  114812102  409
1.0000E+06 0.         1.0001E+06 1.0000E+00 2.0000F+06 1.0000E+00114812102  410
2.0001E+06 0.                                                        114812102  411
2.6250E+06 0.                    0          2          1           4114812102  412
         4          2                                                  114812102  413
6.0000E+05 0.         6.0001E+05 1.0000E+00 1.0000E+06 1.0000F+00114812102  414
1.0001E+06 0.                                                        114812102  415
2.4250E+06 0.                    0          2          1           4114812102  416
         4          2                                                  114812102  417
2.0000E+05 0.         2.0001E+05 1.0000E+00 6.0000E+05 1.0000E+00114812102  418
6.0001E+05 0.                                                        114812102  419
2.2250E+06 0.                    0          2          1           3114812102  420
         3          2                                                  114812102  421
1.0000E-05 1.0000E+00 2.0000E+05 1.0000E+00 2.0001E+05 0.            114812102  422
                                                                     114812  0  423
                                                                     1148 0  0  424
1.0010F+03 9.9917E-01            1          0          0           0114814102  425
                                                                     114814  0  426
                                                                     1148 0  0  427
                                                                       -1       428
```