JAERI-M
83-236

NEANDC(J) 96/U
INDC(JAP) 83/L

EVALUATION OF NEUTRON NUCLEAR DATA FOR ^{246}Cm AND ^{247}Cm

January 1984

Yasuyuki KIKUCHI

日 本 原 子 力 研 究 所
Japan Atomic Energy Research Institute

JAERI-M レポートは，日本原子力研究所が不定期に公刊している研究報告書です。
入手の問合わせは，日本原子力研究所技術情報部情報資料課（〒319-11茨城県那珂郡東海村）あて，お申しこしください。なお，このほかに財団法人原子力弘済会資料センター（〒319-11 茨城県那珂郡東海村日本原子力研究所内）で複写による実費頒布をおこなっております。

JAERI-M reports are issued irregularly.
Inquiries about availability of the reports should be addressed to Information Section, Division of Technical Information, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken 319-11, Japan.

編集兼発行　日本原子力研究所
印　　刷　いばらき印刷㈱

Evaluation of Neutron Nuclear Data for ^{246}Cm and ^{247}Cm

Yasuyuki KIKUCHI

Department of Physics

Tokai Research Establishment, JAERI

(Received December 21, 1983)

Neutron nuclear data of ^{246}Cm and ^{247}Cm have been evaluated. Evaluated quantities are the total, elastic and inelastic scattering, fission, capture, (n,2n), (n,3n) and (n,4n) reaction cross sections, the resolved and unresolved resonance parameters, the angular and energy distributions of the emitted neutrons, and the average number of neutrons emitted per fission. The fission cross section was evaluated mainly on the basis of measured data. The other cross sections were calculated with the optical and statistical models because of scarce measured data. Discussion is given on the nuclear model calculations.

Keywords: Curium-246, Curium-247, Evaluation, Resonance Parameters, Fission, Optical Model, Statistical Model, Neutron Nuclear Data

---

This work was performed under contracts between Power Reactor and Nuclear Fuel Development Corporation and Japan Atomic Energy Research Institute

^{246}Cmと^{247}Cmの中性子核データの評価

日本原子力研究所東海研究所物理部
菊池 廉之

（1983年12月21日受理）

^{246}Cmと^{247}Cmの中性子核データを評価した。評価した量は，全断面積，弾性・非弾性散乱，核分裂，捕獲，（n，2n），（n，3n），（n，4n）反応の各断面積，分離・非分離共鳴パラメータ，放出中性子の角度およびエネルギー分布，核分裂当りの平均放出中性子数である。核分裂断面積は主として実験値に基いて評価した。他の断面積は実験値が乏しいので，光学・統計模型により計算した。この模型計算についても議論を行った。

CONTENTS

目　　次

1. Introduction

Neutron nuclear data of Am and Cm isotopes are required to analyze the down-stream problems of fuel cycle. JENDL-2 contains the data of $^{241-243}$Am and $^{242-245}$Cm. In JENDL-3, we will supply the data of higher Cm and Bk isotopes in order to analyze the complete production and decay chain up to ^{252}Cf.

According to this program, the data of ^{246}Cm and ^{247}Cm have been evaluated in fiscal year 1982 under contracts with Power Reactor and Nuclear Fuel Development Corporation. The evaluated quantities are the total, elastic and inelastic scattering, fission, capture, (n,2n), (n,3n) and (n,4n) reaction cross sections, the resolved and unresolved resonance parameters, the angular and energy distributions of the emitted neutrons, and the average number of neutrons per fission.

The method and results of the evaluation are described in chapter 2 and 3 for ^{246}Cm and ^{247}Cm, respectively. The present results are compared with the available experimental data and with the ENDF/B-V and ENDL-78 data. The applicability of the theoretical calculation adopted in the present work is discussed in chapter 4.

2. Curium-246

2.1 Thermal Cross Sections

The thermal capture and fission cross sections have been measured, and the measure data agree fairly well with one another as seen in Table 1. The weighted average values are 1.23 ± 0.14 barns for capture and 0.15 ± 0.01 barns for fission. We adopted these values in the present work.

2.2 Resonance Parameters

2.2.1 Resolved Resonance Parameters

The resonance parameters reported by experimenters have been collected and stored in REPSTOR system[6]. They are shown in Table 2 with the presently evaluated data. The parameters were deduced from the transmission measurements by Coté et al.[7], Berreth et al.[8], Benjamin et al.[9] and Belanova et al.[10] for the resonances up to 100 eV. On the other hand, Moore and Keyworth[11] gave the fission and capture areas for the resonances between 84 and 381 eV. Recently Stopa et al.[12] gave the fission areas for the low lying two levels (4.3 and 15.3 eV).

The neutron widths were obtained on the basis of the data of Berreth et al.[8], Benjamin et al.[9] and Belanova et al.[10] for the levels up to 100 eV. For the higher levels, the neutron widths were obtained from the capture area data of Moore and Keyworth[11] by assuming the radiation width of 31 meV. The radiation width of 31 ± 6 meV was assumed on the basis of shape analysis by Benjamin et al.[9] for nearly all the levels except ones of 84 and 159 eV for which the radiation widths were obtained from the evaluated neutron width and the capture area of Moore and Keyworth[11]. The fission widths were obtained from the fission area data of Stopa et al.[12] for the first two levels and of

Moore and Keyworth[11] for the higher levels.

The thermal capture cross section and capture resonance integral calculated from the parameters agree well with the measured data. For the fission, however, the calculated thermal cross section and resonance integral were smaller than the measured data by an order of magnitude. Hence we abandoned the fission area data of Stopa et al.[12] for the first two levels and adjusted the fission widths for these two levels so that the calculated thermal fission cross section and the fission resonance integral might agree with the measured data within their quoted errors. The fission width thus adjusted is 3.6 meV and is considerably larger than those for the higher levels as seen in Table 2, but is consistent with the average fission widths in the unresolved resonance region.

The maximum energy of the resolved resonance region was set at 330 eV, since the 361 eV level was reported to be doublet by Moore and Keyworth[11].

2.2.2 Unresolved Resonance Parameters

The fission cross sections of Moore and Keyworth[11] and Stopa et al.[12] are the only available experimental data in the unresolved resonance region between 330 eV and 30 keV. The fission cross section in this energy range was evaluated mainly on the basis of the measured data of Stopa et al.[12]

The fission widths were searched for so as to reproduce the evaluated fission cross section, by assuming the neutron strength functions and the effective scattering radius obtained with the optical model calculation which will be described later. The radiation width of 31 meV and the observable level spacing of 31.75 eV were taken from the

resolved resonances.

The unresolved resonance parameters thus obtained are given in Table 3 as well as the calculated cross sections.

2.2.3 Resonance Integrals

The measured resonance integral data are tabulated in Table 4 with the values calculated from the presently evaluated resonance parameters. The calculated fission integral of 9.5 barns agrees with the measured data within their uncertainty as the result of adjusting the fission widths for the first two resonances. On the other hand, the calculated capture integral of 102.5 barns is a little smaller than the measured ones. We could not improve this discrepancy by adjusting the resonance parameters, because the calculated thermal capture cross section is a little larger than the measured ones.

2.3 Cross Sections above Resonance Region

2.3.1 Fission Cross Section

Three measured data are available for the fission cross section in this energy range:

Moore and Keyworth[11]	(1971):	20 eV ∿ 2.8 MeV
Fomushkin et al.[14]	(1980):	0.3 MeV ∿ 4.5 MeV
Stopa et al.[12]	(1982):	0.1 eV ∿ 80 keV.

The present evaluation was made mainly on the basis of the data of Stopa et al. and Fomushkin et al. up to 4.5 MeV, and the evaluated curve was drawn by assuming the (n,n'f) cross section above 6 MeV. The evaluated fission cross section are shown in Fig. 1 with the measured data as well as the other evaluated data.

2.3.2 Other Cross Sections

No measured data have so far been reported for the other cross sections. Hence the evaluation was made by the theoretical calculation based on the optical, statistical and evaporation models.

We adopted the same optical potential parameters as used in the evaluation of ^{241}Am, ^{242m}Am, ^{242g}Am, ^{243}Am, ^{242}Cm and ^{243}Cm for JENDL-2. This potential parameters were obtained by Igarasi and Nakagawa[15] so as to reproduce the total cross section of ^{241}Am measured by Phillips and Howe[16]. The parameter set is given in Table 5. The level density parameters were taken from the recommendation by Gilbert and Cameron[17] and are given in Table 6.

The (n,2n), (n,3n) and (n,4n) reaction cross sections were calculated with Pearlstein's method[18] based on the evaporation model. The neutron emission cross section approximated to the difference between the compound nucleus formation cross section and the fission cross section, because the charged particle emission and the compound elastic scattering cross sections are negligibly small.

Taking account of the (n,2n), (n,3n), (n,4n) and fission cross sections as the competing processes, the capture, elastic and inelastic scattering cross sections were calculated with the statistical model code CASTHY[19]. The γ-ray strength function was determined to be 9.76×10^{-4} from the radiation width and the mean level spacing in the resolved resonance region. Twenty nine discrete levels were taken into account up to 1509 keV and levels above 1526 keV were assumed to be overlapping.

The level scheme of the discrete levels was taken from Table of Isotope, 7th edition[20] and is shown in Table 7. The Q-values of (n,2n), (n,3n) and (n,4n) reactions were obtained from the compilation of Wapstra and Bos[21] and are given in Table 8. The calculated cross sections are shown in Figs. 2-4 with the other evaluated data.

2.4 Other Quantities

2.4.1 Average Number of Neutrons Emitted per Fission

There is no measurement on the ν-value for the neutron-induced fission of ^{246}Cm. Hence the semi-empirical formula by Howerton was adopted;

$$\nu(Z,A_t E_n) = 2.33 + 0.06\,[2 - (-1)^{A_t+1-Z} - (-1)^Z] + 0.15\,(Z-92) + 0.02(A_t-235) + [0.130 + 0.006\,(A_t-235)] \times [E_n - E_T(Z,A_t)],$$

$$E_T(Z,A_t) = 18.6 - 0.36\,Z^2/(A_t+1) + 0.2[2 - (-1)^{A_t+1-Z} - (-1)^Z] - B_n,$$

where E_T represents the fission threshold energy, E_n is the neutron energy, A_t the mass number of target nucleus, Z the atomic number and B_n the neutron separation energy from compound nucleus. Applying $A_t = 246$, $B_n = 5.1577$ MeV, we obtained

$$E_T = 0.410 \text{ MeV}$$

$$\nu = 3.19 + 0.196\,E_n.$$

As no measurement has been reported on the number of delayed neutrons, we estimated ν_d from the systematics proposed by Tuttle[23]:

$$\nu_d = \exp[13.81 + 0.1754(A_c-3Z)(A_c/Z)],$$

where A_c is the mass number of the compound nucleus. We also assumed that the (n,n'f) process was dominant after its channel opens ($E \gtrsim 6 \sim 8$ MeV). Under these assumptions, the presently evaluated value is

$$\nu_d = 0.00916 \quad \text{for} \quad E < 6 \text{ MeV},$$

$$0.00630 \quad \text{for} \quad E > 8 \text{ MeV}.$$

Both values are linearly connected between 6 and 8 MeV.

As to the decay constants and fraction of delayed neutrons, the values for ^{240}Pu was assumed because of analogous values of $(A_c-3Z)(A_c/Z)$, and the evaluated data by Tuttle[24] were adopted.

2.4.2 Angular Distribution of Emitted Neutrons

The angular distribution of the elastically scattered neutrons were calculated with the optical model. The 90° symmetric scattering in the laboratory system was assumed for the inelastic scattering.

2.4.3 Energy Distribution of Emitted Neutrons

The simple evaporation spectrum was assumed for the inelastically scattered neutrons which leave the residual nucleus in continuum excited states (MT = 91). The nuclear temperature (θ) was determined as

$$\theta = T_n \qquad E_n < E_x$$

$$\theta = \frac{1 + \sqrt{1 - 4a(E_n - \Delta)}}{2a} \qquad E_n > E_x$$

where E_n is the incident neutron energy, and a and Δ are the level density parameters and the pairing energy of the residual nucleus. T_n is the nuclear temperature in the constant temperature model and E_x is the joining energy between the constant temperature and Fermi gas models.

As to the (n,2n) and (n,3n) reactions, we assumed the successive evaporation model. For the (n,2n) process, the first neutron evaporates leaving the residual nucleus in the excited states higher than the neutron separation energy, and then the second neutron evaporates from the excited states. In calculating the temperature for the second

neutron, we assumed that the second neutron evaporated from a excited state corresponding the average energy of the first neutron. In the ENDF/B format, the temperature of each neutron is stored independently in each subsection.

2.4.4 Fission Spectrum

The Maxwellian spectrum was adopted in the present work. As no measured data exist for ^{246}Cm, the temperature was determined from the interpolation between the data of ^{245}Cm and ^{247}Cm measured by Zhuravlev et al.[25] The obtained temperature is 1.48 MeV.

2.5 Discussion

The presently evaluated cross sections are shown in Fig. 5. The present evaluation is much based on the theoretical calculation, since the experimental data are scarce except for the fission and thermal cross sections. The applicability of the theoretical model will be discussed in chapter 4.

The resonance parameters obtained from the fission area measured by Stopa et al.[12] fail to reproduce the thermal fission cross section and the fission resonance integral. We adjusted these parameters so as to obtain good agreement. The resonance parameters of the low-lying levels should be measured more carefully.

3. Curium-247

3.1 Thermal Cross Sections

The thermal fission cross sections were measured by several experimenters. On the other hand, experimental data are scarce and discrepant for the thermal capture cross section. The measured data are shown in Table 9. The old data of Bentley et al.[26] were omitted in taking an average. The weighted average values are 60 barns for capture and 97 ± 15 barns for fission. We adopted these values.

3.2 Resonance Parameters

3.2.1 Resolved Resonance Parameters

Only two sets of measured resonance parameters have so far been reported: Belanova et al.[29] gave the total and neutron widths for 5 levels up to 18.1 eV, and Moore and Keyworth[11] gave the reduced neutron widths and fission widths for the levels between 21.3 eV and 59.66 eV.

We adopted these parameters with the radiation width of 40 meV which was assumed by Moore and Keyworth. Though Moore and Keyworth gave the fission widths with the Reich-Moore formula, we tentatively took them with Breit-Wigner formula.

The thermal cross sections calculated from these resonance parameters are much smaller than the measured ones. Hence we added a negative resonance at -0.3 eV whose widths were determined so as to reproduce the adopted fission and capture cross sections at 0.0253 eV. Finally the parameters of the first positive level at 1.247 eV were so modified that the calculated resonance integrals agreed with the measured ones.

The obtained resonance parameters are tabulated in Table 10 with those of Belanova et al. and of Moore and Keyworth. The upper energy of

the resolved resonance region was set at 60 eV, since no level missing seems to occur up to 60 eV.

3.2.2 Unresolved Resonance Parameters

The fission cross section data measured by Moore and Keyworth[11] are the only available experimental data in the energy region above 60 eV. Hence the unresolved resonance parameters were determined so as to reproduce these data.

The radiation width of 40 meV and the observable level spacing of 1.75 eV were taken from the resolved resonance parameters. The neutron strength function and the effective scattering radius were determined from the optical model calculation.

The fission widths were estimated from the channel theory[30] of fission. The energies of the transition states were assumed from the systematic survey[31] of other fissile nucleus. It was expected from the assumed transition states that

(1) the 4^- state has only one partially open channel (bending vibration),

(2) the 5^- state has one open channel (mass asymmetry vibration) and one partially open channel (bending vibration),

(3) the 3^+ and 5^+ states have one partially open channel (gamma vibration), and

(4) the 4^+ and 6^+ states have one open channel (ground state) and one partially open channel (gamma vibration).

The difference of the fission width between 4^- and 5^- states can be confirmed from the resolved resonance parameters.

Finally the neutron strength function was adjusted so as to reproduce the structure observed in the measured fission cross section. The unresolved resonance parameters are tabulated in Table 11 with the calculated cross sections.

3.2.3 Resonance Integrals

The measured resonance integrals are given in Table 12 with the calculated values from the present resonance parameters. As to the fission integral, we assumed a smaller value than the weighted average, because the data of Halperin et al.[28] deviates so much from the other two.

3.3 Cross Sections above Resonance Region

3.3.1 Fission Cross Section

The fission cross section was measured by Moore and Keyworth[11] up to 1.9 MeV. As no other experimental data exist, the present evaluated curve was drawn on the basis of their data with the eye-guide method. In the energy region above 1.9 MeV, the cross section was estimated from the trends of the other Cm-isotopes by taking account of (n,n'f) and (n,2n'f) processes.

The evaluated cross section is shown in Fig. 6 with the data of Moore and Keyworth as well as the other evaluated curves.

3.3.2 Other Cross Sections

The evaluation of all the other cross sections was made with the optical, statistical and evaporation models, as no experimental data were available.

The same optical potential parameters and the same calculation procedure were used as in the case of ^{246}Cm. The γ-ray strength function was determined from the average radiation width and the mean level spacing in the resolved resonance region. The level scheme and the Q-values of (n,2n), (n,3n) and (n,4n) reactions are shown in Tables 13 and 14, respectively.

The calculated cross sections are shown in Figs. 7-9 with the other evaluated curves.

3.4 Other Quantities

3.4.1 Average Number of Neutrons Emitted per Fission

The ν-value for the thermal fission of ^{247}Cm was reported by Zhuravlev et al.[25] to be 3.79 ± 0.15. The energy dependence was estimated from the semi-empirical formula by Howerton[22]. The present result is

$$\nu = 3.79 + 0.202\ E_n.$$

The average number of delayed neutrons was estimated with the same method as used for ^{246}Cm. The result is

$$\nu_d = 0.0134 \text{ for } E < 6 \text{ MeV},$$
$$= 0.0092 \text{ for } E > 8 \text{ MeV}.$$

As to the decay constants and the fraction of delayed neutrons, the values for ^{241}Pu were adopted, taking account of analogous $(A_c-3Z)(A_c/Z)$ values.

3.4.2 Angular and Energy Distribution of Emitted Neutrons

The same procedure as used for ^{246}Cm was adopted.

3.4.3 Fission Spectrum

The temperature was measured by Zhuravlev et al.[25] We adopted this datum: T = 1.47 MeV.

3.5 Discussion

The presently evaluated cross sections are shown in Fig. 10.

As described in section 3.2.1, Moore and Keyworth[11] gave the fission widths with Reich-Moore formula. We took them with Breit-Wigner formula, because Reich-Moore formula is not applicable to ENDF/B-V format. This may cause some errors in the calculated fission cross section particularly in the shape of valleys among resonances. This problem should be improved in future.

4. Discussion on Calculational Model

In the present theoretical calculation, we adopted the spherical optical model, although the Cm nuclides are highly deformed. This was decided from following reasons:

(1) The spherical optical model can satisfactorily reproduce the total cross section and the s- and p-wave strength functions, if an adequate set of parameters is selected.

(2) We have not yet established a consistent method to connect the coupled channel optical model to the statistical model. Various methods used outside have various approximations which cause another ambiguity on the results.

On the other hand, we admit that the present method has following drawbacks:

(1) It cannot inevitably give the direct (collective) inelastic scattering cross sections, which becomes dominant in the energy region above several MeV.

(2) Though the present potential parameters reproduce the total cross section of ^{241}Am, they contain the deformation effect of ^{241}Am. Hence it is not guaranteed that they reproduce the cross section of Cm isotopes which have different deformation.

In the recent evaluation of Cm isotopes, Maino et al.[32,33] calculated the direct contributions of elastic and inelastic scattering with the coupled channel optical model and added the results obtained with the statistical model based on the spherical optical model. Ohsawa pointed out[34], however, that such an incoherent sum of the direct contribution might overestimate the inelastic scattering cross section. Hence consistent connection should be established between the coupled channel optical model and the statistical model. This is now under way.

5. Concluding Remarks

Evaluation of neutron nuclear data was performed on ^{246}Cm and ^{247}Cm. The evaluated data were stored in magnetic tape with ENDF/B-V format and will be contained in JENDL-3.

The thermal and resonance cross sections were evaluated on the basis of measured data. The resonance integrals calculated from the present resonance parameters are consistent with the measured data. In the higher energy region, however, the evaluation was made on the basis of the theoretical calculation except for the fission cross section, because no experimental data are available for the other cross sections. Hence further experimental works are much required particularly on the capture cross section above keV region and the total cross section in MeV region. The measured capture cross section at one energy point of some tens of keV must improve the situation very much.

Acknowledgment

The author wishes to thank S. Igarasi and K. Shibata for their helpful discussion. He acknowledges T. Narita and T. Mimura for their aid in treating numerical nuclear data. He also thanks K. Teruyama for her assistance in computation. Careful typewriting by N. Komatsu is much appreciated. This work was made under contracts between Power Reactor and Nuclear Fuel Development Corporation and Japan Atomic Energy Research Institute.

References

1) Halperin J., Druschel R.E. and Eby R.E.: "Chemistry Division Annual Progress Report for Period Ending May 20, 1969", p.20 ORNL-4437 (1969)

2) Thompson M.C., Hyder M.L. and Reuland R.J.: J. Inorg. Nucl. Chem., 33, 1553 (1971)

3) Benjamin R.W., MacMurdo K.W. and Spencer J.D.: Nucl. Sci. Eng., 47, 203 (1972)

4) Zhuravlev K.D., Kroshkin N.I. and Chetverikov A.P.: Sov. At. Energy, 39, 907 (1975)

5) Gavrilov V.D. and Goncharov V.A.: Sov. At. Energy, 44, 274 (1978)

6) Nakagawa T.: "Proc. 1978 Seminar on Nuclear Data, Dec. 20-21, 1978, Tokai", p.51, JAERI-M 8163 (1979) [in Japanese]

7) Coté R.E., Barnes R.F. and Diamond H.: Phys. Rev., 134B, 1281 (1964)

8) Berreth J.R., Simpson F.B. and Rusche B.C.: Nucl. Sci. Eng., 49, 145 (1972)

9) Benjamin R.W., Ahlfeld C.E., Harvey J.A. and Hill N.W.: Nucl. Sci. Eng., 55, 440 (1974)

10) Belanova T.S., Zamyatin Yu.S., Kolesov A.G., Kocherygin N.G., Nikol'skii S.N., Safonov V.A., Kalebin S.M., Artamonov V.S. and Ivanov R.N.: Sov. At. Energy, 39, 1020 (1975)

11) Moore M.S. and Keyworth G.A.: Phys. Rev., C3, 1656 (1971)

12) Stopa C.R.S., Maguire H.T., Jr., Harris D.R., Block R.C., Slovacek R.E., Dabbs J.W.T., Dougan R.J., Hoff R.W. and Lougheed R.W.: Paper Presented at ANS Topical Meeting on Advances in Reactor Physics and Core Thermal Hydraulics, Sept. 22-24, 1982, Kiamesha Lake, New York.

13) Schuman R.P. and Berreth J.R.: "Resonance Integral Measurements", IN-1296 (1969)

14) Fomushkin E.F., Novoselov G.F., Vinogradov Yu.I., Gavrilov V.V. and Zherebtsov V.A.: Sov. J. Nucl. Phys., 31, 19 (1980)

15) Igarasi S. and Nakagawa T.: "Evaluation of Neutron Nuclear Data for ^{242}Cm", JAERI-M 8342 (1979) [in Japanese]

16) Phillips T.W. and Howe R.E.: Nucl. Sci. Eng., 69, 375 (1979)

17) Gilbert A. and Cameron A.G.W.: Can. J. Phys., 43, 1446 (1965)

18) Pearlstein S.: Nucl. Sci. Eng., 23, 238 (1965)

19) Igarasi S.: J. Nucl. Sci. Technol., 12, 67 (1975)

20) Lederer C.M. and Shirley V.S.: "Table of Isotopes", 7th Edition (1978)

21) Wapstra A.H. and Bos K.: Atomic Data and Nuclear Data Tables, 19, No.3 (1977)

22) Howerton R.J.: Nucl. Sci. Eng., 62, 438 (1977)

23) Tuttle R.J.: Proc. Consultant's Meeting on Delayed Neutron Properties, Vienna, 26-30 March 1979, p.29, INDC(NDS)-107/G+Special (1979)

24) Tuttle R.J.: Nucl. Sci. Eng., 56, 37 (1975)

25) Zhuravlev K.D., Zamyatnin Yu.S., Kroshkin N.I.: Proc. 2nd All Union Conf. Neutron Physics, Kiev, 1973, Vol.4, p.57 (1973) [in Russian]

26) Bentley W.C., Diamond H., Fields P.R., Friedman A.M., Gindler J.E., Hass D.C., Huizenga J.R., Inghram M.G., Jaffey A.J., Magnusson L.B., Manning W.M., Mech J.F., Pyle G.L., Sjoblom R., Stevens C.M. and Studier M.H.: Proc. 1st Geneva Conf., 1955, Vol.7, p.261 (1956) U.N., New York

27) Diamond H., Hines J.J., Sjoblom R.K., Barnes R.F., Metta D.N., Lerner J.L. and Fields P.R.: J. Inorg. Nucl. Chem., 30, 2553 (1968)

28) Halperin J., Oliver J.H., Stoughton R.W.: "Chemistry Division Annual Progress Report for Period May 20, 1970", p.37, ORNL-4581 (1970)

29) Belanova T.S., Kolesov A.G., Klinov A.V., Nikol'skii S.N., Poruchikov V.A., Nefedov V.N., Artamonov V.S., Ivanov R.N. and Kalebin S.M.: Sov. At. Energy, 47, 772 (1979)

30) Bohr A.: Proc. 1st Geneva Conf., 1955, Vol.2, p.151 (1956), U.N., New York

31) Kikuchi Y. and An S.: J. Nucl. Sci. Technol., 7, 157 (1970)

32) Maino G., Menapace E., Vaccari M. and Ventura A.: "Evaluation of ^{246}Cm Neutron Cross Sections from 10^{-5} eV to 15 MeV", TIB/FICS(82)3, INDC(ITY)-8 (1982)

33) Maino G., Menapace E., Vaccari M. and Ventura A.: "Evaluation of Cm-247 Neutron Cross-Sections from 10^{-5} eV to 15 MeV", TIB/FICS(82)6, INDC(ITY)-9 (1982)

34) Ohsawa T.: Private Communication (1983)

Table 1 Thermal cross sections of ^{246}Cm

(barns)

	Capture	Fission
Experimental		
69 Halperin[1]	1.2 ± 0.4	
71 Thompson[2]	1.5 ± 0.5	
72 Benjamin[3]		0.17 ± 0.10
75 Zhuravlev[4]		0.14 ± 0.05
78 Gavrilov[5]	1.14 ± 0.3	
Average	1.23 ± 0.14	0.15 ± 0.01
Present*	1.33	0.142

* Calculated from the resonance parameters.

Table 2 Resonance parameters of ^{246}Cm

ENERGY (EV)	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH* (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	MISCELLANEOUS**	REFERENCE
4.315	0.5		0.34 ± 0.01	31 ± 6	(3.6)	L = 0	JENDL-3
						COM= GF-ADJUSTED	
4.31 ± 0.02			* 0.36 ± 0.04	35 ± 2		WGH= 0.17 ± 0.01	BNL-325(3)
4.33		36.4 ± 5.0	0.39 ± 0.01	35 ± 5		S = 6700 ±900	64COTE+
4.31 ± 0.02				35 ± 2		GNO= 0.16 ± 0.15	72BERRETH+
4.315± 0.003				31 ± 6		GNO= 0.15 ± 0.01	74BENJAMIN+
4.32		27 ± 2	0.34 ± 0.01			S = 11170	77BELANOVA+
4.31			(0.35 ± 0.04)	(35 ± 2)	0.43 ± 0.11	ARF= 4.0 ± 0.1	81BLOCK+
4.3						ARF= 4.1 ± 0.5	82STOPA+
15.33	0.5		0.52 ± 0.01	(31 ± 6)	(3.6)	L = 0	JENDL-3
						COM= GF-ADJUSTED	
15.29 ± 0.8			* 0.55 ± 0.08	35 ± 3		WGH= 0.14 ± 0.02	BNL-325(3)
15.29 ± 0.08				35 ± 3		GNO= 0.14 ± 0.02	72BERRETH+
15.33 ± 0.02				31		GNO= 0.14 ± 0.03	74BENJAMIN+
15.29		28 ± 3	0.52 ± 0.01			S = 1580	77BELANOVA+
15.3			(0.55 ± 0.08)	(35 ± 3)	0.40 ± 0.10	ARF= 1.6 ± 0.4	81BLOCK+
15.3						ARF= 1.6 ± 0.3	82STOPA+
(19.66)							64COTE+
26.9			1.6 ± 0.7				64COTE+
(36.2)							64COTE+
84.62	0.5		28.3 ± 0.2	28.9	0.53 ± 0.1	L = 0	JENDL-3
84.43			* 22 ± 5	(37)	0.70 ± 0.10	WGH= 2.39 ± 0.54	BNL-325(3)
84.6			35				64COTE+
84.43			22 ± 5	(37)	0.70 ± 0.10	ARF= 12.5 ± 0.4	71MOORE+
						ARG= 661 ±100	
84.62 ± 0.06				31		GNO= 2.9 ± 0.3	74BENJAMIN+
84.4			17.8 ± 8.5				77BELANOVA+
91.91	0.5		20.9 ± 3.3	(31 ± 6)	0.14 ± 0.03	L = 0	JENDL-3
91.84			* 18.0 ± 1.5	(37)	0.17 ± 0.03	WGH= 1.88 ± 0.16	BNL-325(3)
91.84			19 ± 2	(37)	0.17 ± 0.03	ARF= 2.8 ± 0.4	71MOORE+
						ARG= 560 ±30	
91.91 ± 0.06				31		GNO= 1.0 ± 0.3	74BENJAMIN+
91.5			9.9 ± 2.5			S = 5220	77BELANOVA+
158.5	0.5		31.7 ± 3.5	32.7	0.83 ± 0.11	L = 0	JENDL-3
158.4			* 30 ± 3	(37)		WGH= 2.39 ± 0.24	BNL-325(3)
158.4			29 ± 5	(37)	0.73 ± 0.11	ARF= 8.2 ± 0.8	71MOORE+
						ARG= 414 ±40	
158.5 ± 0.1				31		GNO= 2.1 ± 0.7	74BENJAMIN+
157.0			34.1 ± 7.6			S = 10450	77BELANOVA+
158.5						ARF= 12 ± 4	82STOPA+
250.7	0.5		9.1 ± 6	(31 ± 6)	0.32 ± 0.3	L = 0	JENDL-3
250.7			* 9 ± 6	(37)	0.38 ± 0.30	WGH= 0.57 ± 0.38	BNL-325(3)
250.7			9 ± 6	(37)	0.38 ± 0.3	ARF= 1.2 ± 0.5	71MOORE+
						ARG= 116 ±60	
278.3	0.5		6.5 ± 6	(31 ± 6)	1.12 ± 1.2	L = 0	JENDL-3
278.3			* 7 ± 6	(37)	1.3 ± 1.2	WGH= 0.42 ± 0.36	BNL-325(3)
278.3			7 ± 6	(37)	1.3 ± 1.2	ARF= 2.9 ± 0.9	71MOORE+
						ARG= 80 ±60	
288.2	0.5		83 ±87	(31 ± 6)	0.26 ± 0.14	L = 0	JENDL-3
288.2			* 59 ±38	(37)	0.31 ± 0.14	WGH= 3.5 ± 2.2	BNL-325(3)
288.2			59 ±38	(37)	0.31 ± 0.14	ARF= 2.7 ± 0.9	71MOORE+
						ARG= 323 ±80	
313.4	0.5		29 ±11	(31 ± 6)	0.13 ± 0.1	L = 0	JENDL-3
313.4			* 25 ± 8	(37)		WGH= 1.4 ± 0.5	BNL-325(3)
313.4			25 ± 8	(37)	0.15 ± 0.10	ARF= 0.8 ± 0.3	71MOORE+
						ARG= 197 ±35	
361	0.5		97	(31 ± 6)	(0.41)	L = 0	JENDL-3
361.0				(37)			BNL-325(3)
361.0						ARF= 3.5 ± 0.7	71MOORE+
						COM= DOUBLET H	
361.1	0.5		290 ±530	(31 ± 6)	0.15 ± 0.09	L = 0	JENDL-3
361.1			*118 ±57	(37)	0.18 ± 0.09	WGH= 6.0 ± 6.9	BNL-325(3)
361.1			118 ±57	(37)	0.18 ± 0.09	ARF= 1.5 ± 0.6	71MOORE+
						ARG= 303 ±35	

* A denotes $g\Gamma_n$

** L : orbital angular momentum

COM: comment

WGH: $g\Gamma_n^0$

S : σ_0

GNO: Γ_n^0

ARF: fission area

ARG: capture area

Table 3 Energy dependence of unresolved resonance parameters and the calculated cross sections for ^{246}Cm

The energy dependent fission widths and D_{obs} are given with the fixed parameters listed below:

$S_0 = 0.94 \times 10^{-4}$ $S_1 = 3.17 \times 10^{-4}$ $S_2 = 0.88 \times 10^{-4}$

$R = 9.15$ fm $\Gamma_\gamma = 31$ meV

E_n (keV)	Γ_f (meV)	D_{obs} (eV)	σ_t (barns)	σ_c (barns)	σ_f (barns)
0.33	2.02	31.7	32.0	5.40	0.336
0.35	2.25	31.7	31.4	5.15	0.356
0.4	1.87	31.7	30.1	4.68	0.271
0.45	1.47	31.7	29.0	4.30	0.198
0.5	1.30	31.7	28.1	3.99	0.163
0.55	1.30	31.7	27.3	3.72	0.152
0.6	1.48	31.7	26.6	3.49	0.161
0.7	2.00	31.7	25.4	3.11	0.192
0.8	2.56	31.7	24.5	2.82	0.220
0.9	2.49	31.7	23.7	2.60	0.198
1.0	2.20	31.7	23.1	2.44	0.165
1.5	1.86	31.7	20.9	1.91	0.110
2.0	1.87	31.6	19.6	1.63	0.0937
2.4	1.96	31.6	18.9	1.49	0.0895
2.7	2.26	31.6	18.5	1.40	0.0970
3.0	2.31	31.6	18.1	1.34	0.0940
4.0	2.33	31.5	17.2	1.18	0.0836
5.0	2.22	31.5	16.6	1.08	0.0733
6.0	2.17	31.4	16.2	1.01	0.0667
8.0	2.18	31.3	15.6	0.897	0.0600
10	2.23	31.2	15.3	0.816	0.0558
15	2.25	30.9	14.7	0.677	0.0470
20	2.33	30.6	14.4	0.585	0.0422
30	2.57	30.1	14.0	0.468	0.0373

Table 4 Resonance integrals of ^{246}Cm

(barns)

	Capture	Fission
Experimental		
69 Schuman[13]	110 ± 40	
69 Halperin[1]	121 ± 7	
71 Thompson[2]	135 ± 25	
72 Benjamin[3]		10.0 ± 0.4
75 Zhuravlev[4]		13.3 ± 1.5
78 Gavrilov[5]	118 ± 15	
Average	121 ± 8	10.3 ± 2.5
Present*	102.5	9.5

* Calculated from the resonance parameters.

Table 5 Optical potential parameters

V	$= 43.4 - 0.107\ E_n$	(MeV)
W_s	$= 6.95 - 0.339\ E_n + 0.0531\ E_n^2$	(MeV)
V_{so}	$= 7.0$	(MeV)
r_o	$= r_{so} = 1.282$	(fm)
r_s	$= 1.29$	(fm)
a	$= a_{so} = 0.60$	(fm)
b	$= 0.5$	(fm)

Derivative Wood-Saxon form for surface imaginary term and no volume term.

Table 6 Level density parameters of Cm-isotopes

Isotope		243	244	245	246	247	248
a	(MeV^{-1})	25.59	25.97	26.03	25.98	26.20	26.46
$\sigma_M^2/\sqrt{U}$	($MeV^{-\frac{1}{2}}$)	17.49	17.67	17.74	17.77	17.89	18.03
Δ	(MeV)	0.72	1.22	0.72	1.11	0.72	1.623
Ex	(MeV)	3.84	4.33	3.83	4.22	3.83	4.73
T	(MeV)	0.420	0.415	0.415	0.415	0.413	0.411

Table 7 Level Scheme of ^{246}Cm

No	Energy (keV)	I^{π}	No	Energy (keV)	I^{π}
GS	0	0^+	15	1165	3^+
1	42.85	2^+	16	1175	0^+
2	141.99	4^+	17	1179	8^-
3	295.5	6^+	18	1211	2^+
4	500.0	8^+	19	1220	4^+
5	841.7	2^-	20	1250	1^-
6	876.4	3^-	21	1289	0^+
7	923.3	4^-	22	1300	3^-
8	981.0	5^-	23	1318	2^+
9	1051	6^-	24	1349	1^-
10	1079	1^-	25	1367	2^-
11	1105	2^-	26	1379	4^+
12	1124	2^+	27	1452	1^+
13	1128	3^-	28	1478	2^+
14	1129	7^-	29	1509	3^+

Levels above 1526 keV are assumed to be overlapping.

Table 8 Q-values and threshold energies of (n,xn) reaction cross sections for ^{246}Cm

Reaction	Q-value (MeV)	Threshold energy (MeV)
n,2n	- 6.4570	6.4835
n,3n	-11.9770	12.0261
n,4n	-18.7765	18.8534

Table 9 Thermal cross sections of ^{247}Cm

(barns)

	Capture	Fission
Experimental		
55 Beniley[26]	180*	
68 Diamond[27]		108 ± 5
70 Halperin[28]		120 ± 12
72 Benjamin[3]		82 ± 5
75 Zhuravlev[4]		80 ± 7
78 Gavrilov[5]	60	
Average	60	97 ± 15
Present**	59.9	97.0

* Omitted in averaging.

** Calculated from the resonance parameters.

Table 10 Resonance parameters of ^{247}Cm

ENERGY (EV)	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH* (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	MISCELLANEOUS**	REFERENCE
-0.3	4.5		0.0221	(40)	67.8	L = 0 COM= THERMAL-ADJUST	JENDL-3
1.247 1.247± 0.005	4.5	74 ± 4	0.643 a 0.56 ± 0.09	29.4	44.6	L = 0 COM= RI-ADJUSTED H	JENDL-3 79BELANOVA+
2.919 2.919± 0.010	4.5	70 ±30	0.10 a 0.10 ± 0.04	(40)	30	L = 0	JENDL-3 79BELANOVA+
3.189 3.189± 0.010	4.5	103 ± 6	1.0 a 1.0 ± 0.1	(40)	62	L = 0	JENDL-3 79BELANOVA+
9.55 9.55 ± 0.03	4.5	166 ±60	0.91 a 0.91 ± 0.33	(40)	125	L = 0	JENDL-3 79BELANOVA+
18.1 18.1 ± 0.1	4.5	210 ±170	3.7 a 3.7 ± 1.5	(40)	166	L = 0	JENDL-3 79BELANOVA+
21.30 21.30 21.30	4.5		0.13 a 0.13 a 0.13	(40) (40) (40)	404 404 404	L = 0 WOO= 0.027 WOO= 0.027	JENDL-3 BNL-325(3) 71MOORE+
24.03 24.03 24.03	4.5		0.044 a 0.044 a 0.044	(40) (40) (40)	134 134 134	L = 0 WOO= 0.008 WOO= 0.008	JENDL-3 BNL-325(3) 71MOORE+
25.36 25.36 25.36	4.5		0.010 a 0.010 a 0.010	(40) (40) (40)	28 28 28	L = 0 WOO= 0.002 WOO= 0.002	JENDL-3 BNL-325(3) 71MOORE+
26.19 26.19 26.19	4.5		0.15 a 0.15 a 0.15	(40) (40) (40)	220 220 220	L = 0 WOO= 0.003 WOO= 0.003	JENDL-3 BNL-325(3) 71MOORE+
28.04 28.04 28.04	4.5		0.058 a 0.058 a 0.058	(40) (40) (40)	53 53 53	L = 0 WOO= 0.011 WOO= 0.011	JENDL-3 BNL-325(3) 71MOORE+
30.25 30.25 30.25	4.5		3.45 a 3.45 a 3.45	(40) (40) (40)	4 4 4	L = 0 WOO= 0.627 WOO= 0.627	JENDL-3 BNL-325(3) 71MOORE+
30.62 30.62 30.62	4.5		0.19 a 0.19 a 0.19	(40) (40) (40)	52 52 52	L = 0 WOO= 0.034 WOO= 0.034	JENDL-3 BNL-325(3) 71MOORE+
32.23 32.23 32.23	4.5		0.51 a 0.51 a 0.51	(40) (40) (40)	26 26 26	L = 0 WOO= 0.089 WOO= 0.089	JENDL-3 BNL-325(3) 71MOORE+
36.36 36.36 36.36	4.5		1.83 a 1.83 a 1.83	(40) (40) (40)	61 61 61	L = 0 WOO= 0.270 WOO= 0.270	JENDL-3 BNL-325(3) 71MOORE+
37.74 37.74 37.74	4.5		0.025 a 0.025 a 0.025	(40) (40) (40)	666 666 666	L = 0 WOO= 0.004 WOO= 0.004	JENDL-3 BNL-325(3) 71MOORE+
37.76 37.76 37.76	4.5		1.33 a 1.33 a 1.33	(40) (40) (40)	13 13 13	L = 0 WOO= 0.217 WOO= 0.217	JENDL-3 BNL-325(3) 71MOORE+
38.52 38.52 38.52	4.5		0.008 a 0.008 a 0.008	(40) (40) (40)	706 706 706	L = 0 WOO= 0.001 WOO= 0.001	JENDL-3 BNL-325(3) 71MOORE+
38.95 38.95 38.95	4.5		0.095 a 0.095 a 0.095	(40) (40) (40)	167 167 167	L = 0 WOO= 0.016 WOO= 0.016	JENDL-3 BNL-325(3) 71MOORE+
40.61 40.61 40.61	4.5		0.032 a 0.032 a 0.032	(40) (40) (40)	48 48 48	L = 0 WOO= 0.005 WOO= 0.005	JENDL-3 BNL-325(3) 71MOORE+
41.25 41.25 41.25	4.5		0.66 a 0.66 a 0.66	(40) (40) (40)	20 20 20	L = 0 WOO= 0.103 WOO= 0.103	JENDL-3 BNL-325(3) 71MOORE+
41.76 41.76 41.76	4.5		0.052 a 0.052 a 0.052	(40) (40) (40)	546 546 546	L = 0 WOO= 0.008 WOO= 0.008	JENDL-3 BNL-325(3) 71MOORE+
43.39 43.39 43.39	4.5		0.19 a 0.19 a 0.19	(40) (40) (40)	4 4 4	L = 0 WOO= 0.029 WOO= 0.029	JENDL-3 BNL-325(3) 71MOORE+
44.87	4.5		2.10	(40)	32	L = 0	JENDL-3

ENERGY (EV)	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH* (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	MISCELLANEOUS**	REFERENCE
44.87			A 2.10	(40)	32	WGO= 0.313	BNL-325(3)
44.87			A 2.10	(40)	32	WGO= 0.313	71MOORE+
45.21	4.5		0.58	(40)	60	L = 0	JENDL-3
45.21			A 0.58	(40)	60	WGO= 0.086	BNL-325(3)
45.21			A 0.58	(40)	60	WGO= 0.086	71MOORE+
47.92	4.5		1.17	(40)	164	L = 0	JENDL-3
47.92			A 1.17	(40)	164	WGO= 0.169	BNL-325(3)
47.92			A 1.17	(40)	164	WGO= 0.169	71MOORE+
48.85	4.5		6.80	(40)	82	L = 0	JENDL-3
48.85			A 6.80	(40)	82	WGO= 0.973	BNL-325(3)
48.85			A 6.80	(40)	82	WGO= 0.973	71MOORE+
50.08	4.5		2.36	(40)	55	L = 0	JENDL-3
50.08			A 2.36	(40)	55	WGO= 0.334	BNL-325(3)
50.08			A 2.36	(40)	55	WGO= 0.334	71MOORE+
50.69	4.5		3.18	(40)	52	L = 0	JENDL-3
50.69			A 3.18	(40)	52	WGO= 0.447	BNL-325(3)
50.69			A 3.18	(40)	52	WGO= 0.447	71MOORE+
51.78	4.5		1.66	(40)	14	L = 0	JENDL-3
51.78			A 1.66	(40)	14	WGO= 0.231	BNL-325(3)
51.78			A 1.66	(40)	14	WGO= 0.231	71MOORE+
52.19	4.5		1.26	(40)	4	L = 0	JENDL-3
52.19			A 1.26	(40)	4	WGO= 0.175	BNL-325(3)
52.19			A 1.26	(40)	4	WGO= 0.175	71MOORE+
53.63	4.5		0.45	(40)	324	L = 0	JENDL-3
53.63			A 0.45	(40)	324	WGO= 0.062	BNL-325(3)
53.63			A 0.45	(40)	324	WGO= 0.062	71MOORE+
55.10	4.5		0.53	(40)	38	L = 0	JENDL-3
55.10			A 0.53	(40)	38	WGO= 0.072	BNL-325(3)
55.10			A 0.53	(40)	38	WGO= 0.072	71MOORE+
56.18	4.5		0.66	(40)	69	L = 0	JENDL-3
56.18			A 0.66	(40)	69	WGO= 0.088	BNL-325(3)
56.18			A 0.66	(40)	69	WGO= 0.088	71MOORE+
59.66	4.5		1.57	(40)	114	L = 0	JENDL-3
59.66			A 1.57	(40)	114	WGO= 2.037	BNL-325(3)
59.66			A 1.57	(40)	114	WGO= 2.037	71MOORE+

* A denotes $2g\Gamma_n$

** L : orbital angular momentum

COM: comment

WGO: $g\Gamma_n^0$

Table 11 Energy dependence of unresolved resonance parameters and the calculated cross sections for ^{247}Cm

The energy dependences of S_0, S_1 and D_{obs} are given with the fixed parameters listed below:

$R = 9.1521$ fm $\Gamma_\gamma = 40$ meV

$\Gamma_f^{(4-)} = 53.4$ meV $\Gamma_f^{(5-)} = 500$ meV

$\Gamma_f^{(3+)} = 80$ meV $\Gamma_f^{(4+)} = 680$ meV

$\Gamma_f^{(5+)} = 50$ meV $\Gamma_f^{(6+)} = 470$ meV.

E_n (keV)	S_0 ($\times 10^{-4}$)	S_1 ($\times 10^{-4}$)	D_{obs} (eV)	σ_t (barns)	σ_c (barns)	σ_f (barns)
0.06	2.52	7.64	1.75	144.6	38.8	77.3
0.07	2.75	8.36	1.75	146.4	38.0	77.3
0.09	0.82	2.50	1.75	46.4	11.8	21.7
0.125	0.78	2.38	1.75	39.5	9.45	17.5
0.175	1.24	3.75	1.75	49.2	11.6	22.6
0.25	1.35	4.10	1.75	45.9	10.1	20.3
0.35	0.93	2.84	1.75	31.3	6.15	12.1
0.45	0.96	2.92	1.75	29.4	5.45	10.9
0.55	1.43	4.35	1.75	36.0	6.61	14.1
0.7	1.13	3.42	1.75	28.4	4.77	10.0
0.9	1.14	3.46	1.75	26.5	4.16	8.87
1.25	0.88	2.66	1.75	21.0	2.82	5.92
1.75	1.02	3.09	1.74	20.9	2.61	5.70
2.5	1.08	3.27	1.74	19.9	2.24	5.04
3.5	0.89	2.70	1.74	17.2	1.64	3.64
4.5	0.99	3.00	1.73	17.2	1.57	3.58
5.5	0.98	2.97	1.73	16.6	1.42	3.26
7.0	0.97	2.94	1.72	16.0	1.28	2.95
9.0	0.94	2.86	1.72	15.3	1.14	2.63
12.5	1.00	3.05	1.70	15.1	1.06	2.51
17.5	0.95	2.88	1.68	14.4	0.912	2.19
25	0.97	2.95	1.66	14.1	0.829	2.07
30	1.00	3.04	1.64	14.0	0.796	2.05

Table 12 Resonance integrals of ^{247}Cm

(barns)

	Capture	Fission
Experimental		
70 Halperin[28]		1060 ± 110
72 Benjamin[3]		778 ± 50
75 Zhuravlev[4]		730 ± 70
78 Gavrilov[5]	490	
Average	490	825 ± 122
Present*	495	769

* Calculated from the resonance parameters.

Table 13 Level scheme of ^{247}Cm

No	Energy (keV)	I^{π}	No	Energy (keV)	I^{π}
GS	0	$9/2^-$	6	317	$9/2^+$
1	61.5	$11/2^-$	7	342	$9/2^+$
2	133	$13/2^-$	8	404	$1/2^+$
3	227	$5/2^+$	9	433	$3/2^+$
4	266	$7/2^+$	10	449	$5/2^+$
5	285	$7/2^+$			

Levels above 479 keV are assumed to be overlapping.

Table 14 Q-values and threshold energies of (n,xn) reaction cross sections for ^{247}Cm

Reaction	Q-value (MeV)	Threshold energy (MeV)
n,2n	- 5.1577	5.1787
n,3n	-11.6147	11.6621
n,4n	-17.1347	17.2046

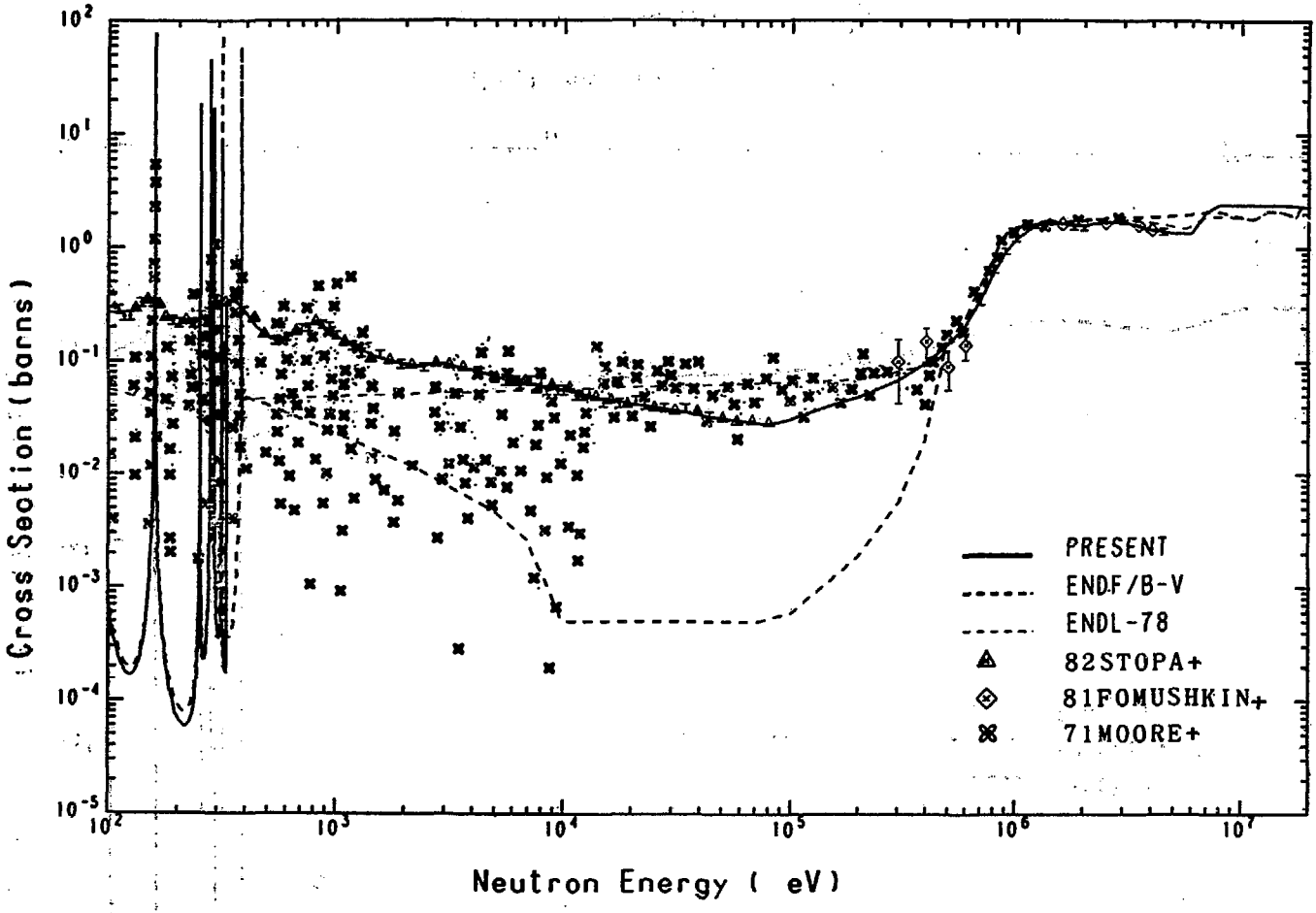

Fig. 1 Fission cross sections of ^{246}Cm

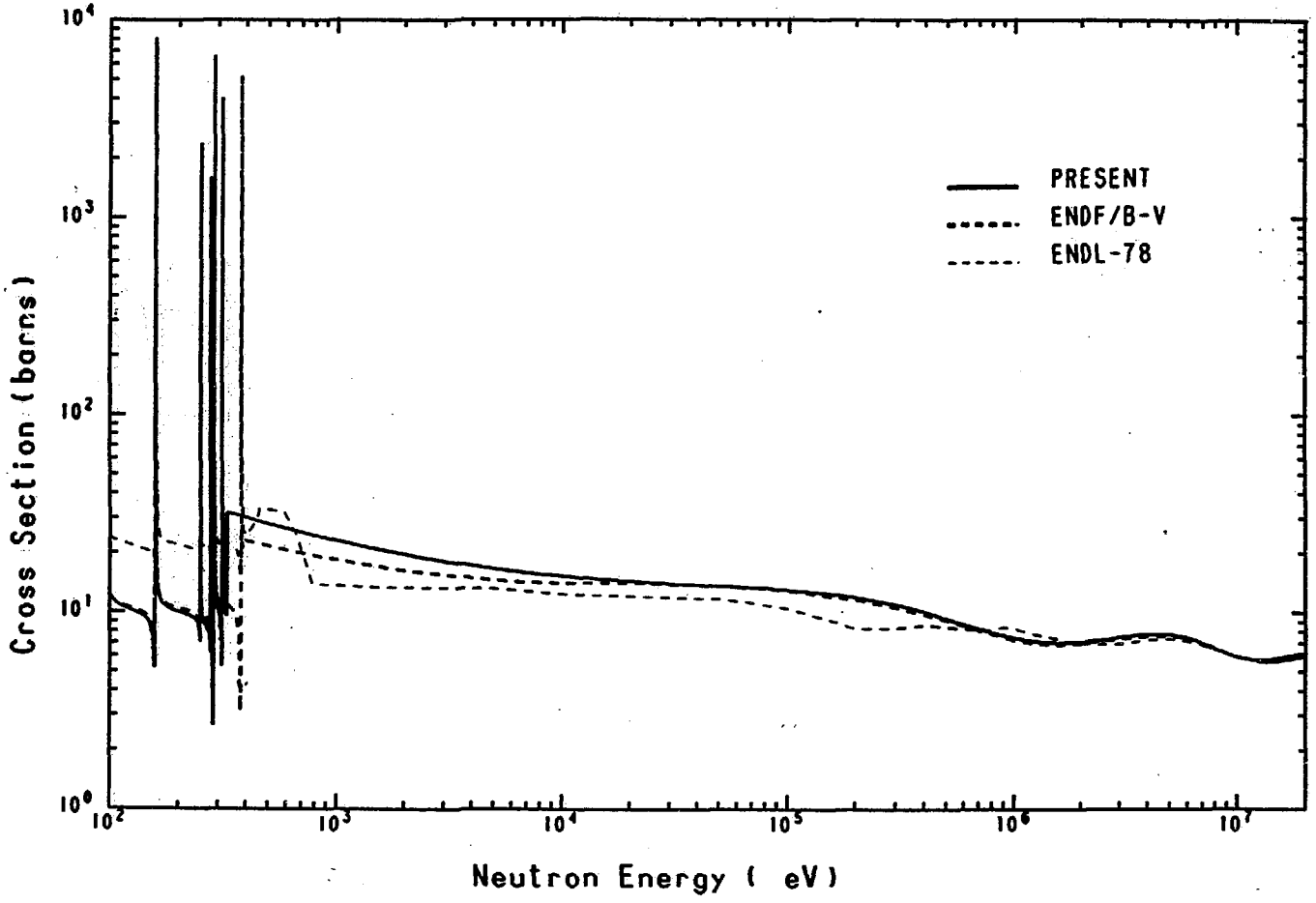

Fig. 2 Total cross sections of ^{246}Cm

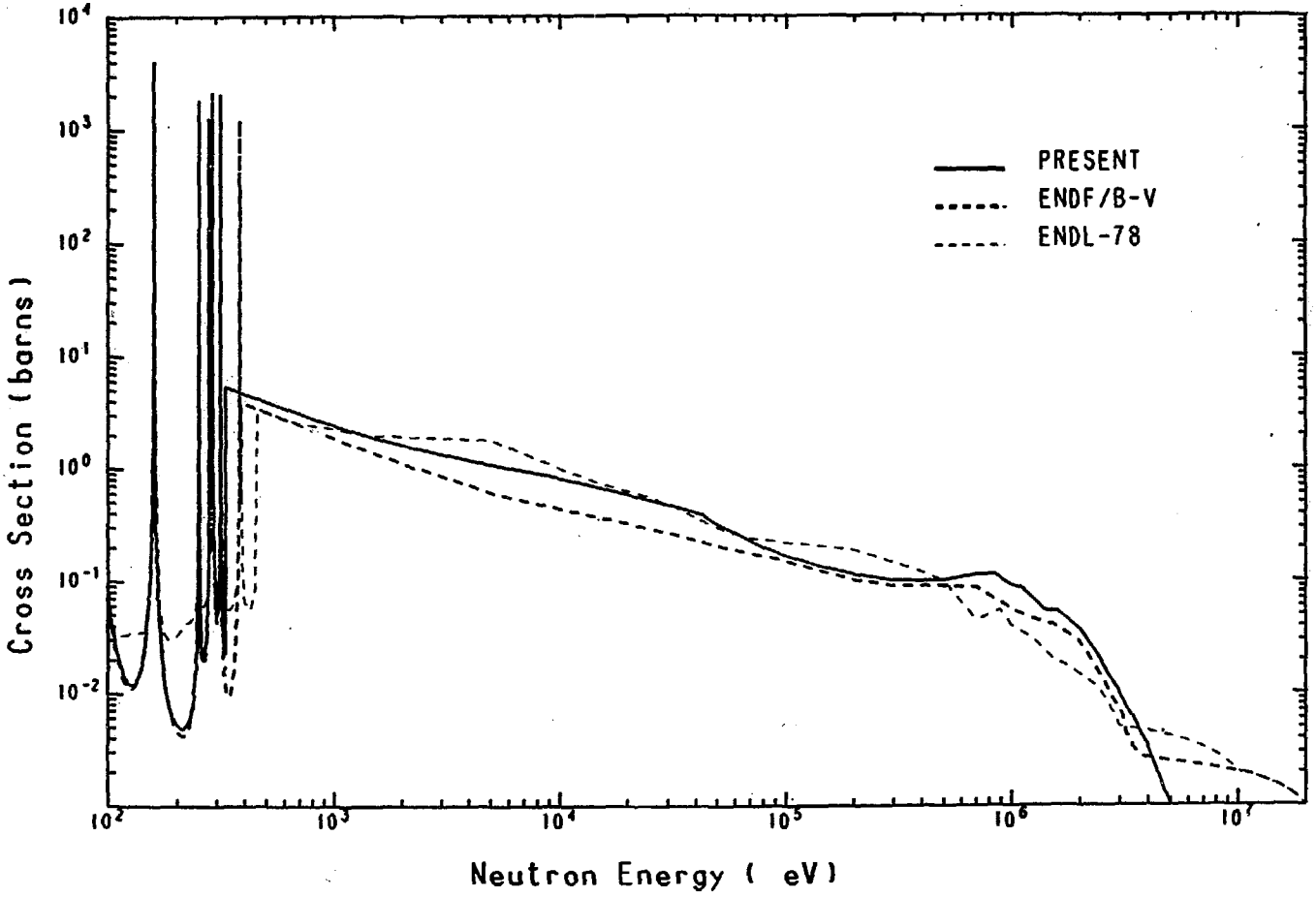

Fig. 3 Capture cross sections of ^{246}Cm

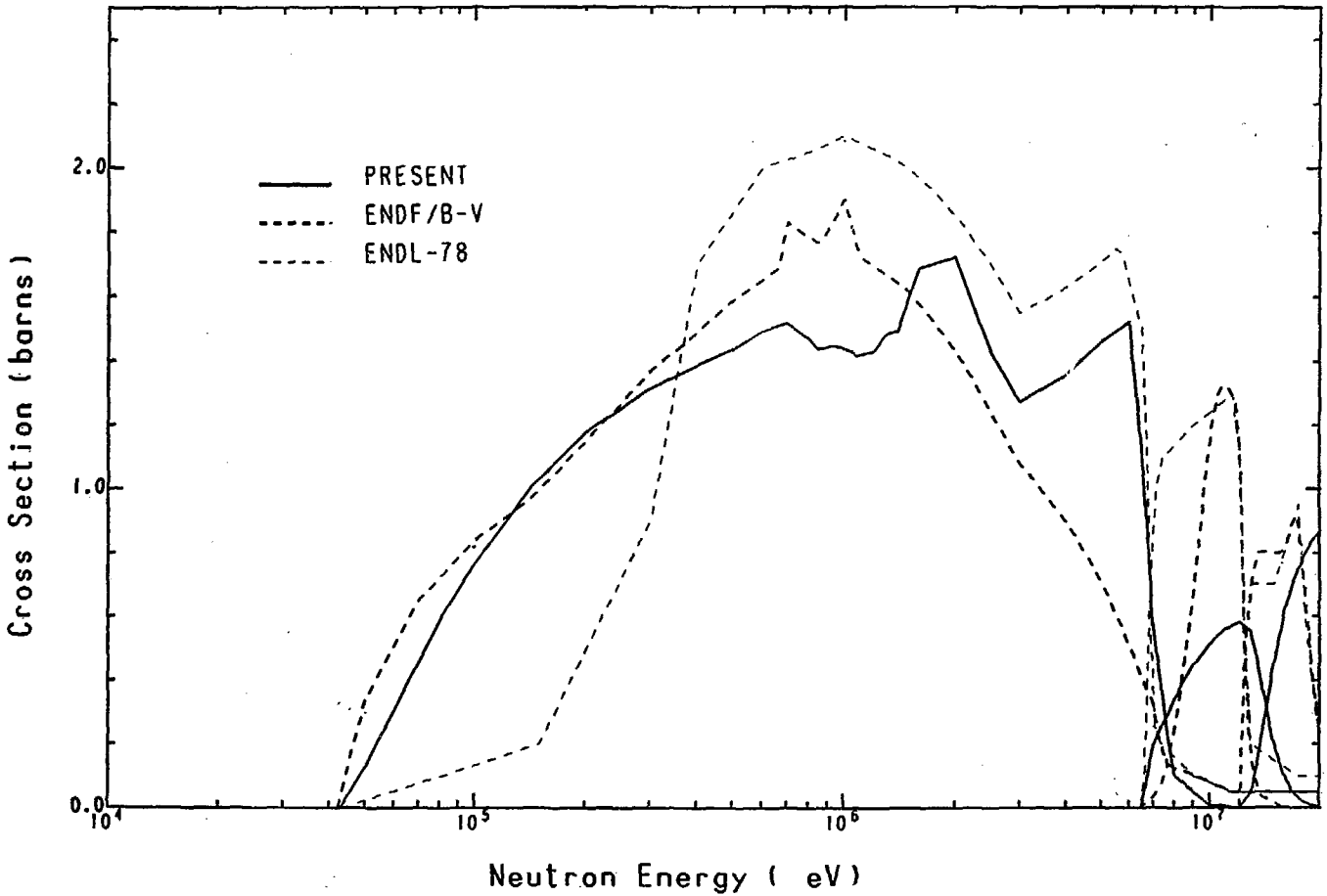

Fig. 4 Inelastic scattering, (n,2n) and (n,3n) reaction cross sections of ^{246}Cm

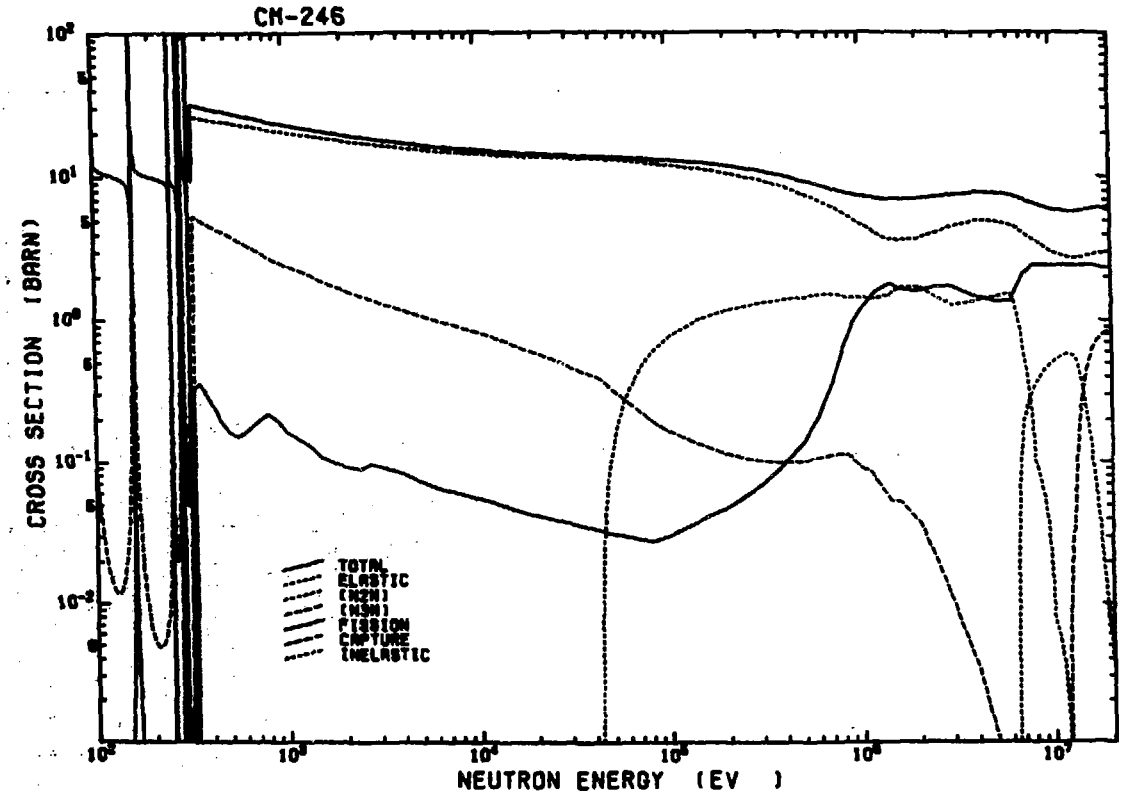

Fig. 5 Evaluated cross sections of ^{246}Cm

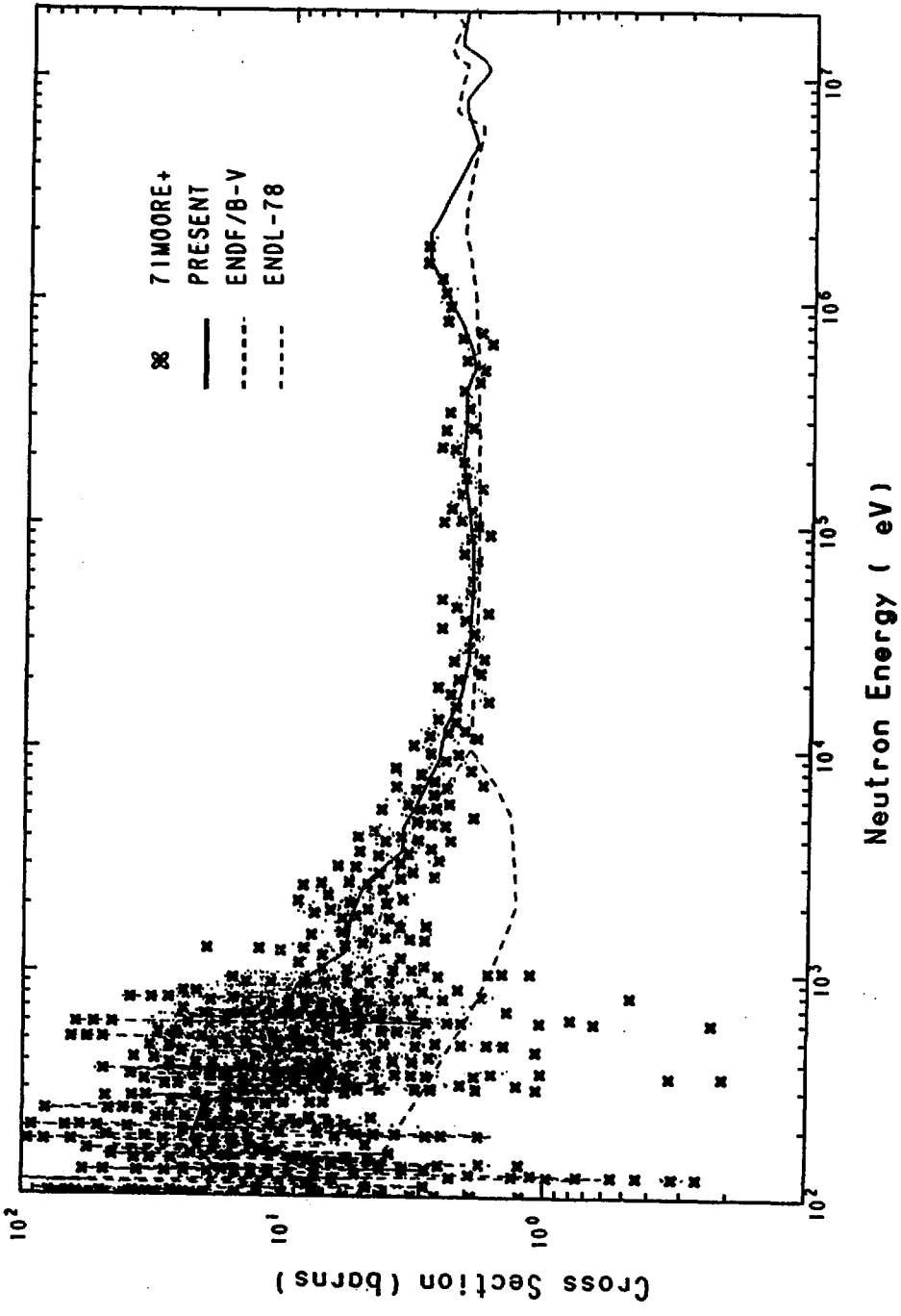

Fig. 6 Fission cross sections of ^{247}Cm

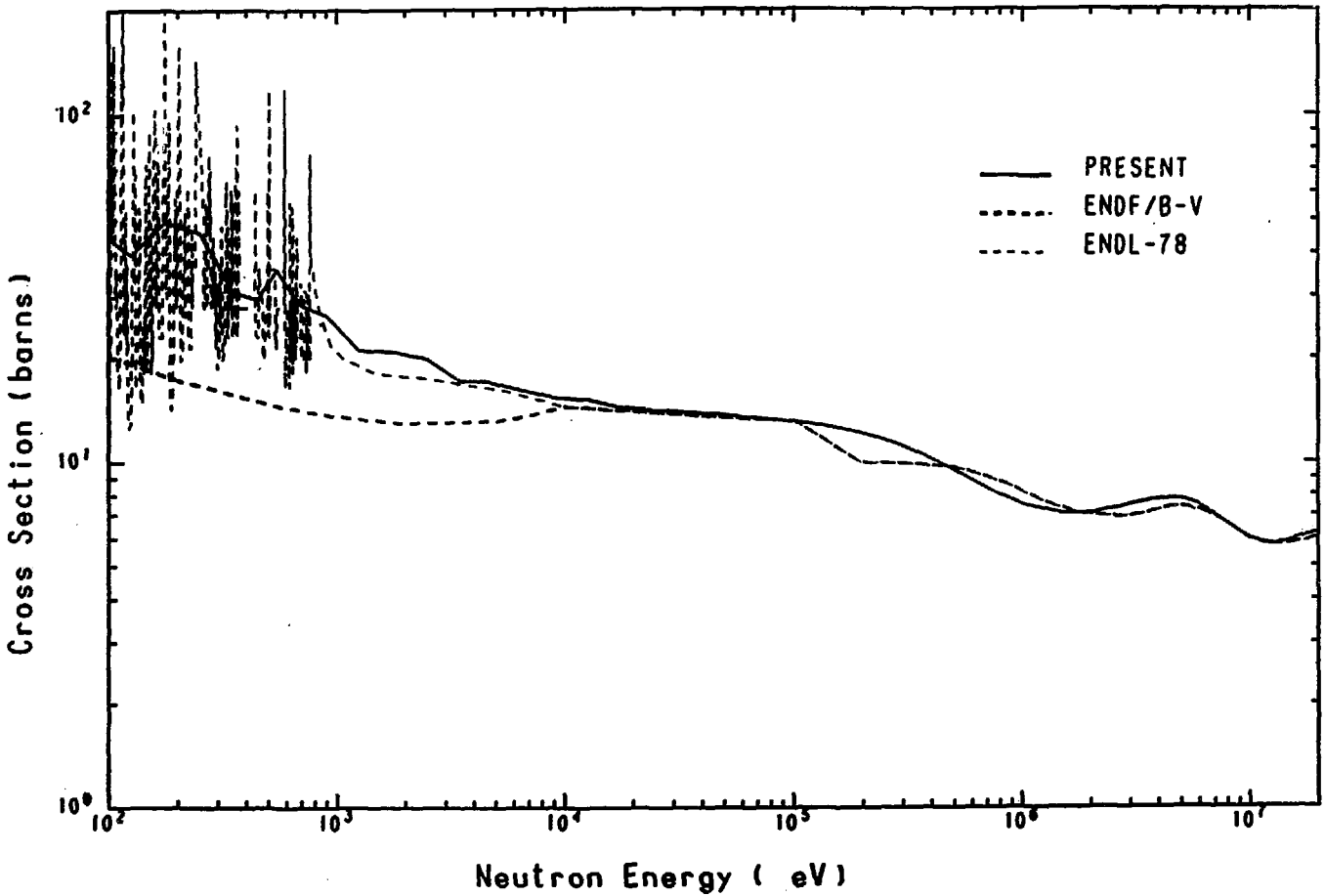

Fig. 7 Total cross sections of ^{247}Cm

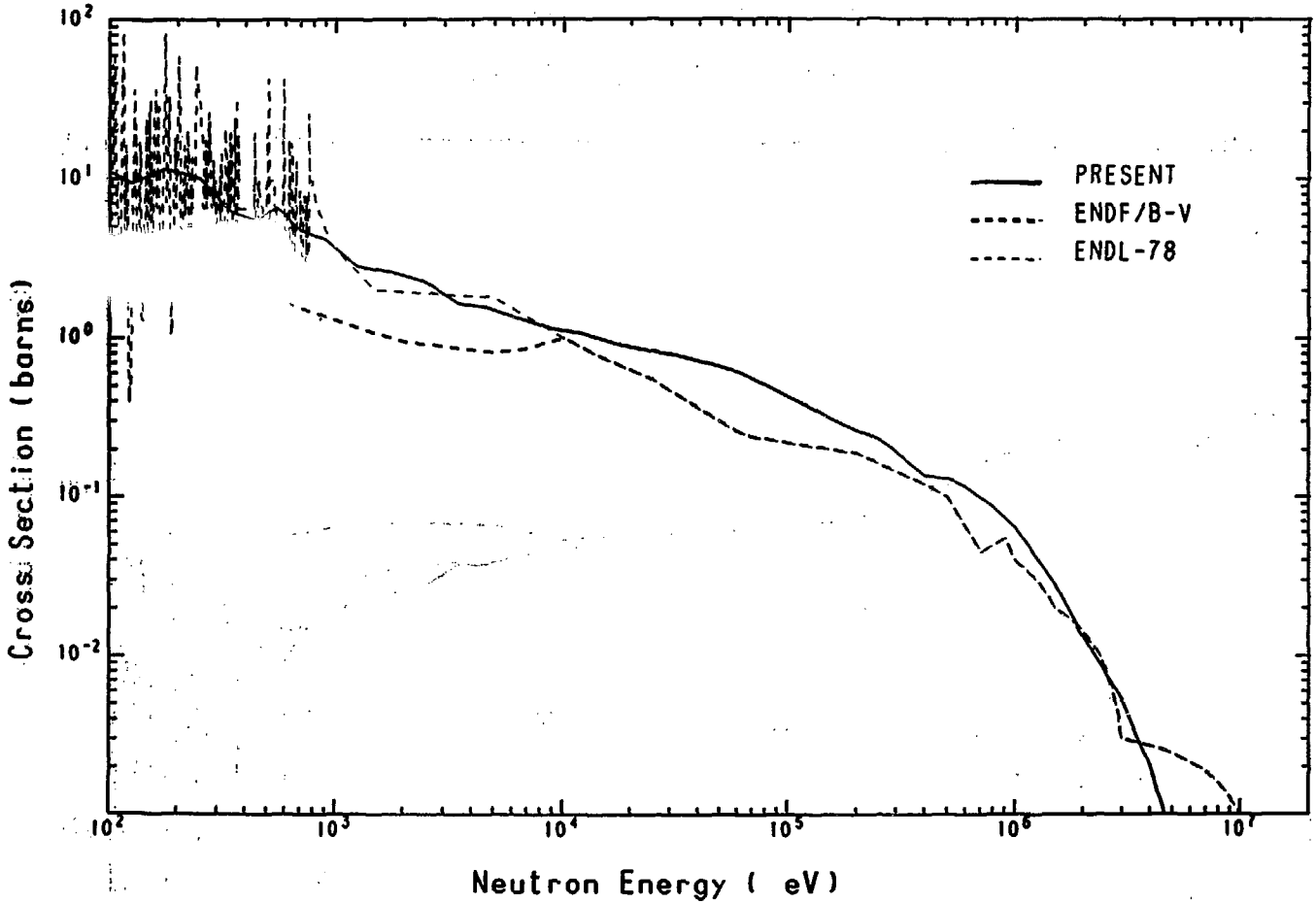

Fig. 8 Capture cross sections of ^{247}Cm

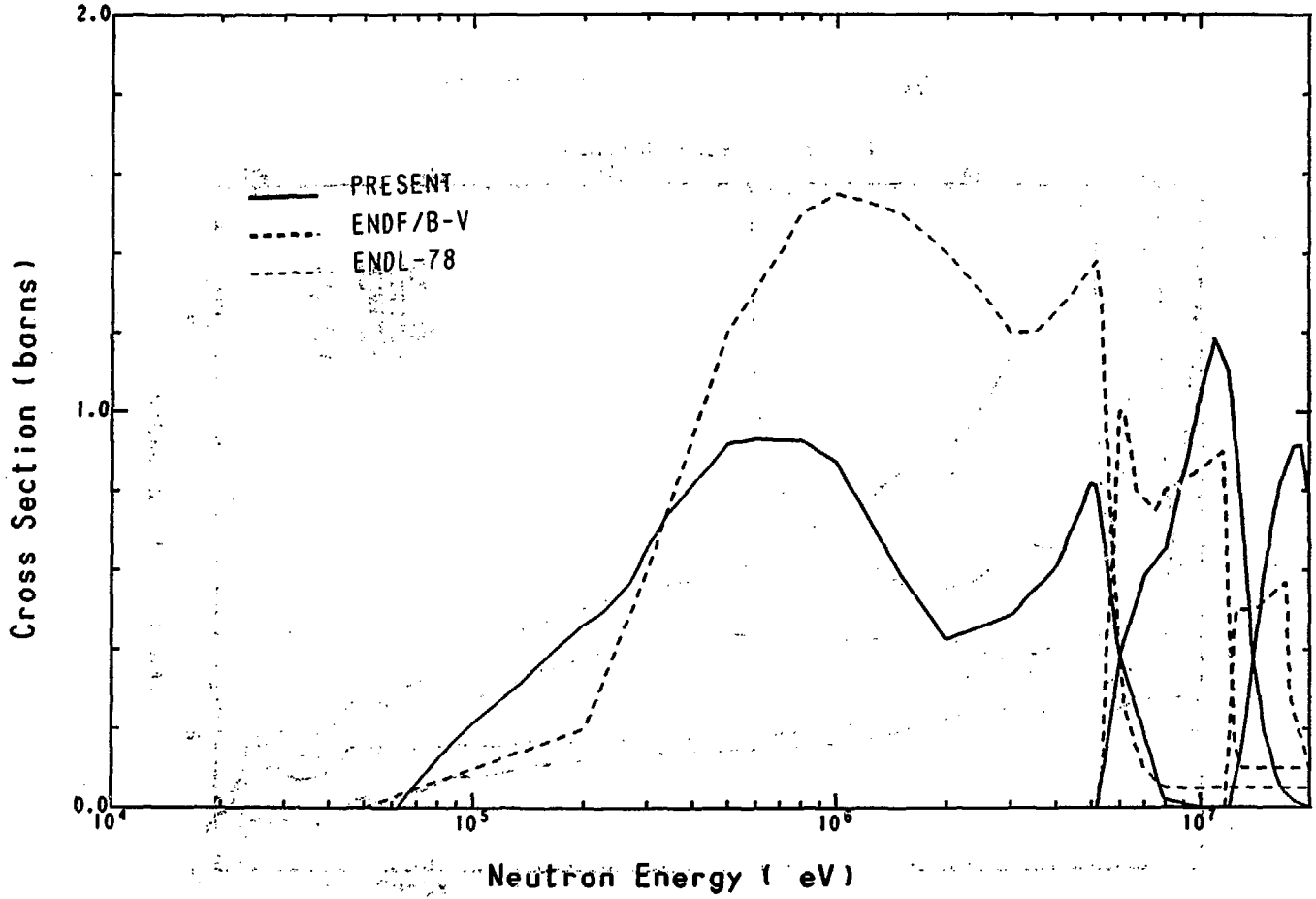

Fig. 9 Inelastic scattering, (n,2n) and (n,3n) reaction cross sections of ^{247}Cm

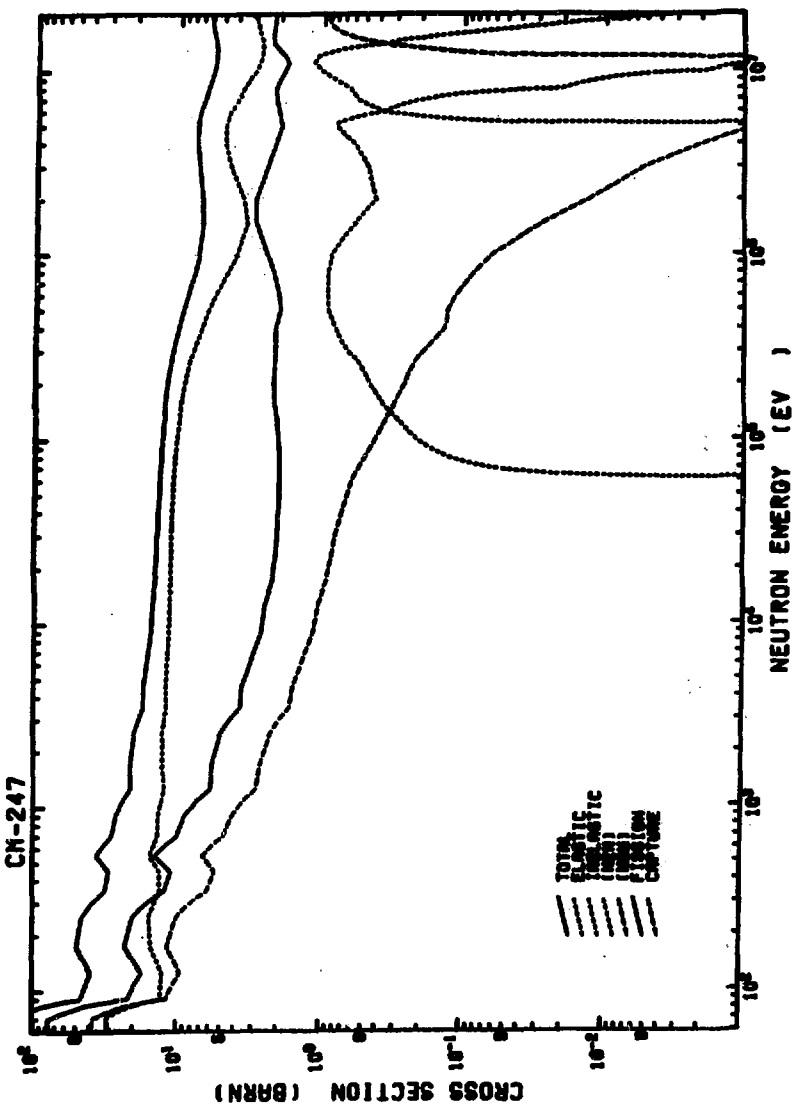

Fig. 10 Evaluated cross sections of ^{247}Cm

Appendix

List with ENDF/B format

File 4 is omitted from the list

Cm-246 File 1

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62460+ 4 2.43953+ 2          1          1          0          09646 1451    1
 0.0    + 0 0.0    + 0          0          0          0          09646 1451    2
 0.0    + 0 0.0    + 0          0          0        114         839646 1451    3
 96-CM-246 JAERI      EVAL-MAR83 Y.KIKUCHI                         9646 1451    4
 JAERI-M83-236        DIST-MAR84                                   9646 1451    5
EVALUATION FOR JENDL-3. DETAILS GIVEN IN REF./1/.                  9646 1451    6
                                                                   9646 1451    7
MF=1                                                               9646 1451    8
  MT=451   COMMENTS AND DICTIONARY                                 9646 1451    9
  MT=452   NUMBER OF NEUTRONS PER FISSION                          9646 1451   10
             SEMI-EMPIRICAL FORMULA BY HOWERTON /2/.               9646 1451   11
  MT=455   NUMBER OF DELAYED NEUTRONS                              9646 1451   12
             SEMI-EMPIRICAL FORMULA BY TUTTLE /3/.                 9646 1451   13
                                                                   9646 1451   14
MF=2,MT=1  RESONANCE PARAMETERS                                    9646 1451   15
  RESOLVED RESONANCES : 1.0E-5 - 330 EV                            9646 1451   16
    EVALUATION BASED ON THE FOLLOWING DATA :                       9646 1451   17
      GAM-N : BERRETH+ /4/ , BENJAMIN + /5/ , BELANOVA +/6/.       9646 1451   18
      GAM-F : MOORE AND KEYWORTH /7/,STOPA+ /8/.                   9646 1451   19
      GAM-G : BENJAMIN+ /5/ ,MOORE AND KEYWORTH /7/.               9646 1451   20
    GAM-F FOR THE 1ST 2 LEVELS ADJUSTED TO FIT THE THERMAL VALUES.9646 1451   21
                                                                   9646 1451   22
  UNRESOLVED RESONANCES : 330 EV - 30 KEV                          9646 1451   23
    OBTAIED FROM OPTICAL MODEL CALCULATION:                        9646 1451   24
        S0=0.94E-4   ,S1=3.17E-4  ,S2=0.88E-4  ,R=9.15 FM.         9646 1451   25
    ESTIMATED FROM RESOLVED RESONANCES:                            9646 1451   26
        D0BS=31.7 EV ,GAM-G=31 MILLI-EV.                           9646 1451   27
    GAM-F OBTAINED BY FITTING THE DATA OF STOPA+ /8/.              9646 1451   28
                                                                   9646 1451   29
  CALCULATED 2200 M/S CROSS SECTIONS AND RESONANCE INTEGRALS       9646 1451   30
                  2200 M/S VALUE          RES.INT                  9646 1451   31
      TOTAL          10.97  B             272.3  B                 9646 1451   32
      FISSION        0.142  B               9.5  B                 9646 1451   33
      CAPTURE        1.334  B             102.5  B                 9646 1451   34
                                                                   9646 1451   35
MF=3                                                               9646 1451   36
  MT=1,2,4,51-79,91,102,251   SIG-T,SIG-EL,SIG-IN,SIG-C,MU-BAR     9646 1451   37
        CALCULATED WITH OPTICAL AND STATISTICAL MODELS.            9646 1451   38
        OPTICAL POTENTIAL PARAMETERS WERE OBTAINED BY FITTING THE 9646 1451   39
        DATA OF PHILLIPS AND HOWE /9/ FOR AM-241:                  9646 1451   40
           V = 43.4 - 0.107*EN                     (MEV)           9646 1451   41
           WS= 6.95 - 0.339*EN + 0.0531*EN**2      (MEV)           9646 1451   42
           WV= 0              , VSO = 7.0          (MEV)           9646 1451   43
           R = RSO = 1.282    , RS = 1.29          (FM)            9646 1451   44
           A = ASO = 0.60     , B  = 0.5           (FM)            9646 1451   45
        STATISTICAL MODEL CALCULATION WITH CASTHY CODE /10/.       9646 1451   46
           COMPETING PROCESSES : FISSION,(N,2N),(N,3N),(N,4N).     9646 1451   47
```

```
........10........20........30........40........50........60......MAT MF MT   SEQ
          LEVEL FLUCTUATION CONSIDERED.                                9646 1451   48
        THE LEVEL SCHEME TAKEN FROM REF. /11/                          9646 1451   49
                    NO.          ENERGY(KEV)    SPIN-PARITY            9646 1451   50
                   G.S.              0             0 -                9646 1451   51
                     1              42.85          2 +                9646 1451   52
                     2             141.99          4 +                9646 1451   53
                     3             295.5           6 +                9646 1451   54
                     4             500.0           8 +                9646 1451   55
                     5             841.7           2 -                9646 1451   56
                     6             876.4           3 -                9646 1451   57
                     7             923.3           4 -                9646 1451   58
                     8             981.0           5 -                9646 1451   59
                     9            1051             6 -                9646 1451   60
                    10            1079             1 -                9646 1451   61
                    11            1105             2 -                9646 1451   62
                    12            1124             2 +                9646 1451   63
                    13            1128             3 -                9646 1451   64
                    14            1129             7 -                9646 1451   65
                    15            1165             3 +                9646 1451   66
                    16            1175             0 +                9646 1451   67
                    17            1179             8 -                9646 1451   68
                    18            1211             2 +                9646 1451   69
                    19            1220             4 +                9646 1451   70
                    20            1250             1 -                9646 1451   71
                    21            1289             0 +                9646 1451   72
                    22            1300             3 -                9646 1451   73
                    23            1318             2 +                9646 1451   74
                    24            1349             1 -                9646 1451   75
                    25            1367             2 -                9646 1451   76
                    26            1379             4 +                9646 1451   77
                    27            1452             1 +                9646 1451   78
                    28            1478             2 +                9646 1451   79
                    29            1509             3 +                9646 1451   80
              CONTINUUM LEVELS ASSUMED ABOVE 1526 KEV.                 9646 1451   81
        THE LEVEL DENSITY PARAMETERS : GILBERT AND CAMERON /12/.       9646 1451   82
        GAMMA-RAY STRENGTH FUNCTION OF 9.76E-4 DEDUCED FROM            9646 1451   83
        RESONANCE PARAMETERS.                                          9646 1451   84
                                                                       9646 1451   85
  MT=16,17,37       (N,2N),(N,3N),(N,4N)                               9646 1451   86
        CALCULATED WITH EVAPORATION MODEL.                             9646 1451   87
                                                                       9646 1451   88
  MT=18             FISSION                                            9646 1451   89
        EVALUATED ON THE BASIS OF THE MEASURED DATA BY STOPA+ /8/.     9646 1451   90
        AND FOMUSHKIN/13/.                                             9646 1451   91
                                                                       9646 1451   92
                                                                       9646 1451   93
MF=4                                                                   9646 1451   94
  MT=2,51-79            CALCULATED WITH OPTICAL MODEL.                 9646 1451   95
  MT=16,17,18,37,91     ISOTROPIC IN LABORATORY SYSTEM.                9646 1451   96
                                                                       9646 1451   97
MF=5                                                                   9646 1451   98
  MT=16,17,37,91        EVAPORATION SPECTRUM.                          9646 1451   99
  MT=18                 MAXWELLIAN FISSION SPECTRUM.                   9646 1451  100
                        TEMPERATURE ESTIMATED FROM DATA OF ZHURAVLAV
```

```
.........10........20........30........40........50........60......MAT MF MT  SEQ
                    + /14/ FOR CM-245 AND CM-247.                   9646 1451  101
                                                                    9646 1451  102
                                                                    9646 1451  103
REFERENCES                                                          9646 1451  104
 1) KIKUCHI Y.: JAERI-M83-236(1984).                                9646 1451  105
 2) HOWERTON R.J.: NUCL.SCI.ENG.,62,438(1977).                      9646 1451  106
 3) TUTTLE R.J.: INDG(NDS)-107/G+SPECIAL,P.29 (1979).               9646 1451  107
 4) BERRETH T.R.ET AL.: NUCL.SCI.ENG.,49,145(1972).                 9646 1451  108
 5) BENJAMIN R.W.ET AL.: NUCL.SCI.ENG.,55,440(1974).                9646 1451  109
 6) BELANOVA T.S.ET AL.: SOV.AT.ENERGY,39,1020(1975).               9646 1451  110
 7) MOORE M.S.AND.KEYWORTH G.A.: PHYS.REV.,C3,1656(1971)            9646 1451  111
 8) STOPA C.R.S.ET AL.: ANS TOPICAL MEETING,KIAMESHA LAKE,SEPT.82.  9646 1451  112
 9) PHILLIPS T.W. AND HOWE F.R.:NUCL.SCI.ENG.,69,375(1979).         9646 1451  113
10) IGARASI S. : J.NUCL.SCI.TECHNOL.,12,67 (1975).                  9646 1451  114
11) LEDERER C.M. AND SHIRLEY V.S. : TABLE OF ISOTOPES , 7TH ED.     9646 1451  115
12) GILBERT A. AND CAMERON A.G.W. : CAN.J.PHYS.,43,1446 (1965).     9646 1451  116
13) FOMSHKIN E.F.ET AL.: SOV.J.NUCL. PHYS.,31,19(1980).             9646 1451  117
14) ZHURAVLEV K.D.ET AL.: 1973 KIEV CONF.,VOL.4,P.57 (1973).        9646 1451  118
                                 1        451        200            9646 1451  119
                                 1        452          3            9646 1451  120
                                 1        455          7            9646 1451  121
                                 2        151        151            9646 1451  122
                                 3          1         50            9646 1451  123
                                 3          2         50            9646 1451  124
                                 3          4         23            9646 1451  125
                                 3         16          9            9646 1451  126
                                 3         17          7            9646 1451  127
                                 3         18         14            9646 1451  128
                                 3         37          4            9646 1451  129
                                 3         51         23            9646 1451  130
                                 3         52         22            9646 1451  131
                                 3         53         21            9646 1451  132
                                 3         54         20            9646 1451  133
                                 3         55         19            9646 1451  134
                                 3         56         19            9646 1451  135
                                 3         57         18            9646 1451  136
                                 3         58         18            9646 1451  137
                                 3         59         17            9646 1451  138
                                 3         60         17            9646 1451  139
                                 3         61         16            9646 1451  140
                                 3         62         16            9646 1451  141
                                 3         63         16            9646 1451  142
                                 3         64         15            9646 1451  143
                                 3         65         15            9646 1451  144
                                 3         66         15            9646 1451  145
                                 3         67         14            9646 1451  146
                                 3         68         14            9646 1451  147
                                 3         69         13            9646 1451  148
                                 3         70         13            9646 1451  149
                                 3         71         13            9646 1451  150
                                 3         72         12            9646 1451  151
                                 3         73         12            9646 1451  152
                                 3         74         12            9646 1451  153
                                 3         75         11            9646 1451  154
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
                                  3        76        11            9646 1451  154
                                  3        77        10            9646 1451  155
                                  3        78        10            9646 1451  156
                                  3        79        10            9646 1451  157
                                  3        91         9            9646 1451  158
                                  3       102        24            9646 1451  159
                                  3       251        24            9646 1451  160
                                  4         2       279            9646 1451  161
                                  4        16        10            9646 1451  162
                                  4        17        10            9646 1451  163
                                  4        18        10            9646 1451  164
                                  4        37        10            9646 1451  165
                                  4        51       194            9646 1451  166
                                  4        52       186            9646 1451  167
                                  4        53       180            9646 1451  168
                                  4        54       172            9646 1451  169
                                  4        55       152            9646 1451  170
                                  4        56       149            9646 1451  171
                                  4        57       142            9646 1451  172
                                  4        58       138            9646 1451  173
                                  4        59       130            9646 1451  174
                                  4        60       126            9646 1451  175
                                  4        61       123            9646 1451  176
                                  4        62       121            9646 1451  177
                                  4        63       119            9646 1451  178
                                  4        64       117            9646 1451  179
                                  4        65       114            9646 1451  180
                                  4        66       112            9646 1451  181
                                  4        67       110            9646 1451  182
                                  4        68       104            9646 1451  183
                                  4        69       101            9646 1451  184
                                  4        70        98            9646 1451  185
                                  4        71        96            9646 1451  186
                                  4        72        94            9646 1451  187
                                  4        73        91            9646 1451  188
                                  4        74        89            9646 1451  189
                                  4        75        87            9646 1451  190
                                  4        76        85            9646 1451  191
                                  4        77        81            9646 1451  192
                                  4        78        79            9646 1451  193
                                  4        79        77            9646 1451  194
                                  4        91        75            9646 1451  195
                                  5        16        17            9646 1451  196
                                  5        17        22            9646 1451  197
                                  5        18         7            9646 1451  198
                                  5        37        25            9646 1451  199
                                  5        91        10            9646 1451  200
                                                                   9646 1  0  201
9.62460+ 4 2.43953+ 2             0         1         0           09646 1452  202
0.0    + 0 0.0    + 0             0         0         2           09646 1452  203
3.19000+ 0 1.96000- 8                                              9646 1452  204
                                                                   9646 1  0  205
9.62460+ 4 2.43953+ 2             0         2         0           09646 1455  206
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 0.0     + 0 0.0     + 0          0          0          6          09646 1455  207
 1.29000- 2 3.13000- 2 1.35000- 1 3.33000- 1 1.36000+ 0 4.04000+ 09646 1455  208
 0.0     + 0 0.0     + 0          0          0          1          49646 1455  209
           4           2          0          0          0          09646 1455  210
 1.00000- 5 9.20000- 3 6.00000+ 6 9.20000- 3 8.00000+ 6 6.30000- 39646 1455  211
 2.00000+ 7 6.30000- 3                                              9646 1455  212
                                                                    9646 1  0  213
                                                                    9646 0  0  214
```

Cm-246 File 2

```
.........10.........20.........30.........40.........50.........60......MAT MF MT  SEQ
 9.62460+ 4 2.43953+ 2           0           0           1           09646 2151  215
 9.62460+ 4 1.00000+ 0           0           1           2           09646 2151  216
 1.00000- 5 3.30000+ 2           1           2           0           09646 2151  217
 0.0    + 0 9.14678- 1           0           0           1           09646 2151  218
 2.43953+ 2 0.0    + 0           0           0          66          119646 2151  219
 4.31500+ 0 5.00000- 1 3.49400- 2 3.40000- 4 3.10000- 2 3.60000- 39646 2151  220
 1.53300+ 1 5.00000- 1 3.51200- 2 5.20000- 4 3.10000- 2 3.60000- 39646 2151  221
 8.46200+ 1 5.00000- 1 5.57300- 2 2.63000- 2 2.89000- 2 5.30000- 49646 2151  222
 9.19100+ 1 5.00000- 1 5.20400- 2 2.09000- 2 3.10000- 2 1.40000- 49646 2151  223
 1.58500+ 2 5.00000- 1 6.50300- 2 3.17000- 2 3.27000- 2 6.30000- 49646 2151  224
 2.50700+ 2 5.00000- 1 4.04200- 2 9.10000- 3 3.10000- 2 3.20000- 49646 2151  225
 2.78300+ 2 5.00000- 1 3.86200- 2 6.50000- 3 3.10000- 2 1.12000- 39646 2151  226
 2.88200+ 2 5.00000- 1 1.14260- 1 8.29999- 2 3.10000- 2 2.60000- 49646 2151  227
 3.13400+ 2 5.00000- 1 6.01300- 2 2.90000- 2 3.10000- 2 1.30000- 49646 2151  228
 3.61000+ 2 5.00000- 1 1.28410- 1 9.69999- 2 3.10000- 2 4.10000- 49646 2151  229
 3.81100+ 2 5.00000- 1 3.21150- 1 2.90000- 1 3.10000- 2 1.50000- 49646 2151  230
 3.30000+ 2 3.00000+ 4           2           2           0           09646 2151  231
 0.0    + 0 9.14680- 1           0           0           3           09646 2151  232
 2.43950+ 2 0.0    + 0           0           0           1           09646 2151  233
 5.00000- 1 0.0    + 0           2           0         150          249646 2151  234
 0.0    + 0 0.0    + 0 0.0    + 0 1.00000+ 0 0.0    + 0 1.00000+ 09646 2151  235
 3.30000+ 2 3.17310+ 1 0.0    + 0 2.97910- 3 3.10000- 2 2.02250- 39646 2151  236
 3.50000+ 2 3.17300+ 1 0.0    + 0 2.97900- 3 3.10000- 2 2.25120- 39646 2151  237
 4.00000+ 2 3.17270+ 1 0.0    + 0 2.97880- 3 3.10000- 2 1.87440- 39646 2151  238
 4.50000+ 2 3.17240+ 1 0.0    + 0 2.97850- 3 3.10000- 2 1.47110- 39646 2151  239
 5.00000+ 2 3.17220+ 1 0.0    + 0 2.97820- 3 3.10000- 2 1.30140- 39646 2151  240
 5.50000+ 2 3.17190+ 1 0.0    + 0 2.97800- 3 3.10000- 2 1.30090- 39646 2151  241
 6.00000+ 2 3.17160+ 1 0.0    + 0 2.97770- 3 3.10000- 2 1.47590- 39646 2151  242
 7.00000+ 2 3.17100+ 1 0.0    + 0 2.97720- 3 3.10000- 2 1.99630- 39646 2151  243
 8.00000+ 2 3.17050+ 1 0.0    + 0 2.97660- 3 3.10000- 2 2.55520- 39646 2151  244
 9.00000+ 2 3.16990+ 1 0.0    + 0 2.97610- 3 3.10000- 2 2.48650- 39646 2151  245
 1.00000+ 3 3.16930+ 1 0.0    + 0 2.97560- 3 3.10000- 2 2.20220- 39646 2151  246
 1.50000+ 3 3.16650+ 1 0.0    + 0 2.97290- 3 3.10000- 2 1.86330- 39646 2151  247
 2.00000+ 3 3.16370+ 1 0.0    + 0 2.97020- 3 3.10000- 2 1.86610- 39646 2151  248
 2.40000+ 3 3.16140+ 1 0.0    + 0 2.96810- 3 3.10000- 2 1.95990- 39646 2151  249
 2.70000+ 3 3.15970+ 1 0.0    + 0 2.96650- 3 3.10000- 2 2.26870- 39646 2151  250
 3.00000+ 3 3.15800+ 1 0.0    + 0 2.96490- 3 3.10000- 2 2.31040- 39646 2151  251
 4.00000+ 3 3.15240+ 1 0.0    + 0 2.95960- 3 3.10000- 2 2.32470- 39646 2151  252
 5.00000+ 3 3.14670+ 1 0.0    + 0 2.95440- 3 3.10000- 2 2.22010- 39646 2151  253
 6.00000+ 3 3.14110+ 1 0.0    + 0 2.94910- 3 3.10000- 2 2.16850- 39646 2151  254
 8.00000+ 3 3.12990+ 1 0.0    + 0 2.93860- 3 3.10000- 2 2.18280- 39646 2151  255
 1.00000+ 4 3.11870+ 1 0.0    + 0 2.92810- 3 3.10000- 2 2.22840- 39646 2151  256
 1.50000+ 4 3.09100+ 1 0.0    + 0 2.90200- 3 3.10000- 2 2.25040- 39646 2151  257
 2.00000+ 4 3.06350+ 1 0.0    + 0 2.87620- 3 3.10000- 2 2.33460- 39646 2151  258
 3.00000+ 4 3.00930+ 1 0.0    + 0 2.82530- 3 3.10000- 2 2.57030- 39646 2151  259
 2.43950+ 2 0.0    + 0           1           0           2           09646 2151  260
 5.00000- 1 0.0    + 0           2           0         150          249646 2151  261
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 0.0     + 0 0.0     + 0 0.0     + 0 1.00000+ 0 0.0     + 0 1.00000+ 09646 2151  262
 3.30000+ 2 3.17310+ 1 0.0     + 0 1.00720- 2 3.10000- 2 2.02250- 39646 2151  263
 3.50000+ 2 3.17300+ 1 0.0     + 0 1.00720- 2 3.10000- 2 2.25120- 39646 2151  264
 4.00000+ 2 3.17270+ 1 0.0     + 0 1.00710- 2 3.10000- 2 1.87440- 39646 2151  265
 4.50000+ 2 3.17240+ 1 0.0     + 0 1.00700- 2 3.10000- 2 1.47110- 39646 2151  266
 5.00000+ 2 3.17220+ 1 0.0     + 0 1.00690- 2 3.10000- 2 1.30140- 39646 2151  267
 5.50000+ 2 3.17190+ 1 0.0     + 0 1.00680- 2 3.10000- 2 1.30090- 39646 2151  268
 6.00000+ 2 3.17160+ 1 0.0     + 0 1.00670- 2 3.10000- 2 1.47590- 39646 2151  269
 7.00000+ 2 3.17100+ 1 0.0     + 0 1.00660- 2 3.10000- 2 1.99630- 39646 2151  270
 8.00000+ 2 3.17050+ 1 0.0     + 0 1.00640- 2 3.10000- 2 2.55520- 39646 2151  271
 9.00000+ 2 3.16990+ 1 0.0     + 0 1.00620- 2 3.10000- 2 2.48650- 39646 2151  272
 1.00000+ 3 3.16930+ 1 0.0     + 0 1.00600- 2 3.10000- 2 2.20220- 39646 2151  273
 1.50000+ 3 3.16650+ 1 0.0     + 0 1.00510- 2 3.10000- 2 1.86330- 39646 2151  274
 2.00000+ 3 3.16370+ 1 0.0     + 0 1.00420- 2 3.10000- 2 1.86610- 39646 2151  275
 2.40000+ 3 3.16140+ 1 0.0     + 0 1.00350- 2 3.10000- 2 1.95990- 39646 2151  276
 2.70000+ 3 3.15970+ 1 0.0     + 0 1.00300- 2 3.10000- 2 2.26870- 39646 2151  277
 3.00000+ 3 3.15800+ 1 0.0     + 0 1.00240- 2 3.10000- 2 2.31040- 39646 2151  278
 4.00000+ 3 3.15240+ 1 0.0     + 0 1.00060- 2 3.10000- 2 2.32470- 39646 2151  279
 5.00000+ 3 3.14670+ 1 0.0     + 0 9.98850- 3 3.10000- 2 2.22010- 39646 2151  280
 6.00000+ 3 3.14110+ 1 0.0     + 0 9.97070- 3 3.10000- 2 2.16850- 39646 2151  281
 8.00000+ 3 3.12990+ 1 0.0     + 0 9.93510- 3 3.10000- 2 2.18280- 39646 2151  282
 1.00000+ 4 3.11870+ 1 0.0     + 0 9.89960- 3 3.10000- 2 2.22840- 39646 2151  283
 1.50000+ 4 3.09100+ 1 0.0     + 0 9.81170- 3 3.10000- 2 2.25040- 39646 2151  284
 2.00000+ 4 3.06350+ 1 0.0     + 0 9.72440- 3 3.10000- 2 2.33460- 39646 2151  285
 3.00000+ 4 3.00930+ 1 0.0     + 0 9.55230- 3 3.10000- 2 2.57030- 39646 2151  286
 1.50000+ 0 0.0     + 0           2          0          150          249646 2151  287
 0.0     + 0 0.0     + 0 0.0     + 0 1.00000+ 0 0.0     + 0 1.00000+ 09646 2151  288
 3.30000+ 2 1.58660+ 1 0.0     + 0 5.03620- 3 3.10000- 2 2.02250- 39646 2151  289
 3.50000+ 2 1.58650+ 1 0.0     + 0 5.03600- 3 3.10000- 2 2.25120- 39646 2151  290
 4.00000+ 2 1.58640+ 1 0.0     + 0 5.03550- 3 3.10000- 2 1.87440- 39646 2151  291
 4.50000+ 2 1.58620+ 1 0.0     + 0 5.03510- 3 3.10000- 2 1.47110- 39646 2151  292
 5.00000+ 2 1.58610+ 1 0.0     + 0 5.03460- 3 3.10000- 2 1.30140- 39646 2151  293
 5.50000+ 2 1.58590+ 1 0.0     + 0 5.03420- 3 3.10000- 2 1.30090- 39646 2151  294
 6.00000+ 2 1.58580+ 1 0.0     + 0 5.03370- 3 3.10000- 2 1.47590- 39646 2151  295
 7.00000+ 2 1.58550+ 1 0.0     + 0 5.03280- 3 3.10000- 2 1.99630- 39646 2151  296
 8.00000+ 2 1.58520+ 1 0.0     + 0 5.03190- 3 3.10000- 2 2.55520- 39646 2151  297
 9.00000+ 2 1.58490+ 1 0.0     + 0 5.03100- 3 3.10000- 2 2.48650- 39646 2151  298
 1.00000+ 3 1.58470+ 1 0.0     + 0 5.03010- 3 3.10000- 2 2.20220- 39646 2151  299
 1.50000+ 3 1.58320+ 1 0.0     + 0 5.02560- 3 3.10000- 2 1.86330- 39646 2151  300
 2.00000+ 3 1.58180+ 1 0.0     + 0 5.02110- 3 3.10000- 2 1.86610- 39646 2151  301
 2.40000+ 3 1.58070+ 1 0.0     + 0 5.01750- 3 3.10000- 2 1.95990- 39646 2151  302
 2.70000+ 3 1.57990+ 1 0.0     + 0 5.01480- 3 3.10000- 2 2.26870- 39646 2151  303
 3.00000+ 3 1.57900+ 1 0.0     + 0 5.01220- 3 3.10000- 2 2.31040- 39646 2151  304
 4.00000+ 3 1.57620+ 1 0.0     + 0 5.00320- 3 3.10000- 2 2.32470- 39646 2151  305
 5.00000+ 3 1.57340+ 1 0.0     + 0 4.99430- 3 3.10000- 2 2.22010- 39646 2151  306
 6.00000+ 3 1.57060+ 1 0.0     + 0 4.98530- 3 3.10000- 2 2.16850- 39646 2151  307
 8.00000+ 3 1.56500+ 1 0.0     + 0 4.96750- 3 3.10000- 2 2.18280- 39646 2151  308
 1.00000+ 4 1.55940+ 1 0.0     + 0 4.94980- 3 3.10000- 2 2.22840- 39646 2151  309
 1.50000+ 4 1.54550+ 1 0.0     + 0 4.90580- 3 3.10000- 2 2.25040- 39646 2151  310
 2.00000+ 4 1.53180+ 1 0.0     + 0 4.86220- 3 3.10000- 2 2.33460- 39646 2151  311
 3.00000+ 4 1.50470+ 1 0.0     + 0 4.77610- 3 3.10000- 2 2.57030- 39646 2151  312
 2.43950+ 2 0.0     + 0           2          0          2            09646 2151  313
 1.50000+ 0 0.0     + 0           2          0          150          249646 2151  314
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 0.0     + 0 0.0     + 0 0.0     + 0 1.00000+ 0 0.0     + 0 1.00000+ 09646 2151  315
 3.30000+ 2 1.58660+ 1 0.0     + 0 1.39620- 3 3.10000- 2 2.02250- 39646 2151  316
 3.50000+ 2 1.58650+ 1 0.0     + 0 1.39610- 3 3.10000- 2 2.25120- 39646 2151  317
 4.00000+ 2 1.58640+ 1 0.0     + 0 1.39600- 3 3.10000- 2 1.87440- 39646 2151  318
 4.50000+ 2 1.58620+ 1 0.0     + 0 1.39590- 3 3.10000- 2 1.47110- 39646 2151  319
 5.00000+ 2 1.58610+ 1 0.0     + 0 1.39580- 3 3.10000- 2 1.30140- 39646 2151  320
 5.50000+ 2 1.58590+ 1 0.0     + 0 1.39560- 3 3.10000- 2 1.30090- 39646 2151  321
 6.00000+ 2 1.58580+ 1 0.0     + 0 1.39550- 3 3.10000- 2 1.47590- 39646 2151  322
 7.00000+ 2 1.58550+ 1 0.0     + 0 1.39530- 3 3.10000- 2 1.99630- 39646 2151  323
 8.00000+ 2 1.58520+ 1 0.0     + 0 1.39500- 3 3.10000- 2 2.55520- 39646 2151  324
 9.00000+ 2 1.58490+ 1 0.0     + 0 1.39480- 3 3.10000- 2 2.48650- 39646 2151  325
 1.00000+ 3 1.58470+ 1 0.0     + 0 1.39450- 3 3.10000- 2 2.20220- 39646 2151  326
 1.50000+ 3 1.58320+ 1 0.0     + 0 1.39330- 3 3.10000- 2 1.86330- 39646 2151  327
 2.00000+ 3 1.58180+ 1 0.0     + 0 1.39200- 3 3.10000- 2 1.86610- 39646 2151  328
 2.40000+ 3 1.58070+ 1 0.0     + 0 1.39100- 3 3.10000- 2 1.95990- 39646 2151  329
 2.70000+ 3 1.57990+ 1 0.0     + 0 1.39030- 3 3.10000- 2 2.26870- 39646 2151  330
 3.00000+ 3 1.57900+ 1 0.0     + 0 1.38950- 3 3.10000- 2 2.31040- 39646 2151  331
 4.00000+ 3 1.57620+ 1 0.0     + 0 1.38700- 3 3.10000- 2 2.32470- 39646 2151  332
 5.00000+ 3 1.57340+ 1 0.0     + 0 1.38460- 3 3.10000- 2 2.22010- 39646 2151  333
 6.00000+ 3 1.57060+ 1 0.0     + 0 1.38210- 3 3.10000- 2 2.16850- 39646 2151  334
 8.00000+ 3 1.56500+ 1 0.0     + 0 1.37720- 3 3.10000- 2 2.18280- 39646 2151  335
 1.00000+ 4 1.55940+ 1 0.0     + 0 1.37220- 3 3.10000- 2 2.22840- 39646 2151  336
 1.50000+ 4 1.54550+ 1 0.0     + 0 1.36000- 3 3.10000- 2 2.25040- 39646 2151  337
 2.00000+ 4 1.53180+ 1 0.0     + 0 1.34800- 3 3.10000- 2 2.33460- 39646 2151  338
 3.00000+ 4 1.50470+ 1 0.0     + 0 1.32410- 3 3.10000- 2 2.57030- 39646 2151  339
 2.50000+ 0 0.0     + 0           2           0          150          249646 2151  340
 0.0     + 0 0.0     + 0 0.0     + 0 1.00000+ 0 0.0     + 0 1.00000+ 09646 2151  341
 3.30000+ 2 1.05770+ 1 0.0     + 0 9.30790- 4 3.10000- 2 2.02250- 39646 2151  342
 3.50000+ 2 1.05770+ 1 0.0     + 0 9.30750- 4 3.10000- 2 2.25120- 39646 2151  343
 4.00000+ 2 1.05760+ 1 0.0     + 0 9.30670- 4 3.10000- 2 1.87440- 39646 2151  344
 4.50000+ 2 1.05750+ 1 0.0     + 0 9.30580- 4 3.10000- 2 1.47110- 39646 2151  345
 5.00000+ 2 1.05740+ 1 0.0     + 0 9.30500- 4 3.10000- 2 1.30140- 39646 2151  346
 5.50000+ 2 1.05730+ 1 0.0     + 0 9.30420- 4 3.10000- 2 1.30090- 39646 2151  347
 6.00000+ 2 1.05720+ 1 0.0     + 0 9.30340- 4 3.10000- 2 1.47590- 39646 2151  348
 7.00000+ 2 1.05700+ 1 0.0     + 0 9.30170- 4 3.10000- 2 1.99630- 39646 2151  349
 8.00000+ 2 1.05680+ 1 0.0     + 0 9.30000- 4 3.10000- 2 2.55520- 39646 2151  350
 9.00000+ 2 1.05660+ 1 0.0     + 0 9.29840- 4 3.10000- 2 2.48650- 39646 2151  351
 1.00000+ 3 1.05640+ 1 0.0     + 0 9.29670- 4 3.10000- 2 2.20220- 39646 2151  352
 1.50000+ 3 1.05550+ 1 0.0     + 0 9.28840- 4 3.10000- 2 1.86330- 39646 2151  353
 2.00000+ 3 1.05460+ 1 0.0     + 0 9.28010- 4 3.10000- 2 1.86610- 39646 2151  354
 2.40000+ 3 1.05380+ 1 0.0     + 0 9.27350- 4 3.10000- 2 1.95990- 39646 2151  355
 2.70000+ 3 1.05320+ 1 0.0     + 0 9.26850- 4 3.10000- 2 2.26870- 39646 2151  356
 3.00000+ 3 1.05270+ 1 0.0     + 0 9.26350- 4 3.10000- 2 2.31040- 39646 2151  357
 4.00000+ 3 1.05080+ 1 0.0     + 0 9.24700- 4 3.10000- 2 2.32470- 39646 2151  358
 5.00000+ 3 1.04890+ 1 0.0     + 0 9.23050- 4 3.10000- 2 2.22010- 39646 2151  359
 6.00000+ 3 1.04700+ 1 0.0     + 0 9.21400- 4 3.10000- 2 2.16850- 39646 2151  360
 8.00000+ 3 1.04330+ 1 0.0     + 0 9.18110- 4 3.10000- 2 2.18280- 39646 2151  361
 1.00000+ 4 1.03960+ 1 0.0     + 0 9.14830- 4 3.10000- 2 2.22840- 39646 2151  362
 1.50000+ 4 1.03030+ 1 0.0     + 0 9.06700- 4 3.10000- 2 2.25040- 39646 2151  363
 2.00000+ 4 1.02120+ 1 0.0     + 0 8.98640- 4 3.10000- 2 2.33460- 39646 2151  364
 3.00000+ 4 1.00310+ 1 0.0     + 0 8.82730- 4 3.10000- 2 2.57030- 39646 2151  365
                                                                      9646 2  0  366
                                                                      9646 0  0  367
```

Cm-246 File 3

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62460+ 4 2.43953+ 2           0          99           0          09646 3  1  368
 0.0     + 0 0.0     + 0           0           0           2        1409646 3  1  369
           2           2         140           5           0          09646 3  1  370
 1.00000- 5 0.0     + 0 3.00000+ 4 0.0     + 0 3.00000+ 4 1.40046+ 19646 3  1  371
 4.00000+ 4 1.37875+ 1 4.30759+ 4 1.37322+ 1 5.00000+ 4 1.36237+ 19646 3  1  372
 6.00000+ 4 1.34778+ 1 6.32456+ 4 1.34360+ 1 8.00000+ 4 1.32508+ 19646 3  1  373
 1.00000+ 5 1.30311+ 1 1.42582+ 5 1.25763+ 1 1.50000+ 5 1.24839+ 19646 3  1  374
 2.00000+ 5 1.19723+ 1 2.96711+ 5 1.10100+ 1 3.00000+ 5 1.09752+ 19646 3  1  375
 4.00000+ 5 1.01052+ 1 5.00000+ 5 9.36787+ 0 5.02050+ 5 9.35486+ 09646 3  1  376
 6.00000+ 5 8.76748+ 0 7.00000+ 5 8.29015+ 0 8.00000+ 5 7.92108+ 09646 3  1  377
 8.45150+ 5 7.78526+ 0 8.79992+ 5 7.69207+ 0 9.00000+ 5 7.64280+ 09646 3  1  378
 9.27085+ 5 7.58082+ 0 9.85021+ 5 7.46452+ 0 1.00000+ 6 7.43781+ 09646 3  1  379
 1.05531+ 6 7.34986+ 0 1.08342+ 6 7.31106+ 0 1.10953+ 6 7.27826+ 09646 3  1  380
 1.12861+ 6 7.25612+ 0 1.13262+ 6 7.25165+ 0 1.13363+ 6 7.25054+ 09646 3  1  381
 1.16978+ 6 7.21322+ 0 1.17982+ 6 7.20370+ 0 1.18383+ 6 7.19999+ 09646 3  1  382
 1.20000+ 6 7.18561+ 0 1.21596+ 6 7.17226+ 0 1.22500+ 6 7.16506+ 09646 3  1  383
 1.25512+ 6 7.14282+ 0 1.29428+ 6 7.11770+ 0 1.30533+ 6 7.11134+ 09646 3  1  384
 1.32340+ 6 7.10157+ 0 1.35453+ 6 7.08651+ 0 1.37260+ 6 7.07912+ 09646 3  1  385
 1.38465+ 6 7.07433+ 0 1.40000+ 6 7.06870+ 0 1.45795+ 6 7.05123+ 09646 3  1  386
 1.48406+ 6 7.04524+ 0 1.51519+ 6 7.03950+ 0 1.53226+ 6 7.03696+ 09646 3  1  387
 1.60000+ 6 7.03081+ 0 2.00000+ 6 7.08769+ 0 2.50000+ 6 7.28105+ 09646 3  1  388
 3.00000+ 6 7.50570+ 0 4.00000+ 6 7.77412+ 0 5.00000+ 6 7.73850+ 09646 3  1  389
 6.00000+ 6 7.46866+ 0 6.23707+ 6 7.36239+ 0 6.48347+ 6 7.25765+ 09646 3  1  390
 6.48350+ 6 7.25764+ 0 6.60894+ 6 7.19386+ 0 6.73680+ 6 7.13064+ 09646 3  1  391
 6.86714+ 6 7.06798+ 0 7.00000+ 6 7.00587+ 0 7.23762+ 6 6.88661+ 09646 3  1  392
 7.35944+ 6 6.82774+ 0 7.48331+ 6 6.76937+ 0 7.60926+ 6 6.71151+ 09646 3  1  393
 7.73734+ 6 6.65413+ 0 7.80218+ 6 6.62563+ 0 7.86757+ 6 6.59725+ 09646 3  1  394
 7.93351+ 6 6.56899+ 0 8.00000+ 6 6.54085+ 0 8.45897+ 6 6.38956+ 09646 3  1  395
 8.69824+ 6 6.31524+ 0 8.94427+ 6 6.24178+ 0 9.00000+ 6 6.22554+ 09646 3  1  396
 9.19727+ 6 6.16917+ 0 9.32644+ 6 6.13318+ 0 9.45742+ 6 6.09741+ 09646 3  1  397
 9.59024+ 6 6.06184+ 0 9.72493+ 6 6.02648+ 0 9.79298+ 6 6.00888+ 09646 3  1  398
 9.86151+ 6 5.99133+ 0 9.93051+ 6 5.97383+ 0 9.96519+ 6 5.96510+ 09646 3  1  399
 1.00000+ 7 5.95638+ 0 1.04721+ 7 5.90570+ 0 1.07164+ 7 5.88053+ 09646 3  1  400
 1.09664+ 7 5.85547+ 0 1.10000+ 7 5.85215+ 0 1.12222+ 7 5.83051+ 09646 3  1  401
 1.13523+ 7 5.81808+ 0 1.14840+ 7 5.80566+ 0 1.16172+ 7 5.79327+ 09646 3  1  402
 1.17519+ 7 5.78091+ 0 1.18199+ 7 5.77474+ 0 1.18882+ 7 5.76858+ 09646 3  1  403
 1.19570+ 7 5.76242+ 0 1.19915+ 7 5.75934+ 0 1.20000+ 7 5.75859+ 09646 3  1  404
 1.20260+ 7 5.75628+ 0 1.20261+ 7 5.75627+ 0 1.22625+ 7 5.75408+ 09646 3  1  405
 1.25036+ 7 5.75189+ 0 1.27494+ 7 5.74971+ 0 1.28741+ 7 5.74861+ 09646 3  1  406
 1.30000+ 7 5.74752+ 0 1.34907+ 7 5.77651+ 0 1.40000+ 7 5.80565+ 09646 3  1  407
 1.44914+ 7 5.83291+ 0 1.47435+ 7 5.84659+ 0 1.50000+ 7 5.86030+ 09646 3  1  408
 1.52365+ 7 5.88165+ 0 1.54768+ 7 5.90309+ 0 1.57208+ 7 5.92459+ 09646 3  1  409
 1.59687+ 7 5.94618+ 0 1.60000+ 7 5.94889+ 0 1.62443+ 7 5.96988+ 09646 3  1  410
 1.64924+ 7 5.99095+ 0 1.67443+ 7 6.01210+ 0 1.70000+ 7 6.03332+ 09646 3  1  411
 1.72447+ 7 6.05211+ 0 1.74929+ 7 6.07096+ 0 1.77446+ 7 6.08986+ 09646 3  1  412
 1.78718+ 7 6.09933+ 0 1.80000+ 7 6.10883+ 0 1.82096+ 7 6.12423+ 09646 3  1  413
 1.84216+ 7 6.13968+ 0 1.86361+ 7 6.15516+ 0 1.88530+ 7 6.17068+ 09646 3  1  414
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.88534+ 7 6.17071+ 0 1.88535+ 7 6.17072+ 0 1.90000+ 7 6.17928+ 09646 3  1  415
 1.92080+ 7 6.19134+ 0 1.94182+ 7 6.20342+ 0 1.97070+ 7 6.21984+ 09646 3  1  416
 1.98530+ 7 6.22807+ 0 2.00000+ 7 6.23630+ 0                      9646 3  1  417
                                                                  9646 3  0  418
 9.62460+ 4 2.43953+ 2         0         0         0            09646 3  2  419
 0.0    + 0 0.0    + 0         0         0         2          1409646 3  2  420
          2         2       140         5         0            09646 3  2  421
 1.00000- 5 0.0    + 0 3.00000+ 4 0.0    + 0 3.00000+ 4 1.34988+ 19646 3  2  422
 4.00000+ 4 1.33517+ 1 4.30759+ 4 1.33127+ 1 5.00000+ 4 1.31414+ 19646 3  2  423
 6.00000+ 4 1.28771+ 1 6.32456+ 4 1.27954+ 1 8.00000+ 4 1.24372+ 19646 3  2  424
 1.00000+ 5 1.20664+ 1 1.42582+ 5 1.13992+ 1 1.50000+ 5 1.12839+ 19646 3  2  425
 2.00000+ 5 1.06343+ 1 2.96711+ 5 9.52982+ 0 3.00000+ 5 9.49177+ 09646 3  2  426
 4.00000+ 5 8.52210+ 0 5.00000+ 5 7.68851+ 0 5.02050+ 5 7.67320+ 09646 3  2  427
 6.00000+ 5 6.95503+ 0 7.00000+ 5 6.30859+ 0 8.00000+ 5 5.70512+ 09646 3  2  428
 8.45150+ 5 5.47321+ 0 8.79992+ 5 5.26930+ 0 9.00000+ 5 5.15231+ 09646 3  2  429
 9.27085+ 5 5.02447+ 0 9.85021+ 5 4.77073+ 0 1.00000+ 6 4.71040+ 09646 3  2  430
 1.05531+ 6 4.53158+ 0 1.08342+ 6 4.44971+ 0 1.10953+ 6 4.36550+ 09646 3  2  431
 1.12861+ 6 4.30566+ 0 1.13262+ 6 4.29308+ 0 1.13363+ 6 4.28948+ 09646 3  2  432
 1.16978+ 6 4.18101+ 0 1.17982+ 6 4.15232+ 0 1.18383+ 6 4.14018+ 09646 3  2  433
 1.20000+ 6 4.09441+ 0 1.21596+ 6 4.05672+ 0 1.22500+ 6 4.03561+ 09646 3  2  434
 1.25512+ 6 3.96806+ 0 1.29428+ 6 3.88668+ 0 1.30533+ 6 3.86642+ 09646 3  2  435
 1.32340+ 6 3.83511+ 0 1.35453+ 6 3.78664+ 0 1.37260+ 6 3.75991+ 09646 3  2  436
 1.38465+ 6 3.74340+ 0 1.40000+ 6 3.72479+ 0 1.45795+ 6 3.68931+ 09646 3  2  437
 1.48406+ 6 3.67698+ 0 1.51519+ 6 3.66424+ 0 1.53226+ 6 3.65821+ 09646 3  2  438
 1.60000+ 6 3.63986+ 0 2.00000+ 6 3.73777+ 0 2.50000+ 6 4.11491+ 09646 3  2  439
 3.00000+ 6 4.51428+ 0 4.00000+ 6 4.96329+ 0 5.00000+ 6 4.92587+ 09646 3  2  440
 6.00000+ 6 4.59505+ 0 6.23707+ 6 4.52375+ 0 6.48347+ 6 4.43531+ 09646 3  2  441
 6.48350+ 6 4.43529+ 0 6.60894+ 6 4.36952+ 0 6.73680+ 6 4.29800+ 09646 3  2  442
 6.86714+ 6 4.22039+ 0 7.00000+ 6 4.13636+ 0 7.23762+ 6 4.02358+ 09646 3  2  443
 7.35944+ 6 3.96649+ 0 7.48331+ 6 3.90891+ 0 7.60926+ 6 3.85082+ 09646 3  2  444
 7.73734+ 6 3.79219+ 0 7.80218+ 6 3.76267+ 0 7.86757+ 6 3.73301+ 09646 3  2  445
 7.93351+ 6 3.70320+ 0 8.00000+ 6 3.67325+ 0 8.45897+ 6 3.49839+ 09646 3  2  446
 8.69824+ 6 3.41127+ 0 8.94427+ 6 3.32430+ 0 9.00000+ 6 3.30521+ 09646 3  2  447
 9.19727+ 6 3.24465+ 0 9.32644+ 6 3.20598+ 0 9.45742+ 6 3.16739+ 09646 3  2  448
 9.59024+ 6 3.12889+ 0 9.72493+ 6 3.09046+ 0 9.79298+ 6 3.07128+ 09646 3  2  449
 9.86151+ 6 3.05212+ 0 9.93051+ 6 3.03298+ 0 9.96519+ 6 3.02342+ 09646 3  2  450
 1.00000+ 7 3.01386+ 0 1.04721+ 7 2.94481+ 0 1.07164+ 7 2.91010+ 09646 3  2  451
 1.09664+ 7 2.87525+ 0 1.10000+ 7 2.87063+ 0 1.12222+ 7 2.84462+ 09646 3  2  452
 1.13523+ 7 2.82963+ 0 1.14840+ 7 2.81462+ 0 1.16172+ 7 2.79960+ 09646 3  2  453
 1.17519+ 7 2.78458+ 0 1.18199+ 7 2.77706+ 0 1.18882+ 7 2.76954+ 09646 3  2  454
 1.19570+ 7 2.76201+ 0 1.19915+ 7 2.75825+ 0 1.20000+ 7 2.75733+ 09646 3  2  455
 1.20260+ 7 2.75461+ 0 1.20261+ 7 2.75461+ 0 1.22625+ 7 2.74745+ 09646 3  2  456
 1.25036+ 7 2.74020+ 0 1.27494+ 7 2.73284+ 0 1.28741+ 7 2.72913+ 09646 3  2  457
 1.30000+ 7 2.72539+ 0 1.34907+ 7 2.74033+ 0 1.40000+ 7 2.75489+ 09646 3  2  458
 1.44914+ 7 2.76582+ 0 1.47435+ 7 2.77111+ 0 1.50000+ 7 2.77629+ 09646 3  2  459
 1.52365+ 7 2.79092+ 0 1.54768+ 7 2.80541+ 0 1.57208+ 7 2.81977+ 09646 3  2  460
 1.59687+ 7 2.83400+ 0 1.60000+ 7 2.83577+ 0 1.62443+ 7 2.85061+ 09646 3  2  461
 1.64924+ 7 2.86534+ 0 1.67443+ 7 2.87996+ 0 1.70000+ 7 2.89445+ 09646 3  2  462
 1.72447+ 7 2.90786+ 0 1.74929+ 7 2.92117+ 0 1.77446+ 7 2.93437+ 09646 3  2  463
 1.78718+ 7 2.94093+ 0 1.80000+ 7 2.94747+ 0 1.82096+ 7 2.95863+ 09646 3  2  464
 1.84216+ 7 2.96973+ 0 1.86361+ 7 2.98077+ 0 1.88530+ 7 2.99173+ 09646 3  2  465
 1.88534+ 7 2.99175+ 0 1.88535+ 7 2.99176+ 0 1.90000+ 7 2.99742+ 09646 3  2  466
 1.92080+ 7 3.00574+ 0 1.94182+ 7 3.01398+ 0 1.97070+ 7 3.02507+ 09646 3  2  467
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.98530+ 7 3.03056+ 0 2.00000+ 7 3.03602+ 0                       9646 3  2  468
                                                                   9646 3  0  469
 9.62460+ 4 2.43953+ 2           0          99           0         09646 3  4  470
 0.0     + 0-4.29000+ 4           0           0           1        599646 3  4  471
         59          3           0           0           0         09646 3  4  472
 4.30759+ 4 0.0     + 0 5.00000+ 4 1.29233- 1 8.00000+ 4 5.86908- 19646 3  4  473
 1.00000+ 5 7.66811- 1 1.42582+ 5 1.00289+ 0 2.00000+ 5 1.17462+ 09646 3  4  474
 2.96711+ 5 1.31013+ 0 4.00000+ 5 1.38531+ 0 5.02050+ 5 1.43801+ 09646 3  4  475
 6.00000+ 5 1.49339+ 0 7.00000+ 5 1.51804+ 0 8.00000+ 5 1.47008+ 09646 3  4  476
 8.45150+ 5 1.43694+ 0 8.79992+ 5 1.44108+ 0 9.00000+ 5 1.44425+ 09646 3  4  477
 9.27085+ 5 1.44792+ 0 9.85021+ 5 1.44241+ 0 1.00000+ 6 1.43649+ 09646 3  4  478
 1.05531+ 6 1.42603+ 0 1.08342+ 6 1.41602+ 0 1.10953+ 6 1.41865+ 09646 3  4  479
 1.12861+ 6 1.42078+ 0 1.13262+ 6 1.42157+ 0 1.13363+ 6 1.42234+ 09646 3  4  480
 1.16978+ 6 1.42607+ 0 1.17982+ 6 1.42631+ 0 1.18383+ 6 1.42723+ 09646 3  4  481
 1.20000+ 6 1.42781+ 0 1.21596+ 6 1.43664+ 0 1.22500+ 6 1.44191+ 09646 3  4  482
 1.25512+ 6 1.45850+ 0 1.29428+ 6 1.47753+ 0 1.30533+ 6 1.48084+ 09646 3  4  483
 1.32340+ 6 1.48520+ 0 1.35453+ 6 1.48883+ 0 1.37260+ 6 1.49089+ 09646 3  4  484
 1.38465+ 6 1.49113+ 0 1.40000+ 6 1.48938+ 0 1.45795+ 6 1.55506+ 09646 3  4  485
 1.48406+ 6 1.58168+ 0 1.51519+ 6 1.61210+ 0 1.53226+ 6 1.62812+ 09646 3  4  486
 1.60000+ 6 1.68814+ 0 2.00000+ 6 1.72223+ 0 2.50000+ 6 1.43698+ 09646 3  4  487
 3.00000+ 6 1.27144+ 0 4.00000+ 6 1.35746+ 0 5.00000+ 6 1.46161+ 09646 3  4  488
 6.00000+ 6 1.52331+ 0 6.48350+ 6 1.13641+ 0 7.00000+ 6 5.71039- 19646 3  4  489
 8.00000+ 6 1.04611- 1 1.00000+ 7 8.36212- 3 1.20261+ 7 6.86897- 49646 3  4  490
 1.30000+ 7 2.34033- 4 1.50000+ 7 2.45350- 4 1.70000+ 7 1.56702- 49646 3  4  491
 1.88534+ 7 1.20308- 4 2.00000+ 7 6.59716- 5                       9646 3  4  492
                                                                   9646 3  0  493
 9.62460+ 4 2.43953+ 2           0          99           0         09646 3 16  494
 0.0     + 0-6.45700+ 6           0           0           1        179646 3 16  495
         17          2           0           0           0         09646 3 16  496
 6.48347+ 6 0.0     + 0 7.00000+ 6 1.98430- 1 8.00000+ 6 3.42990- 19646 3 16  497
 9.00000+ 6 4.46770- 1 1.00000+ 7 5.14160- 1 1.10000+ 7 5.57140- 19646 3 16  498
 1.20000+ 7 5.80480- 1 1.20260+ 7 5.30980- 1 1.30000+ 7 5.54080- 19646 3 16  499
 1.40000+ 7 3.85420- 1 1.50000+ 7 2.21880- 1 1.60000+ 7 1.04810- 19646 3 16  500
 1.70000+ 7 4.78050- 2 1.80000+ 7 2.08100- 2 1.88530+ 7 1.00320- 29646 3 16  501
 1.90000+ 7 8.82750- 3 2.00000+ 7 3.69930- 3                       9646 3 16  502
                                                                   9646 3  0  503
 9.62460+ 4 2.43953+ 2           0          99           0         09646 3 17  504
 0.0     + 0-1.19770+ 7           0           0           1        109646 3 17  505
         10          2           0           0           0         09646 3 17  506
 1.20261+ 7 0.0     + 0 1.30000+ 7 4.78170- 2 1.40000+ 7 2.45100- 19646 3 17  507
 1.50000+ 7 4.51880- 1 1.60000+ 7 6.10910- 1 1.70000+ 7 7.14930- 19646 3 17  508
 1.80000+ 7 7.84280- 1 1.88530+ 7 8.28610- 1 1.90000+ 7 8.35390- 19646 3 17  509
 2.00000+ 7 8.71080- 1                                             9646 3 17  510
                                                                   9646 3  0  511
 9.62460+ 4 2.43953+ 2           0          99           0         09646 3 18  512
 0.0     + 0 2.00000+ 8           0           0           2        329646 3 18  513
          2          2          32           5           0         09646 3 18  514
 1.00000- 5 0.0     + 0 3.00000+ 4 0.0     + 0 3.00000+ 4 3.73000- 29646 3 18  515
 4.00000+ 4 3.39000- 2 5.00000+ 4 3.14000- 2 6.00000+ 4 3.00000- 29646 3 18  516
 8.00000+ 4 2.80000- 2 1.00000+ 5 3.11000- 2 1.50000+ 5 4.08000- 29646 3 18  517
 2.00000+ 5 4.88000- 2 3.00000+ 5 6.89999- 2 4.00000+ 5 9.87000- 29646 3 18  518
 5.00000+ 5 1.41000- 1 6.00000+ 5 2.12000- 1 7.00000+ 5 3.51000- 19646 3 18  519
 8.00000+ 5 6.32000- 1 9.00000+ 5 9.42000- 1 1.00000+ 6 1.20000+ 09646 3 18  520
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.20000+ 6 1.59000+ 0 1.40000+ 6 1.80000+ 0 1.60000+ 6 1.65000+ 09646 3 18  521
 2.00000+ 6 1.59000+ 0 2.50000+ 6 1.71000+ 0 3.00000+ 6 1.71000+ 09646 3 18  522
 4.00000+ 6 1.45000+ 0 5.00000+ 6 1.35000+ 0 6.00000+ 6 1.35000+ 09646 3 18  523
 7.00000+ 6 2.10000+ 0 8.00000+ 6 2.42000+ 0 1.00000+ 7 2.42000+ 09646 3 18  524
 1.50000+ 7 2.42000+ 0 2.00000+ 7 2.32000+ 0                      9646 3 18  525
                                                                  9646 3  0  526
 9.62460+ 4 2.43953+ 2           0          99           0       09646 3 37  527
 0.0    + 0-1.87765+ 7           0           0           1       39646 3 37  528
         3           2           0           0           0       09646 3 37  529
 1.88535+ 7 0.0    + 0 1.90000+ 7 8.42910- 8 2.00000+ 7 5.43320- 39646 3 37  530
                                                                  9646 3  0  531
 9.62460+ 4 2.43953+ 2           0           1           0       09646 3 51  532
 0.0    + 0-4.29000+ 4           0           0           1      599646 3 51  533
        59           3           0           0           0       09646 3 51  534
 4.30759+ 4 0.0    + 0 5.00000+ 4 1.29233- 1 8.00000+ 4 5.86908- 19646 3 51  535
 1.00000+ 5 7.66811- 1 1.42582+ 5 1.00289+ 0 2.00000+ 5 1.16392+ 09646 3 51  536
 2.96711+ 5 1.26452+ 0 4.00000+ 5 1.28035+ 0 5.02050+ 5 1.25884+ 09646 3 51  537
 6.00000+ 5 1.23342+ 0 7.00000+ 5 1.18003+ 0 8.00000+ 5 1.07790+ 09646 3 51  538
 8.45150+ 5 1.02759+ 0 8.79992+ 5 9.63650- 1 9.00000+ 5 9.23574- 19646 3 51  539
 9.27085+ 5 8.81554- 1 9.85021+ 5 7.98828- 1 1.00000+ 6 7.80466- 19646 3 51  540
 1.05531+ 6 7.28881- 1 1.08342+ 6 7.04799- 1 1.10953+ 6 6.74398- 19646 3 51  541
 1.12861+ 6 6.49791- 1 1.13262+ 6 6.44292- 1 1.13363+ 6 6.42217- 19646 3 51  542
 1.16978+ 6 5.93245- 1 1.17982+ 6 5.79751- 1 1.18383+ 6 5.73991- 19646 3 51  543
 1.20000+ 6 5.51871- 1 1.21596+ 6 5.34517- 1 1.22500+ 6 5.23405- 19646 3 51  544
 1.25512+ 6 4.88866- 1 1.29428+ 6 4.43855- 1 1.30533+ 6 4.32587- 19646 3 51  545
 1.32340+ 6 4.13904- 1 1.35453+ 6 3.83988- 1 1.37260+ 6 3.66702- 19646 3 51  546
 1.38465+ 6 3.55300- 1 1.40000+ 6 3.42357- 1 1.45795+ 6 3.17715- 19646 3 51  547
 1.48406+ 6 3.07987- 1 1.51519+ 6 2.96338- 1 1.53226+ 6 2.89909- 19646 3 51  548
 1.60000+ 6 2.64096- 1 2.00000+ 6 1.19375- 1 2.50000+ 6 3.27234- 29646 3 51  549
 3.00000+ 6 8.99876- 3 4.00000+ 6 9.18767- 4 5.00000+ 6 9.81162- 59646 3 51  550
 6.00000+ 6 1.18543- 5 6.48350+ 6 3.35842- 6 7.00000+ 6 6.26612- 79646 3 51  551
 8.00000+ 6 1.86356- 8 1.00000+ 7 5.27554-11 1.20261+ 7 2.08007-139646 3 51  552
 1.30000+ 7 1.80652-14 1.50000+ 7 1.32691-15 1.70000+ 7 7.05518-179646 3 51  553
 1.88534+ 7 6.13177-18 2.00000+ 7 9.19501-19                      9646 3 51  554
                                                                  9646 3  0  555
 9.62460+ 4 2.43953+ 2           0           2           0       09646 3 52  556
 0.0    + 0-1.42000+ 5           0           0           1      559646 3 52  557
        55           3           0           0           0       09646 3 52  558
 1.42582+ 5 0.0    + 0 2.00000+ 5 1.07017- 2 2.96711+ 5 4.56170- 29646 3 52  559
 4.00000+ 5 1.04906- 1 5.02050+ 5 1.78514- 1 6.00000+ 5 2.57109- 19646 3 52  560
 7.00000+ 5 3.30528- 1 8.00000+ 5 3.77680- 1 8.45150+ 5 3.91035- 19646 3 52  561
 8.79992+ 5 3.91387- 1 9.00000+ 5 3.84625- 1 9.27085+ 5 3.81754- 19646 3 52  562
 9.85021+ 5 3.70219- 1 1.00000+ 6 3.68099- 1 1.05531+ 6 3.65143- 19646 3 52  563
 1.08342+ 6 3.62934- 1 1.10953+ 6 3.58030- 1 1.12861+ 6 3.52929- 19646 3 52  564
 1.13262+ 6 3.51618- 1 1.13363+ 6 3.50483- 1 1.16978+ 6 3.34646- 19646 3 52  565
 1.17982+ 6 3.29922- 1 1.18383+ 6 3.27951- 1 1.20000+ 6 3.19745- 19646 3 52  566
 1.21596+ 6 3.13773- 1 1.22500+ 6 3.10017- 1 1.25512+ 6 2.95208- 19646 3 52  567
 1.29428+ 6 2.75544- 1 1.30533+ 6 2.70569- 1 1.32340+ 6 2.61079- 19646 3 52  568
 1.35453+ 6 2.46979- 1 1.37260+ 6 2.38838- 1 1.38465+ 6 2.33403- 19646 3 52  569
 1.40000+ 6 2.26969- 1 1.45795+ 6 2.16739- 1 1.48406+ 6 2.12719- 19646 3 52  570
 1.51519+ 6 2.07621- 1 1.53226+ 6 2.04593- 1 1.60000+ 6 1.90842- 19646 3 52  571
 2.00000+ 6 9.07533- 2 2.50000+ 6 2.57768- 2 3.00000+ 6 7.50094- 39646 3 52  572
 4.00000+ 6 8.79060- 4 5.00000+ 6 1.05534- 4 6.00000+ 6 1.39046- 59646 3 52  573
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 6.48350+ 6 4.05614- 6 7.00000+ 6 7.75512- 7 8.00000+ 6 2.39419- 89646 3 52  574
 1.00000+ 7 7.16878-11 1.20261+ 7 2.92331-13 1.30000+ 7 2.57147-149646 3 52  575
 1.50000+ 7 1.93557-15 1.70000+ 7 1.04973-16 1.88534+ 7 9.25760-189646 3 52  576
 2.00000+ 7 1.39895-18                                          9646 3 52  577
                                                                9646 3  0  578
 9.62460+ 4 2.43953+ 2          0          3          0         09646 3 53  579
 0.0     + 0-2.95500+ 5          0          0          1        539646 3 53  580
        53          3          0          0          0         09646 3 53  581
 2.96711+ 5 0.0     + 0 4.00000+ 5 5.93248- 5 5.02050+ 5 6.46657- 49646 3 53  582
 6.00000+ 5 2.86300- 3 7.00000+ 5 7.48176- 3 8.00000+ 5 1.44964- 29646 3 53  583
 8.45150+ 5 1.83006- 2 8.79992+ 5 2.12053- 2 9.00000+ 5 2.24244- 29646 3 53  584
 9.27085+ 5 2.45259- 2 9.85021+ 5 2.86611- 2 1.00000+ 6 2.98020- 29646 3 53  585
 1.05531+ 6 3.43628- 2 1.08342+ 6 3.66480- 2 1.10953+ 6 3.87343- 29646 3 53  586
 1.12861+ 6 4.00566- 2 1.13262+ 6 4.03272- 2 1.13363+ 6 4.02466- 29646 3 53  587
 1.16978+ 6 4.15878- 2 1.17982+ 6 4.18843- 2 1.18383+ 6 4.19808- 29646 3 53  588
 1.20000+ 6 4.23025- 2 1.21596+ 6 4.28238- 2 1.22500+ 6 4.30756- 29646 3 53  589
 1.25512+ 6 4.32644- 2 1.29428+ 6 4.32431- 2 1.30533+ 6 4.32312- 29646 3 53  590
 1.32340+ 6 4.28831- 2 1.35453+ 6 4.25320- 2 1.37260+ 6 4.23765- 29646 3 53  591
 1.38465+ 6 4.22006- 2 1.40000+ 6 4.19145- 2 1.49795+ 6 4.31880- 29646 3 53  592
 1.48406+ 6 4.37750- 2 1.51519+ 6 4.43559- 2 1.53226+ 6 4.45678- 29646 3 53  593
 1.60000+ 6 4.44914- 2 2.00000+ 6 2.62432- 2 2.50000+ 6 8.56583- 39646 3 53  594
 3.00000+ 6 2.85224- 3 4.00000+ 6 4.36483- 4 5.00000+ 6 6.59571- 59646 3 53  595
 6.00000+ 6 1.03382- 5 6.48350+ 6 3.18515- 6 7.00000+ 6 6.36000- 79646 3 53  596
 8.00000+ 6 2.09194- 8 1.00000+ 7 6.88342-11 1.20261+ 7 2.98224-139646 3 53  597
 1.30000+ 7 2.67961-14 1.50000+ 7 2.09631-15 1.70000+ 7 1.17271-169646 3 53  598
 1.88534+ 7 1.05787-17 2.00000+ 7 1.61762-18                    9646 3 53  599
                                                                9646 3  0  600
 9.62460+ 4 2.43953+ 2          0          4          0         09646 3 54  601
 0.0     + 0-5.00000+ 5          0          0          1        519646 3 54  602
        51          3          0          0          0         09646 3 54  603
 5.02050+ 5 0.0     + 0 6.00000+ 5 1.03793- 7 7.00000+ 5 1.67721- 69646 3 54  604
 8.00000+ 5 8.63143- 6 8.45150+ 5 1.59772- 5 8.79992+ 5 2.34462- 59646 3 54  605
 9.00000+ 5 2.71691- 5 9.27085+ 5 3.71608- 5 9.85021+ 5 5.97762- 59646 3 54  606
 1.00000+ 6 6.49685- 5 1.05531+ 6 9.47580- 5 1.08342+ 6 1.10857- 49646 3 54  607
 1.10953+ 6 1.29132- 4 1.12861+ 6 1.43856- 4 1.13262+ 6 1.47101- 49646 3 54  608
 1.13363+ 6 1.47919- 4 1.16978+ 6 2.03356- 4 1.17982+ 6 2.13786- 49646 3 54  609
 1.18383+ 6 2.18012- 4 1.20000+ 6 2.35687- 4 1.21596+ 6 2.54905- 49646 3 54  610
 1.22500+ 6 2.66439- 4 1.25512+ 6 3.03468- 4 1.29428+ 6 3.54305- 49646 3 54  611
 1.30533+ 6 3.69458- 4 1.32340+ 6 3.94802- 4 1.35453+ 6 4.40859- 49646 3 54  612
 1.37260+ 6 4.79850- 4 1.38465+ 6 4.99241- 4 1.40000+ 6 5.23233- 49646 3 54  613
 1.45795+ 6 6.49038- 4 1.48406+ 6 7.11865- 4 1.51519+ 6 7.92001- 49646 3 54  614
 1.53226+ 6 8.38030- 4 1.60000+ 6 1.00613- 3 2.00000+ 6 1.16150- 39646 3 54  615
 2.50000+ 6 7.21300- 4 3.00000+ 6 3.96337- 4 4.00000+ 6 1.14178- 49646 3 54  616
 5.00000+ 6 2.58832- 5 6.00000+ 6 5.25353- 6 6.48350+ 6 1.74519- 69646 3 54  617
 7.00000+ 6 3.68880- 7 8.00000+ 6 1.31250- 8 1.00000+ 7 4.88678-119646 3 54  618
 1.20261+ 7 2.31993-13 1.30000+ 7 2.15995-14 1.50000+ 7 1.80744-159646 3 54  619
 1.70000+ 7 1.06826-16 1.88534+ 7 1.00179-17 2.00000+ 7 1.56259-189646 3 54  620
                                                                9646 3  0  621
 9.62460+ 4 2.43953+ 2          0          5          0         09646 3 55  622
 0.0     + 0-8.41700+ 5          0          0          1        479646 3 55  623
        47          3          0          0          0         09646 3 55  624
 8.45150+ 5 0.0     + 0 8.79992+ 5 6.48107- 2 9.00000+ 5 8.92530- 29646 3 55  625
 9.27085+ 5 1.14432- 1 9.85021+ 5 1.45093- 1 1.00000+ 6 1.49602- 19646 3 55  626
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.05531+ 6 1.62871- 1 1.08342+ 6 1.66731- 1 1.10953+ 6 1.66375- 19646 3 55  627
 1.12861+ 6 1.63665- 1 1.13262+ 6 1.62252- 1 1.13363+ 6 1.61920- 19646 3 55  628
 1.16978+ 6 1.52916- 1 1.17982+ 6 1.50073- 1 1.18383+ 6 1.48689- 19646 3 55  629
 1.20000+ 6 1.44154- 1 1.21596+ 6 1.41235- 1 1.22500+ 6 1.38957- 19646 3 55  630
 1.25512+ 6 1.32796- 1 1.29428+ 6 1.24434- 1 1.30533+ 6 1.22039- 19646 3 55  631
 1.32340+ 6 1.18265- 1 1.35453+ 6 1.11566- 1 1.37260+ 6 1.07735- 19646 3 55  632
 1.38465+ 6 1.05056- 1 1.40000+ 6 1.01912- 1 1.45795+ 6 9.68430- 29646 3 55  633
 1.48406+ 6 9.47295- 2 1.51519+ 6 9.22872- 2 1.53226+ 6 9.10096- 29646 3 55  634
 1.60000+ 6 8.60917- 2 2.00000+ 6 4.73723- 2 2.50000+ 6 1.59862- 29646 3 55  635
 3.00000+ 6 5.18139- 3 4.00000+ 6 6.58283- 4 5.00000+ 6 8.00219- 59646 3 55  636
 6.00000+ 6 1.00491- 5 6.48350+ 6 2.86247- 6 7.00000+ 6 5.35761- 79646 3 55  637
 8.00000+ 6 1.60388- 8 1.00000+ 7 4.75230-11 1.20261+ 7 1.93685-139646 3 55  638
 1.30000+ 7 1.69416-14 1.50000+ 7 1.26138-15 1.70000+ 7 6.78321-179646 3 55  639
 1.88534+ 7 5.93971-18 2.00000+ 7 8.93455-19                          9646 3 55  640
                                                                      9646 3  0  641
 9.62460+ 4 2.43953+ 2           0           6           0           09646 3 56  642
 0.0     + 0-8.76400+ 5           0           0           1          469646 3 56  643
         46          3           0           0           0           09646 3 56  644
 8.79992+ 5 0.0     + 0 9.00000+ 5 2.43470- 2 9.27085+ 5 4.56212- 29646 3 56  645
 9.85021+ 5 7.44166- 2 1.00000+ 6 7.94897- 2 1.05531+ 6 9.42238- 29646 3 56  646
 1.08342+ 6 9.95654- 2 1.10953+ 6 1.02724- 1 1.12861+ 6 1.03559- 19646 3 56  647
 1.13262+ 6 1.03104- 1 1.13363+ 6 1.02904- 1 1.16978+ 6 1.00510- 19646 3 56  648
 1.17982+ 6 9.94104- 2 1.18383+ 6 9.90244- 2 1.20000+ 6 9.74210- 29646 3 56  649
 1.21596+ 6 9.67552- 2 1.22500+ 6 9.58549- 2 1.25512+ 6 9.33936- 29646 3 56  650
 1.29428+ 6 8.99735- 2 1.30533+ 6 8.90535- 2 1.32340+ 6 8.71883- 29646 3 56  651
 1.35453+ 6 8.37818- 2 1.37260+ 6 8.19070- 2 1.38465+ 6 8.05483- 29646 3 56  652
 1.40000+ 6 7.88620- 2 1.45795+ 6 7.72733- 2 1.48406+ 6 7.66811- 29646 3 56  653
 1.51519+ 6 7.58458- 2 1.53226+ 6 7.53423- 2 1.60000+ 6 7.29832- 29646 3 56  654
 2.00000+ 6 4.27072- 2 2.50000+ 6 1.50979- 2 3.00000+ 6 5.11205- 39646 3 56  655
 4.00000+ 6 7.04406- 4 5.00000+ 6 9.13668- 5 6.00000+ 6 1.19630- 59646 3 56  656
 6.48350+ 6 3.45029- 6 7.00000+ 6 6.51876- 7 8.00000+ 6 1.97478- 89646 3 56  657
 1.00000+ 7 5.94268-11 1.20261+ 7 2.44782-13 1.30000+ 7 2.15026-149646 3 56  658
 1.50000+ 7 1.61410-15 1.70000+ 7 8.74172-17 1.88534+ 7 7.69761-189646 3 56  659
 2.00000+ 7 1.16148-18                                                9646 3 56  660
                                                                      9646 3  0  661
 9.62460+ 4 2.43953+ 2           0           7           0           09646 3 57  662
 0.0     + 0-9.23300+ 5           0           0           1          449646 3 57  663
         44          3           0           0           0           09646 3 57  664
 9.27085+ 5 0.0     + 0 9.85021+ 5 2.51321- 2 1.00000+ 6 2.87217- 29646 3 57  665
 1.05531+ 6 3.89018- 2 1.08342+ 6 4.26832- 2 1.10953+ 6 4.54293- 29646 3 57  666
 1.12861+ 6 4.69121- 2 1.13262+ 6 4.70134- 2 1.13363+ 6 4.69606- 29646 3 57  667
 1.16978+ 6 4.76601- 2 1.17982+ 6 4.75518- 2 1.18383+ 6 4.75353- 29646 3 57  668
 1.20000+ 6 4.74445- 2 1.21596+ 6 4.76811- 2 1.22500+ 6 4.76546- 29646 3 57  669
 1.25512+ 6 4.73553- 2 1.29428+ 6 4.67854- 2 1.30533+ 6 4.66181- 29646 3 57  670
 1.32340+ 6 4.60882- 2 1.35453+ 6 4.51534- 2 1.37260+ 6 4.46619- 29646 3 57  671
 1.38465+ 6 4.42846- 2 1.40000+ 6 4.37368- 2 1.45795+ 6 4.42419- 29646 3 57  672
 1.48406+ 6 4.45353- 2 1.51519+ 6 4.47959- 2 1.53226+ 6 4.48705- 29646 3 57  673
 1.60000+ 6 4.47133  2 2.00000+ 6 2.86701- 2 2.50000+ 6 1.10067- 29646 3 57  674
 3.00000+ 6 4.02070- 3 4.00000+ 6 6.33799- 4 5.00000+ 6 9.05472- 59646 3 57  675
 6.00000+ 6 1.25236- 5 6.48350+ 6 3.66518- 6 7.00000+ 6 6.99715- 79646 3 57  676
 8.00000+ 6 2.14704- 8 1.00000+ 7 6.60335-11 1.20261+ 7 2.76953-139646 3 57  677
 1.30000+ 7 2.44798-14 1.50000+ 7 1.85792-15 1.70000+ 7 1.01575-169646 3 57  678
 1.88534+ 7 9.00846-18 2.00000+ 7 1.36451-18                          9646 3 57  679
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
                                                                  9646 3  0  680
 9.62460+ 4 2.43953+ 2          0          8          0          09646 3 58  681
 0.0     + 0-9.81000+ 5         0          0          1         439646 3 58  682
         43         3           0          0          0          09646 3 58  683
 9.85021+ 5 0.0     + 0 1.00000+ 6 2.48894- 4 1.05531+ 6 1.54847- 39646 3 58  684
 1.08342+ 6 2.33075- 3 1.10953+ 6 3.12406- 3 1.12861+ 6 3.73579- 39646 3 58  685
 1.13262+ 6 3.86591- 3 1.13363+ 6 3.89204- 3 1.16978+ 6 5.01273- 39646 3 58  686
 1.17982+ 6 5.31357- 3 1.18383+ 6 5.43484- 3 1.20000+ 6 5.91965- 39646 3 58  687
 1.21596+ 6 6.43012- 3 1.22500+ 6 6.71523- 3 1.25512+ 6 7.54882- 39646 3 58  688
 1.29428+ 6 8.62757- 3 1.30533+ 6 8.91996- 3 1.32340+ 6 9.33112- 39646 3 58  689
 1.35453+ 6 1.00132- 2 1.37260+ 6 1.04224- 2 1.38465+ 6 1.06585- 29646 3 58  690
 1.40000+ 6 1.09109- 2 1.45795+ 6 1.24930- 2 1.48406+ 6 1.32097- 29646 3 58  691
 1.51519+ 6 1.40369- 2 1.53226+ 6 1.44644- 2 1.60000+ 6 1.58441- 29646 3 58  692
 2.00000+ 6 1.35804- 2 2.50000+ 6 6.26485- 3 3.00000+ 6 2.59188- 39646 3 58  693
 4.00000+ 6 4.86034- 4 5.00000+ 6 7.78571- 5 6.00000+ 6 1.15294- 59646 3 58  694
 6.48350+ 6 3.44458- 6 7.00000+ 6 6.68705- 7 8.00000+ 6 2.10179- 89646 3 58  695
 1.00000+ 7 6.71208-11 1.20261+ 7 2.89433-13 1.30000+ 7 2.58350-149646 3 58  696
 1.50000+ 7 1.99307-15 1.70000+ 7 1.10333-16 1.88534+ 7 9.87707-189646 3 58  697
 2.00000+ 7 1.50373-18                                             9646 3 58  698
                                                                   9646 3  0  699
 9.62460+ 4 2.43953+ 2          0          9          0          09646 3 59  700
 0.0     + 0-1.05100+ 6         0          0          1         419646 3 59  701
         41         3           0          0          0          09646 3 59  702
 1.05531+ 6 0.0     + 0 1.08342+ 6 2.15831- 4 1.10953+ 6 4.50342- 49646 3 59  703
 1.12861+ 6 6.38932- 4 1.13262+ 6 6.80286- 4 1.13363+ 6 6.90166- 49646 3 59  704
 1.16978+ 6 1.06594- 3 1.17982+ 6 1.17362- 3 1.18383+ 6 1.21704- 39646 3 59  705
 1.20000+ 6 1.38917- 3 1.21596+ 6 1.57515- 3 1.22500+ 6 1.67984- 39646 3 59  706
 1.25512+ 6 2.00097- 3 1.29428+ 6 2.42611- 3 1.30533+ 6 2.54508- 39646 3 59  707
 1.32340+ 6 2.72463- 3 1.35453+ 6 3.03351- 3 1.37260+ 6 3.24472- 39646 3 59  708
 1.38465+ 6 3.35833- 3 1.40000+ 6 3.46764- 3 1.45795+ 6 4.17133- 39646 3 59  709
 1.48406+ 6 4.49282- 3 1.51519+ 6 4.87655- 3 1.53226+ 6 5.08266- 39646 3 59  710
 1.60000+ 6 5.77918- 3 2.00000+ 6 5.63067- 3 2.50000+ 6 2.98125- 39646 3 59  711
 3.00000+ 6 1.39590- 3 4.00000+ 6 3.19373- 4 5.00000+ 6 5.93025- 59646 3 59  712
 6.00000+ 6 9.57317- 6 6.48350+ 6 2.92994- 6 7.00000+ 6 5.79352- 79646 3 59  713
 8.00000+ 6 1.86832- 8 1.00000+ 7 6.27323-11 1.20261+ 7 2.82096-139646 3 59  714
 1.30000+ 7 2.55492-14 1.50000+ 7 2.01517-15 1.70000+ 7 1.13431-169646 3 59  715
 1.88534+ 7 1.02802-17 2.00000+ 7 1.57551-18                       9646 3 59  716
                                                                   9646 3  0  717
 9.62460+ 4 2.43953+ 2          0         10          0          09646 3 60  718
 0.0     + 0-1.07900+ 6         0          0          1         409646 3 60  719
         40         3           0          0          0          09646 3 60  720
 1.08342+ 6 0.0     + 0 1.10953+ 6 2.92510- 2 1.12861+ 6 4.12381- 29646 3 60  721
 1.13262+ 6 4.33161- 2 1.13363+ 6 4.38297- 2 1.16978+ 6 5.83308- 29646 3 60  722
 1.17982+ 6 6.10840- 2 1.18383+ 6 6.18029- 2 1.20000+ 6 6.49100- 29646 3 60  723
 1.21596+ 6 6.77717- 2 1.22500+ 6 6.88553- 2 1.25512+ 6 7.16684- 29646 3 60  724
 1.29428+ 6 7.22682- 2 1.30533+ 6 7.18625- 2 1.32340+ 6 7.13082- 29646 3 60  725
 1.35453+ 6 6.95856- 2 1.37260+ 6 6.81292- 2 1.38465+ 6 6.70231- 29646 3 60  726
 1.40000+ 6 6.55732- 2 1.45795+ 6 6.41084- 2 1.48406+ 6 6.31128- 29646 3 60  727
 1.51519+ 6 6.19534- 2 1.53226+ 6 6.13532- 2 1.60000+ 6 5.88079- 29646 3 60  728
 2.00000+ 6 3.37243- 2 2.50000+ 6 1.16125- 2 3.00000+ 6 3.76127- 39646 3 60  729
 4.00000+ 6 4.60818- 4 5.00000+ 6 5.40808- 5 6.00000+ 6 6.64892- 69646 3 60  730
 6.48350+ 6 1.88360- 6 7.00000+ 6 3.51661- 7 8.00000+ 6 1.04923- 89646 3 60  731
 1.00000+ 7 3.06070-11 1.20261+ 7 1.24174-13 1.30000+ 7 1.08827-149646 3 60  732
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.50000+ 7 8.09381-16 1.70000+ 7 4.34178-17 1.88534+ 7 3.79451-189646 3 60  733
 2.00000+ 7 5.69979-19                                            9646 3 60  734
                                                                  9646 3  0  735
 9.62460+ 4 2.43953+ 2          0          11          0          09646 3 61  736
 0.0     + 0-1.10500+ 6          0           0          1         399646 3 61  737
         39          3          0           0          0          09646 3 61  738
 1.10953+ 6 0.0     + 0 1.12861+ 6 1.81082- 2 1.13262+ 6 2.04792- 29646 3 61  739
 1.13363+ 6 2.10407- 2 1.16978+ 6 3.80827- 2 1.17982+ 6 4.16241- 29646 3 61  740
 1.18383+ 6 4.28259- 2 1.20000+ 6 4.73860- 2 1.21596+ 6 5.13975- 29646 3 61  741
 1.22500+ 6 5.31639- 2 1.25512+ 6 5.81968- 2 1.29428+ 6 6.18275- 29646 3 61  742
 1.30533+ 6 6.23637- 2 1.32340+ 6 6.30200- 2 1.35453+ 6 6.31054- 29646 3 61  743
 1.37260+ 6 6.27809- 2 1.38465+ 6 6.23154- 2 1.40000+ 6 6.16750- 29646 3 61  744
 1.45795+ 6 6.25949- 2 1.48406+ 6 6.26693- 2 1.51519+ 6 6.25779- 29646 3 61  745
 1.53226+ 6 6.24798- 2 1.60000+ 6 6.16414- 2 2.00000+ 6 3.86569- 29646 3 61  746
 2.50000+ 6 1.41414- 2 3.00000+ 6 4.80610- 3 4.00000+ 6 6.30893- 49646 3 61  747
 5.00000+ 6 7.73283- 5 6.00000+ 6 9.76642- 6 6.48350+ 6 2.78700- 69646 3 61  748
 7.00000+ 6 5.22843- 7 8.00000+ 6 1.56881- 8 1.00000+ 7 4.65703-119646 3 61  749
 1.20261+ 7 1.90614-13 1.30000+ 7 1.67013-14 1.50000+ 7 1.24522-159646 3 61  750
 1.70000+ 7 6.70864-17 1.88534+ 7 5.88440-18 2.00000+ 7 8.85911-199646 3 61  751
                                                                  9646 3  0  752
 9.62460+ 4 2.43953+ 2          0          12          0          09646 3 62  753
 0.0     + 0-1.12400+ 6          0           0          1         389646 3 62  754
        38          3          0           0          0          09646 3 62  755
 1.12861+ 6 0.0     + 0 1.13262+ 6 4.47045- 3 1.13363+ 6 5.20574- 39646 3 62  756
 1.16978+ 6 3.30013- 2 1.17982+ 6 4.07716- 2 1.18383+ 6 4.37936- 29646 3 62  757
 1.20000+ 6 5.53506- 2 1.21596+ 6 6.59912- 2 1.22500+ 6 7.13321- 29646 3 62  758
 1.25512+ 6 8.62624- 2 1.29428+ 6 9.89521- 2 1.30533+ 6 1.01651- 19646 3 62  759
 1.32340+ 6 1.04957- 1 1.35453+ 6 1.08475- 1 1.37260+ 6 1.09087- 19646 3 62  760
 1.38465+ 6 1.09062- 1 1.40000+ 6 1.09021- 1 1.45795+ 6 1.13574- 19646 3 62  761
 1.48406+ 6 1.14708- 1 1.51519+ 6 1.15116- 1 1.53226+ 6 1.15000- 19646 3 62  762
 1.60000+ 6 1.12525- 1 2.00000+ 6 6.75859- 2 2.50000+ 6 2.40182- 29646 3 62  763
 3.00000+ 6 7.67727- 3 4.00000+ 6 8.50081- 4 5.00000+ 6 8.94636- 59646 3 62  764
 6.00000+ 6 1.05322- 5 6.48350+ 6 2.98934- 6 7.00000+ 6 5.62321- 79646 3 62  765
 8.00000+ 6 1.69696- 8 1.00000+ 7 4.89937-11 1.20261+ 7 1.95579-139646 3 62  766
 1.30000+ 7 1.70725-14 1.50000+ 7 1.26291-15 1.70000+ 7 6.76205-179646 3 62  767
 1.88534+ 7 5.91504-18 2.00000+ 7 8.89825-19                       9646 3 62  768
                                                                  9646 3  0  769
 9.62460+ 4 2.43953+ 2          0          13          0          09646 3 63  770
 0.0     + 0-1.12800+ 6          0           0          1         379646 3 63  771
        37          3          0           0          0          09646 3 63  772
 1.13262+ 6 0.0     + 0 1.13363+ 6 2.80058- 3 1.16978+ 6 1.98099- 29646 3 63  773
 1.17982+ 6 2.28274- 2 1.18383+ 6 2.39478- 2 1.20000+ 6 2.80188- 29646 3 63  774
 1.21596+ 6 3.16340- 2 1.22500+ 6 3.33082- 2 1.25512+ 6 3.80228- 29646 3 63  775
 1.29428+ 6 4.23206- 2 1.30533+ 6 4.32553- 2 1.32340+ 6 4.43382- 29646 3 63  776
 1.35453+ 6 4.55085- 2 1.37260+ 6 4.59740- 2 1.38465+ 6 4.61143- 29646 3 63  777
 1.40000+ 6 4.61747- 2 1.45795+ 6 4.85693- 2 1.48406+ 6 4.94416- 29646 3 63  778
 1.51519+ 6 5.02106- 2 1.53226+ 6 5.05266- 2 1.60000+ 6 5.11139- 29646 3 63  779
 2.00000+ 6 3.41165- 2 2.50000+ 6 1.32025- 2 3.00000+ 6 4.71569- 39646 3 63  780
 4.00000+ 6 6.72703- 4 5.00000+ 6 8.81195- 5 6.00000+ 6 1.16096- 59646 3 63  781
 6.48350+ 6 3.35589- 6 7.00000+ 6 6.35903- 7 8.00000+ 6 1.93243- 89646 3 63  782
 1.00000+ 7 5.82675-11 1.20261+ 7 2.40977-13 1.30000+ 7 2.12051-149646 3 63  783
 1.50000+ 7 1.59392-15 1.70000+ 7 8.64808-17 1.88534+ 7 7.62782-189646 3 63  784
 2.00000+ 7 1.15194-18                                            9646 3 63  785
```

```
.........10.........20.........30.........40.........50.........60......MAT MF MT  SEQ
                                                                     9646 3  0  786
 9.62460+ 4 2.43953+ 2           0          14           0          09646 3 64  787
 0.0     + 0-1.12900+ 6           0           0           1         369646 3 64  788
         36          3           0           0           0          09646 3 64  789
 1.13363+ 6 0.0     + 0 1.16978+ 6 4.65858- 7 1.17982+ 6 9.20145- 79646 3 64  790
 1.18383+ 6 1.13491- 6 1.20000+ 6 2.28987- 6 1.21596+ 6 3.95842- 69646 3 64  791
 1.22500+ 6 5.15637- 6 1.25512+ 6 1.04985- 5 1.29428+ 6 2.09986- 59646 3 64  792
 1.30533+ 6 2.47480- 5 1.32340+ 6 3.16723- 5 1.35453+ 6 4.59576- 59646 3 64  793
 1.37260+ 6 8.38104- 5 1.38465+ 6 9.24755- 5 1.40000+ 6 1.03795- 49646 3 64  794
 1.45795+ 6 1.67038- 4 1.48406+ 6 2.01345- 4 1.51519+ 6 2.48424- 49646 3 64  795
 1.53226+ 6 2.77119- 4 1.60000+ 6 4.01738- 4 2.00000+ 6 9.54290- 49646 3 64  796
 2.50000+ 6 9.20650- 4 3.00000+ 6 5.93347- 4 4.00000+ 6 1.85442- 49646 3 64  797
 5.00000+ 6 4.07840- 5 6.00000+ 6 7.14960- 6 6.48350+ 6 2.23723- 69646 3 64  798
 7.00000+ 6 4.50631- 7 8.00000+ 6 1.49781- 8 1.00000+ 7 5.40092-119646 3 64  799
 1.20261+ 7 2.57011-13 1.30000+ 7 2.37043-14 1.50000+ 7 1.92332-159646 3 64  800
 1.70000+ 7 1.10749-16 1.88534+ 7 1.02102-17 2.00000+ 7 1.57902-189646 3 64  801
                                                                     9646 3  0  802
 9.62460+ 4 2.43953+ 2           0          15           0          09646 3 65  803
 0.0     + 0-1.16500+ 6           0           0           1         359646 3 65  804
         35          3           0           0           0          09646 3 65  805
 1.16978+ 6 0.0     + 0 1.17982+ 6 4.70453- 3 1.18383+ 6 6.56177- 39646 3 65  806
 1.20000+ 6 1.48500- 2 1.21596+ 6 2.36610- 2 1.22500+ 6 2.85823- 29646 3 65  807
 1.25512+ 6 4.36670- 2 1.29428+ 6 5.91550- 2 1.30533+ 6 6.28152- 29646 3 65  808
 1.32340+ 6 6.76340- 2 1.35453+ 6 7.41527- 2 1.37260+ 6 7.69181- 29646 3 65  809
 1.38465+ 6 7.82711- 2 1.40000+ 6 7.97686- 2 1.45795+ 6 8.76426- 29646 3 65  810
 1.48406+ 6 9.03184- 2 1.51519+ 6 9.26179- 2 1.53226+ 6 9.34770- 29646 3 65  811
 1.60000+ 6 9.43729- 2 2.00000+ 6 6.06270- 2 2.50000+ 6 2.27006- 29646 3 65  812
 3.00000+ 6 7.56388- 3 4.00000+ 6 8.87701- 4 5.00000+ 6 9.79295- 59646 3 65  813
 6.00000+ 6 1.19732- 5 6.48350+ 6 3.44926- 6 7.00000+ 6 6.57741- 79646 3 65  814
 8.00000+ 6 2.02513- 8 1.00000+ 7 6.00592-11 1.20261+ 7 2.43625-139646 3 65  815
 1.30000+ 7 2.13917-14 1.50000+ 7 1.60035-15 1.70000+ 7 8.64733-179646 3 65  816
 1.88534+ 7 7.61434-18 2.00000+ 7 1.14953-18                          9646 3 65  817
                                                                     9646 3  0  818
 9.62460+ 4 2.43953+ 2           0          16           0          09646 3 66  819
 0.0     + 0-1.17500+ 6           0           0           1         349646 3 66  820
        34          3           0           0           0          09646 3 66  821
 1.17982+ 6 0.0     + 0 1.18383+ 6 2.26025- 3 1.20000+ 6 6.81033- 39646 3 66  822
 1.21596+ 6 1.11319- 2 1.22500+ 6 1.35016- 2 1.25512+ 6 2.05088- 29646 3 66  823
 1.29428+ 6 2.68384- 2 1.30533+ 6 2.81425- 2 1.32340+ 6 3.00148- 29646 3 66  824
 1.35453+ 6 3.21338- 2 1.37260+ 6 3.25987- 2 1.38465+ 6 3.27582- 29646 3 66  825
 1.40000+ 6 3.29321- 2 1.45795+ 6 3.46680- 2 1.48406+ 6 3.49817- 29646 3 66  826
 1.51519+ 6 3.49873- 2 1.53226+ 6 3.48776- 2 1.60000+ 6 3.38773- 29646 3 66  827
 2.00000+ 6 2.01914- 2 2.50000+ 6 7.15772- 3 3.00000+ 6 2.24858- 39646 3 66  828
 4.00000+ 6 2.36873- 4 5.00000+ 6 2.39956- 5 6.00000+ 6 2.75859- 69646 3 66  829
 6.48350+ 6 7.76314- 7 7.00000+ 6 1.44154- 7 8.00000+ 6 4.20970- 99646 3 66  830
 1.00000+ 7 1.18180-11 1.20261+ 7 4.70865-14 1.30000+ 7 4.06996-159646 3 66  831
 1.50000+ 7 2.93819-16 1.70000+ 7 1.55023-17 1.88534+ 7 1.34135-189646 3 66  832
 2.00000+ 7 2.00585-19                                                9646 3 66  833
                                                                     9646 3  0  834
 9.62460+ 4 2.43953+ 2           0          17           0          09646 3 67  835
 0.0     + 0-1.1790 + 6           0           0           1         339646 3 67  836
        33          3           0           0           0          09646 3 67  837
 1.18383+ 6 0.0     + 0 1.20000+ 6 2.17463- 8 1.21596+ 6 1.19539- 79646 3 67  838
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.22500+ 6 2.20505- 7 1.25512+ 6 9.77347- 7 1.29428+ 6 2.97898- 69646 3 67  839
 1.30533+ 6 3.80069- 6 1.32340+ 6 5.41885- 6 1.35453+ 6 9.04872- 69646 3 67  840
 1.37260+ 6 2.26000- 5 1.38465+ 6 2.53790- 5 1.40000+ 6 2.91184- 59646 3 67  841
 1.45795+ 6 4.89040- 5 1.48406+ 6 6.14846- 5 1.51519+ 6 7.80517- 59646 3 67  842
 1.53226+ 6 8.84004- 5 1.60000+ 6 1.34883- 4 2.00000+ 6 3.72387- 49646 3 67  843
 2.50000+ 6 5.78990- 4 3.00000+ 6 2.49658- 4 4.00000+ 6 9.13639- 59646 3 67  844
 5.00000+ 6 2.39791- 5 6.00000+ 6 4.63046- 6 6.48350+ 6 1.49405- 69646 3 67  845
 7.00000+ 6 3.09744- 7 8.00000+ 6 1.08440- 8 1.00000+ 7 4.31996-119646 3 67  846
 1.20261+ 7 2.19099-13 1.30000+ 7 2.06258-14 1.50000+ 7 1.73429-159646 3 67  847
 1.70000+ 7 1.02906-16 1.88534+ 7 9.70055-18 2.00000+ 7 1.51768-189646 3 67  848
                                                                   9646 3  0  849
 9.62460+ 4 2.43953+ 2           0          18           0          09646 3 68  850
 0.0    + 0-1.21100+ 6           0           0           1         319646 3 68  851
        31          3           0           0           0          09646 3 68  852
 1.21596+ 6 0.0    + 0 1.22500+ 6 5.53346- 3 1.25512+ 6 2.30493- 29646 3 68  853
 1.29428+ 6 4.47796- 2 1.30533+ 6 5.01324- 2 1.32340+ 6 5.77947- 29646 3 68  854
 1.35453+ 6 6.84104- 2 1.37260+ 6 7.28117- 2 1.38465+ 6 7.51363- 29646 3 68  855
 1.40000+ 6 7.77607- 2 1.45795+ 6 8.89118- 2 1.48406+ 6 9.24214- 29646 3 68  856
 1.51519+ 6 9.53430- 2 1.53226+ 6 9.64261- 2 1.60000+ 6 9.77908- 29646 3 68  857
 2.00000+ 6 6.25820- 2 2.50000+ 6 2.28512- 2 3.00000+ 6 7.47674- 39646 3 68  858
 4.00000+ 6 8.42812- 4 5.00000+ 6 8.87982- 5 6.00000+ 6 1.04274- 59646 3 68  859
 6.48350+ 6 2.95753- 6 7.00000+ 6 5.56632- 7 8.00000+ 6 1.68266- 89646 3 68  860
 1.00000+ 7 4.86679-11 1.20261+ 7 1.94493-13 1.30000+ 7 1.69900-149646 3 68  861
 1.50000+ 7 1.25754-15 1.70000+ 7 6.73724-17 1.88534+ 7 5.89650-189646 3 68  862
 2.00000+ 7 8.87331-19                                                9646 3 68  863
                                                                   9646 3  0  864
 9.62460+ 4 2.43953+ 2           0          19           0          09646 3 69  865
 0.0    + 0-1.22000+ 6           0           0           1         309646 3 69  866
        30          3           0           0           0          09646 3 69  867
 1.22500+ 6 0.0    + 0 1.25512+ 6 6.37286- 3 1.29428+ 6 1.72779- 29646 3 69  868
 1.30533+ 6 2.02371- 2 1.32340+ 6 2.45399- 2 1.35453+ 6 3.11081- 29646 3 69  869
 1.37260+ 6 3.43377- 2 1.38465+ 6 3.62033- 2 1.40000+ 6 3.82540- 29646 3 69  870
 1.45795+ 6 4.64238- 2 1.48406+ 6 4.93644- 2 1.51519+ 6 5.22936- 29646 3 69  871
 1.53226+ 6 5.35971- 2 1.60000+ 6 5.65875- 2 2.00000+ 6 4.02826- 29646 3 69  872
 2.50000+ 6 1.65401- 2 3.00000+ 6 5.89713- 3 4.00000+ 6 7.61517- 49646 3 69  873
 5.00000+ 6 9.12155- 5 6.00000+ 6 1.18551- 5 6.48350+ 6 3.48902- 69646 3 69  874
 7.00000+ 6 6.77793- 7 8.00000+ 6 2.14318- 8 1.00000+ 7 6.59120-119646 3 69  875
 1.20261+ 7 2.73395-13 1.30000+ 7 2.41894-14 1.50000+ 7 1.83433-159646 3 69  876
 1.70000+ 7 1.00276-16 1.88534+ 7 8.90675-18 2.00000+ 7 1.35078-189646 3 69  877
                                                                   9646 3  0  878
 9.62460+ 4 2.43953+ 2           0          20           0          09646 3 70  879
 0.0    + 0-1.25000+ 6           0           0           1         299646 3 70  880
        29          3           0           0           0          09646 3 70  881
 1.25512+ 6 0.0    + 0 1.29428+ 6 1.88478- 2 1.30533+ 6 2.18045- 29646 3 70  882
 1.32340+ 6 2.59946- 2 1.35453+ 6 3.13776- 2 1.37260+ 6 3.35062- 29646 3 70  883
 1.38465+ 6 3.46302- 2 1.40000+ 6 3.57613- 2 1.45795+ 6 4.04594- 29646 3 70  884
 1.48406+ 6 4.16667- 2 1.51519+ 6 4.27151- 2 1.53226+ 6 4.31730- 29646 3 70  885
 1.60000+ 6 4.40455- 2 2.00000+ 6 2.92752- 2 2.50000+ 6 1.06885- 29646 3 70  886
 3.00000+ 6 3.57944- 3 4.00000+ 6 4.49331- 4 5.00000+ 6 5.29841- 59646 3 70  887
 6.00000+ 6 6.53352- 6 6.48350+ 6 1.85199- 6 7.00000+ 6 3.46150- 79646 3 70  888
 8.00000+ 6 1.03467- 8 1.00000+ 7 3.02250-11 1.20261+ 7 1.22856-139646 3 70  889
 1.30000+ 7 1.07819-14 1.50000+ 7 8.02629-16 1.70000+ 7 4.31039-179646 3 70  890
 1.88534+ 7 3.77128-18 2.00000+ 7 5.66863-19                          9646 3 70  891
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
                                                                  9646 3  0  892
 9.62460+ 4 2.43953+ 2           0          21           0         09646 3 71  893
 0.0     + 0-1.28900+ 6                      0           1        289646 3 71  894
         28          3           0           0           0         09646 3 71  895
 1.29428+ 6 0.0     + 0 1.30533+ 6 2.61115- 3 1.32340+ 6 5.76185- 29646 3 71  896
 1.35453+ 6 1.08802- 2 1.37260+ 6 1.33444- 2 1.38465+ 6 1.47624- 29646 3 71  897
 1.40000+ 6 1.64044- 2 1.45795+ 6 2.19438- 2 1.48406+ 6 2.36541- 29646 3 71  898
 1.51519+ 6 2.51389- 2 1.53226+ 6 2.57336- 2 1.60000+ 6 2.69385- 29646 3 71  899
 2.00000+ 6 1.81393- 2 2.50000+ 6 6.69766- 3 3.00000+ 6 2.17230- 39646 3 71  900
 4.00000+ 6 2.34540- 4 5.00000+ 6 2.37746- 5 6.00000+ 6 2.72113- 69646 3 71  901
 6.48350+ 6 7.65081- 7 7.00000+ 6 1.42256- 7 8.00000+ 6 4.16667- 99646 3 71  902
 1.00000+ 7 1.17080-11 1.20261+ 7 4.67267-14 1.30000+ 7 4.04437-159646 3 71  903
 1.50000+ 7 2.92234-16 1.70000+ 7 1.54286-17 1.88534+ 7 1.33595-189646 3 71  904
 2.00000+ 7 1.99868-19                                             9646 3 71  905
                                                                  9646 3  0  906
 9.62460+ 4 2.43953+ 2           0          22           0         09646 3 72  907
 0.0     + 0-1.30000+ 6           0           0           1        279646 3 72  908
         27          3           0           0           0         09646 3 72  909
 1.30533+ 6 0.0     + 0 1.32340+ 6 7.94168- 3 1.35453+ 6 1.40398- 29646 3 72  910
 1.37260+ 6 1.68031- 2 1.38465+ 6 1.83947- 2 1.40000+ 6 2.01826- 29646 3 72  911
 1.45795+ 6 2.65249- 2 1.48406+ 6 2.88187- 2 1.51519+ 6 3.11228- 29646 3 72  912
 1.53226+ 6 3.21944- 2 1.60000+ 6 3.53651- 2 2.00000+ 6 2.81986- 29646 3 72  913
 2.50000+ 6 1.17630- 2 3.00000+ 6 4.40741- 3 4.00000+ 6 6.50822- 49646 3 72  914
 5.00000+ 6 8.59307- 5 6.00000+ 6 1.13716- 5 6.48350+ 6 3.29111- 69646 3 72  915
 7.00000+ 6 6.24805- 7 8.00000+ 6 1.90355- 8 1.00000+ 7 5.74724-119646 3 72  916
 1.20261+ 7 2.38319-13 1.30000+ 7 2.10029-14 1.50000+ 7 1.58003-159646 3 72  917
 1.70000+ 7 8.58302-17 1.88534+ 7 7.57922-18 2.00000+ 7 1.14541-189646 3 72  918
                                                                  9646 3  0  919
 9.62460+ 4 2.43953+ 2           0          23           0         09646 3 73  920
 0.0     + 0-1.31800+ 6           0           0           1        269646 3 73  921
         26          3           0           0           0         09646 3 73  922
 1.32340+ 6 0.0     + 0 1.35453+ 6 1.25106- 2 1.37260+ 6 2.00364- 29646 3 73  923
 1.38465+ 6 2.48267- 2 1.40000+ 6 3.06482- 2 1.45795+ 6 5.08935- 29646 3 73  924
 1.48406+ 6 5.81271- 2 1.51519+ 6 6.50737- 2 1.53226+ 6 6.82070- 29646 3 73  925
 1.60000+ 6 7.62227- 2 2.00000+ 6 5.64845- 2 2.50000+ 6 2.13471- 29646 3 73  926
 3.00000+ 6 7.20212- 3 4.00000+ 6 8.33195- 4 5.00000+ 6 8.79646- 59646 3 73  927
 6.00000+ 6 1.03003- 5 6.48350+ 6 2.91855- 6 7.00000+ 6 5.49533- 79646 3 73  928
 8.00000+ 6 1.66479- 8 1.00000+ 7 4.82626-11 1.20261+ 7 1.93140-139646 3 73  929
 1.30000+ 7 1.68873-14 1.50000+ 7 1.25091-15 1.70000+ 7 6.70645-179646 3 73  930
 1.88534+ 7 5.87348-18 2.00000+ 7 8.84244-19                       9646 3 73  931
                                                                  9646 3  0  932
 9.62460+ 4 2.43953+ 2           0          24           0         09646 3 74  933
 0.0     + 0-1.34900+ 6           0           0           1        259646 3 74  934
         25          3           0           0           0         09646 3 74  935
 1.35453+ 6 0.0     + 0 1.37260+ 6 8.08712- 3 1.38465+ 6 1.08801- 29646 3 74  936
 1.40000+ 6 1.39163- 2 1.45795+ 6 2.32579- 2 1.48406+ 6 2.62572- 29646 3 74  937
 1.51519+ 6 2.90962- 2 1.53226+ 6 3.03901- 2 1.60000+ 6 3.40020- 29646 3 74  938
 2.00000+ 6 2.65287- 2 2.50000+ 6 1.01112- 2 3.00000+ 6 3.46248- 39646 3 74  939
 4.00000+ 6 4.42494- 4 5.00000+ 6 5.23385- 5 6.00000+ 6 6.46589- 69646 3 74  940
 6.48350+ 6 1.83357- 6 7.00000+ 6 3.42924- 7 8.00000+ 6 1.02619- 89646 3 74  941
 1.00000+ 7 3.00036-11 1.20261+ 7 1.22085-13 1.30000+ 7 1.07228-149646 3 74  942
 1.50000+ 7 7.98701-16 1.70000+ 7 4.29203-17 1.88534+ 7 3.75765-189646 3 74  943
 2.00000+ 7 5.65045-19                                             9646 3 74  944
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
                                                                  9646 3  0  945
 9.62460+ 4 2.43953+ 2           0          25           0          09646 3 75  946
 0.0    + 0-1.36700+ 6           0           0           1         249646 3 75  947
         24          3           0           0           0          09646 3 75  948
 1.37260+ 6 0.0    + 0 1.38465+ 6 5.33025- 3 1.40000+ 6 8.73965- 39646 3 75  949
 1.45795+ 6 1.90191- 2 1.48406+ 6 2.26173- 2 1.51519+ 6 2.62494- 29646 3 75  950
 1.53226+ 6 2.79514- 2 1.60000+ 6 3.31144- 2 2.00000+ 6 2.94216- 29646 3 75  951
 2.50000+ 6 1.20369- 2 3.00000+ 6 4.36095- 3 4.00000+ 6 6.02610- 49646 3 75  952
 5.00000+ 6 7.46541- 5 6.00000+ 6 9.48711- 6 6.48350+ 6 2.71133- 69646 3 75  953
 7.00000+ 6 5.09773- 7 8.00000+ 6 1.53408- 8 1.00000+ 7 4.56152-119646 3 75  954
 1.20261+ 7 1.87470-13 1.30000+ 7 1.64639-14 1.50000+ 7 1.22897-159646 3 75  955
 1.70000+ 7 6.63282-17 1.88534+ 7 5.82799-18 2.00000+ 7 8.78337-199646 3 75  956
                                                                  9646 3  0  957
 9.62460+ 4 2.43953+ 2           0          26           0          09646 3 76  958
 0.0    + 0-1.37900+ 6           0           0           1         239646 3 76  959
         23          3           0           0           0          09646 3 76  960
 1.38465+ 6 0.0    + 0 1.40000+ 6 1.77906- 3 1.45795+ 6 1.29430- 29646 3 76  961
 1.48406+ 6 1.81589- 2 1.51519+ 6 2.39004- 2 1.53226+ 6 2.67173- 29646 3 76  962
 1.60000+ 6 3.52069- 2 2.00000+ 6 3.28779- 2 2.50000+ 6 1.44148- 29646 3 76  963
 3.00000+ 6 5.49517- 3 4.00000+ 6 7.42220- 4 5.00000+ 6 8.91717- 59646 3 76  964
 6.00000+ 6 1.15624- 5 6.48350+ 6 3.40120- 6 7.00000+ 6 6.61945- 79646 3 76  965
 8.00000+ 6 2.10390- 8 1.00000+ 7 6.50115-11 1.20261+ 7 2.70397-139646 3 76  966
 1.30000+ 7 2.39609-14 1.50000+ 7 1.81903-15 1.70000+ 7 9.95537-179646 3 76  967
 1.88534+ 7 8.85222-18 2.00000+ 7 1.34342-18                       9646 3 76  968
                                                                  9646 3  0  969
 9.62460+ 4 2.43953+ 2           0          27           0          09646 3 77  970
 0.0    + 0-1.45200+ 6           0           0           1         219646 3 77  971
         21          3           0           0           0          09646 3 77  972
 1.45795+ 6 0.0    + 0 1.48406+ 6 6.25773- 3 1.51519+ 6 1.40520- 29646 3 77  973
 1.53226+ 6 1.82296- 2 1.60000+ 6 3.18502- 2 2.00000+ 6 3.75687- 29646 3 77  974
 2.50000+ 6 1.50705- 2 3.00000+ 6 5.22111- 3 4.00000+ 6 6.03922- 49646 3 77  975
 5.00000+ 6 6.16141- 5 6.00000+ 6 6.95549- 6 6.48350+ 6 1.94641- 69646 3 77  976
 7.00000+ 6 3.64064- 7 8.00000+ 6 1.10080- 8 1.00000+ 7 3.16363-119646 3 77  977
 1.20261+ 7 1.25315-13 1.30000+ 7 1.09284-14 1.50000+ 7 8.03111-169646 3 77  978
 1.70000+ 7 4.27262-17 1.88534+ 7 3.72408-18 2.00000+ 7 5.59388-199646 3 77  979
                                                                  9646 3  0  980
 9.62460+ 4 2.43953+ 2           0          28           0          09646 3 78  981
 0.0    + 0-1.47800+ 6           0           0           1         209646 3 78  982
         20          3           0           0           0          09646 3 78  983
 1.48406+ 6 0.0    + 0 1.51519+ 6 8.37200- 3 1.53226+ 6 1.35880- 29646 3 78  984
 1.60000+ 6 3.29280- 2 2.00000+ 6 4.71138- 2 2.50000+ 6 1.90224- 29646 3 78  985
 3.00000+ 6 6.73495- 3 4.00000+ 6 8.17210- 4 5.00000+ 6 8.66829- 59646 3 78  986
 6.00000+ 6 1.01132- 5 6.48350+ 6 2.86066- 6 7.00000+ 6 5.38740- 79646 3 78  987
 8.00000+ 6 1.63748- 8 1.00000+ 7 4.76472-11 1.20261+ 7 1.91081-139646 3 78  988
 1.30000+ 7 1.67309-14 1.50000+ 7 1.24091-15 1.70000+ 7 [illegible].65987-179646 3 78  989
 1.88534+ 7 5.83862-18 2.00000+ 7 8.79558-19                       9646 3 78  990
                                                                  9646 3  0  991
 9.62460+ 4 2.43953+ 2           0          29           0          09646 3 79  992
 0.0    + 0-1.50900+ 6           0           0           1         199646 3 79  993
         19          3           0           0           0          09646 3 79  994
 1.51519+ 6 0.0    + 0 1.53226+ 6 3.15637- 3 1.60000+ 6 1.97240- 29646 3 79  995
 2.00000+ 6 4.03743- 2 2.50000+ 6 1.73550- 2 3.00000+ 6 6.52391- 39646 3 79  996
 4.00000+ 6 8.47485- 4 5.00000+ 6 9.42789- 5 6.00000+ 6 1.14417- 59646 3 79  997
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 6.48350+ 6 3.28723- 6 7.00000+ 6 6.28091- 7 8.00000+ 6 1.95088- 89646 3 79  998
 1.00000+ 7 5.83797-11 1.20261+ 7 2.38036-13 1.30000+ 7 2.09669-149646 3 79  999
 1.50000+ 7 1.57244-15 1.70000+ 7 8.51670-17 1.88534+ 7 7.51612-189646 3 79 1000
 2.00000+ 7 1.13629-18                                            9646 3 79 1001
                                                                  9646 3  0 1002
 9.62460+ 4 2.43953+ 2          0          98          0          09646 3 91 1003
 0.0     + 0-1.52600+ 6          0           0          1         189646 3 91 1004
         18          3          0           0          0          09646 3 91 1005
 1.53226+ 6 0.0     + 0 1.60000+ 6 2.56461- 2 2.00000+ 6 6.41659- 19646 3 91 1006
 2.50000+ 6 1.04583+ 0 3.00000+ 6 1.13924+ 0 4.00000+ 6 1.34046+ 09646 3 91 1007
 5.00000+ 6 1.45953+ 0 6.00000+ 6 1.52304+ 0 6.48350+ 6 1.13633+ 09646 3 91 1008
 7.00000+ 6 5.71023- 1 8.00000+ 6 1.04611- 1 1.00000+ 7 8.36212- 39646 3 91 1009
 1.20261+ 7 6.86897- 4 1.30000+ 7 2.34033- 4 1.50000+ 7 2.45350- 49646 3 91 1010
 1.70000+ 7 1.56702- 4 1.88534+ 7 1.20308- 4 2.00000+ 7 6.59716- 59646 3 91 1011
                                                                  9646 3  0 1012
 9.62460+ 4 2.43953+ 2          0          99          0          09646 3102 1013
 0.0     + 0 0.0     + 0          0           0          2         629646 3102 1014
         2           2         62           5          0          09646 3102 1015
 1.00000- 5 0.0     + 0 3.00000+ 4 0.0     + 0 3.00000+ 4 4.68487- 19646 3102 1016
 4.30759+ 4 3.86448- 1 5.00000+ 4 3.21691- 1 8.00000+ 4 1.98740- 19646 3102 1017
 1.00000+ 5 1.66747- 1 1.42582+ 5 1.34799- 1 2.00000+ 5 1.14610- 19646 3102 1018
 2.96711+ 5 1.01697- 1 4.00000+ 5 9.90904- 2 5.02050+ 5 1.01349- 19646 3102 1019
 6.00000+ 5 1.07058- 1 7.00000+ 5 1.12523- 1 8.00000+ 5 1.13876- 19646 3102 1020
 8.45150+ 5 1.13884- 1 8.79992+ 5 1.08786- 1 9.00000+ 5 1.04240- 19646 3102 1021
 9.27085+ 5 1.00018- 1 9.85021+ 5 9.22742- 2 1.00000+ 6 9.09188- 29646 3102 1022
 1.05531+ 6 8.82770- 2 1.08342+ 6 8.73639- 2 1.10953+ 6 8.52947- 29646 3102 1023
 1.12861+ 6 8.32953- 2 1.13262+ 6 8.26757- 2 1.13363+ 6 8.23973- 29646 3102 1024
 1.16978+ 6 7.75186- 2 1.17982+ 6 7.61557- 2 1.18383+ 6 7.55322- 29646 3102 1025
 1.20000+ 6 7.33870- 2 1.21596+ 6 7.19055- 2 1.22500+ 6 7.09334- 29646 3102 1026
 1.25512+ 6 6.77414- 2 1.29428+ 6 6.37054- 2 1.30533+ 6 6.26995- 29646 3102 1027
 1.32340+ 6 6.09516- 2 1.35453+ 6 5.82398- 2 1.37260+ 6 5.67289- 29646 3102 1028
 1.38465+ 6 5.57017- 2 1.40000+ 6 5.45266- 2 1.45795+ 6 5.38066- 29646 3102 1029
 1.48406+ 6 5.36878- 2 1.51519+ 6 5.35492- 2 1.53226+ 6 5.34612- 29646 3102 1030
 1.60000+ 6 5.28111- 2 2.00000+ 6 3.76904- 2 2.50000+ 6 1.91588- 29646 3102 1031
 3.00000+ 6 9.97636- 3 4.00000+ 6 3.36674- 3 5.00000+ 6 1.02214- 39646 3102 1032
 6.00000+ 6 3.00967- 4 6.48350+ 6 1.27153- 4 7.00000+ 6 3.62298- 59646 3102 1033
 8.00000+ 6 2.50332- 6 1.00000+ 7 4.42054- 8 1.20261+ 7 1.25139- 99646 3102 1034
 1.30000+ 7 2.95394-10 1.50000+ 7 1.85328-10 1.70000+ 7 8.36013-119646 3102 1035
 1.88534+ 7 5.03966-11 2.00000+ 7 2.44071-11                      9646 3102 1036
                                                                  9646 3  0 1037
 9.62460+ 4 2.43953+ 2          0           0          0          09646 3251 1038
 0.0     + 0 0.0     + 0          0           0          1         639646 3251 1039
         63          3          0           0          0          09646 3251 1040
 1.00000- 5 2.73276- 3 1.00000+ 3 3.14156- 3 1.00000+ 4 9.78089- 39646 3251 1041
 3.00000+ 4 2.86001- 2 4.30759+ 4 4.17947- 2 5.00000+ 4 4.91936- 29646 3251 1042
 8.00000+ 4 8.23063- 2 1.00000+ 5 1.04057- 1 1.42582+ 5 1.47644- 19646 3251 1043
 2.00000+ 5 1.98942- 1 2.96711+ 5 2.66386- 1 4.00000+ 5 3.17108- 19646 3251 1044
 5.02050+ 5 3.52424- 1 6.00000+ 5 3.75757- 1 7.00000+ 5 3.94149- 19646 3251 1045
 8.00000+ 5 4.11517- 1 8.45150+ 5 4.18562- 1 8.79992+ 5 4.25803- 19646 3251 1046
 9.00000+ 5 4.29962- 1 9.27085+ 5 4.34616- 1 9.85021+ 5 4.43852- 19646 3251 1047
 1.00000+ 6 4.45989- 1 1.05531+ 6 4.52263- 1 1.08342+ 6 4.55308- 19646 3251 1048
 1.10953+ 6 4.59461- 1 1.12861+ 6 4.62652- 1 1.13262+ 6 4.63359- 19646 3251 1049
 1.13363+ 6 4.63586- 1 1.16978+ 6 4.70044- 1 1.17982+ 6 4.71866- 19646 3251 1050
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.18383+ 6 4.72695- 1 1.20000+ 6 4.75806- 1 1.21596+ 6 4.78380- 19646 3251 1051
 1.22500+ 6 4.79911- 1 1.25512+ 6 4.85213- 1 1.29428+ 6 4.92549- 19646 3251 1052
 1.30533+ 6 4.94528- 1 1.32340+ 6 4.97763- 1 1.35453+ 6 5.03275- 19646 3251 1053
 1.37260+ 6 5.06661- 1 1.38465+ 6 5.08893- 1 1.40000+ 6 5.11583- 19646 3251 1054
 1.45795+ 6 5.18793- 1 1.48406+ 6 5.22107- 1 1.51519+ 6 5.26221- 19646 3251 1055
 1.53226+ 6 5.28538- 1 1.60000+ 6 5.38181- 1 2.00000+ 6 6.02648- 19646 3251 1056
 2.50000+ 6 6.67941- 1 3.00000+ 6 7.10894- 1 4.00000+ 6 7.64980- 19646 3251 1057
 5.00000+ 6 7.97535- 1 6.00000+ 6 8.14400- 1 6.48350+ 6 8.18272- 19646 3251 1058
 7.00000+ 6 8.20006- 1 8.00000+ 6 8.18869- 1 1.00000+ 7 8.19366- 19646 3251 1059
 1.20261+ 7 8.46008- 1 1.30000+ 7 8.63271- 1 1.50000+ 7 8.96857- 19646 3251 1060
 1.70000+ 7 9.22196- 1 1.88534+ 7 9.37279- 1 2.00000+ 7 9.43487- 19646 3251 1061
                                                                   9646 3  0 1062
                                                                   9646 0  0 1063
```

Cm-246 File 5

```
.........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62460+ 4 2.43953+ 2          0          0          2          09646 5 16 4961
 6.48350+ 6 0.0    + 0          0          9          1          29646 5 16 4962
          2          2          0          0          0          09646 5 16 4963
 6.48350+ 6 5.00000- 1 2.00000+ 7 5.00000- 1                      9646 5 16 4964
 0.0    + 0 0.0    + 0          0          0          1          89646 5 16 4965
          8          2          0          0          0          09646 5 16 4966
 6.48350+ 6 4.74441+ 5 8.00000+ 6 5.34585+ 5 1.00000+ 7 6.04529+ 59646 5 16 4967
 1.20000+ 7 6.66964+ 5 1.40000+ 7 7.23888+ 5 1.60000+ 7 7.76546+ 59646 5 16 4968
 1.80000+ 7 8.25773+ 5 2.00000+ 7 8.72163+ 5                      9646 5 16 4969
 6.48350+ 6 0.0    + 0          0          9          1          29646 5 16 4970
          2          2          0          0          0          09646 5 16 4971
 6.48350+ 6 5.00000- 1 2.00000+ 7 5.00000- 1                      9646 5 16 4972
 0.0    + 0 0.0    + 0          0          0          1          89646 5 16 4973
          8          2          0          0          0          09646 5 16 4974
 6.48350+ 6 4.14810+ 5 8.00000+ 6 4.14810+ 5 1.00000+ 7 4.14810+ 59646 5 16 4975
 1.20000+ 7 3.85051+ 5 1.40000+ 7 4.73020+ 5 1.60000+ 7 5.47093+ 59646 5 16 4976
 1.80000+ 7 6.12250+ 5 2.00000+ 7 6.71101+ 5                      9646 5 16 4977
                                                                  9646 5  0 4978
 9.62460+ 4 2.43953+ 2          0          0          3          09646 5 17 4979
 1.20261+ 7 0.0    + 0          0          9          1          29646 5 17 4980
          2          2          0          0          0          09646 5 17 4981
 1.20261+ 7 3.33333- 1 2.00000+ 7 3.33333- 1                      9646 5 17 4982
 0.0    + 0 0.0    + 0          0          0          1          59646 5 17 4983
          5          2          0          0          0          09646 5 17 4984
 1.20261+ 7 6.67739+ 5 1.40000+ 7 7.23888+ 5 1.60000+ 7 7.76546+ 59646 5 17 4985
 1.80000+ 7 8.25773+ 5 2.00000+ 7 8.72163+ 5                      9646 5 17 4986
 1.20261+ 7 0.0    + 0          0          9          1          29646 5 17 4987
          2          2          0          0          0          09646 5 17 4988
 1.20261+ 7 3.33333- 1 2.00000+ 7 3.33333- 1                      9646 5 17 4989
 0.0    + 0 0.0    + 0          0          0          1          59646 5 17 4990
          5          2          0          0          0          09646 5 17 4991
 1.20261+ 7 4.50068+ 5 1.40000+ 7 4.92224+ 5 1.60000+ 7 5.51655+ 59646 5 17 4992
 1.80000+ 7 6.13260+ 5 2.00000+ 7 6.71330+ 5                      9646 5 17 4993
 1.20261+ 7 0.0    + 0          0          9          1          29646 5 17 4994
          2          2          0          0          0          09646 5 17 4995
 1.20261+ 7 3.33333- 1 2.00000+ 7 3.33333- 1                      9646 5 17 4996
 0.0    + 0 0.0    + 0          0          0          1          59646 5 17 4997
          5          2          0          0          0          09646 5 17 4998
 1.20261+ 7 4.15385+ 5 1.40000+ 7 4.15385+ 5 1.60000+ 7 4.15385+ 59646 5 17 4999
 1.80000+ 7 4.15385+ 5 2.00000+ 7 3.96181+ 5                      9646 5 17 5000
                                                                  9646 5  0 5001
 9.62460+ 4 2.43953+ 2          0          0          1          09646 5 18 5002
-2.00000+ 7 0.0    + 0          0          7          1          29646 5 18 5003
          2          2          0          0          0          09646 5 18 5004
 1.00000- 5 1.00000+ 0 2.00000+ 7 1.00000+ 0                      9646 5 18 5005
 0.0    + 0 0.0    + 0          0          0          1          29646 5 18 5006
          2          2          0          0          0          09646 5 18 5007
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
1.00000- 5 1.48000+ 6 2.00000+ 7 1.48000+ 6                        9646 5 18 5008
                                                                   9646 5  0 5009
9.62460+ 4 2.43953+ 2          0          0          4           09646 5 37 5010
1.88534+ 7 0.0     + 0          0          9          1           29646 5 37 5011
         2          2          0          0          0           09646 5 37 5012
1.88534+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                        9646 5 37 5013
0.0     + 0 0.0     + 0          0          0          1           29646 5 37 5014
         2          2          0          0          0           09646 5 37 5015
1.88534+ 7 8.45886+ 5 2.00000+ 7 8.72163+ 5                        9646 5 37 5016
1.88534+ 7 0.0     + 0          0          9          1           29646 5 37 5017
         2          2          0          0          0           09646 5 37 5018
1.88534+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                        9646 5 37 5019
0.0     + 0 0.0     + 0          0          0          1           29646 5 37 5020
         2          2          0          0          0           09646 5 37 5021
1.88534+ 7 6.88481+ 5 2.00000+ 7 7.01900+ 5                        9646 5 37 5022
1.88534+ 7 0.0     + 0          0          9          1           29646 5 37 5023
         2          2          0          0          0           09646 5 37 5024
1.88534+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                        9646 5 37 5025
0.0     + 0 0.0     + 0          0          0          1           29646 5 37 5026
         2          2          0          0          0           09646 5 37 5027
1.88534+ 7 4.84317+ 5 2.00000+ 7 4.91539+ 5                        9646 5 37 5028
1.88534+ 7 0.0     + 0          0          9          1           29646 5 37 5029
         2          2          0          0          0           09646 5 37 5030
1.88534+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                        9646 5 37 5031
0.0     + 0 0.0     + 0          0          0          1           29646 5 37 5032
         2          2          0          0          0           09646 5 37 5033
1.88534+ 7 4.19619+ 5 2.00000+ 7 4.19619+ 5                        9646 5 37 5034
                                                                   9646 5  0 5035
9.62460+ 4 2.43953+ 2          0          0          1           09646 5 91 5036
1.53230+ 6 0.0     + 0          0          9          1           29646 5 91 5037
         2          2          0          0          0           09646 5 91 5038
1.53230+ 6 1.00000+ 0 2.00000+ 7 1.00000+ 0                        9646 5 91 5039
0.0     + 0 0.0     + 0          0          0          1          119646 5 91 5040
        11          2          0          0          0           09646 5 91 5041
1.53230+ 6 4.15289+ 5 2.00000+ 6 4.15289+ 5 4.00000+ 6 4.15289+ 59646 5 91 5042
6.00000+ 6 4.53518+ 5 8.00000+ 6 5.34585+ 5 1.00000+ 7 6.04529+ 59646 5 91 5043
1.20000+ 7 6.66964+ 5 1.40000+ 7 7.23688+ 5 1.60000+ 7 7.76546+ 59646 5 91 5044
1.80000+ 7 8.25773+ 5 2.00000+ 7 8.72163+ 5                        9646 5 91 5045
                                                                   9646 5  0 5046
                                                                   9646 0  0 5047
```

Cm-247 File 1

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62470+ 4 2.44948+ 2          1          1          0          09647 1451    1
 0.0    + 0 0.0    + 0          0          0          0          09647 1451    2
 0.0    + 0 0.0    + 0          0          0         92         459647 1451    3
 96-CM-247 JAERI       EVAL-MAR83 Y.KIKUCHI                        9647 1451    4
 JAERI-M83-236         DIST-MAR84                                  9647 1451    5
EVALUATION FOR JENDL-3. DETAILS GIVEN IN REF./1/.                   9647 1451    6
                                                                    9647 1451    7
MF=1                                                                9647 1451    8
  MT=451   COMMENTS AND DICTIONARY                                  9647 1451    9
  MT=452   NUMBER OF NEUTRONS PER FISSION                           9647 1451   10
             DATA OF ZHURAVLEV + /2/.                               9647 1451   11
  MT=455   NUMBER OF DELAYED NEUTRONS                               9647 1451   12
             SEMI-EMPIRICAL FORMULA BY TUTTLE /3/.                  9647 1451   13
                                                                    9647 1451   14
MF=2,MT=1  RESONANCE PARAMETERS                                     9647 1451   15
  RESOLVED RESONANCES : 1.0E-5 - 60 EV                              9647 1451   16
    EVALUATION BASED ON THE FOLLOWING DATA :                        9647 1451   17
      GAM-N : BELANOVA +/4/.                                        9647 1451   18
      GAM-F : MOORE AND KEYWORTH /5/.                               9647 1451   19
      GAM-G : MOORE AND KEYWORTH /5/.                               9647 1451   20
    A NEGATIVE RESONACE ADDED AT -0.3 EV.                           9647 1451   21
                                                                    9647 1451   22
  UNRESOLVED RESONANCES : 60 EV - 30 KEV                            9647 1451   23
    OBTAIED FROM OPTICAL MODEL CALCULATION:                         9647 1451   24
        S2=0.88E-4  ,R=9.1521 FM.                                   9647 1451   25
    ESTIMATED FROM RESOLVED RESONANCES:                             9647 1451   26
        DOBS=1.75 EV ,GAM-G=40 MILLI-EV.                            9647 1451   27
    GAM-F ESTIMATED BY SYSTEMATIC SURVEY /6/                        9647 1451   28
    SO AND S1 SEARCHED FOR BY FITTIND THE DATA OF MOORE AND         9647 1451   29
    KEYWORTH /5/.                                                   9647 1451   30
                                                                    9647 1451   31
  CALCULATED 2200 M/S CROSS SECTIONS AND RESONANCE INTEGRALS        9647 1451   32
                  2200 M/S VALUE          RES.INT                   9647 1451   33
      TOTAL          165.6  B               1406  B                9647 1451   34
      FISSION         97.0  B                769  B                9647 1451   35
      CAPTURE         59.9  B                495  B                9647 1451   36
                                                                    9647 1451   37
MF=3                                                                9647 1451   38
  MT=1,2,4,51-60,91,102,251   SIG-T,SIG-EL,SIG-IN,SIG-C,MU-BAR      9647 1451   39
        CALCULATED WITH OPTICAL AND STATISTICAL MODELS.             9647 1451   40
        OPTICAL POTENTIAL PARAMETERS WERE OBTAINED BY FITTING THE   9647 1451   41
        DATA OF PHILLIPS AND HOWE /6/ FOR AM-241:                   9647 1451   42
           V = 43.4 - 0.107*EN                        (MEV)         9647 1451   43
           WS= 6.95 - 0.339*EN + 0.0531*EN**2         (MEV)         9647 1451   44
           WV= 0              , VSO = 7.0             (MEV)         9647 1451   45
           R = RSO = 1.282    , RS = 1.29             (FM)          9647 1451   46
           A = ASO = 0.60     , B  = 0.5              (FM)          9647 1451   47
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
        STATISTICAL MODEL CALCULATION WITH CASTHY CODE /7/.        9647 1451   48
           COMPETING PROCESSES : FISSION,(N,2N),(N,3N),(N,4N).     9647 1451   49
           LEVEL FLUCTUATION CONSIDERED.                           9647 1451   50
        THE LEVEL SCHEME TAKEN FROM REF. /8/                       9647 1451   51
                  NO.        ENERGY(KEV)   SPIN-PARITY             9647 1451   52
                 G.S.            0            9/2 -                9647 1451   53
                   1            61.5         11/2 -                9647 1451   54
                   2           133           13/2 -                9647 1451   55
                   3           227            5/2 +                9647 1451   56
                   4           266            7/2 +                9647 1451   57
                   5           285            7/2 +                9647 1451   58
                   6           317            9/2 +                9647 1451   59
                   7           342            9/2 +                9647 1451   60
                   8           404            1/2 +                9647 1451   61
                   9           433            3/2 +                9647 1451   62
                  10           449            5/2 +                9647 1451   63
              CONTINUUM LEVELS ASSUMED ABOVE 479 KEV.              9647 1451   64
        THE LEVEL DENSITY PARAMETERS : GILBERT AND CAMERON /9/.    9647 1451   65
        GAMMA-RAY STRENGTH FUNCTION OF 2.29E-2 DEDUCED FROM        9647 1451   66
        RESONANCE PARAMETERS.                                      9647 1451   67
                                                                   9647 1451   68
  MT=16,17,37      (N,2N),(N,3N),(N,4N)                            9647 1451   69
        CALCULATED WITH EVAPORATION MODEL.                         9647 1451   70
                                                                   9647 1451   71
  MT=18            FISSION                                         9647 1451   72
        EVALUATED ON THE BASIS OF THE MEASURED DATA BY MOORE AND   9647 1451   73
        KEYWORTH /5/.                                              9647 1451   74
                                                                   9647 1451   75
MF=4                                                               9647 1451   76
  MT=2,51-60          CALCULATED WITH OPTICAL MODEL.               9647 1451   77
  MT=16,17,18,37,91   ISOTROPIC IN LABORATORY SYSTEM.              9647 1451   78
                                                                   9647 1451   79
MF=5                                                               9647 1451   80
  MT=16,17,37,91      EVAPORATION SPECTRUM.                        9647 1451   81
  MT=18               MAXWELLIAN FISSION SPECTRUM.                 9647 1451   82
                      TEMPERATURE ESTIMATED FROM DATA OF ZHURAVLAV9647 1451   83
                      + /2/.                                       9647 1451   84
                                                                   9647 1451   85
REFERENCES                                                         9647 1451   86
 1) KIKUCHI Y.: JAERI-M83-236(1984).                               9647 1451   87
 2) ZHURAVLEV K.D.ET AL.: 1973 KIEV CONF.,VOL.4,P.57 (1973).       9647 1451   88
 3) TUTTLE R.J.: INDG(NDS)-107/G+SPECIAL,P.29 (1979).              9647 1451   89
 4) BELANOVA T.S.ET AL.: SOV.AT.ENERGY,47,772(1979).               9647 1451   90
 5) MOORE M.S.AND.KEYWORTH G.A.: PHYS.REV.,C3,1656(1971)           9647 1451   91
 6) PHILLIPS T.W. AND HOWE F.R. : NUCL.SCI.ENG.,69,375(1979).      9647 1451   92
 7) IGARASI S. : J.NUCL.SCI.TECHNOL.,12,67 (1975).                 9647 1451   93
 8) LEDERER C.M. AND SHIRLEY V.S. : TABLE OF ISOTOPES , 7TH ED.    9647 1451   94
 9) GILBERT A. AND CAMERON A.G.W. : CAN.J.PHYS.,43,1446 (1965).    9647 1451   95
                                 1        451        140           9647 1451   96
                                 1        452          3           9647 1451   97
                                 1        455          7           9647 1451   98
                                 2        151        194           9647 1451   99
                                 3          1         42           9647 1451  100
```

```
........10........20........30........40........50........60......MAT MF MT   SEQ
                                   3         2        42            9647 1451  101
                                   3         4        15            9647 1451  102
                                   3        16         9            9647 1451  103
                                   3        17         7            9647 1451  104
                                   3        18        13            9647 1451  105
                                   3        37         5            9647 1451  106
                                   3        51        15            9647 1451  107
                                   3        52        14            9647 1451  108
                                   3        53        13            9647 1451  109
                                   3        54        13            9647 1451  110
                                   3        55        12            9647 1451  111
                                   3        56        12            9647 1451  112
                                   3        57        11            9647 1451  113
                                   3        58        11            9647 1451  114
                                   3        59        10            9647 1451  115
                                   3        60        10            9647 1451  116
                                   3        91        10            9647 1451  117
                                   3       102        16            9647 1451  118
                                   3       251        17            9647 1451  119
                                   4         2       203            9647 1451  120
                                   4        16        10            9647 1451  121
                                   4        17        10            9647 1451  122
                                   4        18        10            9647 1451  123
                                   4        37        10            9647 1451  124
                                   4        51       114            9647 1451  125
                                   4        52       104            9647 1451  126
                                   4        53        96            9647 1451  127
                                   4        54        94            9647 1451  128
                                   4        55        92            9647 1451  129
                                   4        56        87            9647 1451  130
                                   4        57        85            9647 1451  131
                                   4        58        81            9647 1451  132
                                   4        59        79            9647 1451  133
                                   4        60        77            9647 1451  134
                                   4        91        75            9647 1451  135
                                   5        16        17            9647 1451  136
                                   5        17        22            9647 1451  137
                                   5        18         7            9647 1451  138
                                   5        37        25            9647 1451  139
                                   5        91        10            9647 1451  140
                                                                   9647 1  0  141
9.62470+ 4 2.44948+ 2              0         1         0           09647 1452  142
0.0    + 0 0.0    + 0              0         0         2           09647 1452  143
3.79000+ 0 2.02000- 8                                               9647 1452  144
                                                                    9647 1  0  145
9.62470+ 4 2.44948+ 2              0         2         0           09647 1455  146
0.0    + 0 0.0    + 0              0         0         6           09647 1455  147
1.28000- 2 2.99000- 2 1.24000- 1 3.52000- 1 1.61000+ 0 3.47000+ 09647 1455  148
0.0    + 0 0.0    + 0              0         0         1           49647 1455  149
         4          2              0         0         0           09647 1455  150
1.00000- 5 1.34000- 2 6.00000+ 6 1.34000- 2 8.00000+ 6 9.20000- 39647 1455  151
2.00000+ 7 9.20000- 3                                               9647 1455  152
                                                                    9647 1  0  153
```

Cm-247 File 2

```
-........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62470+ 4 2.44947+ 2          0          0          1           09647 2151  155
 9.62470+ 4 1.00000+ 0          0          1          2           09647 2151  156
 1.00000- 5 6.00000+ 1          1          2          0           09647 2151  157
 4.50000+ 0 9.14180- 1          0          0          1           09647 2151  158
 2.44947+ 2 0.0     + 0          0          0        210          359647 2151  159
-3.00000- 1 4.50000+ 0 1.07822- 1 2.21000- 5 4.00000- 2 6.78000- 29647 2151  160
 1.24700+ 0 4.50000+ 0 7.46430- 2 6.43000- 4 2.94000- 2 4.46000- 29647 2151  161
 2.91900+ 0 4.50000+ 0 7.01000- 2 9.99999- 5 4.00000- 2 3.00000- 29647 2151  162
 3.18900+ 0 4.50000+ 0 1.03000- 1 1.00000- 3 4.00000- 2 6.20000- 29647 2151  163
 9.55000+ 0 4.50000+ 0 1.65910- 1 9.10000- 4 4.00000- 2 1.25000- 19647 2151  164
 1.81000+ 1 4.50000+ 0 2.09700- 1 3.70000- 3 4.00000- 2 1.66000- 19647 2151  165
 2.13000+ 1 4.50000+ 0 4.44130- 1 1.30000- 4 4.00000- 2 4.04000- 19647 2151  166
 2.40300+ 1 4.50000+ 0 1.74044- 1 4.40000- 5 4.00000- 2 1.34000- 19647 2151  167
 2.53500+ 1 4.50000+ 0 6.60100- 2 1.00000- 5 4.00000- 2 2.60000- 29647 2151  168
 2.61900+ 1 4.50000+ 0 2.60150- 1 1.50000- 4 4.00000- 2 2.20000- 19647 2151  169
 2.80400+ 1 4.50000+ 0 9.30580- 2 5.80000- 5 4.00000- 2 5.30000- 29647 2151  170
 3.02500+ 1 4.50000+ 0 4.74500- 2 3.45000- 3 4.00000- 2 4.00000- 39647 2151  171
 3.06200+ 1 4.50000+ 0 9.21900- 2 1.90000- 4 4.00000- 2 5.20000- 29647 2151  172
 3.22300+ 1 4.50000+ 0 6.65100- 2 5.10000- 4 4.00000- 2 2.60000- 29647 2151  173
 3.63600+ 1 4.50000+ 0 1.02630- 1 1.63000- 3 4.00000- 2 6.10000- 29647 2151  174
 3.77400+ 1 4.50000+ 0 5.95025- 1 2.50000- 5 4.00000- 2 5.55000- 19647 2151  175
 3.77600+ 1 4.50000+ 0 5.43300- 2 1.33000- 3 4.00000- 2 1.30000- 29647 2151  176
 3.95200+ 1 4.50000+ 0 7.45006- 1 6.00000- 6 4.00000- 2 7.05000- 19647 2151  177
 3.99500+ 1 4.50000+ 0 2.07095- 1 9.49999- 5 4.00000- 2 1.67000- 19647 2151  178
 4.06100+ 1 4.50000+ 0 8.80320- 2 3.20000- 5 4.00000- 2 4.80000- 29647 2151  179
 4.12500+ 1 4.50000+ 0 6.06600- 2 6.60000- 4 4.00000- 2 2.00000- 29647 2151  180
 4.17600+ 1 4.50000+ 0 5.86052- 1 5.20000- 5 4.00000- 2 5.46000- 19647 2151  181
 4.33900+ 1 4.50000+ 0 4.41900- 2 1.90000- 4 4.00000- 2 4.00000- 39647 2151  182
 4.48700+ 1 4.50000+ 0 7.41000- 2 2.10000- 3 4.00000- 2 3.20000- 29647 2151  183
 4.52100+ 1 4.50000+ 0 1.00580- 1 5.80000- 4 4.00000- 2 6.00000- 29647 2151  184
 4.79200+ 1 4.50000+ 0 2.05170- 1 1.17000- 3 4.00000- 2 1.64000- 19647 2151  185
 4.88500+ 1 4.50000+ 0 1.28800- 1 6.80000- 3 4.00000- 2 8.20000- 29647 2151  186
 5.00800+ 1 4.50000+ 0 9.73600- 2 2.36000- 3 4.00000- 2 5.50000- 29647 2151  187
 5.06900+ 1 4.50000+ 0 9.51800- 2 3.18000- 3 4.00000- 2 5.20000- 29647 2151  188
 5.17800+ 1 4.50000+ 0 5.56600- 2 1.66000- 3 4.00000- 2 1.40000- 29647 2151  189
 5.21900+ 1 4.50000+ 0 4.52600- 2 1.26000- 3 4.00000- 2 4.00000- 39647 2151  190
 5.36300+ 1 4.50000+ 0 3.64450- 1 4.50000- 4 4.00000- 2 3.24000- 19647 2151  191
 5.51000+ 1 4.50000+ 0 7.85300- 2 5.30000- 4 4.00000- 2 3.80000- 29647 2151  192
 5.61800+ 1 4.50000+ 0 1.09660- 1 6.60000- 4 4.00000- 2 6.89999- 29647 2151  193
 5.96600+ 1 4.50000+ 0 1.55570- 1 1.57000- 3 4.00000- 2 1.14000- 19647 2151  194
 6.00000+ 1 3.00000+ 4          2          2          0           09647 2151  195
 4.50000+ 0 9.15210- 1          0          0          2           09647 2151  196
 2.44950+ 2 0.0     + 0          0          0          2           09647 2151  197
 4.00000+ 0 0.0     + 0          2          0        144          239647 2151  198
 0.0     + 0 0.0     + 0 0.0     + 0 1.00000+ 0 0.0     + 0 1.00000+ 09647 2151  199
 6.00000+ 1 3.88840+ 0 0.0     + 0 9.78180- 4 4.00000- 2 5.34170- 29647 2151  200
 7.00000+ 1 3.88830+ 0 0.0     + 0 1.06990- 3 4.00000- 2 5.34170- 29647 2151  201
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 9.00000+ 1 3.88810+ 0 0.0    + 0 3.19930- 4 4.00000- 2 5.34170- 29647 2151  202
 1.25000+ 2 3.88780+ 0 0.0    + 0 3.04860- 4 4.00000- 2 5.34170- 29647 2151  203
 1.75000+ 2 3.88740+ 0 0.0    + 0 4.80570- 4 4.00000- 2 5.34170- 29647 2151  204
 2.50000+ 2 3.88680+ 0 0.0    + 0 5.24230- 4 4.00000- 2 5.34170- 29647 2151  205
 3.50000+ 2 3.88590+ 0 0.0    + 0 3.63240- 4 4.00000- 2 5.34170- 29647 2151  206
 4.50000+ 2 3.88510+ 0 0.0    + 0 3.73650- 4 4.00000- 2 5.34170- 29647 2151  207
 5.50000+ 2 3.88420+ 0 0.0    + 0 5.56500- 4 4.00000- 2 5.34170- 29647 2151  208
 7.00000+ 2 3.88300+ 0 0.0    + 0 4.37450- 4 4.00000- 2 5.34170- 29647 2151  209
 9.00000+ 2 3.88130+ 0 0.0    + 0 4.42800- 4 4.00000- 2 5.34170- 29647 2151  210
 1.25000+ 3 3.87840+ 0 0.0    + 0 3.40270- 4 4.00000- 2 5.34170- 29647 2151  211
 1.75000+ 3 3.87410+ 0 0.0    + 0 3.93800- 4 4.00000- 2 5.34170- 29647 2151  212
 2.50000+ 3 3.86790+ 0 0.0    + 0 4.17120- 4 4.00000- 2 5.34170- 29647 2151  213
 3.50000+ 3 3.85940+ 0 0.0    + 0 3.42590- 4 4.00000- 2 5.34170- 29647 2151  214
 4.50000+ 3 3.85110+ 0 0.0    + 0 3.80900- 4 4.00000- 2 5.34170- 29647 2151  215
 5.50000+ 3 3.84270+ 0 0.0    + 0 3.75510- 4 4.00000- 2 5.34170- 29647 2151  216
 7.00000+ 3 3.83030+ 0 0.0    + 0 3.71420- 4 4.00000- 2 5.34170- 29647 2151  217
 9.00000+ 3 3.81370+ 0 0.0    + 0 3.58720- 4 4.00000- 2 5.34170- 29647 2151  218
 1.25000+ 4 3.78480+ 0 0.0    + 0 3.80120- 4 4.00000- 2 5.34170- 29647 2151  219
 1.75000+ 4 3.74410+ 0 0.0    + 0 3.54530- 4 4.00000- 2 5.34170- 29647 2151  220
 2.50000+ 4 3.68380+ 0 0.0    + 0 3.57680- 4 4.00000- 2 5.34170- 29647 2151  221
 3.00000+ 4 3.64410+ 0 0.0    + 0 3.65130- 4 4.00000- 2 5.34170- 29647 2151  222
 5.00000+ 0 0.0    + 0          2           0         144          239647 2151  223
 0.0    + 0 0.0    + 0 0.0    + 0 1.00000+ 0 0.0    + 0 2.00000+ 09647 2151  224
 6.00000+ 1 3.18140+ 0 0.0    + 0 8.00330- 4 4.00000- 2 5.00000- 19647 2151  225
 7.00000+ 1 3.18130+ 0 0.0    + 0 8.75350- 4 4.00000- 2 5.00000- 19647 2151  226
 9.00000+ 1 3.18120+ 0 0.0    + 0 2.61760- 4 4.00000- 2 5.00000- 19647 2151  227
 1.25000+ 2 3.18090+ 0 0.0    + 0 2.49430- 4 4.00000- 2 5.00000- 19647 2151  228
 1.75000+ 2 3.18060+ 0 0.0    + 0 3.93190- 4 4.00000- 2 5.00000- 19647 2151  229
 2.50000+ 2 3.18010+ 0 0.0    + 0 4.28920- 4 4.00000- 2 5.00000- 19647 2151  230
 3.50000+ 2 3.17940+ 0 0.0    + 0 2.97190- 4 4.00000- 2 5.00000- 19647 2151  231
 4.50000+ 2 3.17870+ 0 0.0    + 0 3.05720- 4 4.00000- 2 5.00000- 19647 2151  232
 5.50000+ 2 3.17800+ 0 0.0    + 0 4.55320- 4 4.00000- 2 5.00000- 19647 2151  233
 7.00000+ 2 3.17700+ 0 0.0    + 0 3.57910- 4 4.00000- 2 5.00000- 19647 2151  234
 9.00000+ 2 3.17560+ 0 0.0    + 0 3.62290- 4 4.00000- 2 5.00000- 19647 2151  235
 1.25000+ 3 3.17320+ 0 0.0    + 0 2.78400- 4 4.00000- 2 5.00000- 19647 2151  236
 1.75000+ 3 3.16970+ 0 0.0    + 0 3.22200- 4 4.00000- 2 5.00000- 19647 2151  237
 2.50000+ 3 3.16460+ 0 0.0    + 0 3.41280- 4 4.00000- 2 5.00000- 19647 2151  238
 3.50000+ 3 3.15770+ 0 0.0    + 0 2.80300- 4 4.00000- 2 5.00000- 19647 2151  239
 4.50000+ 3 3.15090+ 0 0.0    + 0 3.11640- 4 4.00000- 2 5.00000- 19647 2151  240
 5.50000+ 3 3.14410+ 0 0.0    + 0 3.07240- 4 4.00000- 2 5.00000- 19647 2151  241
 7.00000+ 3 3.13380+ 0 0.0    + 0 3.03890- 4 4.00000- 2 5.00000- 19647 2151  242
 9.00000+ 3 3.12030+ 0 0.0    + 0 2.93500- 4 4.00000- 2 5.00000- 19647 2151  243
 1.25000+ 4 3.09670+ 0 0.0    + 0 3.11000- 4 4.00000- 2 5.00000- 19647 2151  244
 1.75000+ 4 3.06330+ 0 0.0    + 0 2.90070- 4 4.00000- 2 5.00000- 19647 2151  245
 2.50000+ 4 3.01400+ 0 0.0    + 0 2.92650- 4 4.00000- 2 5.00000- 19647 2151  246
 3.00000+ 4 2.98160+ 0 0.0    + 0 2.98740- 4 4.00000- 2 5.00000- 19647 2151  247
 2.44950+ 2 0.0    + 0          1           0           4           09647 2151  248
 3.00000+ 0 0.0    + 0          2           0         144          239647 2151  249
 0.0    + 0 0.0    + 0 0.0    + 0 1.00000+ 0 0.0    + 0 1.00000+ 09647 2151  250
 6.00000+ 1 4.99930+ 0 0.0    + 0 3.81910- 3 4.00000- 2 8.00000- 29647 2151  251
 7.00000+ 1 4.99920+ 0 0.0    + 0 4.17710- 3 4.00000- 2 8.00000- 29647 2151  252
 9.00000+ 1 4.99900+ 0 0.0    + 0 1.24910- 3 4.00000- 2 8.00000- 29647 2151  253
 1.25000+ 2 4.99860+ 0 0.0    + 0 1.19030- 3 4.00000- 2 8.00000- 29647 2151  254
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.75000+ 2 4.99810+ 0 0.0    + 0 1.87630- 3 4.00000- 2 8.00000- 29647 2151  255
 2.50000+ 2 4.99730+ 0 0.0    + 0 2.04680- 3 4.00000- 2 8.00000- 29647 2151  256
 3.50000+ 2 4.99620+ 0 0.0    + 0 1.41820- 3 4.00000- 2 8.00000- 29647 2151  257
 4.50000+ 2 4.99510+ 0 0.0    + 0 1.45890- 3 4.00000- 2 8.00000- 29647 2151  258
 5.50000+ 2 4.99400+ 0 0.0    + 0 2.17280- 3 4.00000- 2 8.00000- 29647 2151  259
 7.00000+ 2 4.99240+ 0 0.0    + 0 1.70800- 3 4.00000- 2 8.00000- 29647 2151  260
 9.00000+ 2 4.99020+ 0 0.0    + 0 1.72880- 3 4.00000- 2 8.00000- 29647 2151  261
 1.25000+ 3 4.98650+ 0 0.0    + 0 1.32850- 3 4.00000- 2 8.00000- 29647 2151  262
 1.75000+ 3 4.98100+ 0 0.0    + 0 1.53750- 3 4.00000- 2 8.00000- 29647 2151  263
 2.50000+ 3 4.97300+ 0 0.0    + 0 1.62860- 3 4.00000- 2 8.00000- 29647 2151  264
 3.50000+ 3 4.96210+ 0 0.0    + 0 1.33760- 3 4.00000- 2 8.00000- 29647 2151  265
 4.50000+ 3 4.95140+ 0 0.0    + 0 1.48710- 3 4.00000- 2 8.00000- 29647 2151  266
 5.50000+ 3 4.94070+ 0 0.0    + 0 1.46610- 3 4.00000- 2 8.00000- 29647 2151  267
 7.00000+ 3 4.92460+ 0 0.0    + 0 1.45020- 3 4.00000- 2 8.00000- 29647 2151  268
 9.00000+ 3 4.90330+ 0 0.0    + 0 1.40060- 3 4.00000- 2 8.00000- 29647 2151  269
 1.25000+ 4 4.86620+ 0 0.0    + 0 1.48410- 3 4.00000- 2 8.00000- 29647 2151  270
 1.75000+ 4 4.81380+ 0 0.0    + 0 1.38420- 3 4.00000- 2 8.00000- 29647 2151  271
 2.50000+ 4 4.73630+ 0 0.0    + 0 1.39650- 3 4.00000- 2 8.00000- 29647 2151  272
 3.00000+ 4 4.68530+ 0 0.0    + 0 1.42560- 3 4.00000- 2 8.00000- 29647 2151  273
 4.00000+ 0 0.0    + 0          2          0         144         239647 2151  274
 0.0    + 0 0.0    + 0 0.0    + 0 2.00000+ 0 0.0    + 0 2.00000+ 09647 2151  275
 6.00000+ 1 3.88840+ 0 0.0    + 0 2.97040- 3 4.00000- 2 6.80000- 19647 2151  276
 7.00000+ 1 3.88830+ 0 0.0    + 0 3.24890- 3 4.00000- 2 6.80000- 19647 2151  277
 9.00000+ 1 3.88810+ 0 0.0    + 0 9.71530- 4 4.00000- 2 6.80000- 19647 2151  278
 1.25000+ 2 3.88780+ 0 0.0    + 0 9.25770- 4 4.00000- 2 6.80000- 19647 2151  279
 1.75000+ 2 3.88740+ 0 0.0    + 0 1.45930- 3 4.00000- 2 6.80000- 19647 2151  280
 2.50000+ 2 3.88680+ 0 0.0    + 0 1.59190- 3 4.00000- 2 6.80000- 19647 2151  281
 3.50000+ 2 3.88590+ 0 0.0    + 0 1.10300- 3 4.00000- 2 6.80000- 19647 2151  282
 4.50000+ 2 3.88510+ 0 0.0    + 0 1.13470- 3 4.00000- 2 6.80000- 19647 2151  283
 5.50000+ 2 3.88420+ 0 0.0    + 0 1.68990- 3 4.00000- 2 6.80000- 19647 2151  284
 7.00000+ 2 3.88300+ 0 0.0    + 0 1.32840- 3 4.00000- 2 6.80000- 19647 2151  285
 9.00000+ 2 3.88130+ 0 0.0    + 0 1.34460- 3 4.00000- 2 6.80000- 19647 2151  286
 1.25000+ 3 3.87840+ 0 0.0    + 0 1.03330- 3 4.00000- 2 6.80000- 19647 2151  287
 1.75000+ 3 3.87410+ 0 0.0    + 0 1.19590- 3 4.00000- 2 6.80000- 19647 2151  288
 2.50000+ 3 3.86790+ 0 0.0    + 0 1.26670- 3 4.00000- 2 6.80000- 19647 2151  289
 3.50000+ 3 3.85940+ 0 0.0    + 0 1.04030- 3 4.00000- 2 6.80000- 19647 2151  290
 4.50000+ 3 3.85110+ 0 0.0    + 0 1.15670- 3 4.00000- 2 6.80000- 19647 2151  291
 5.50000+ 3 3.84270+ 0 0.0    + 0 1.14030- 3 4.00000- 2 6.80000- 19647 2151  292
 7.00000+ 3 3.83030+ 0 0.0    + 0 1.12790- 3 4.00000- 2 6.80000- 19647 2151  293
 9.00000+ 3 3.81370+ 0 0.0    + 0 1.08930- 3 4.00000- 2 6.80000- 19647 2151  294
 1.25000+ 4 3.78480+ 0 0.0    + 0 1.15430- 3 4.00000- 2 6.80000- 19647 2151  295
 1.75000+ 4 3.74410+ 0 0.0    + 0 1.07660- 3 4.00000- 2 6.80000- 19647 2151  296
 2.50000+ 4 3.68380+ 0 0.0    + 0 1.08620- 3 4.00000- 2 6.80000- 19647 2151  297
 3.00000+ 4 3.64410+ 0 0.0    + 0 1.10880- 3 4.00000- 2 6.80000- 19647 2151  298
 5.00000+ 0 0.0    + 0          2          0         144         239647 2151  299
 0.0    + 0 0.0    + 0 0.0    + 0 2.00000+ 0 0.0    + 0 1.00000+ 09647 2151  300
 6.00000+ 1 3.18140+ 0 0.0    + 0 2.43040- 3 4.00000- 2 5.00000- 29647 2151  301
 7.00000+ 1 3.18130+ 0 0.0    + 0 2.65820- 3 4.00000- 2 5.00000- 29647 2151  302
 9.00000+ 1 3.18120+ 0 0.0    + 0 7.94890- 4 4.00000- 2 5.00000- 29647 2151  303
 1.25000+ 2 3.18090+ 0 0.0    + 0 7.57450- 4 4.00000- 2 5.00000- 29647 2151  304
 1.75000+ 2 3.18060+ 0 0.0    + 0 1.19400- 3 4.00000- 2 5.00000- 29647 2151  305
 2.50000+ 2 3.18010+ 0 0.0    + 0 1.30250- 3 4.00000- 2 5.00000- 29647 2151  306
 3.50000+ 2 3.17940+ 0 0.0    + 0 9.02490- 4 4.00000- 2 5.00000- 29647 2151  307
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 4.50000+ 2 3.17870+ 0 0.0    + 0 9.28370- 4 4.00000- 2 5.00000- 29647 2151  308
 5.50000+ 2 3.17800+ 0 0.0    + 0 1.38270- 3 4.00000- 2 5.00000- 29647 2151  309
 7.00000+ 2 3.17700+ 0 0.0    + 0 1.08690- 3 4.00000- 2 5.00000- 29647 2151  310
 9.00000+ 2 3.17560+ 0 0.0    + 0 1.10020- 3 4.00000- 2 5.00000- 29647 2151  311
 1.25000+ 3 3.17320+ 0 0.0    + 0 8.45430- 4 4.00000- 2 5.00000- 29647 2151  312
 1.75000+ 3 3.16970+ 0 0.0    + 0 9.78430- 4 4.00000- 2 5.00000- 29647 2151  313
 2.50000+ 3 3.16460+ 0 0.0    + 0 1.03640- 3 4.00000- 2 5.00000- 29647 2151  314
 3.50000+ 3 3.15770+ 0 0.0    + 0 8.51190- 4 4.00000- 2 5.00000- 29647 2151  315
 4.50000+ 3 3.15090+ 0 0.0    + 0 9.46360- 4 4.00000- 2 5.00000- 29647 2151  316
 5.50000+ 3 3.14410+ 0 0.0    + 0 9.32990- 4 4.00000- 2 5.00000- 29647 2151  317
 7.00000+ 3 3.13380+ 0 0.0    + 0 9.22830- 4 4.00000- 2 5.00000- 29647 2151  318
 9.00000+ 3 3.12030+ 0 0.0    + 0 8.91280- 4 4.00000- 2 5.00000- 29647 2151  319
 1.25000+ 4 3.09670+ 0 0.0    + 0 9.44430- 4 4.00000- 2 5.00000- 29647 2151  320
 1.75000+ 4 3.06330+ 0 0.0    + 0 8.80860- 4 4.00000- 2 5.00000- 29647 2151  321
 2.50000+ 4 3.01400+ 0 0.0    + 0 8.88690- 4 4.00000- 2 5.00000- 29647 2151  322
 3.00000+ 4 2.98160+ 0 0.0    + 0 9.07200- 4 4.00000- 2 5.00000- 29647 2151  323
 6.00000+ 0 0.0     + 0          2          0         144         239647 2151  324
 0.0     + 0 0.0     + 0         + 0 1.00000+ 0 0.0     + 0 2.00000+ 09647 2151  325
 6.00000+ 1 2.69190+ 0 0.0    + 0 2.05650- 3 4.00000- 2 4.70000- 19647 2151  326
 7.00000+ 1 2.69190+ 0 0.0    + 0 2.24920- 3 4.00000- 2 4.70000- 19647 2151  327
 9.00000+ 1 2.69180+ 0 0.0    + 0 6.72600- 4 4.00000- 2 4.70000- 19647 2151  328
 1.25000+ 2 2.69160+ 0 0.0    + 0 6.40920- 4 4.00000- 2 4.70000- 19647 2151  329
 1.75000+ 2 2.69130+ 0 0.0    + 0 1.01030- 3 4.00000- 2 4.70000- 19647 2151  330
 2.50000+ 2 2.69080+ 0 0.0    + 0 1.10210- 3 4.00000- 2 4.70000- 19647 2151  331
 3.50000+ 2 2.69030+ 0 0.0    + 0 7.63640- 4 4.00000- 2 4.70000- 19647 2151  332
 4.50000+ 2 2.68970+ 0 0.0    + 0 7.85540- 4 4.00000- 2 4.70000- 19647 2151  333
 5.50000+ 2 2.68910+ 0 0.0    + 0 1.17000- 3 4.00000- 2 4.70000- 19647 2151  334
 7.00000+ 2 2.68820+ 0 0.0    + 0 9.19670- 4 4.00000- 2 4.70000- 19647 2151  335
 9.00000+ 2 2.68700+ 0 0.0    + 0 9.30910- 4 4.00000- 2 4.70000- 19647 2151  336
 1.25000+ 3 2.68500+ 0 0.0    + 0 7.15360- 4 4.00000- 2 4.70000- 19647 2151  337
 1.75000+ 3 2.68210+ 0 0.0    + 0 8.27900- 4 4.00000- 2 4.70000- 19647 2151  338
 2.50000+ 3 2.67770+ 0 0.0    + 0 8.76930- 4 4.00000- 2 4.70000- 19647 2151  339
 3.50000+ 3 2.67190+ 0 0.0    + 0 7.20240- 4 4.00000- 2 4.70000- 19647 2151  340
 4.50000+ 3 2.66610+ 0 0.0    + 0 8.00770- 4 4.00000- 2 4.70000- 19647 2151  341
 5.50000+ 3 2.66040+ 0 0.0    + 0 7.89460- 4 4.00000- 2 4.70000- 19647 2151  342
 7.00000+ 3 2.65170+ 0 0.0    + 0 7.80850- 4 4.00000- 2 4.70000- 19647 2151  343
 9.00000+ 3 2.64020+ 0 0.0    + 0 7.54160- 4 4.00000- 2 4.70000- 19647 2151  344
 1.25000+ 4 2.62030+ 0 0.0    + 0 7.99130- 4 4.00000- 2 4.70000- 19647 2151  345
 1.75000+ 4 2.59210+ 0 0.0    + 0 7.45340- 4 4.00000- 2 4.70000- 19647 2151  346
 2.50000+ 4 2.55030+ 0 0.0    + 0 7.51970- 4 4.00000- 2 4.70000- 19647 2151  347
 3.00000+ 4 2.52290+ 0 0.0    + 0 7.67630- 4 4.00000- 2 4.70000- 19647 2151  348
                                                                   9647 2   0  349
                                                                   9647 0   0  350
```

Cm-247 File 3

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62470+ 4 2.44948+ 2          0          99          0           09647 3  1  351
 0.0    + 0 0.0    + 0          0           0          2         1179647 3  1  352
          2          2        117           5          0           09647 3  1  353
 1.00000- 5 0.0    + 0 3.00000+ 4 0.0    + 0 3.00000+ 4 1.40308+ 19647 3  1  354
 5.00000+ 4 1.36800+ 1 6.17511+ 4 1.35341+ 1 8.00000+ 4 1.33334+ 19647 3  1  355
 1.00000+ 5 1.31251+ 1 1.33543+ 5 1.27788+ 1 1.50000+ 5 1.26081+ 19647 3  1  356
 2.00000+ 5 1.20900+ 1 2.27927+ 5 1.18047+ 1 2.67086+ 5 1.14147+ 19647 3  1  357
 2.86164+ 5 1.12301+ 1 3.00000+ 5 1.10992+ 1 3.18294+ 5 1.09290+ 19647 3  1  358
 3.43396+ 5 1.07023+ 1 4.00000+ 5 1.02216+ 1 4.05649+ 5 1.01760+ 19647 3  1  359
 4.34768+ 5 9.94799+ 0 4.50833+ 5 9.82718+ 0 4.80956+ 5 9.61022+ 09647 3  1  360
 5.00000+ 5 9.47944+ 0 6.00000+ 5 8.87217+ 0 8.00000+ 5 8.01151+ 09647 3  1  361
 1.00000+ 6 7.51081+ 0 1.22474+ 6 7.28622+ 0 1.50000+ 6 7.06833+ 09647 3  1  362
 1.73205+ 6 7.07602+ 0 2.00000+ 6 7.08371+ 0 3.00000+ 6 7.48685+ 09647 3  1  363
 4.00000+ 6 7.76846+ 0 4.47214+ 6 7.76140+ 0 5.00000+ 6 7.75434+ 09647 3  1  364
 5.17870+ 6 7.72702+ 0 5.17876+ 6 7.72700+ 0 5.37283+ 6 7.66775+ 09647 3  1  365
 5.57424+ 6 7.60893+ 0 5.78320+ 6 7.55056+ 0 6.00000+ 6 7.49264+ 09647 3  1  366
 6.44742+ 6 7.25038+ 0 6  .349+ 6 7.13220+ 0 6.92820+ 6 7.01595+ 09647 3  1  367
 7.00000+ 6 6.98297+ 0 7 .8188+ 6 6.90159+ 0 7.31218+ 6 6.84511+ 09647 3  1  368
 7.44484+ 6 6.78910+ 0  .57991+ 6 6.73354+ 0 7.64836+ 6 6.70593+ 09647 3  1  369
 7.71743+ 6 6.67844+ 0 7.78712+ 6 6.65105+ 0 7.85744+ 6 6.62379+ 09647 3  1  370
 7.89284+ 6 6.61019+ 0 7.92840+ 6 6.59663+ 0 7.96412+ 6 6.58309+ 09647 3  1  371
 8.00000+ 6 6.56958+ 0 8.45897+ 6 6.41746+ 0 8.69824+ 6 6.34272+ 09647 3  1  372
 8.94427+ 6 6.26886+ 0 9.00000+ 6 6.25253+ 0 9.19727+ 6 6.19585+ 09647 3  1  373
 9.32644+ 6 6.15967+ 0 9.45742+ 6 6.12370+ 0 9.59024+ 6 6.08794+ 09647 3  1  374
 9.72493+ 6 6.05238+ 0 9.79298+ 6 6.03468+ 0 9.86151+ 6 6.01704+ 09647 3  1  375
 9.93051+ 6 5.99944+ 0 1.00000+ 7 5.98190+ 0 1.03919+ 7 5.93332+ 09647 3  1  376
 1.05935+ 7 5.90919+ 0 1.07991+ 7 5.88514+ 0 1.10000+ 7 5.86218+ 09647 3  1  377
 1.10087+ 7 5.86120+ 0 1.12223+ 7 5.83735+ 0 1.13306+ 7 5.82547+ 09647 3  1  378
 1.14400+ 7 5.81361+ 0 1.15505+ 7 5.80177+ 0 1.16061+ 7 5.79586+ 09647 3  1  379
 1.16620+ 7 5.78996+ 0 1.16621+ 7 5.78996+ 0 1.20000+ 7 5.78179+ 09647 3  1  380
 1.23128+ 7 5.77444+ 0 1.26517+ 7 5.76669+ 0 1.30000+ 7 5.75895+ 09647 3  1  381
 1.32431+ 7 5.77309+ 0 1.34907+ 7 5.78727+ 0 1.37430+ 7 5.80148+ 09647 3  1  382
 1.40000+ 7 5.81573+ 0 1.42436+ 7 5.82902+ 0 1.44914+ 7 5.84235+ 09647 3  1  383
 1.47435+ 7 5.85570+ 0 1.50000+ 7 5.86909+ 0 1.52440+ 7 5.89105+ 09647 3  1  384
 1.54919+ 7 5.91309+ 0 1.57439+ 7 5.93521+ 0 1.60000+ 7 5.95742+ 09647 3  1  385
 1.62443+ 7 5.97835+ 0 1.64924+ 7 5.99936+ 0 1.67443+ 7 6.02044+ 09647 3  1  386
 1.70000+ 7 6.04160+ 0 1.72046+ 7 6.05835+ 0 1.72047+ 7 6.05836+ 09647 3  1  387
 1.72050+ 7 6.05838+ 0 1.74004+ 7 6.07224+ 0 1.75980+ 7 6.08613+ 09647 3  1  388
 1.77979+ 7 6.10006+ 0 1.80000+ 7 6.11402+ 0 1.82449+ 7 6.13076+ 09647 3  1  389
 1.84932+ 7 6.14755+ 0 1.87449+ 7 6.16440+ 0 1.88720+ 7 6.17283+ 09647 3  1  390
 1.90000+ 7 6.18128+ 0 1.92452+ 7 6.19734+ 0 1.94936+ 7 6.21345+ 09647 3  1  391
 1.97452+ 7 6.22959+ 0 1.98722+ 7 6.23768+ 0 2.00000+ 7 6.24578+ 09647 3  1  392
                                                                   9647 3  0  393
 9.62470+ 4 2.44948+ 2          0           0          0           09647 3  2  394
 0.0    + 0 0.0    + 0          0           0          2         1179647 3  2  395
          2          2        117           5          0           09647 3  2  396
 1.00000- 5 0.0    + 0 3.00000+ 4 0.0    + 0 3.00000+ 4 1.11815+ 19647 3  2  397
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 5.00000+ 4 1.10174+ 1 6.17511+ 4 1.09253+ 1 8.00000+ 4 1.07010+ 19647 3  2  398
 1.00000+ 5 1.04300+ 1 1.33543+ 5 9.99398+ 0 1.50000+ 5 9.77816+ 09647 3  2  399
 2.00000+ 5 9.16517+ 0 2.27927+ 5 8.87455+ 0 2.67086+ 5 8.46466+ 09647 3  2  400
 2.86164+ 5 8.25235+ 0 3.00000+ 5 8.09480+ 0 3.18294+ 5 7.90399+ 09647 3  2  401
 3.43396+ 5 7.63908+ 0 4.00000+ 5 7.10913+ 0 4.05649+ 5 7.06788+ 09647 3  2  402
 4.34768+ 5 6.86205+ 0 4.50833+ 5 6.75248+ 0 4.80956+ 5 6.55055+ 09647 3  2  403
 5.00000+ 5 6.42762+ 0 6.00000+ 5 5.77372+ 0 8.00000+ 5 4.74686+ 09647 3  2  404
 1.00000+ 6 4.07154+ 0 1.22474+ 6 3.77107+ 0 1.50000+ 6 3.44722+ 09647 3  2  405
 1.73205+ 6 3.54671+ 0 2.00000+ 6 3.64338+ 0 3.00000+ 6 4.49535+ 09647 3  2  406
 4.00000+ 6 4.95750+ 0 4.47214+ 6 4.94846+ 0 5.00000+ 6 4.93436+ 09647 3  2  407
 5.17870+ 6 4.89445+ 0 5.17876+ 6 4.89446+ 0 5.37283+ 6 4.82936+ 09647 3  2  408
 5.57424+ 6 4.76099+ 0 5.78320+ 6 4.68926+ 0 6.00000+ 6 4.61405+ 09647 3  2  409
 6.44742+ 6 4.32971+ 0 6.68349+ 6 4.18764+ 0 6.92820+ 6 4.04552+ 09647 3  2  410
 7.00000+ 6 4.00598+ 0 7.18188+ 6 3.94429+ 0 7.31218+ 6 3.90228+ 09647 3  2  411
 7.44484+ 6 3.86058+ 0 7.57991+ 6 3.81917+ 0 7.64836+ 6 3.79858+ 09647 3  2  412
 7.71743+ 6 3.77806+ 0 7.78712+ 6 3.75761+ 0 7.85744+ 6 3.73723+ 09647 3  2  413
 7.89284+ 6 3.72707+ 0 7.92840+ 6 3.71692+ 0 7.96412+ 6 3.70679+ 09647 3  2  414
 8.00000+ 6 3.69668+ 0 8.45897+ 6 3.53216+ 0 8.69824+ 6 3.44842+ 09647 3  2  415
 8.94427+ 6 3.36365+ 0 9.00000+ 6 3.34468+ 0 9.19727+ 6 3.28196+ 09647 3  2  416
 9.32644+ 6 3.24121+ 0 9.45742+ 6 3.20010+ 0 9.59024+ 6 3.15863+ 09647 3  2  417
 9.72493+ 6 3.11679+ 0 9.79298+ 6 3.09574+ 0 9.86151+ 6 3.07459+ 09647 3  2  418
 9.93051+ 6 3.05335+ 0 1.00000+ 7 3.03202+ 0 1.03919+ 7 2.97103+ 09647 3  2  419
 1.05935+ 7 2.93957+ 0 1.07991+ 7 2.90745+ 0 1.10000+ 7 2.87602+ 09647 3  2  420
 1.10087+ 7 2.87488+ 0 1.12223+ 7 2.84739+ 0 1.13306+ 7 2.83371+ 09647 3  2  421
 1.14400+ 7 2.82008+ 0 1.15505+ 7 2.80649+ 0 1.16061+ 7 2.79972+ 09647 3  2  422
 1.16620+ 7 2.79295+ 0 1.16621+ 7 2.79295+ 0 1.20000+ 7 2.77513+ 09647 3  2  423
 1.23128+ 7 2.76155+ 0 1.26517+ 7 2.74660+ 0 1.30000+ 7 2.73098+ 09647 3  2  424
 1.32431+ 7 2.73834+ 0 1.34907+ 7 2.74540+ 0 1.37430+ 7 2.75214+ 09647 3  2  425
 1.40000+ 7 2.75857+ 0 1.42436+ 7 2.76366+ 0 1.44914+ 7 2.76864+ 09647 3  2  426
 1.47435+ 7 2.77350+ 0 1.50000+ 7 2.77825+ 0 1.52440+ 7 2.79323+ 09647 3  2  427
 1.54919+ 7 2.80806+ 0 1.57439+ 7 2.82276+ 0 1.60000+ 7 2.83731+ 09647 3  2  428
 1.62443+ 7 2.85211+ 0 1.64924+ 7 2.86680+ 0 1.67443+ 7 2.88137+ 09647 3  2  429
 1.70000+ 7 2.89582+ 0 1.72046+ 7 2.90785+ 0 1.72047+ 7 2.90786+ 09647 3  2  430
 1.72050+ 7 2.90787+ 0 1.74004+ 7 2.91746+ 0 1.75980+ 7 2.92697+ 09647 3  2  431
 1.77979+ 7 2.93642+ 0 1.80000+ 7 2.94580+ 0 1.82449+ 7 2.95763+ 09647 3  2  432
 1.84932+ 7 2.96937+ 0 1.87449+ 7 2.98101+ 0 1.88720+ 7 2.98680+ 09647 3  2  433
 1.90000+ 7 2.99256+ 0 1.92452+ 7 3.00418+ 0 1.94936+ 7 3.01573+ 09647 3  2  434
 1.97452+ 7 3.02719+ 0 1.98722+ 7 3.03289+ 0 2.00000+ 7 3.03857+ 09647 3  2  435
                                                                  9647 3  0  436
 9.62470+ 4 2.44948+ 2          0          99          0          09647 3  4  437
 0.0     + 0-6.15000+ 4          0           0          1         359647 3  4  438
        35          3          0           0          0          09647 3  4  439
 6.17511+ 4 0.0     + 0 8.00000+ 4 1.25908- 1 1.00000+ 5 2.16386- 19647 3  4  440
 1.33543+ 5 3.11847- 1 1.50000+ 5 3.60400- 1 2.00000+ 5 4.62363- 19647 3  4  441
 2.27927+ 5 4.99428- 1 2.67086+ 5 5.65333- 1 2.86164+ 5 6.17171- 19647 3  4  442
 3.00000+ 5 6.61820- 1 3.18294+ 5 6.92576- 1 3.43396+ 5 7.45004- 19647 3  4  443
 4.00000+ 5 8.14833- 1 4.05649+ 5 8.21756- 1 4.34768+ 5 8.53496- 19647 3  4  444
 4.50833+ 5 8.69544- 1 4.80956+ 5 9.01639- 1 5.00000+ 5 9.20870- 19647 3  4  445
 6.00000+ 5 9.32775- 1 8.00000+ 5 9.28392- 1 1.00000+ 6 8.74628- 19647 3  4  446
 1.50000+ 6 5.92640- 1 2.00000+ 6 4.26970- 1 3.00000+ 6 4.86167- 19647 3  4  447
 4.00000+ 6 6.08939- 1 5.00000+ 6 8.19223- 1 5.17870+ 6 8.13088- 19647 3  4  448
 6.00000+ 6 3.90885- 1 8.00000+ 6 2.06796- 2 1.00000+ 7 1.88084- 39647 3  4  449
 1.16620+ 7 2.42824- 4 1.30000+ 7 1.58752- 4 1.50000+ 7 1.58759- 49647 3  4  450
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.72046+ 7 1.94027+ 4 2.00000+ 7 1.63754- 4                       9647 3  4  451
                                                                   9647 3  0  452
 9.64700+ 4 2.44945+ 2          0          99          0          09647 3 16  453
 0.0    + 0-5.15770+ 6          0           0          1         189647 3 16  454
         18          2          0           0          0          09647 3 16  455
 5.17876+ 6 0.0    + 0 6.00000+ 6 3.87600- 1 7.00000+ 6 5.85690- 19647 3 16  456
 8.00000+ 6 6.52220- 1 9.00000+ 6 8.47140- 1 1.00000+ 7 1.04800+ 09647 3 16  457
 1.10000+ 7 1.18530+ 0 1.16620+ 7 1.13020+ 0 1.20000+ 7 1.10360+ 09647 3 16  458
 1.30000+ 7 7.70990- 1 1.40000+ 7 3.82800- 1 1.50000+ 7 2.00550- 19647 3 16  459
 1.60000+ 7 9.65170- 2 1.70000+ 7 4.34420- 2 1.72050+ 7 3.66900- 29647 3 16  460
 1.80000+ 7 1.88090- 2 1.90000+ 7 7.97730- 3 2.00000+ 7 3.34000- 39647 3 16  461
                                                                   9647 3  0  462
 9.64700+ 4 2.44945+ 2          0          99          0          09647 3 17  463
 0.0    + 0-1.16147+ 7          0           0          1         119647 3 17  464
         11          2          0           0          0          09647 3 17  465
 1.16621+ 7 0.0    + 0 1.20000+ 7 2.83540- 3 1.30000+ 7 1.56820- 19647 3 17  466
 1.40000+ 7 3.74200- 1 1.50000+ 7 5.90130- 1 1.60000+ 7 7.46240- 19647 3 17  467
 1.70000+ 7 8.46200- 1 1.72050+ 7 8.61850- 1 1.80000+ 7 9.11870- 19647 3 17  468
 1.90000+ 7 9.16480- 1 2.00000+ 7 7.96670- 1                       9647 3 17  469
                                                                   9647 3  0  470
 9.62470+ 4 2.44945+ 2          0          99          0          09647 3 18  471
 0.0    + 0 2.00000+ 8          0           0          2         309647 3 18  472
         2          2         30           5          0          09647 3 18  473
 1.00000- 5 0.0    + 0 3.00000+ 4 0.0    + 0 3.00000+ 4 2.05000+ 09647 3 18  474
 5.00000+ 4 2.00000+ 0 8.00000+ 4 2.00000+ 0 1.00000+ 5 2.05000+ 09647 3 18  475
 1.50000+ 5 2.15000+ 0 2.00000+ 5 2.20000+ 0 3.00000+ 5 2.15000+ 09647 3 18  476
 4.00000+ 5 2.16000+ 0 5.00000+ 5 2.00000+ 0 6.00000+ 5 2.05000+ 09647 3 18  477
 8.00000+ 5 2.25000+ 0 1.00000+ 6 2.50000+ 0 1.50000+ 6 3.00000+ 09647 3 18  478
 2.00000+ 6 3.00000+ 0 3.00000+ 6 2.50000+ 0 4.00000+ 6 2.20000+ 09647 3 18  479
 5.00000+ 6 2.00000+ 0 6.00000+ 6 2.10000+ 0 7.00000+ 6 2.20000+ 09647 3 18  480
 8.00000+ 6 2.20000+ 0 9.00000+ 6 2.05000+ 0 1.00000+ 7 1.90000+ 09647 3 18  481
 1.10000+ 7 1.80000+ 0 1.20000+ 7 1.90000+ 0 1.30000+ 7 2.10000+ 09647 3 18  482
 1.40000+ 7 2.30000+ 0 1.50000+ 7 2.30000+ 0 2.00000+ 7 2.20000+ 09647 3 18  483
                                                                   9647 3  0  484
 9.62470+ 4 2.44945+ 2          0          99          0          09647 3 37  485
 0.0    + 0-1.71347+ 7          0           0          1          49647 3 37  486
         4          2          0           0          0          09647 3 37  487
 1.72047+ 7 0.0    + 0 1.80000+ 7 1.24420- 3 1.90000+ 7 4.65840- 29647 3 37  488
 2.00000+ 7 2.07040- 1                                             9647 3 37  489
                                                                   9647 3  0  490
 9.62470+ 4 2.44948+ 2          0           1          0          09647 3 51  491
 0.0    + 0-6.15000+ 4          0           0          1         359647 3 51  492
         35          3          0           0          0          09647 3 51  493
 6.17511+ 4 0.0    + 0 8.00000+ 4 1.25908- 1 1.00000+ 5 2.16386- 19647 3 51  494
 1.33543+ 5 3.11847- 1 1.50000+ 5 3.34860- 1 2.00000+ 5 3.67813- 19647 3 51  495
 2.27927+ 5 3.78950- 1 2.67086+ 5 3.84761- 1 2.86164+ 5 3.80794- 19647 3 51  496
 3.00000+ 5 3.75645- 1 3.18294+ 5 3.68505- 1 3.43396+ 5 3.51401- 19647 3 51  497
 4.00000+ 5 3.16652- 1 4.05649+ 5 3.15756- 1 4.34768+ 5 3.12104- 19647 3 51  498
 4.50833+ 5 3.10692- 1 4.80956+ 5 3.08887- 1 5.00000+ 5 3.07849- 19647 3 51  499
 6.00000+ 5 2.66299- 1 8.00000+ 5 1.82807- 1 1.00000+ 6 1.20225- 19647 3 51  500
 1.50000+ 6 3.36002- 2 2.00000+ 6 8.79314- 3 3.00000+ 6 1.00167- 39647 3 51  501
 4.00000+ 6 1.24939- 4 5.00000+ 6 1.87783- 5 5.17870+ 6 1.28549- 59647 3 51  502
 6.00000+ 6 1.21705- 6 8.00000+ 6 1.80614- 9 1.00000+ 7 6.71952-129647 3 51  503
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.16620+ 7 7.68775-14 1.30000+ 7 8.07177-15 1.50000+ 7 6.12565-169647 3 51  504
 1.72046+ 7 5.24891-17 2.00000+ 7 1.88665-18                        9647 3 51  505
                                                                    9647 3  0  50[illegible]
 9.62470+ 4 2.44948+ 2          0          2          0           09647 3 52  5[illegible]
 0.0     + 0-1.33000+ 5          0          0          1          329647 3 52  5[illegible]
        32          3          0          0          0           09647 3 52  50[illegible]
 1.33543+ 5 0.0     + 0 1.50000+ 5 2.55402- 2 2.00000+ 5 9.45492- 29647 3 52  510
 2.27927+ 5 1.20479- 1 2.67086+ 5 1.45482- 1 2.86164+ 5 1.54141- 19647 3 52  511
 3.00000+ 5 1.59259- 1 3.18294+ 5 1.64026- 1 3.43396+ 5 1.66542- 19647 3 52  512
 4.00000+ 5 1.67365- 1 4.05649+ 5 1.68310- 1 4.34768+ 5 1.73077- 19647 3 52  513
 4.50833+ 5 1.75715- 1 4.80956+ 5 1.80724- 1 5.00000+ 5 1.83595- 19647 3 52  514
 6.00000+ 5 1.71770- 1 8.00000+ 5 1.30547- 1 1.00000+ 6 9.19533- 29647 3 52  515
 1.50000+ 6 2.81011- 2 2.00000+ 6 7.63353- 3 3.00000+ 6 9.06033- 49647 3 52  516
 4.00000+ 6 1.16927- 4 5.00000+ 6 1.80401- 5 5.17870+ 6 1.24000- 59647 3 52  517
 6.00000+ 6 1.19138- 6 8.00000+ 6 1.79349- 9 1.00000+ 7 6.75703-129647 3 52  518
 1.16620+ 7 7.80877-14 1.30000+ 7 8.24914-15 1.50000+ 7 6.32838-169647 3 52  519
 1.72046+ 7 5.48360-17 2.00000+ 7 1.99333-18                        9647 3 52  520
                                                                    9647 3  0  521
 9.62470+ 4 2.44948+ 2          0          3          0           09647 3 53  522
 0.0     + 0-2.27000+ 5          0          0          1          299647 3 53  523
        29          3          0          0          0           09647 3 53  524
 2.27927+ 5 0.0     + 0 2.67086+ 5 3.50896- 2 2.86164+ 5 4.15477- 29647 3 53  525
 3.00000+ 5 4.36073- 2 3.18294+ 5 4.55876- 2 3.43396+ 5 4.66053- 29647 3 53  526
 4.00000+ 5 4.63493- 2 4.05649+ 5 4.65940- 2 4.34768+ 5 4.78353- 29647 3 53  527
 4.50833+ 5 4.82608- 2 4.80956+ 5 4.82360- 2 5.00000+ 5 4.86246- 29647 3 53  528
 6.00000+ 5 4.52243- 2 8.00000+ 5 3.51023- 2 1.00000+ 6 2.47341- 29647 3 53  529
 1.50000+ 6 7.51541- 3 2.00000+ 6 2.23392- 3 3.00000+ 6 3.81043- 49647 3 53  530
 4.00000+ 6 6.65308- 5 5.00000+ 6 1.17025- 5 5.17870+ 6 8.09867- 69647 3 53  531
 6.00000+ 6 7.72729- 7 8.00000+ 6 1.11165- 9 1.00000+ 7 4.21881-129647 3 53  532
 1.16620+ 7 4.86316-14 1.30000+ 7 5.07421-15 1.50000+ 7 3.79444-169647 3 53  533
 1.72046+ 7 3.20416-17 2.00000+ 7 1.12983-18                        9647 3 53  534
                                                                    9647 3  0  535
 9.62470+ 4 2.44948+ 2          0          4          0           09647 3 54  536
 0.0     + 0-2.66000+ 5          0          0          1          289647 3 54  537
        28          3          0          0          0           09647 3 54  538
 2.67086+ 5 0.0     + 0 2.86164+ 5 4.06896- 2 3.00000+ 5 5.41956- 29647 3 54  539
 3.18294+ 5 6.74509- 2 3.43396+ 5 7.71494- 2 4.00000+ 5 8.26402- 29647 3 54  540
 4.05649+ 5 8.32721- 2 4.34768+ 5 8.60206- 2 4.50833+ 5 8.72850- 29647 3 54  541
 4.80956+ 5 8.85029- 2 5.00000+ 5 8.93483- 2 6.00000+ 5 8.15008- 29647 3 54  542
 8.00000+ 5 5.89089- 2 1.00000+ 6 3.88758- 2 1.50000+ 6 1.07167- 29647 3 54  543
 2.00000+ 6 3.04715- 3 3.00000+ 6 4.93328- 4 4.00000+ 6 8.38393- 59647 3 54  544
 5.00000+ 6 1.45595- 5 5.17870+ 6 1.00572- 5 6.00000+ 6 9.55097- 79647 3 54  545
 8.00000+ 6 1.37136- 9 1.00000+ 7 5.23511-12 1.16620+ 7 6.07070-149647 3 54  546
 1.30000+ 7 6.35821-15 1.50000+ 7 4.77664-16 1.72046+ 7 4.05621-179647 3 54  547
 2.00000+ 7 1.43837-18                                              9647 3 54  548
                                                                    9647 3  0  549
 9.62470+ 4 2.44948+ 2          0          5          0           09647 3 55  550
 0.0     + 0-2.85000+ 5          0          0          1          279647 3 55  551
        27          3          0          0          0           09647 3 55  552
 2.86164+ 5 0.0     + 0 3.00000+ 5 2.91130- 2 3.18294+ 5 4.70068- 29647 3 55  553
 3.43396+ 5 6.14751- 2 4.00000+ 5 7.33102- 2 4.05649+ 5 7.42641- 29647 3 55  554
 4.34768+ 5 7.84050- 2 4.50833+ 5 8.02512- 2 4.80956+ 5 8.23663- 29647 3 55  555
 5.00000+ 5 8.36440- 2 6.00000+ 5 7.77536- 2 8.00000+ 5 5.71000- 29647 3 55  556
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.00000+ 6 3.79656- 2 1.50000+ 6 1.05698- 2 2.00000+ 6 3.02015- 39647 3 55  557
 3.00000+ 6 4.90570- 4 4.00000+ 6 8.34539- 5 5.00000+ 6 1.45038- 59647 3 55  558
 5.17870+ 6 1.00197- 5 6.00000+ 6 9.52344- 7 8.00000+ 6 1.36861- 99647 3 55  559
 1.00000+ 7 5.22525-12 1.16620+ 7 6.06201-14 1.30000+ 7 6.35059-159647 3 55  560
 1.50000+ 7 4.77063-16 1.72046+ 7 4.05252-17 2.00000+ 7 1.43736-189647 3 55  561
                                                                  9647 3  0  562
 9.62470+ 4 2.44948+ 2          0          6          0          09647 3 56  563
 0.0     + 0-3.17000+ 5          0          0          1         259647 3 56  564
        25          3          0          0          0          09647 3 56  565
 3.18294+ 5 0.0     + 0 3.43396+ 5 4.18316- 2 4.00000+ 5 7.35634- 29647 3 56  566
 4.05649+ 5 7.57150- 2 4.34768+ 5 8.50214- 2 4.50833+ 5 8.91759- 29647 3 56  567
 4.80956+ 5 9.54868- 2 5.00000+ 5 9.87173- 2 6.00000+ 5 9.63250- 29647 3 56  568
 8.00000+ 5 7.14170- 2 1.00000+ 6 4.66996- 2 1.50000+ 6 1.25457- 39647 3 56  569
 2.00000+ 6 3.52432- 3 3.00000+ 6 5.61831- 4 4.00000+ 6 9.49622- 39647 3 56  570
 5.00000+ 6 1.64539- 5 5.17870+ 6 1.13570- 5 6.00000+ 6 1.07645- 69647 3 56  571
 8.00000+ 6 1.54596- 9 1.00000+ 7 5.94618-12 1.16620+ 7 6.93947-149647 3 56  572
 1.30000+ 7 7.29894-15 1.50000+ 7 5.51517-16 1.72046+ 7 4.71806-179647 3 56  573
 2.00000+ 7 1.68606-18                                            9647 3 56  574
                                                                  9647 3  0  575
 9.62470+ 4 2.44948+ 2          0          7          0          09647 3 57  576
 0.0     + 0-3.42000+ 5          0          0          1         249647 3 57  577
        24          3          0          0          0          09647 3 57  578
 3.43396+ 5 0.0     + 0 4.00000+ 5 5.49525- 2 4.05649+ 5 5.78453- 29647 3 57  579
 4.34768+ 5 7.01637- 2 4.50833+ 5 7.55851- 2 4.80956+ 5 8.38169- 29647 3 57  580
 5.00000+ 5 8.80095- 2 6.00000+ 5 8.96855- 2 8.00000+ 5 6.84637- 29647 3 57  581
 1.00000+ 6 4.52810- 2 1.50000+ 6 1.23226- 2 2.00000+ 6 3.48383- 39647 3 57  582
 3.00000+ 6 5.57910- 4 4.00000+ 6 9.44158- 5 5.00000+ 6 1.63750- 59647 3 57  583
 5.17870+ 6 1.13038- 5 6.00000+ 6 1.07245- 6 8.00000+ 6 1.54190- 99647 3 57  584
 1.00000+ 7 5.93143-12 1.16620+ 7 6.92625-14 1.30000+ 7 7.28731-159647 3 57  585
 1.50000+ 7 5.50600-16 1.72046+ 7 4.71230-17 2.00000+ 7 1.68448-189647 3 57  586
                                                                  9647 3  0  587
 9.62470+ 4 2.44948+ 2          0          8          0          09647 3 58  588
 0.0     + 0-4.04000+ 5          0          0          1         229647 3 58  589
        22          3          0          0          0          09647 3 58  590
 4.05649+ 5 0.0     + 0 4.34768+ 5 8.69562- 4 4.50833+ 5 1.04337- 39647 3 58  591
 4.80956+ 5 1.43239- 3 5.00000+ 5 1.66652- 3 6.00000+ 5 2.54323- 39647 3 58  592
 8.00000+ 5 3.37832- 3 1.00000+ 6 3.26401- 3 1.50000+ 6 1.51869- 39647 3 58  593
 2.00000+ 6 5.47993- 4 3.00000+ 6 1.13288- 4 4.00000+ 6 2.17464- 59647 3 58  594
 5.00000+ 6 3.99807- 6 5.17870+ 6 2.7[illegible]038- 6 6.00000+ 6 2.70731- 79647 3 58  595
 8.00000+ 6 3.96226-10 1.00000+ 7 1.49297-12 1.16620+ 7 1.71455-149647 3 58  596
 1.30000+ 7 1.78473-15 1.50000+ 7 1.32663-16 1.72046+ 7 1.11804-179647 3 58  597
 2.00000+ 7 3.92835-19                                            9647 3 58  598
                                                                  9647 3  0  599
 9.62470+ 4 2.44948+ 2          0          9          0          09647 3 59  600
 0.0     + 0-4.33000+ 5          0          0          1         219647 3 59  601
        21          3          0          0          0          09647 3 59  602
 4.34768+ 5 0.0     + 0 4.50833+ 5 1.53550- 3 4.80956+ 5 2.91133- 39647 3 59  603
 5.00000+ 5 3.73329- 3 6.00000+ 5 6.75105- 3 8.00000+ 5 9.11572- 39647 3 59  604
 1.00000+ 6 8.41338- 3 1.50000+ 6 3.53663- 3 2.00000+ 6 1.20802- 39647 3 59  605
 3.00000+ 6 2.31970- 4 4.00000+ 6 4.27764- 5 5.00000+ 6 7.75022- 69647 3 59  606
 5.17870+ 6 5.38265- 6 6.00000+ 6 5.22690- 7 8.00000+ 6 7.64759-109647 3 59  607
 1.00000+ 7 2.89248-12 1.16620+ 7 3.33476-14 1.30000+ 7 3.47943-159647 3 59  608
 1.50000+ 7 2.59198-16 1.72046+ 7 2.18950-17 2.00000+ 7 7.71063-199647 3 59  609
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
                                                                   9647 3  0  610
 9.62470+ 4 2.44948+ 2           0          10           0        09647 3 60  611
 0.0    + 0-4.49000+ 5           0           0           1       209647 3 60  612
         20          3           0           0           0        09647 3 60  613
 4.50833+ 5 0.0    + 0 4.80956+ 5 9.27540- 3 5.00000+ 5 1.22798- 29647 3 60  614
 6.00000+ 5 2.01260- 2 8.00000+ 5 2.16223- 2 1.00000+ 6 1.74050- 29647 3 60  615
 1.50000+ 6 6.19354- 3 2.00000+ 6 1.98062- 3 3.00000+ 6 3.54324- 49647 3 60  616
 4.00000+ 6 6.27906- 5 5.00000+ 6 1.11640- 5 5.17870+ 6 7.73583- 69647 3 60  617
 6.00000+ 6 7.45801- 7 8.00000+ 6 1.08567- 9 1.00000+ 7 4.12718-129647 3 60  618
 1.16620+ 7 4.78225-14 1.30000+ 7 5.00384-15 1.50000+ 7 3.73989-169647 3 60  619
 1.72046+ 7 3.17035-17 2.00000+ 7 1.12063-18                        9647 3 60  620
                                                                   9647 3  0  621
 9.62470+ 4 2.44948+ 2           0          98           0        09647 3 91  622
 0.0    + 0-4.79000+ 5           0           0           1       199647 3 91  623
         19          3           0           0           0        09647 3 91  624
 4.80956+ 5 0.0    + 0 5.00000+ 5 3.40223- 3 6.00000+ 5 7.47964- 29647 3 91  625
 8.00000+ 5 2.89930- 1 1.00000+ 6 4.39811- 1 1.50000+ 6 4.66019- 19647 3 91  626
 2.00000+ 6 3.91497- 1 3.00000+ 6 4.81075- 1 4.00000+ 6 6.08146- 19647 3 91  627
 5.00000+ 6 8.19090- 1 5.17870+ 6 8.12996- 1 6.00000+ 6 3.90876- 19647 3 91  628
 8.00000+ 6 2.06796- 2 1.00000+ 7 1.88084- 3 1.16620+ 7 2.42824- 49647 3 91  629
 1.30000+ 7 1.58752- 4 1.50000+ 7 1.58759- 4 1.72046+ 7 1.94027- 49647 3 91  630
 2.00000+ 7 1.63754- 4                                              9647 3 91  631
                                                                   9647 3  0  632
 9.62470+ 4 2.44948+ 2           0          99           0        09647 3102  633
 0.0    + 0 0.0    + 0           0           0           2       399647 3102  634
         2           2          39           5           0        09647 3102  635
 1.00000- 5 0.0    + 0 3.00000+ 4 0.0    + 0 3.00000+ 4 7.99340- 19647 3102  636
 5.00000+ 4 6.62641- 1 6.17511+ 4 6.08819- 1 8.00000+ 4 5.06489- 19647 3102  637
 1.00000+ 5 4.28727- 1 1.33543+ 5 3.52118- 1 1.50000+ 5 3.19543- 19647 3102  638
 2.00000+ 5 2.62471- 1 2.27927+ 5 2.46968- 1 2.67086+ 5 2.20496- 19647 3102  639
 2.86164+ 5 2.04814- 1 3.00000+ 5 1.92584- 1 3.18294+ 5 1.80384- 19647 3102  640
 3.43396+ 5 1.63528- 1 4.00000+ 5 1.37635- 1 4.05649+ 5 1.36787- 19647 3102  641
 4.34768+ 5 1.33657- 1 4.50833+ 5 1.32461- 1 4.80956+ 5 1.31063- 19647 3102  642
 5.00000+ 5 1.30950- 1 6.00000+ 5 1.15676- 1 8.00000+ 5 8.62599- 29647 3102  643
 1.00000+ 6 6.46460- 2 1.50000+ 6 2.84744- 2 2.00000+ 6 1.33553- 29647 3102  644
 3.00000+ 6 5.32941- 3 4.00000+ 6 2.02527- 3 5.00000+ 6 7.55236- 49647 3102  645
 5.17870+ 6 5.96126- 4 6.00000+ 6 1.04692- 4 8.00000+ 6 7.40521- 79647 3102  646
 1.00000+ 7 1.66841- 8 1.16620+ 7 9.56117-10 1.30000+ 7 3.91719-109647 3102  647
 1.50000+ 7 2.50905-10 1.72046+ 7 2.19171-10 2.00000+ 7 1.36510-109647 3102  648
                                                                   9647 3  0  649
 9.62470+ 4 2.44948+ 2           0           0           0        09647 3251  650
 0.0    + 0 ).0    + 0           0           0           1       409647 3251  651
         40          3           0           0           0        09647 3251  652
 1.00000- 5 2.72167- 3 1.00000+ 3 3.28022- 3 1.00000+ 4 1.07758- 29647 3251  653
 3.00000+ 4 3.45564- 2 5.00000+ 4 5.93684- 2 6.17511+ 4 7.41206- 29647 3251  654
 8.00000+ 4 9.74630- 2 1.00000+ 5 1.22915- 1 1.33543+ 5 1.63753- 19647 3251  655
 1.50000+ 5 1.83005- 1 2.00000+ 5 2.36521- 1 2.27927+ 5 2.62491- 19647 3251  656
 2.67086+ 5 2.95801- 1 2.86164+ 5 3.11356- 1 3.00000+ 5 3.22418- 19647 3251  657
 3.18294+ 5 3.35994- 1 3.43396+ 5 3.54096- 1 4.00000+ 5 3.89401- 19647 3251  658
 4.05649+ 5 3.92209- 1 4.34768+ 5 4.05582- 1 4.50833+ 5 4.12239- 19647 3251  659
 4.80956+ 5 4.23683- 1 5.00000+ 5 4.30119- 1 6.00000+ 5 4.63062- 19647 3251  660
 8.00000+ 5 5.05117- 1 1.00000+ 6 5.25804- 1 1.50000+ 6 5.62466- 19647 3251  661
 2.00000+ 6 6.17692- 1 3.00000+ 6 7.09432- 1 4.00000+ 6 7.63323- 19647 3251  662
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 5.00000+ 6 7.97045- 1 5.17870+ 6 8.01285- 1 6.00000+ 6 8.14916- 19647 3251  663
 8.00000+ 6 8.20004- 1 1.00000+ 7 8.20237- 1 1.16620+ 7 8.40231- 19647 3251  664
 1.30000+ 7 8.63268- 1 1.50000+ 7 8.96686- 1 1.72046+ 7 9.24103- 19647 3251  665
 2.00000+ 7 9.43422- 1                                            9647 3251  666
                                                                  9647 3  0  667
                                                                  9647 0  0  668
```

Cm-247 File 5

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 9.62470+ 4 2.44948+ 2           0           0           2          09647 5 16 1913
 5.17870+ 6 0.0     + 0           0           9           1          29647 5 16 1914
          2           2           0           0           0          09647 5 16 1915
 5.17870+ 6 5.00000- 1 2.00000+ 7 5.00000- 1                           9647 5 16 1916
 0.0     + 0 0.0     + 0           0           0           1          99647 5 16 1917
          9           2           0           0           0          09647 5 16 1918
 5.17870+ 6 4.32053+ 5 6.00000+ 6 4.68407+ 5 8.00000+ 6 5.46556+ 59647 5 16 1919
 1.00000+ 7 6.14536+ 5 1.20000+ 7 6.75512+ 5 1.40000+ 7 7.31287+ 59647 5 16 1920
 1.60000+ 7 7.83001+ 5 1.80000+ 7 8.31430+ 5 2.00000+ 7 8.77129+ 59647 5 16 1921
 5.17870+ 6 0.0     + 0           0           9           1          29647 5 16 1922
          2           2           0           0           0          09647 5 16 1923
 5.17870+ 6 5.00000- 1 2.00000+ 7 5.00000- 1                           9647 5 16 1924
 0.0     + 0 0.0     + 0           0           0           1          99647 5 16 1925
          9           2           0           0           0          09647 5 16 1926
 5.17870+ 6 4.15289+ 5 6.00000+ 6 4.15289+ 5 8.00000+ 6 4.15289+ 59647 5 16 1927
 1.00000+ 7 4.15289+ 5 1.20000+ 7 4.29504+ 5 1.40000+ 7 5.10076+ 59647 5 16 1928
 1.60000+ 7 5.79512+ 5 1.80000+ 7 6.41457+ 5 2.00000+ 7 6.97928+ 59647 5 16 1929
                                                                       9647 5  0 1930
 9.62470+ 4 2.44948+ 2           0           0           3          09647 5 17 1931
 1.16621+ 7 0.0     + 0           0           9           1          29647 5 17 1932
          2           2           0           0           0          09647 5 17 1933
 1.16621+ 7 3.33333- 1 2.00000+ 7 3.33333- 1                           9647 5 17 1934
 0.0     + 0 0.0     + 0           0           0           1          69647 5 17 1935
          6           2           0           0           0          09647 5 17 1936
 1.16621+ 7 6.65614+ 5 1.20000+ 7 6.75512+ 5 1.40000+ 7 7.31287+ 59647 5 17 1937
 1.60000+ 7 7.83001+ 5 1.80000+ 7 8.31430+ 5 2.00000+ 7 8.77129+ 59647 5 17 1938
 1.16621+ 7 0.0     + 0           0           9           1          29647 5 17 1939
          2           2           0           0           0          09647 5 17 1940
 1.16621+ 7 3.33333- 1 2.00000+ 7 3.33333- 1                           9647 5 17 1941
 0.0     + 0 0.0     + 0           0           0           1          69647 5 17 1942
          6           2           0           0           0          09647 5 17 1943
 1.16621+ 7 4.74437+ 5 1.20000+ 7 4.79579+ 5 1.40000+ 7 5.24310+ 59647 5 17 1944
 1.60000+ 7 5.82823+ 5 1.80000+ 7 6.42190+ 5 2.00000+ 7 6.98096+ 59647 5 17 1945
 1.16621+ 7 0.0     + 0           0           9           1          29647 5 17 1946
          2           2           0           0           0          09647 5 17 1947
 1.16621+ 7 3.33333- 1 2.00000+ 7 3.33333- 1                           9647 5 17 1948
 0.0     + 0 0.0     + 0           0           0           1          69647 5 17 1949
          6           2           0           0           0          09647 5 17 1950
 1.16621+ 7 4.14810+ 5 1.20000+ 7 4.14810+ 5 1.40000+ 7 4.14810+ 59647 5 17 1951
 1.60000+ 7 4.14810+ 5 1.80000+ 7 4.14810+ 5 2.00000+ 7 4.34435+ 59647 5 17 1952
                                                                       9647 5  0 1953
 9.62470+ 7 2.44948+ 2           0           0           1          09647 5 18 1954
-2.00000+ 7 0.0     + 0           0           7           1          29647 5 18 1955
          2           2           0           0           0          09647 5 18 1956
 1.00000- 5 1.00000+ 0 2.00000+ 7 1.00000+ 0                           9647 5 18 1957
 0.0     + 0 0.0     + 0           0           0           1          29647 5 18 1958
          2           2           0           0           0          09647 5 18 1959
```

```
........10........20........30........40........50........60......MAT MF MT  SEQ
 1.00000- 5 1.47000+ 6 2.00000+ 7 1.47000+ 6                       9647 5 18 1960
                                                                   9647 5  0 1961
 9.62470+ 4 2.44948+ 2           0           0           4        09647 5 37 1962
 1.72046+ 7 0.0     + 0           0           9           1        29647 5 37 1963
          2           2           0           0           0        09647 5 37 1964
 1.72046+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                       9647 5 37 1965
 0.0     + 0 0.0     + 0           0           0           1        39647 5 37 1966
          3           2           0           0           0        09647 5 37 1967
 1.72046+ 7 8.12524+ 5 1.80000+ 7 8.31430+ 5 2.00000+ 7 8.77129+ 59647 5 37 1968
 1.72046+ 7 0.0     + 0           0           9           1        29647 5 37 1969
          2           2           0           0           0        09647 5 37 1970
 1.72046+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                          47 5 37 1971
 0.0     + 0 0.0     + 0           0           0           1           47 5 37 1972
          3           2           0           0           0        09647 5 37 1973
 1.72046+ 7 6.67733+ 5 1.80000+ 7 6.76864+ 5 2.00000+ 7 7.10427+ 59647 5 37 1974
 1.72046+ 7 0.0     + 0           0           9           1        29647 5 37 1975
          2           2           0           0           0        09647 5 37 1976
 1.72046+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                       9647 5 37 1977
 0.0     + 0 0.0     + 0           0           0           1        39647 5 37 1978
          3           2           0           0           0        09647 5 37 1979
 1.72046+ 7 4.50064+ 5 1.80000+ 7 4.55001+ 5 2.00000+ 7 4.79628+ 59647 5 37 1980
 1.72046+ 7 0.0     + 0           0           9           1        29647 5 37 1981
          2           2           0           0           0        09647 5 37 1982
 1.72046+ 7 2.50000- 1 2.00000+ 7 2.50000- 1                       9647 5 37 1983
 0.0     + 0 0.0     + 0           0           0           1        39647 5 37 1984
          3           2           0           0           0        09647 5 37 1985
 1.72046+ 7 4.15385+ 5 1.80000+ 7 4.15385+ 5 2.00000+ 7 4.15385+ 59647 5 37 1986
                                                                   9647 5  0 1987
 9.62470+ 4 2.44948+ 2           0           0           1        09647 5 91 1988
 4.80960+ 5 0.0     + 0           0           9           1        29647 5 91 1989
          2           2           0           0           0        09647 5 91 1990
 4.80960+ 5 1.00000+ 0 2.00000+ 7 1.00000+ 0                       9647 5 91 1991
 0.0     + 0 0.0     + 0           0           0           1       119647 5 91 1992
         11           2           0           0           0        09647 5 91 1993
 4.80960+ 5 4.13194+ 5 2.00000+ 6 4.13194+ 5 4.00000+ 6 3.73421+ 59647 5 91 1994
 6.00000+ 6 4.68407+ 5 8.00000+ 6 5.46556+ 5 1.00000+ 7 6.14536+ 59647 5 91 1995
 1.20000+ 7 6.75512+ 5 1.40000+ 7 7.31287+ 5 1.60000+ 7 7.83001+ 59647 5 91 1996
 1.80000+ 7 8.31430+ 5 2.00000+ 7 8.77129+ 5                       9647 5 91 1997
                                                                   9647 5  0 1998
                                                                   9647 0  0 1999
```