**An Integrated System for Production of Neutronics
and Photonics Computational Constants
Volume 17, Part A**

**PROGRAM LINEAR (VERSION 77-1): LINEARIZE DATA
IN THE EVALUATED NUCLEAR DATA FILE/
VERSION B (ENDF/B) FORMAT**

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**PROGRAM LINEAR (VERSION 77-?): LINEARIZE DATA
IN THE EVALUATED NUCLEAR DATA FILE/
VERSION B (ENDF/B) FORMAT**

Lawrence Livermore Laboratory

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Foreword

The total cross section probability of fission is calculated by means of the evaluated data in the ENDF/B format. In the intermediate stage of the calculation, the data are converted into the form of the ENDF/B format. We have developed the following program to convert the computer code of the evaluated data into the ENDF/B format. The program is written in FORTRAN and is available on the IBM 360/370.

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PROGRAM LINEAR (VERSION 77-1): LINEARIZE
DATA IN THE EVALUATED NUCLEAR
DATA FILE/VERSION B (ENDF/B) FORMAT

Abstract

the authors have concluded that both concepts evaluated in this paper are not suitable for a linear-linear intermediate form and that the linear-linear form is the main advantage of the code is that it is not necessary to consider anything but linear forms.

Introduction

The ENDF-6 format (ENDF Version 6.0 ENDF-60) format is used to store the data in the file. Within the ENDF-60 format, each section of the data is represented by a table of energy vs. cross section and/or reaction rate. The following interaction laws listed below:

Interpolation Laws

linear-linear interpolation is used with the linear-linear interpolation with a piecewise linear function plotted as a linear-linear behavior (dashed curve) between 0.01 and 100 eV.

Because the cross section is a function of energy, the linear-linear interpolation, the second starts from the energy value of the first interval, taking the interval ΔE . The interval is divided to n sub-intervals, the width of the interval is $\Delta E/n$. The linear-linear interpolation is used from the energy value of the first interval to which the n sub-intervals are divided, the energy of the n sub-interval is $E_{n+1} = E_1 + n \Delta E/n$. The interpolation law used in a linear-linear interpolation is

the interpolation of the linear-linear interpolation is used to find the difference between the linear-linear interpolation and the linear-linear interpolation.⁶ The linear-linear interpolation is used to find the difference between the linear-linear interpolation and the linear-linear interpolation.

$$f(E) = f(E_1) + \frac{f(E_2) - f(E_1)}{E_2 - E_1} (E - E_1)$$

$$f(E) = f(E_1) + \frac{f(E_2) - f(E_1)}{E_2 - E_1} (E - E_1)$$

⁶ Ibid. p. 10.

⁷ Ibid. p. 10. The linear-linear interpolation is used to find the difference between the linear-linear interpolation and the linear-linear interpolation.

⁸ Ibid. p. 10. The linear-linear interpolation is used to find the difference between the linear-linear interpolation and the linear-linear interpolation.

$$\begin{aligned}
& \left(\frac{1}{\lambda_{k+1}} - \frac{1}{\lambda_k} \right) \left(\lambda_k \ln(Y_{k+1}) - (Y_{k+1} - Y_k) \right) - \left(\frac{1}{\lambda_{k+1}} - \frac{1}{\lambda_k} \right) \left(\lambda_k \ln(Y_k) - Y_k \right) \\
& = \left(\frac{1}{\lambda_{k+1}} - \frac{1}{\lambda_k} \right) \left(\lambda_k \ln(Y_{k+1}) - Y_k \right) - \left(\lambda_k \ln(Y_{k+1}) - Y_k \right) + \lambda_k \left(\frac{1}{\lambda_k} \right)^{1/2}
\end{aligned} \tag{12}$$

$$0 \leq \lambda_{k+1} < \lambda_k$$

$$\begin{aligned}
& \lambda_k = \lambda_{k+1} + \lambda_k \ln(Y_{k+1}) - Y_k \\
& = \lambda_k \left(1 + \ln(Y_{k+1}) - Y_k \right) + \lambda_k (\lambda_k - \lambda_{k+1}) \\
& = \left(\frac{\lambda_k}{\lambda_{k+1}} \right) + \lambda_k (\lambda_k - \lambda_{k+1})
\end{aligned} \tag{13}$$

and then, we can obtain the difference by differentiating with respect to λ

$$\frac{d}{d\lambda} \lambda_k$$

$$= \frac{d}{d\lambda} \left(\frac{\lambda_k}{\lambda_{k+1}} \right) = \frac{1}{\lambda_{k+1}} + \lambda_k$$

$$= \frac{1}{\lambda_{k+1}} + \lambda_k \tag{14}$$

$$= \frac{1}{\lambda_{k+1}} + \lambda_k \ln(Y_{k+1}) - Y_k + \lambda_k \ln(Y_{k+1}) - Y_k + \lambda_k \ln(Y_{k+1}) - Y_k \tag{15}$$

$$= \left(\frac{1}{\lambda_{k+1}} \right)$$

$$\left(\frac{1}{\lambda_{k+1}} \right) = \frac{1}{\lambda_{k+1}} \tag{16}$$

$$= \frac{1}{\lambda_{k+1}} + \lambda_k \ln(Y_{k+1}) - Y_k + \lambda_k \ln(Y_{k+1}) - Y_k + \lambda_k \ln(Y_{k+1}) - Y_k \tag{17}$$

$$= \frac{1}{\lambda_{k+1}} + \lambda_k \ln(Y_{k+1}) - Y_k + \lambda_k \ln(Y_{k+1}) - Y_k + \lambda_k \ln(Y_{k+1}) - Y_k \tag{18}$$

$$\left(\frac{1}{\lambda_{k+1}} \right)$$

$$\left(\frac{1}{\lambda_{k+1}} \right) = \left(\frac{1}{\lambda_{k+1}} \right)$$

Example Output Listing

...the

the computer will eventually use disks as a permanent memory, as shown in Fig. 2, below.

Fig. 2. Computer architecture.

Program Listing

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PROGRAM LITABR (TYPE=LIST, TAPES=1, LUN=UNITAREA, COUNTRY=
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  7 VERSION, DR=1, OUTBER=1978
  8 VERSION, DR=1, JANJAN=1977
  9 REPORT, DR=1, CARP=1978, JANJAN=1977
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  11 WRITER, DR=1, TERMITE=1, LUN=1
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^a χ^2 test for independence. χ^2 = 1.04, df = 1, p = .31.
^b χ^2 test for independence. χ^2 = 1.04, df = 1, p = .31.

6 **7** **8**

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the 1990s, the number of people in the world who are illiterate has increased from 1.2 billion to 1.5 billion. The number of illiterate people in the world is expected to increase to 1.7 billion by the year 2015. The number of illiterate people in the world is expected to increase to 1.7 billion by the year 2015. The number of illiterate people in the world is expected to increase to 1.7 billion by the year 2015.

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1997) using a spectrophotometer (Shimadzu UV-1601U).

1. *Journal of the American Medical Association*, 1997; 277: 1033-1038.

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the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.4 billion. The number of people aged 65 and over is expected to increase from 200 million to 400 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

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10. *Chlorophyll *a** and *Chlorophyll *b** were determined by the method of Arar and Cook (1987).

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1. *Die Bedeutung der Kunst für die Menschheit*
 2. *Die Kunst als Spiegel der Gesellschaft*
 3. *Die Kunst als Ausdruck der menschlichen Seele*
 4. *Die Kunst als Werkzeug der Erziehung*
 5. *Die Kunst als Quelle der Inspiration*
 6. *Die Kunst als Ausdruck der menschlichen Freiheit*
 7. *Die Kunst als Ausdruck der menschlichen Würde*
 8. *Die Kunst als Ausdruck der menschlichen Liebe*
 9. *Die Kunst als Ausdruck der menschlichen Hoffnung*
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 15. *Die Kunst als Ausdruck der menschlichen Vielfalt*
 16. *Die Kunst als Ausdruck der menschlichen Kreativität*
 17. *Die Kunst als Ausdruck der menschlichen Intelligenz*
 18. *Die Kunst als Ausdruck der menschlichen Empfindung*
 19. *Die Kunst als Ausdruck der menschlichen Reflexion*
 20. *Die Kunst als Ausdruck der menschlichen Kritik*
 21. *Die Kunst als Ausdruck der menschlichen Zustimmung*
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1. The first step in the process of the scientific method is to ask a question. This question should be based on observation and should be specific and measurable. For example, "Does the amount of sunlight affect the growth of a plant?"

2. The second step is to form a hypothesis. A hypothesis is a statement that can be tested. It should be based on the question and should be a prediction of the outcome. For example, "If a plant receives more sunlight, then it will grow taller." 3. The third step is to design an experiment. The experiment should be designed to test the hypothesis. It should include a control group and an experimental group. The control group is the group that does not receive the treatment being tested. The experimental group is the group that receives the treatment. In this example, the control group would be plants that receive a normal amount of sunlight, and the experimental group would be plants that receive more sunlight.

4. The fourth step is to collect data. Data is the information that is gathered during the experiment. It should be recorded in a table or graph. In this example, the data would be the height of the plants in the control group and the experimental group. 5. The fifth step is to analyze the data. This step involves looking at the data and seeing if it supports the hypothesis. In this example, if the plants in the experimental group are taller than the plants in the control group, then the data supports the hypothesis.

6. The sixth step is to draw a conclusion. A conclusion is a statement that summarizes the results of the experiment. It should be based on the data and should answer the question. In this example, the conclusion would be that the amount of sunlight does affect the growth of a plant.

7. The seventh step is to communicate the results. This step involves sharing the results of the experiment with others. It can be done by writing a report or giving a presentation.

8. The eighth step is to repeat the experiment. This step is done to make sure that the results are consistent. If the results are consistent, then the hypothesis is supported. If the results are not consistent, then the hypothesis is rejected.

9. The ninth step is to publish the results. This step involves putting the results of the experiment in a journal or on a website. This allows others to see the results and to use the information in their own work.

10. The tenth step is to use the results. This step involves using the results of the experiment to make decisions or to solve problems. In this example, the results could be used to decide how much sunlight to give a plant.

11. The eleventh step is to evaluate the experiment. This step involves looking at the experiment and seeing if it was done correctly. It also involves seeing if the results are reliable. If the results are reliable, then the hypothesis is supported. If the results are not reliable, then the hypothesis is rejected.

12. The twelfth step is to revise the hypothesis. This step is done if the hypothesis is rejected. It involves making a new hypothesis that can be tested. In this example, the new hypothesis would be that the amount of water affects the growth of a plant.

13. The thirteenth step is to design a new experiment. This step is done to test the new hypothesis. It should include a control group and an experimental group. In this example, the control group would be plants that receive a normal amount of water, and the experimental group would be plants that receive more water.

14. The fourteenth step is to collect data. Data is the information that is gathered during the experiment. It should be recorded in a table or graph. In this example, the data would be the height of the plants in the control group and the experimental group.

15. The fifteenth step is to analyze the data. This step involves looking at the data and seeing if it supports the hypothesis. In this example, if the plants in the experimental group are taller than the plants in the control group, then the data supports the hypothesis.

16. The sixteenth step is to draw a conclusion. A conclusion is a statement that summarizes the results of the experiment. It should be based on the data and should answer the question. In this example, the conclusion would be that the amount of water does affect the growth of a plant.

17. The seventeenth step is to communicate the results. This step involves sharing the results of the experiment with others. It can be done by writing a report or giving a presentation.

18. The eighteenth step is to repeat the experiment. This step is done to make sure that the results are consistent. If the results are consistent, then the hypothesis is supported. If the results are not consistent, then the hypothesis is rejected.

19. The nineteenth step is to publish the results. This step involves putting the results of the experiment in a journal or on a website. This allows others to see the results and to use the information in their own work.

20. The twentieth step is to use the results. This step involves using the results of the experiment to make decisions or to solve problems. In this example, the results could be used to decide how much water to give a plant.

References

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