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USAGE OF THE BOB7-SERIES PROGRAMS FOR THE ANALYSIS OF Ge(Li) GAMMA-RAY SPECTRA

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This is an instruction manual on usage of the BOB7-series programs for Ge(Li) gamma-ray spectrum analysis. The input formats in this manual will be final ones. Contents are the following: general instructions on the usage, functions and structure of the program, input constructions, constitution of the input data, the input cards specifying control indices of the analysis and the heading cards describing the spectrum data, the input data for energy calibration and efficiency correction, and input and output listings of two sample anayses using the program.

Ge（Li）γ線スペクトル解析プログラム BOB 73／73 S，BOB 75 の使用手引

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本書はγ線スペクトル解析用のプログラムBOB 73／73S およびBOB 75 のための解説書である。
最初に，本プログラムを使用する上での一般的な注意を与えたのち，プログラムの機能を説明した。次いで，入力様式の解説に入り，入力データの構成からはじめて，データの解析条件を指定する様々なパラメータを与えるコントロール・データを記述するヘッディング・カードおよびエネルギー較正と計数効率の補正のための入力データを説明した。
最後に，2種類のスペクトル・データを解析例としてその入力データと出力を表にして示した。

Contents

1. Introduction

This is the instruction manual for "BOB7" series programs analyzing Ge(Li) gamma-ray spectra[1,2).

It should first be mentioned that the relevant program does not assure a remarkable inprovement of the results beyond the quality of the input data. For example, the pile-up effect appearing in the measurement at a high counting rate causes attenuation of the peak area. Correction for the effect is not considered in the program. In order to eliminate the error, therefore, one must either use a pile-up rejector or avoid the measurement at a high counting rate from the beginning. For users adopting the latter countermeasure, we recommend to set the time constant of the amplifier to 1 or 2μsec and to reduce the total counting rate below about 3,000cps. The percentage dead time is not suitable as the measure of the pile-up effect because it does not uniquely correspond to the magnitude of the pile-up effect, depending on the size of the AD converter or the time constant of the amplifying circuit.

The channel shift during the measurement is not corrected by the program either. In order to reduce the amount of the channel shift, efforts should be made for keeping constant room temperature and low moisture.

Since the threshold for the peak detection is devised on a delicate balance between the first derivative and the statistical variance, it is not recommended that the user raises the statistical fluctuations above the pure deviation in the disintegration rate; namely, the background spectrum should not be subtracted from the relevant spectrum. If one wants to subtract the natural background, one should carry out the subtraction via software with separately measured spectra of the sample and background as in the case of the search of a buried small peak by the use of a subprogram SUBTRAX.

Unlike most of the prevailing codes, this program does not require the accurate FWHM value as an input datum. A rough measure of the peak width is, however, still necessary because the conditions of the data-smooth and the threshold in the peak search loosely depend on it. An index, ISM, is used for denoting the measure; the correspondence between the value of ISM and the number of data points to be used in the smoothing is given later. Roughly speaking, the number of the smoothing points should be equal to the FWHM.

The peak-searching subprogram PKREC tends to pick up spurious peaks rather than overlook small real peaks, especially at the poor counting statistics. It is, therefore, recommended to filter those spurious peaks by putting an index ISEL = 1 if one wants to save the computing time and does not care possible drop-out of exptremely small real peaks. In the case where one wants to detect a small peak lying on a very high Compton plateau, one had better set ISEL = 0. One can take out only the peaks with quite large intensities by putting ISEL = 2.

The shape of the peaks given by the Ge(Li) detector can hardly be approximated by the pure Gaussian curve because of the complex mechanism of the charge collection. The peak asymmetry and the tailing on the low-energy side need to be taken into consideration to attain more reasonable fit. The values of the parameters determining the peak shape can either be sought in the fitting process or be fixed at the previously determined values. One of the advantages of this program is that the information to be given as input is restricted to the least number. There is no parameter the initial estimate of which must be given in the fitting procedure. The shape parameters are no exceptions. However, it is not recommended to freely adjust the peak shape in the fitting procedure for each peak group because the probability of unsuccessful fitting becomes fairly high when the peak shape is not fixed. Furthermore, in order to maintain the consistency in the shape parameters when regarded as functions of energy, the skewness factor had better be determined first with a set of the standard spectra without introducing the tail. This procedure is performed by setting WDR0 = 0.0, ISEL = 2, and NIJ = 0. The values of the parameters describing the tail are then sought for the above standard spectra by fixing the skewness factor WDR to thus determined value; giving the WDR0 (and the WDRC if necessary), and putting ISEL = 0 or 1 and NIJ = 2. The resulting values of the two parameters describing the tail will widely vary from peak to peak. However, one can obtain sufficient accuracy by selecting the most probable constant value for each of the parameters, since the tail is a minor correction in most cases.

2. Constituents of the Program

The program "BOB73/5" consists of the following elements.

MAIN: the main program which combines all the subprograms to form the complete procedure.

BGSLOP: a subroutine for calculating the slope of the off-peak plateau in the low-energy side (BOB75 only). This subroutine is called if ISLP≠0.

CALAF: a subroutine visualizing the obtained calibration curve in relation to the given standard data in energy calibration and efficiency correction.

CDREAD: a subroutine for reading input data in card-form, being called for ISFG≥2. The data size (channels) is not limited.

CLEAR: a subroutine for the initial zero clearance of variables.

DECAY: a function calculating the decay correction factor, being called when IDEC≠0. It is effective only for the built-in Eu standard sources.

DKREAD: a subroutine for reading input data written in disk or magnetic tape with format of (10F7.0) or binary, being called for ISFG=0.

ECHO: a dummy subroutine which can be temporarily substituted by the user for further data treatment such as the decay correction or identification of nuclides[a].

ENGEF: a subroutine for energy calibration and efficiency correction. The calibration can be carried out either by constructing the calibration curve (or the efficiency curve) with the internal or the external standard peaks, or by giving the values of the coeffients of the curve. The calibration curve for the energy is fitted to a polynomial of the channel number, while the logarithm of the counting efficiency is expressed in a polynomial of the logarithm of the energy.

FINDSK: a subroutine for determining the line shape function of a typical peak in the spectrum; the obtained information is used in the succeeding subprogram, PKFIT, for analyzing the rest of the peak groups in the spectrum. The procedure via FINDSK is, however, performed only when the peak shape changes remarkably with each data as in the case of the γ-scanning of the reactor fuel rod. Generally, the peak shape is better determined beforehand with a set of the standard spectra. This subroutine is called if neither WDR0 nor WDRC is given, and ISEL is set equal to 0 or 1 at the same time. This subroutine requires additional information regarding the channel number of the reference peak and the confidence interval in FORMAT(2I4).

FUNX: a function determining the smoothing condition for each peak group, to be used for the NaI(Tl) spectrum or for the spectra given by the low-energy γ-ray spectrometer.

GRAFIC: a subroutine visualizing the result of the least squares fit, being called when IGFT≠0.

IURU: a function calculating the number of days elapsed, being called when IDEC≠0.

LINEQ: a sunbroutine for calculating the inverse matrix.

LIVET: a subroutine for calculating the live counting time when the data have been aquired in the clock-time mode. This subroutine is set for work if ITR=0 and all of ITC, T0 and TS are given in the CD-1 (cf. Table 5.3).

MTREAD: a subroutine for the input data stored in a magnetic tape with format specified as shown in Fig.1, being called for ISFG=1. The data size, the channel number, to be stored in the tape is unlimited as in the case of CDREAD.

NLIEQ and NLNIJ: subroutines giving the values of the fitting function with/without tail and its first derivatives with respect to the involved free parameters at given values of the independent variable (the channel number).

NONLIN: a subroutine for the non-linear least squares fit.

OUTPUT: a subroutine for listing the output data.

PKFIT: a subroutine for the peak-fitting procedure. The peak shape is approximated by an asymmetric Gaussian curve with/without tail in the low-energy side. The asymmetry factor and/or the shape of the tail are either fixed or unfixed in the least squares fit. The shape of the background level can be chosen among the linear (IBG=1), exponential (IBG=0), and various sigmoid curves (IBG>1)[b].

PKREC: a subroutine for the peak search.

POLIN: a subroutine for calculating the values of the coefficients of the calibration or efficiency curve and the involved errors.

POLIX: a subroutine for computing the energy and the counting efficiency of a given peak.

PRETRT: a dummy program which can be temporarily substituted by the user for pre-treatment of the input data[c].

SELECT: a subroutine for the data-smoothing following Savitzky-

Golay's method[3).

SPECTR: a subroutine for plotting input data with CALCOMP 900, being called for positive values of IPLT.

STDDT: a subroutine for collecting the stored data for the energy calibration and efficiency correction, being called by setting a non-zero value to IDEC and/or ISTDT.

SUBTRAX: a subroutine for detecting a weak peak buried in the natural background spectrum. The background spectrum is smoothed and then subtracted from the smoothed data of the relevant spectrum. The residues are cleared unless positive values continue over one FWHM. The resulting spectrum is smoothed once more and subjected to the succeeding peak-searching procedure. This subroutine is set for work for a non-zero value of ISUB, and then the background spectrum is read in SUBTRAX according to the input formats shown in Table 4.4. Note that CD-1 is unnecessary for the background data.

The general flow chart is outlined in Fig.2.

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a) The subroutine ECHO carries the following argument and common variables (in the case of BOB75);

```
      SUBROUTINE ECHO(K)
      COMMON SDATA(8200),XA(16400)/SPT/DATA(8200),COM(6),IDN(2)
     1   /PKF/XB(700),AREA(400),APK(400),SIGAC(400),XC(500)
     2   /ENG/XD(60),ENGY(400),EENGYQ(400),XE(80),ACTY(400),
     3   SIGAC(400),XF(60),UNIT
      COMMON/OUT/XG(3),INIT,IFIN,XH(8),TR,PDT,IDATE,ITIME,XI(12)
```

where

K : the number of the peaks found

SDATA : smoothed data

DATA : raw data

COM : comments on the relevant data

IDN : data identification name (2A4)

AREA : peak area

APK : peak position

SIGAC : standard deviation in AREA

ENGY : peak energy

EENGYQ: error in ENGY

ACTY : activity of a given peak

SIGAC : error in ACTY

UNIT : unit of ACTY.

See Table 5.3 for notations of INIT, IFIN etc.

b) The sigmoid function is defined by

$$\underline{y}(\underline{x}) = \sum_{j=1}^{m} \underline{p}_j \underline{a}(\underline{x}-\underline{x}_j^0)^{1/\underline{n}} + \underline{b} , \tag{1}$$

where the summation should be carried out for all the existing peaks; the relative intensity and centroid of the $\underline{j}$th peak are denoted with $\underline{p}_j$ and $\underline{x}_j^0$, respectively. The quantity $\underline{n}$ is related to the index IBG as

$$\underline{n} = 2\text{x}\underline{\text{IBG}} - 1, \quad \text{for IBG}\neq 0 \tag{2}$$

while $\underline{a}$ and $\underline{b}$ are determined from $\underline{h}_1$ and $\underline{h}_2$, the numbers of counts at the peak boundary channels i and f, respectively, as

$$\underline{a} = \frac{\underline{h}_2 - \underline{h}_1}{\Sigma_{j=1}^{m}\underline{p}_j\{(\underline{x}_j^0-\text{i})^{1/\underline{n}} + (\underline{f}-\underline{x}_j^0)^{1/\underline{n}}\}} \tag{3}$$

and

$$\underline{b} = \underline{h}_1 + \underline{a}\sum_j \underline{p}_j (\underline{x}_j^0 - \underline{i})^{1/\underline{n}}$$

$$= \underline{h}_2 - \underline{a}\sum_j \underline{p}_j (\underline{f} - \underline{x}_j^0)^{1/\underline{n}} , \qquad (4)$$

where $\underline{i}$ and $\underline{f}$ are the channel numbers of the peak boundary on the low- and high-energy sides, respectively.

c) The subroutine PRETRT carries the following arguments;

```
SUBROUTINE PRETRT(INIT,IFIN,INPT,IDMY)
```

where INPT and IFIN are the initial and the final channel of the input data, INIT is the starting channel of analysis, and IDMY is a dummy index.

3. Constitution of Input Data

This program is written in a universal style and is equipped with various optional functions. Users may feel that the input formats are quite complicated, although the basic form is rather simple. We shall attempt to illustrate the outline of the input formats as plainly as possible in this section.

3.1. Basic structure of the input data

The input data set consists of control cards appointing the conditions of analysis (#1), data giving information on the individual spectrum data (#2), and data concerning calibration (#3). The data #1 comes first for fixing the analyzing condition, a series of the standard spectra (#2) follow next, and the calibration data (#3) is attached after the last standard spectrum. Here, the analyzing condition changes from internal to external calibration so that #1 data set is inserted prior to the succeeding sample spectra. This is visualized in Table 3.1.

Table 3.1. Basic structure of input data (for IE=1)

Data Name	Comments
M-1, M-2	Data #1
(CD-0, CD-1, CD-2)	
Spectrum	Data #2
(CD-0, CD-1, CD-2)	A set of ISTD standard spectra
Spectrum	
....	

....	
E-1, (E-2 E-4), (E-2' E-4')	Data #3
M-1, M-2	Data #1
(CD-0, CD-1, CD-2)	
Spectrum	Data #2
(CD-0, CD-2, CD-3)	An arbitrary number of unknown spectrum data
Spectrum	
....	
....	

The situation is further simplified as the portion shown below a dash line in Table 3.1, if energy calibration and efficiency correction need not be carried out.

Table 3.1 gives the input data set for internal and external calibrations (IE = 1 and 0), while those for calibration by reading the already known calibration curve (IE = 2) is shown in Table 3.2.

Table 3.2. Basic structure of input data (for IE=2)

Data Name	Comments
M-1, M-2	Data #1
(CD-0, CD-1, CD-2)	Data #2
Spectrum	First unknown spectrum
E-5 E-9	Data #3
M-1, M-2	Data #1
(CD-0, CD-1, CD-2)	
Spectrum	Data #2 An arbitrary number of unknown spectrum data
(CD-0, CD-1, CD-2)	

Spectrum	

Detailed explanation for individual input data shall be given in the following section.

3.2. Variation of the input data

As a variation of data #1, there is M-1' card which is inserted between M-1 and M-2 when a negative value has been given to ISFG in M-1 card. Variations in the part of data #2 are prepared for various optional choices which are illustrated in Table 3.3. Input data to be required in either subprogram PRETRT (pre-treatment) or ECHO (post-treatment) are not included in Table 3.3. The input data in PRETRT, if any, should be placed between P-2 and SX-1, while those in ECHO should come at the end.

Table 3.3. Variations in the data #2

Data Name	Comments
CD-0	Required for data written in disk or magnetic tape
CD-1 CD-2	Always required for the card-form data. It is needed only if IHD≠0 in the cases of disk or magnetic-tape data
CD-3	Required for the card-form data when IFMT≧2 (variable format)
Spectrum data	
CX-1 CX-2	For disk or MT when IXCN≠0

CD-3'	For card-form data when ISFG>2
P-1, P-2	In the case of IFTG=3 (cf. Table 4.3)
SX-1	In the case of ISUB≠0 (cf. Table 4.4)
CD-3	In the case of ISUB≠0 and IFMT≥2
BG spectrum data	In the case of ISUB≠0, in the card form
FX-1	In the case of WDR0=0 and ISEL<2
P-3	In the case of IFTG=3

The treatment of energy calibration and efficiency correction is carried out in the subprogram ENGEF. Input data necessary for calibration are requested in ENGEF and its daughter STDDT. As mentioned before, the constituents of the input are thoroughly different between the cases IE=1 and 2. They are shown in Table 3.4 and 3.5.

Table 3.4. Input data in the case of IE=1

Data Name	Comments
E-1	Always required
E-2	Required if NP≠0
E-3, E-4	In the case of NP≠0 and IENG=0
E-2', E-3'	In the case of ISTDT≠0
E-4'	In the case of ISTDT≠0 and IENG=0

Table 3.5. Input data in the case of IE=2

Data Name	Comments

E-5	Always required
E-6	Always required
E-7	In the case of <u>ES</u>≠0
E-8	In the case of <u>IENG</u>=0
E-9	In the case of <u>IENG</u>=0 and <u>FS</u>≠0

4. Control Cards, M-1, M-1', and M-2

4.1. Control card M-1

Table 4.1. Formats of M-1 card

Variable	Columns	Format	Comments
ISFG	1- 2	I2	<0 Alphabetic input of the control indexes[a]
			=0 Input via disk
			=1 Input via magnetic tape
			≧2 Input in the card form (ISFG>2 gives the confidence interval for the final channel, IFIN[b]))
ISTD	3- 4	I2	Number of the standard spectra
IRP	5- 6	I2	=0 For Ge(Li) detectors
			≠0 For NaI(Tl) detectors
IE	7- 8	I2	=0 External calibration
			=1 Internal calibration
			=2 Calibration by giving the calibration curve already known
			=9 No calibration
IENG	9-10	I2	=0 Energy assignment and intensity determination
			≠0 Energy assignment only
IDEC	11-12	I2	≠0 Using the stored Eu-152 standard sources[c]
IFMT[d]	13-14	I2	=0 (10F7.0)
			=1 (F6.0,9F7.0)
			=2 Binary data (in the case of ISFG=0)
			≧2 Variable format (card-form data only)

Table 4.1. (continued)

Variable	Columns	Format	Comments
IPLT	15-16	I2	=0 No plot
			=1 2.5 channels/mm
			=2 5 channels/mm
			=3 1 channel/mm
			=10 10 channels/mm
			=20 COM plot
			=30 COM plot (for slide-make)
IW(1)	17-18	I2	=0 Printing the list of analyzing conditions
			≠0 No printing
IW(2)	19-20	I2	=0 Blockwise printing of the original data
			=1 Blockwise printing of the smoothed data
			=2 Blockwise printing of both original and smoothed data
			=3 Channelwise printing of the results of SMART
			=4 No printing
IW(3)	21-22	I2	=0 Print the results of PKREC
			≠0 No printing
IW(4)	23-24	I2	=0 Print the final results
			≠0 No printing
IBG	25-26	I2	=0 Exponential background
			=1 Linear background
			≥2 Stepwise background (with/ without slope)
IFTG	27-28	I2	=0 No fitting
			=1 Fit multiple peaks only
			=2 Fit all peaks
			=3 Fit particularly appointed peaks with given initial estimate[e)]

Table 4.1. (continued)

Variable	Columns	Format		Comments
NIJ	29-30	I2	=0	Fit to the (skew) Gaussian without tail
			=1	Fit to the (skew) Gaussian with fixed tail
			=2	Fit to the (skew) Gaussian with the tail unfixed[f)]
NONPR	31-32	I2	=0	No printing in NONLIN
			=1	Print the input to NONLIN
			=2	Print the output from NONLIN
			=3	Print both input and output of NONLIN
IGFT	33-34	I2	=0	No plotting of the peak-fitting process
			≠0	Plot the fitting process
IPKW	35-36	I2	=0	No printing of the results of PKFIT
			≠0	Print the results
IWT	37-38	I2	=0	Fit with the built-in weight
			=1	Fit with equal weight
ISEL	39-40	I2	=0	No filtration of small peaks
			=1	Filter small peaks
			=2	Pick up large peaks only
ISUB	41-42	I2	≠0	Background spectrum subtraction[g)]
ISLP	43-44	I2	≠0	Determination of the base-line slope (BOB75 only)

a) One may refer to M-1' card in 4.2. as for how to define the above indexes with alphabetic names. In this case, the values of indexes once given in M-1 remain valid unless they are re-defiened in M-1'.

b) The ISFG value greater than 2 gives the upper limit for a possible error in the number of the spectrum data cards. In this case the user is requested to attach an additional card (CD-3') punched 9999999 from column 1 to 7 at the end of data. The program then finds the end of data by detecting this end mark within the range from the (IFIN - 10xISFG) channel to infinity. This function works only in the case of the input format being (10F7.0) or (10I7).

c) IDEC≠0 is a window prepared for particular users who utilize the specified ^{152}Eu standard sources stored in the program for calibration. General users must take other procedures for identifying their standard sources as described in section 5.

Table 4.2. Built-in Eu standard sources

IDEC	Source No.	Relative Intensity	IDEC	Source No.	Relative Intensity
1+20n	Eu-14	1.0	6+20n	Eu-1	0.064266
2+20n	Eu-5	0.017224	7+20n	Eu-102	4.2873
3+20n	Eu-12	1.0424	8+20n	Eu-III	30.458
4+20n	Eu-6	0.011630	9+20n	Eu-I	37.288
5+20n	Eu-7	0.0043183			

Intensities of the sources listed in Table 4.2 are given as the relative values to the intensity of Eu-14, which is 13.364×10^4 γ/sec (on 1973/1/1). The absolute photon intensity is automatically calibrated to the value at the moment of measurement with the decay correction by the use of date and time given in CD-1 (cf. section 5) and the half life of 13.2 y for ^{152}Eu.

The parameter n in Table 2 specifies the number of peaks to be used for calibration with the ^{152}Eu spectrum; n=0 for 14 peaks (EU52), n=1 for 9 peaks (EU2S), and n=2 for 19 peaks (EU2F) (cf. section 6, Table 6.3).

One can also utilize both one of the above built-in sources and other standards together. Here, the procedure identifying the latter sources is not affected at all by whether the built-in source is used or not (cf. section 6).

d) The function of IFMT is slightly different among disk, magnetic tape, and card-form data for IFMT≧2. For disk (ISFG =0) the binary format*) is required for IFMT≧2, whereas the program accepts a variable format and therefore requires an additional card specifying the format in the case of card-form data (ISFG=2). The function of IFMT≧2 is identical to that of IFMT=1 in the case of magnetic tape (ISFG=1).

---

*) For the binary format, the variable must be given as a real instead of an integer.

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e) This window is prepared for allowing users to set arbitrary initial estimates in the peak-fitting process. For IFTG=3, the following cards are to be given after the spectrum data.

Table 4.3. Corrected initial estimates for fitting

Card No.	Variable	Columns	Format	Comments
P-1	NAPK	1- 2	I2	The number of peak groups whose fit is to be corrected (≦10)
P-2	NJPK(I)	1- 2 5- 6		Numbers of the relevant peak groups (I=1,NAPK)

	JFIX(I)	3- 4 7- 8	40I2	JFIT (mutiplicity-1) of the NJPK(I)-th peak group (I=1, NAPK)
P-3	PK(J)	1-80	8F10.3	Channel numbers of all peaks contained in each peak group (J=1,JFIX(I)+1)

f) For NIJ=2, one must put either IPKW≠0 or NONPR=2(3). When NONPR = 2 or 3, the results of each iteration are listed up for all parameters fixed and non-fixed; the bottom parameter represents the skewness factor WDR. If NIJ≠0, the bottom but one gives PKRTO, the ratio of the tail to the peak height, and the parameter above it is for the separation between centers of the main peak and tail, POSRO.

We recommend the user who wants to determine the parameters describing the line shape function to find the WDR first without tail (NIJ=0) (cf. 3.3 and Fig.3) and to determine the tail afterward with the fixed WDR, as shown in Figs.4. Thus obtained values of the tail parameters would largely change from peak to peak. However, roughly averaged values usually give satisfactory agreement since the tail itself is a higher-order correction already.
with a special smoothing procedure. In this case, the background spectrum is required in the card-form after the sample data have read in. A head card similar to CD-2 (cf. 5.4) is then needed for the background data, which is explained in Table 4.4.

Table 4.4. Head card SX-1 of the background spectrum

Variable	Columns	Format	Comments
INPT	1- 4	I4	Initial channel of the background spectrum
IFIN	5- 8	I4	Final channel of the spectrum
INIT	9-12	I4	Initial channel for analysis
ISM	13-14	I2	An index appointing the number of data points used for smoothing
RULT	15-24	E10.5	Factor for normalizing the background spectrum to the sample data

If IFMT has been defined to equal 2 in M-1, CD-3 card is necessary between SX-1 and the following spectrum data.

This function is equiped only in BOB73.

4.2. Control card M-1'

This input format is prepared with the purpose of eliminating possible errors such as error in the column position or giving an incorrect value in the difinition of indexes. This function would be handy if one defines with M-1' frequently changing parameters only while those fixed are given by M-1. An index can be punched in any position of M-1' only if it starts from the (4n+1)th column.

Table 4.5. Alphabetic assignment of indexes

Symbol	Comment	Symbol	Comment
DISK	ISFG=0	LIST	IW(1)=1
TAPE	ISFG=1	DATA	IW(2)=2
CARD	ISFG=2	RSUL	IW(3)=1

LOWR	IRP=1	FINL	IW(4)=1
INTL	IE=1	BACK	IBG=50
COEF	IE=2	STEP	IBG=99
NCAL	IE=9	PFIT	IFTG=2
ENGY	IENG=1	TAIL	NIJ=1
DECY	IDEC=1	FOUT	NONPR=2
BNRY	IFMT=2	GRAF	IGFT=1
FMAT	IFMT=3	RITE	IPKW=1
PLOT	IPLT=2	WEIT	IWT=1
COM	IPLT=20	FILT	ISEL=1
SBTX	ISUB=1	SLOP	ISLP=1 (BOB75)

4.3. Control card M-2

Table 4.6. Formats of M-2 card

Variable	Columns	Format	Comments
CONV	1-10	E10.4	Convergence limit of the least squares fit[a)]
WDR0	11-20	E10.4	Constant term of the skewness factor[b)]
WDRC	21-30	E10.4	Channel-number-dependent term of the skewness factor[c)]
PKRTO	31-40	E10.4	Ratio of the tail to the peak height
POSRO	41-50	E10.4	Separation between centers of the peak and tail
ARM0	51-60	E10.4	Parameter giving the allowance for disagreement of peak-fit[d)]
DPOS	61-70	E10.4	Channel-number-dependent term in POSRO[e)]
SLOPE	71-80	E10.4	Slope of the off-peak plateau in the low-energy side (BOB75)

a) It is defined as 10^{-6} unless it is particularly given.

b) Fitting calculation is performed with preposition that the peak asymmetry is not known if WDR0=0. Determination of the skewness factor is carried out in the following two ways; (1) WDR0=0 and ISEL=2, and WDR0=0 and ISEL<2. In the first case, the skewness factor WDR is found only for large peaks in the spectrum. The two quantities, WDR0 and WDRC, are then manually determined as shown in Fig. 3. In the second case, the user appoints a typical peak in the spectrum with which WDR is to be found. The rest of the peaks are then analyzed with thus extracted value of WDR. The latter function is supplied for spectra taken under so hard condition that the identical counting condition can hardly be realized for the standard spectra. An additional card FX-1 is required for the latter operation.

Table 4.7. Format of FX-1 card

Variable	Columns	Format	Comments
NPK	1- 4	I4	Channel number of the peak appointed
NCH	5- 8	I4	Confidence interval for the given channel number

c) The skewness factor is given by the following equation

$$\underline{WDR} = \underline{WDR0} + \underline{WDRC} \times \underline{PK} ,$$

where PK is the channel number of the relevant peak.

d) It is defined as unity unless it is particularly given. If a shoulder in a multiple peak is overlooked in the final fitting result, the user is recommended to repeat the analysis after redefining ARM0 as 10^{-3}. If the result is still unsatisfactory, one should try the method described in 4.1.e. Giving ARM0 such a small value as 10^{-3} from the beginning is not desirable because the fitting procedure with such a value results in splitting even single peaks into doublets.

5. Headings of the Spectrum Data, CD-0, CD-1, and CD-2 (CD-2')

5.1. Calling the data written in the disk or magnetic tape

For calling the spectrum data stored in the disk or magnetic tape, the following card CD-0 is given.

Table 5.1. Format of CD-0

Variable	Columns	Format	Comments
IDNM	1- 4	A4	Identification name of the spectrum data[a)]
IDISK	5- 6	I2	≠0 Rewriting the edited data in the disk (binary format)[b)]
IHD[c)]	7- 8	I2	=0 Modifying neither CD-1 nor CD-2
			=1 Modifying both CD-1 and CD-2
			=2 Modifying CD-1 only
			=3 Modifying CD-2 only
IRW	9-10	I2	≠0 Rewind disk or MT
IXCN	11-12	I2	Number of the data cards to be substituted[d)] (max. 20)

a) The identification name of each spectrum data is given by the first four out of eight characters assigned to it, as shown in Fig.1 for the case of MT data.

b) The device numbers are F02 for writing and F01 for reading of the data into/from the disk. First, ID name and the data size (the number of channels) are written as one data block, after which CD-1, CD-2, and the body of the spectrum data are written in this order. The maximum data size is 4150 in BOB73/73S while it is 8200 in BOB75. Spectrum data of larger size can be handled via CDREAD or MTREAD.

c) Contents of the head cards are amended by inserting the necessary cards punched with the appointed formats (cf. Tables 5.3 and 5.4) after CD-0.

d) CD-1 and -2 are not included in the number IXCN of the exchanging data cards. These cards are placed after CD-1 and/or CD-2 if necessary (cf. Table 5.2).

Table 5.2. Formats of the exchanging data

Card No.	Variable	Columns	Format	Comments
CX-1	IXC(I)	1-80	20I4	The channel number corresponding to the first data on the Ith card, I=1,IXCN
CX-2	A(J)	1-70	10F7.0	Corrected data, J=IXC(I),IXC(I)+9 (I=1,IXCN)

5.2. Data input in the card-form (CDREAD)

In the data input in the card form, CD-0 is not required, so that the data initiating with CD-1 directly follow M-1,(M-1'), and M-2. The window opens when ISFG $\geq$ 2. Particularly if ISFG > 2, the program can accept spectrum data of unknown size. In this case, one needs to give an appropriate value as the final channel IFIN and to attach a card punched 9999999 from the first to the seven column (CD-3') at the end of data. Then, the true end channel is sought until the number 9999999 is detected (this function starts in act at the (IFIN - ISFGx 10 + 1)-channel, ISFG < 100).

The data correction function explained in the previous section is not necessary in the case of the card-form input data. The function writing in the disk is required instead. The command is given by a non-zero value of IDISK in CD-2. The device number is F02 as before.

5.3. The head card, CD-1

Table 5.3. Format of CD-1

Variable	Columns	Format	Comments
IDN	1- 8	2A4	Data identification name
COM	9-32	6A4	Comments on the spectrum data
ITR	33-38	I6	Counting time (live-time mode)
IUNT	39	I1	= 0 Time unit ksec = 1 Time unit 100 sec = 2 Time unit sec = 3 Time unit min
ITC	40-45	I6	Counting time (clock-time mode)
IDATE	46-51	I6	Date of measurement (the last two figures of A.D., month, day)
ITIME	52-55	I4	Start time of measurement
PDT	56-60	F5.2	Dead time (%)
TO	61-66	F6.2	Constant term in the formula for dead-time correction
TS	67-72	F6.3	Coefficient of the channel-number-dependent term in the formula for dead-time correction

The user needs not specify all variables listed in Table 5.3. The essential data are only IDN and COM. In the case where the absolute intensity is to be determined, ITR and IUNT are also required. If the measurement has been performed in the clock-time mode, the real time ITR is computed with ITC, T0, and TS. ITR is set to unity when it is not given by either method.

IDATE and ITIME are used in the decay correction for the built-in Eu standard source when the efficiency correction is carried out by setting IDEC ≠ 0.

5.4. Head cards, CD-2 and CD-3.

Table 5.4. Format of CD-2

Variable	Columns	Format	Comments
INPT	1- 4	I4	Initial channel of the input data
IFIN	5- 8	I4	Final channel of the input data
INIT	9-12	I4	Initial channel for the analysis
ISM	13-14	I2	≤10 (2xISM+5)-point smooth =11 3-point smooth =12 no smoothing
ISTP	15-16	I2	=0 Continuing the analysis under the same condition =1 End of analysis =2 Continuing the analysis after changing the condition (M-1, M-2)
IFCG	17-20	I4	Final channel for the analysis
IDISK	21-22	I2	≠0 Writing the data in disk (only when ISFG≧2)

If IFCG is not given, IFIN is regarded as the final channel of the analysis.

The user can specify an appropriate format for the card-form input data by setting IFMT=2 and ISFG=2 in M-1 (or "CARD" and "FMAT" in M-1'). Specification of the format is made by inserting the following CD-3 card after CD-2.

Table 5.5. Format of CD-3

Variable	Columns	Format	Comment
FORM	1-80	20A4	Specifying format (with parenthesis)

6. Input Data for Energy Calibration and Efficiency Correction

There are two modes of the calibrating procedure available in the program. In one mode (IE=1 in M-1 or "INTL" in M-1'), the calibration curve is constructed with standard peaks found in a given set of ISTD standard spectra. Here, the input data consist of E-1 through E-4' as explained later. In the other mode (IE=2 in M-1), the calibration is performed with a known calibration curve, in which the input data consist of E-5 through E-9 (cf. 6.4).

6.1. Input data, E-1

Table 6.1. Format of E-1

Variable	Columns	Format	Comments
NP	1- 5	I5	The number of peaks[a] used for calibration
M	6-10	I5	The degree of the calibration curve[b]
EINT	11-20	E10.3	Energy corresponding to IA channel (in keV)
EFIN	21-30	E10.3	Energy corresponding to IZ channel (in keV)
IPCH	31-32	I2	≠0 Punch out the results[c] of ENGEF
ISTDT	33-34	I2	=0 Specifying standard peaks with E-2 through E-4 ≠0 Specifying standard peaks with E-2' through E-4'
UNIT	35-44	E10.3	Unit of activity (=10^4 cps unless being specified)
WCH	45-54	E10.3	Allowance interval in the observed peak position (in keV, =10 keV unless being specified)

IA	55-58	I4	Substituted with INIT unless being specified
IZ	59-62	I4	Substituted with IFIN unless being specified

a) The number of standard peaks, NP, corresponds to that given in E-2 through E-4. The peaks specified via IDEC≠0 and/or ISTDT≠0 are not included in NP. The user can put together either group of standard peaks to construct the calibration curve. If one uses one of the registered Eu standard sources listed in Table 4.2 alone, the required input data becomes E-1 only (NP=0) because the energies and absolute intensities are stored in a subroutine STDDT.

b) The degree of the calibration curve must not exceed the number of standard peaks given, where the number of peaks stands not for NP but for the total number of peaks given. It may happen that a sufficient number of peaks are not available because of failure in identifying some of the observed peaks to the given energies. This happens because either EINT or EFIN is not accurate enough compared to the allowance interval WCH. Conversely, assigning too large a value to WCH is not desirable since it increases the probability of identifying wrong peaks. The degree of the calibration curve should be kept below 6 even if more than a sufficient number of peaks are available. In accuracy in the computation would ruin the result for a higher value of M.

c) The results of ENGEF mentioned here correspond to the input of E-5 through E-9, which consist of the coefficients of the polynomial and the errors involved. Namely, they are used as the input data set as they are in the case of IE=2.

6.2. Input data, E-2 – E-4

The input data set from E-2 to E-4 is required when the user wants to use standard peaks that are not registered in the subroutine STDDT.

Table 6.2. Formats of E-2, E-3 and E-4

Card No.	Variable	Columns	Format	Comments
E-2	EST(I)	1-80	8E10.3	Energies of the standard peaks (keV), I=1,NP
E-3	SACTY(I)	1-80	8E10.3	Absolute intensities of the standard peaks, I=1,NP
E-4	GRATIO(I)	1-80	8E10.3	Branching ratios of the standard peaks, I=1,NP

E-3 and E-4 are not required if the energy calibration only is carried out. In this case, IENG=1 in M-1.

SACTY and GRATIO must be given in such a way that their product equals the number of the emitted photons for the relavant peak.

6.3. Input data when ISTDT≠0, E-2' – E-4'

Table 6.3. Formats of E-2', E-3' and E-4'

Card No.	Variable	Columns	Format	Comments
E-2'	NUC	1- 2	I2	The number of standard sources

				to be referred to
E-3'	NAME(I)	1-80	20A4	Registered name of standard sources, I=1,NUC AM41 = ^{241}Am (single peak) CO57 = ^{57}Co (single peak) HG03 = ^{203}Hg (single peak) SN13 = ^{113}Sn (single peak) CS37 = ^{137}Cs (single peak) MN54 = ^{54}Mn (single peak) NA22 = ^{22}Na (single peak) CO60 = ^{60}Co (two peaks) Y88 = ^{88}Y (two peaks) EU52 = ^{152}Eu (14 peaks) EU2S = ^{152}Eu (9 peaks) EU2F = ^{152}Eu (19 peaks)
E-4'	RINT(I)	1-80	8E10.5	Absolute intensity of the souce, I=1,NUC
	UNIT			Unit of the activity (=10^4 cps unless being specified)

These data are placed after the data set of E-1 through E-4. E-4' is not required when IENG≠0. NAME in E-3' can be punched in an arbitrary order, which must, however, coincide with that of the corresponding RINT.

6.4. Input data when IE=2, E-5 — E-9

Table 6.4. Formats of E-5 through E-9

Card No.	Variable	Columns	Format	Comments
E-5	ICEE	1- 5	I5	The number of the coefficients of the energy calibration curve
	ICEF	6-10	I5	The number of the coefficients

				of the efficiency curve (= ICEE)
	ES	11-21	E11.5	Variance in the polynomial-fit of the channel-to-energy curve
	FS	22-32	E11.5	Variance in the polynomial-fit of the energy-to-efficiency curve
	UNIT	33-43	E11.5	Unit of the activity (= 10^4 cps unless being specified)
E-6	C(I)	1-75	5E15.8	Coefficients of the energy calibration curve, I=1,ICEE
E-7	XI(I,J)	1-69	3D23.16	Elements of the inverse matrix for energy assignment, I=1,ICEE, J=1,ICEE
E-8	CF(I)	1-75	5E15.8	Coefficients of the efficiency curve, I=1,ICEF
E-9	XFI(I,J)	1-69	3D23.16	Elements of the inverse matrix for intensity determination, I=1,ICEF, J=1,ICEF

E-7 and E-9, which give the elements of the inverse matrices[2,4], can be omitted if ES and FS are set equal to zero, respectively.

7. Examples of the Analysis

Two examples of the input and output are listed below. The first example is the analysis of the ^{152}Eu spectrum, which consists of four partial spectra of 1024-channel wide measured by the use of the function of digital zero shift. The second one is for a spectrum of ^{237}Pu in the LX-ray region.

Table 7.1 List of input data for the analysis of a ^{152}Eu spectrum.

```
         1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890123456789012
 2 4   1   11      2    50 2 1         1                                  M-1
           .94   +00           .50   -02 .65   +01                        M-2
71-A-006EU-152     1-1024          40        7109041740 0.5               CD-1
  11024 101  1                                                            CD-2
            [Spectrum Data] (cf. Table 7.2)
71-A-008EU-152   2049-3072         40        7109052103 0.69              CD-1
204930722049 1                                                            CD-2
            [Spectrum Data] (cf. Table 7.2)
71-A-009EU-152   3073-4096         40        7109060920 0.72              CD-1
307340963073 1                                                            CD-2
            [Spectrum Data] (cf. Table 7.2)
71-A-007EU-152   1025-2048         40        7109050912 0.67              CD-1
102520481025 1 2                                                          CD-2
            [Spectrum Data] (cf. Table 7.2)
         4  420.64     840.08                                             E-1
```

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* 73～75 : DATAID / 76～80 : SEQUENTIAL NUMBER

Table 7.2 List of output of the analysis of a ^{152}Eu spectrum

```
77-01-18          ***************  GAMMA SPECTRUM ANALYSIS OF EU-152    1-1024
                                                          BY BOB75   ***************            71-A-006-   1
          ***** DATE OF MEASUREMENT    710904          TIME OF MEASUREMENT   1740 *****

 71-A-006 = BOB75    IDENTIFICATION                              NO  = LIVE TIME CORRECTION
        1 = INITIAL CHANNEL OF DATA                               40 = COUNTING DURATION (LIVE TIME) (KSEC )
     1024 = FINAL CHANNEL OF DATA                               0,50 = PERCENT DEAD TIME
     1024 = NUMBER OF DATA POINTS                                NO  = PLOTTING
      107 = INITIAL CHANNEL OF ANALYSIS                          NO  = ENERGY ASSIGNMENT
     1018 = FINAL CHANNEL OF ANALYSIS                            NO  = EFFICIENCY CORRECTION
      912 = NUMBER OF ANALYZING POINTS                             0 = ORDER OF ENERGY ASSIGNMENT POLYNOMIAL
        7 = POINTS USED IN SMOOTHING                               0 = ORDER OF EFFICIENCY CORRECTION POLYNOMIAL
        7 = POINTS USED IN DERIVATIVE                            NO  = COEFFICIENTS EVALUATED INTERNALLY
      YES = STORED STANDARD                                      NO  = COEFFICIENTS GIVEN EXTERNALLY
      YES = PEAK FITTING

ALL PEAKS WERE FITTED TO THE FUNCTION WITH FOLLOWING PROPERTIES

1/99 POWER   = BACK-GROUND SHAPE
0,9400       = SKEWNESS OF GAUSSIAN FUNCTION
0,00500000   = PEAK RATIO OF TAIL TO MAIN-PEAK
 6,5000000   = DISTANCE(CH,NO,) BETWEEN THE CENTRES OF TAIL AND MAIN-PEAK
BUILT-IN WT,= WEIGHT IN FITTING PROCESS

FILTRATION OF SMALL PEAKS
```

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 1-1024

BY BOB75 *************** 71-A-006- 2

INPUT DATA (FROM 1 CH, TO 1024 CH,)

CH, NO,																				
1 -	40000	1	6	6	10	10	30	40	50	43	48	126	748	3067	7278	10908	11718	11740	11239	11050
21 -	10701	10307	9983	9801	9336	9287	8910	8665	8835	8515	8383	8251	7982	7973	7872	7966	7737	7512	7567	7329
41 -	7318	7263	7096	7035	7006	6944	6883	6829	6702	6770	6708	6476	6519	6403	6340	6356	6269	6232	6190	6175
61 -	5978	6290	6088	6083	5896	6022	5965	5999	5730	5880	5711	5926	5870	5540	5763	5681	5709	5729	5638	5647
81 -	5560	5505	5570	5739	5571	5642	5536	5607	5407	5729	5582	5593	5639	5507	5400	5425	5570	5341	5420	5355
101 -	5297	5363	5156	5172	5175	5290	5108	5231	5102	5183	5075	5197	5123	5225	5119	5088	5069	5131	5153	5030
121 -	5084	4983	5048	5146	5086	4966	5147	5021	4905	5072	5008	5049	5002	5065	4963	4939	5081	4968	5034	5122
141 -	4991	5071	5024	4994	4986	5060	4924	5061	4928	4982	4941	5023	5041	5101	5191	5107	5184	5137	4944	5151
161 -	5039	4863	5156	5198	5184	5124	5136	5088	5061	5231	5144	5209	5163	5159	5226	5330	5709	6368	6947	7182
181 -	6957	6923	7528	8248	8473	7846	6681	5667	4954	4922	4968	4837	4803	4785	4891	4664	4780	4875	4757	4839
201 -	4755	4781	4851	5034	5073	5433	5903	6360	6292	6154	5669	5345	5225	5375	5269	5085	5047	4808	4944	4759
221 -	4642	4611	4651	4753	4643	4562	4719	4704	4644	4633	4574	4705	4670	4689	4653	4527	4565	4623	4518	4657
241 -	4547	4595	4665	4623	4657	4757	4669	4664	4673	4516	4547	4528	4561	4737	4593	4663	4646	4561	4685	4553
261 -	4555	4552	4622	4646	4587	4610	4612	4715	4632	4613	4685	4656	4673	4652	4573	4682	4669	4653	4770	4556
281 -	4713	4637	4722	4763	4729	4689	4582	4635	4687	4432	4550	4554	4605	4549	4595	4797	4777	4733	4681	4689
301 -	4501	4521	4581	4554	4555	4573	4639	4546	4536	4570	4550	4608	4662	4551	4534	4621	4636	4584	4417	4634
321 -	4526	4627	4542	4564	4633	4671	4464	4581	4539	4626	4486	4559	4587	4599	4577	4648	4499	4680	4580	4465
341 -	4695	4607	4579	4554	4658	4664	4616	4584	4564	4623	4458	4677	4644	4724	4621	4760	4796	4713	4783	4788
361 -	4875	4901	4735	4682	4889	4780	4871	4839	4866	4824	4872	4917	4878	4858	5039	4812	4957	4801	4723	4909
381 -	4697	4676	4677	4801	4726	4697	4726	4778	4754	4754	4712	4696	4719	4622	4592	4784	4564	4674	4630	4692
401 -	4674	4740	4752	4785	4752	4603	4749	4823	4754	4787	4679	4550	4527	4711	4667	4640	4602	4610	4727	4601
421 -	4599	4619	4681	4718	4664	4631	4600	4643	4599	4732	4491	4660	4612	4614	4569	4678	4661	4674	4695	4632
441 -	4684	4591	4661	4638	4759	4543	4584	4800	4639	4559	4662	4609	4707	4582	4656	4734	4632	4552	4580	4711
461 -	4818	4674	4711	4754	4785	4752	4684	4606	4696	4764	4644	4596	4630	4617	4627	4650	4547	4554	4467	4417
481 -	4486	4417	4367	4441	4465	4385	4315	4290	4269	4151	4335	4329	4201	4253	4120	4078	4130	4206	4078	4258
501 -	4269	4142	4193	4161	4126	4079	4143	4002	4149	4129	4158	3958	3988	4025	4039	4084	3963	3992	4054	3994
521 -	3966	3947	4022	3981	3937	3943	3878	3884	3966	3993	3921	3899	4004	3944	3907	3772	3869	3782	3880	3790
541 -	3644	3728	3855	3755	3778	3697	3713	3603	3681	3695	3690	3585	3631	3586	3547	3562	3479	3529	3459	3466
561 -	3455	3450	3555	3481	3388	3360	3403	3390	3396	3306	3480	3405	3330	3383	3479	3287	3312	3316	3405	3347
581 -	3346	3335	3373	3256	3375	3204	3298	3284	3350	3284	3531	3835	5026	7916	11623	15081	16148	13557	9477	6133
601 -	4042	3319	3233	3101	3032	3026	3017	2959	2935	2951	2971	3022	3089	3046	3098	2980	3045	2947	2845	2947
621 -	2853	2854	2859	2850	2842	2823	2824	2842	2789	2881	2893	2807	2918	2835	2752	2822	2854	2739	2793	2786
641 -	2709	2781	2804	2836	2745	2761	2677	2855	2909	2739	2772	2739	2650	2765	2881	2740	2761	2724	2867	2912
661 -	2780	2793	2719	2752	2685	2774	2703	2704	2727	2738	2744	2758	2728	2722	2642	2600	2690	2738	2645	2592
681 -	2712	2631	2647	2606	2506	2588	2573	2580	2562	2581	2493	2559	2472	2438	2515	2539	2529	2554	2517	2474
701 -	2565	2539	2537	2490	2517	2519	2600	2443	2496	2506	2434	2596	2438	2531	2536	2522	2574	2739	2812	3138
721 -	3359	3376	3259	2941	2564	2553	2450	2472	2376	2473	2412	2482	2411	2383	2273	2416	2325	2468	2427	2397
741 -	2332	2484	2371	2313	2444	2378	2399	2427	2398	2384	2384	2329	2376	2419	2458	2433	2471	2386	2379	2422
761 -	2439	2492	2465	2347	2322	2520	2425	2544	2513	2487	2356	2393	2435	2398	2281	2411	2275	2393	2338	2349
781 -	2321	2333	2380	2384	2399	2351	2342	2398	2496	2445	2444	2518	2506	2511	2427	2358	2300	2490	2497	2478
801 -	2539	2562	2644	2570	2532	2493	2384	2355	2318	2440	2380	2408	2395	2342	2418	2450	2426	2541	2435	2455
821 -	2468	2461	2504	2543	2467	2590	2585	2576	2633	2691	2637	2704	2915	3827	6978	14095	28057	45264	57985	57631
841 -	44531	26790	13262	5943	3049	2161	1947	1923	1941	1902	1883	2030	2021	1939	1957	1970	2030	1975	1962	1952
861 -	1937	1897	1897	1873	1904	1866	1840	1932	1866	1899	1900	1869	1836	1900	1925	1960	1953	1856	1904	1946
881 -	1904	1892	1866	1921	1887	1884	1878	2011	1884	1873	1893	2004	2142	2530	3063	3541	3820	3410	2890	2391
901 -	2096	1903	1899	1829	1886	1822	1882	1844	1870	1872	1906	1844	1822	1764	1907	1905	1887	1845	1810	1802
921 -	1865	1855	1934	1825	1902	1893	1891	1935	1766	1800	1913	1835	1868	1791	1882	1836	1866	1953	2011	2013
941 -	2062	2210	2012	2004	1815	1820	1896	1926	1795	1936	1858	1887	1917	1862	1821	1839	1879	1878	1813	1826
961 -	1783	1861	1865	1823	1787	1852	1810	1812	1817	1800	1802	1780	1870	1767	1849	1835	1865	1783	1816	1832
981 -	1848	1810	1718	1856	1818	1783	1791	1881	1756	1885	1864	1739	1840	1774	1837	1822	1964	2052	2794	3738
1001 -	5126	6274	6377	5357	3922	2720	2180	1808	1732	1766	1830	1931	1930	2004	1976	1884	1865	1815	1760	1741
1021 -	1781	1713	1752	1675																

77-01-18 ************** GAMMA SPECTRUM ANALYSIS OF EU-152 1-1024

BY BOB75 *************** 71-A-006- 3

SMOOTHED DATA (FROM 1 CH. TO 1024 CH.)

CH. NO.																				
1 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101 -	0	0	0	0	0	0	5191	5181	5132	5151	5122	5159	5163	5171	5125	5108	5100	5105	5112	5083
121 -	5034	5034	5078	5058	5088	5084	5023	5018	5016	4995	5016	5051	5028	5001	4999	4994	4982	5035	5046	5043
141 -	5064	5043	5006	5028	4991	5007	4999	4991	4961	4972	4962	5003	5059	5107	5140	5178	5126	5097	5098	5013
161 -	4999	5048	5075	5145	5200	5153	5100	5105	5120	5150	5182	5186	5159	5160	5189	5394	5809	6366	6830	7005
181 -	7025	7182	7617	8132	8253	7744	6752	5757	5133	4882	4843	4853	4846	4794	4774	4787	4780	4789	4824	4793
201 -	4762	4812	4847	4958	5157	5513	5895	6237	6299	6081	5703	5440	5297	5259	5245	5129	5003	4920	4842	4747
221 -	4685	4638	4664	4659	4661	4661	4653	4679	4661	4628	4629	4656	4686	4675	4615	4598	4556	4572	4590	4580
241 -	4590	4616	4607	4663	4684	4688	4711	4672	4613	4574	4523	4551	4599	4632	4666	4642	4625	4632	4602	4577
261 -	4572	4570	4602	4616	4610	4621	4637	4647	4655	4654	4647	4673	4654	4636	4639	4631	4681	4683	4674	4661
281 -	4657	4668	4728	4735	4723	4670	4661	4613	4577	4554	4537	4533	4563	4592	4658	4718	4761	4769	4690	4617
301 -	4570	4543	4531	4557	4580	4583	4582	4576	4555	4541	4587	4607	4593	4588	4585	4601	4579	4574	4534	4542
321 -	4563	4585	4562	4615	4593	4598	4566	4559	4543	4564	4549	4562	4557	4611	4586	4595	4610	4573	4572	4600
341 -	4586	4594	4610	4595	4625	4639	4624	4609	4559	4560	4572	4620	4637	4689	4704	4728	4743	4767	4770	4821
361 -	4858	4811	4800	4765	4778	4828	4860	4837	4851	4856	4876	4865	4917	4907	4922	4925	4863	4828	4824	4764
381 -	4733	4724	4698	4728	4732	4736	4727	4753	4762	4743	4729	4709	4656	4672	4652	4648	4654	4656	4632	4680
401 -	4692	4733	4767	4748	4713	4716	4723	4766	4806	4746	4645	4607	4592	4626	4659	4645	4632	4640	4640	4633
421 -	4623	4628	4672	4688	4670	4644	4606	4642	4625	4626	4615	4616	4585	4624	4614	4637	4669	4680	4676	4659
441 -	4646	4624	4666	4660	4636	4646	4664	4638	4670	4636	4615	4634	4641	4652	4675	4652	4632	4596	4627	4684
461 -	4728	4741	4735	4739	4769	4731	4683	4677	4685	4684	4676	4634	4603	4629	4630	4615	4584	4521	4479	4463
481 -	4425	4417	4427	4423	4421	4395	4346	4264	4241	4262	4264	4283	4276	4190	4131	4136	4104	4139	4195	4204
501 -	4208	4220	4175	4137	4145	4094	4082	4087	4127	4113	4095	4032	3999	4011	4042	4027	4021	4013	4001	3996
521 -	3985	3976	3979	3981	3959	3910	3899	3921	3940	3946	3955	3948	3954	3929	3900	3832	3824	3836	3816	3750
541 -	3750	3734	3770	3793	3771	3706	3679	3658	3676	3665	3670	3638	3602	3584	3563	3536	3515	3496	3474	3458
561 -	3462	3493	3493	3464	3426	3380	3386	3371	3384	3396	3393	3382	3416	3382	3374	3352	3333	3322	3359	3358
581 -	3367	3329	3344	3315	3293	3269	3291	3263	3298	3285	3341	3897	5449	8224	11813	14648	15241	13379	9917	6472
601 -	4277	3313	3050	3058	3056	3015	2992	2969	2946	2944	2986	3021	3066	3068	3062	3039	2987	2945	2919	2877
621 -	2871	2870	2847	2849	2838	2835	2819	2820	2845	2844	2864	2885	2848	2822	2830	2795	2797	2807	2771	2750
641 -	2762	2778	2790	2810	2760	2738	2774	2808	2823	2828	2748	2697	2742	2758	2786	2784	2762	2784	2831	2850
661 -	2833	2783	2730	2734	2725	2725	2716	2723	2715	2739	2747	2751	2736	2690	2652	2658	2671	2669	2678	2653
681 -	2643	2660	2631	2583	2569	2559	2564	2589	2562	2558	2541	2505	2480	2488	2488	2525	2549	2525	2520	2522
701 -	2529	2534	2533	2505	2530	2527	2525	2517	2478	2484	2500	2498	2509	2519	2497	2554	2585	2699	2902	3127
721 -	3307	3373	3195	2938	2683	2520	2442	2447	2420	2437	2441	2456	2397	2381	2334	2351	2387	2429	2398	2419
741 -	2402	2381	2388	2391	2369	2399	2417	2400	2409	2386	2362	2360	2382	2405	2449	2453	2430	2408	2399	2411
761 -	2458	2465	2414	2403	2384	2421	2486	2529	2490	2463	2416	2408	2376	2392	2351	2335	2339	2357	2339	2346
781 -	2330	2346	2368	2385	2377	2357	2377	2406	2436	2467	2480	2493	2511	2491	2410	2375	2380	2418	2474	2516
801 -	2539	2577	2599	2589	2541	2467	2396	2365	2356	2381	2404	2399	2375	2392	2393	2438	2471	2471	2471	2464
821 -	2449	2488	2489	2508	2536	2549	2568	2618	2624	2633	2603	2503	2613	3579	7303	15921	29739	45012	55203	54859
841 -	44265	28712	14876	6351	2770	1824	1782	1863	1838	1913	1949	1970	1987	1982	1966	1976	1993	1988	1974	1944
861 -	1930	1906	1895	1888	1872	1877	1878	1878	1895	1902	1874	1872	1868	1888	1931	1942	1922	1914	1905	1908
881 -	1910	1899	1888	1892	1879	1908	1916	1922	1906	1894	1881	1979	2202	2579	3092	3516	3641	3410	2947	2436
901 -	2111	1924	1867	1844	1855	1850	1859	1853	1877	1877	1881	1840	1823	1828	1862	1889	1892	1842	1823	1815
921 -	1852	1868	1882	1882	1882	1899	1903	1854	1844	1832	1841	1858	1855	1833	1836	1848	1898	1933	1979	2060
941 -	2092	2110	2063	1960	1862	1866	1843	1883	1885	1871	1881	1906	1876	1865	1848	1849	1856	1861	1833	1814
961 -	1821	1841	1834	1839	1821	1814	1820	1820	1808	1797	1809	1803	1812	1819	1840	1829	1836	1818	1821	1830
981 -	1815	1803	1800	1796	1795	1828	1798	1814	1848	1834	1822	1818	1793	1786	1822	1799	1898	2175	2827	3904
1001 -	5174	6038	6126	5317	4068	2901	2150	1813	1728	1749	1826	1903	1964	1977	1955	1920	1856	1801	0	0
1021 -	0	0	0	0																

***** FINAL PEAK SHOULD BE CHECKED *****

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 1-1024

BY BOB75 *************** 71-A-006- 4

*** RESULTS OF PEAK RECOGNITION ***

PEAK NO.	MIN	PEAK CH.	MAX	PEAK AREA	BK.GD.	STD.DEV.	PK.FT.1	PK.FT.2	JFIT	JFFT	FWHM
1	173	180,00	192	24881	90207	1,8	0,5159E+04	0.4853E+04	1	1	4,167
2	202	208,81	221	11320	85306	3,8	0,4812E+04	0,4685E+04	1	1	4,779
3	588	596,72	606	62441	53246	0,7	0,3263E+04	0,3015E+04	0	0	4,469
4	715	721,57	729	4837	31922	5,4	0,2497E+04	0,2420E+04	0	0	4,620
5	798	802,75	808	1146	21553	18,4	0,2418E+04	0,2365E+04	0	0	5,260
6	830	839,47	849	280963	40736	0,2	0,2633E+04	0,1888E+04	0	1	4,505
7	889	896,84	905	9099	28184	2,8	0,1906E+04	0,1855E+04	0	0	4,567
8	936	941,34	946	1233	16713	15,1	0,1848E+04	0,1866E+04	0	0	4,684
9	994	1002,56	1010	23171	26531	1,2	0,1786E+04	0,1749E+04	0	0	4,622

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 2049-3072

BY BOB75 *************** 71-A-008- 5

***** DATE OF MEASUREMENT 710905 TIME OF MEASUREMENT 2103 *****

```
71-A-008 = BOB75   IDENTIFICATION                 NO   = LIVE TIME CORRECTION
    2049 = INITIAL CHANNEL OF DATA                 40  = COUNTING DURATION (LIVE TIME) (KSEC )
    3072 = FINAL CHANNEL OF DATA                 0,69  = PERCENT DEAD TIME
    1024 = NUMBER OF DATA POINTS                   NO  = PLOTTING
    2056 = INITIAL CHANNEL OF ANALYSIS             NO  = ENERGY ASSIGNMENT
    3066 = FINAL CHANNEL OF ANALYSIS               NO  = EFFICIENCY CORRECTION
    1011 = NUMBER OF ANALYZING POINTS               0  = ORDER OF ENERGY ASSIGNMENT POLYNOMIAL
       7 = POINTS USED IN SMOOTHING                 0  = ORDER OF EFFICIENCY CORRECTION POLYNOMIAL
       7 = POINTS USED IN DERIVATIVE               NO  = COEFFICIENTS EVALUATED INTERNALLY
     YES = STORED STANDARD                         NO  = COEFFICIENTS GIVEN EXTERNALLY
     YES = PEAK FITTING
```

ALL PEAKS WERE FITTED TO THE FUNCTION WITH FOLLOWING PROPERTIES

```
1/99 POWER   = BACK-GROUND SHAPE
0,9400       = SKEWNESS OF GAUSSIAN FUNCTION
0,00500000   = PEAK RATIO OF TAIL TO MAIN-PEAK
 6,5000000   = DISTANCE(CH,NO.) BETWEEN THE CENTRES OF TAIL AND MAIN-PEAK
BUILT-IN WT,= WEIGHT IN FITTING PROCESS
```

FILTRATION OF SMALL PEAKS

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 2049-3072

BY BOB75 *************** 71-A-008- 6

INPUT DATA (FROM 2049 CH. TO 3072 CH.)

CH. NO.																				
2049 -	40000	1230	1285	1255	1378	1356	1367	1312	1236	1220	1217	1228	1172	1222	1208	1183	1216	1165	1157	1144
2069 -	1169	1158	1256	1171	1224	1217	1174	1231	1174	1222	1185	1212	1150	1204	1214	1238	1140	1226	1202	1216
2089 -	1189	1181	1205	1232	1205	1237	1188	1172	1120	1210	1259	1207	1161	1247	1204	1205	1263	1200	1260	1286
2109 -	1224	1290	1357	1623	2193	3043	4313	5160	5529	5028	3971	2707	1943	1478	1299	1172	1239	1138	1205	1221
2129 -	1295	1201	1240	1199	1293	1205	1196	1173	1209	1152	1095	1188	1148	1113	1167	1065	1170	1101	1146	1093
2149 -	1112	1118	1101	1007	1038	1043	1100	1080	1077	1030	1051	1037	1047	1029	1014	1058	1097	1050	1057	1048
2169 -	1008	1040	1000	1033	1027	1018	987	1062	1059	1029	1032	1016	1056	1042	1063	1067	1039	1020	1056	1063
2189 -	1116	1115	1096	1053	1077	1104	1039	992	1067	993	1045	983	999	1043	958	986	932	937	906	890
2209 -	942	885	933	866	867	881	861	841	847	840	903	913	891	864	893	839	825	816	801	833
2229 -	831	831	800	856	833	858	801	805	753	815	851	887	1019	1065	1221	1205	1136	1022	999	819
2249 -	822	841	852	766	762	807	809	858	852	847	958	1015	1085	1022	924	886	811	743	787	776
2269 -	819	836	808	879	809	796	726	773	754	797	764	766	765	778	725	743	760	757	771	754
2289 -	784	756	739	791	685	708	749	723	763	741	692	712	735	716	739	733	748	774	730	775
2309 -	726	749	783	700	771	722	764	744	726	718	730	744	722	727	714	716	769	727	748	722
2329 -	716	716	769	797	738	800	738	759	748	743	826	761	747	715	764	788	800	918	1120	1722
2349 -	3055	5662	8660	12025	13729	12954	10367	6780	3914	1897	1050	760	659	639	603	591	623	611	607	585
2369 -	592	562	630	641	581	612	581	582	578	587	603	577	550	584	616	608	612	586	536	588
2389 -	553	593	542	612	600	596	572	582	576	579	576	534	535	587	614	531	592	560	550	618
2409 -	621	542	587	561	579	598	583	580	596	605	607	562	495	527	566	594	521	547	575	524
2429 -	587	586	626	612	605	639	540	539	546	564	511	535	553	537	545	563	525	503	590	582
2449 -	635	723	860	1054	1129	1221	1036	913	733	619	560	511	531	492	523	524	531	512	504	542
2469 -	549	519	484	483	520	512	534	494	466	504	519	527	488	508	507	522	531	536	511	513
2489 -	526	483	513	550	522	530	501	494	502	522	513	486	504	522	477	517	567	495	552	485
2509 -	487	507	502	543	509	494	511	523	496	522	517	530	467	528	495	552	519	552	501	539
2529 -	473	492	540	528	505	524	508	478	525	466	534	526	509	491	496	520	507	499	524	547
2549 -	540	499	506	520	533	513	521	525	534	517	498	545	541	556	536	518	531	489	546	519
2569 -	530	513	565	553	542	510	524	510	529	528	510	551	561	552	532	542	510	542	562	534
2589 -	534	548	554	526	501	509	535	514	567	560	499	526	508	556	520	533	548	529	545	562
2609 -	534	536	565	551	534	535	523	592	577	531	527	536	505	500	537	556	548	542	522	599
2629 -	544	572	581	561	599	546	581	589	595	571	615	560	603	636	627	698	935	1453	2486	4177
2649 -	6192	7898	8457	7762	5894	3877	2310	1406	1214	1414	1632	1854	1792	1597	1260	946	697	614	491	519
2669 -	520	528	535	485	521	490	484	534	479	501	471	503	481	491	507	535	529	541	534	544
2689 -	505	521	523	551	541	521	543	513	528	563	527	573	518	556	554	614	620	709	713	863
2709 -	1134	1691	3057	5067	7628	9920	10825	9940	7835	5056	2791	1522	818	593	495	424	465	489	444	475
2729 -	472	503	484	444	440	489	464	465	462	445	459	511	452	508	508	497	460	468	486	461
2749 -	472	487	459	465	504	462	500	499	518	479	495	529	465	465	493	492	450	492	477	486
2769 -	458	487	453	485	455	529	508	496	477	483	467	491	465	487	494	521	497	502	503	469
2789 -	497	468	465	505	531	527	503	493	478	511	469	480	536	470	489	528	513	465	499	508
2809 -	486	540	498	528	564	492	535	490	540	493	551	516	478	526	536	486	498	464	531	494
2829 -	497	515	549	521	530	516	549	529	541	512	510	547	474	532	534	572	528	510	557	553
2849 -	491	495	586	548	530	563	550	529	556	514	604	551	568	525	536	517	554	575	494	529
2869 -	535	536	578	545	514	575	554	482	499	555	509	545	516	504	553	531	493	524	530	530
2889 -	525	502	512	504	475	560	525	477	498	515	462	502	491	454	511	450	430	494	409	439
2909 -	430	390	423	346	385	369	361	361	380	322	377	394	352	366	349	340	291	353	366	311
2929 -	333	317	342	332	316	277	293	331	335	324	291	337	334	296	306	312	309	322	307	285
2949 -	308	309	287	309	255	321	292	365	463	645	828	1057	1210	1168	1030	861	606	439	352	285
2969 -	292	296	267	259	277	249	264	241	248	266	237	266	299	291	278	253	239	260	281	258
2989 -	260	256	263	240	264	223	235	264	244	249	251	243	245	226	255	248	271	242	244	260
3009 -	256	246	210	228	241	220	231	254	243	224	224	210	242	248	241	224	225	223	251	237
3029 -	223	236	207	225	263	220	208	188	217	234	214	202	225	195	198	206	221	222	220	268
3049 -	255	261	326	323	291	309	254	221	216	211	223	210	192	198	192	206	214	187	203	199
3069 -	214	226	203	188																

77-01-18 ************** GAMMA SPECTRUM ANALYSIS OF EU-152 2049-3072

BY BOB75 ************** 71-A-008- 7

SMOOTHED DATA (FROM 2049 CH. TO 3072 CH.)

CH. NO.																				
2049 -	0	0	0	0	0	0	0	1302	1258	1229	1208	1208	1208	1200	1203	1206	1189	1172	1163	1142
2069 -	1170	1183	1201	1215	1210	1203	1205	1200	1198	1209	1191	1190	1182	1205	1197	1208	1199	1200	1201	1209
2089 -	1191	1198	1199	1218	1225	1218	1184	1165	1171	1199	1206	1223	1210	1196	1219	1226	1219	1245	1248	1245
2109 -	1249	1254	1360	1647	2260	3186	4251	5098	5390	4918	3969	2871	2006	1477	1279	1190	1174	1172	1212	1219
2129 -	1250	1232	1238	1230	1240	1218	1212	1187	1167	1156	1153	1134	1152	1139	1124	1121	1129	1120	1127	1110
2149 -	1123	1097	1078	1045	1037	1049	1081	1079	1071	1049	1043	1040	1035	1027	1042	1052	1066	1074	1053	1038
2169 -	1028	1019	1020	1027	1012	1018	1025	1035	1045	1043	1030	1029	1040	1053	1062	1050	1045	1035	1047	1077
2189 -	1104	1103	1092	1084	1080	1057	1059	1036	1028	1028	1017	1008	1010	1000	992	970	942	925	914	907
2209 -	912	913	901	884	880	862	861	846	844	864	868	895	901	883	865	849	828	811	816	824
2229 -	822	829	825	838	840	842	810	791	784	798	845	911	1001	1105	1182	1181	1153	1045	944	870
2249 -	842	817	815	797	779	788	822	833	850	887	949	1020	1047	1018	957	865	809	776	765	789
2269 -	807	828	842	841	814	791	754	758	764	777	771	776	762	755	749	745	750	760	767	769
2289 -	761	769	759	734	728	719	719	749	743	726	723	710	717	729	731	743	748	756	755	746
2309 -	753	749	746	746	742	742	752	736	734	726	728	732	731	718	723	730	739	745	739	719
2329 -	721	738	751	774	777	766	757	749	753	773	778	767	752	736	745	765	791	849	1064	1806
2349 -	3293	5784	8940	11784	13249	12697	10295	7060	4112	2076	1056	674	619	607	605	605	607	609	608	586
2369 -	583	598	607	616	616	596	583	584	583	591	584	575	575	581	601	617	598	583	566	566
2389 -	562	574	577	593	592	598	582	578	560	576	557	549	563	565	581	582	561	559	591	586
2409 -	594	587	566	568	584	582	588	589	597	606	586	553	530	537	548	560	563	545	544	559
2429 -	574	592	610	623	619	593	569	556	535	539	539	536	534	551	551	533	535	537	550	587
2449 -	643	738	875	1038	1141	1155	1062	912	745	630	556	521	509	509	519	521	521	517	524	532
2469 -	533	517	500	492	507	519	515	502	499	504	511	513	507	503	508	525	527	526	525	513
2489 -	503	511	517	526	534	521	504	503	506	508	506	508	498	495	515	515	529	536	517	500
2509 -	497	497	516	518	513	513	503	509	513	521	510	513	500	507	511	536	529	539	521	506
2529 -	498	510	510	526	526	506	508	497	494	504	517	513	513	501	502	503	507	515	526	532
2549 -	529	517	512	514	522	522	524	525	521	519	520	530	544	547	540	523	517	517	523	519
2569 -	531	533	548	546	543	522	516	519	520	521	533	543	549	555	539	528	533	539	540	546
2589 -	545	544	540	526	517	507	520	544	545	540	528	519	520	531	535	538	532	545	546	542
2609 -	547	549	547	550	536	535	552	563	561	556	531	515	513	518	528	546	543	548	549	556
2629 -	568	571	572	577	571	571	581	576	595	587	583	591	599	596	618	683	913	1509	2637	4313
2649 -	6200	7726	8253	7560	5942	4025	2421	1515	1228	1360	1621	1791	1772	1583	1267	973	727	584	521	508
2669 -	514	524	520	513	497	499	503	500	497	495	483	487	485	499	507	525	534	542	535	530
2689 -	520	521	529	537	540	535	523	530	532	543	548	546	538	552	559	604	631	667	718	808
2709 -	1096	1814	3175	5262	7700	9685	10528	9792	7752	5250	3043	1552	824	541	447	450	448	459	469	471
2729 -	480	488	470	465	456	461	471	467	451	464	464	474	490	500	494	492	479	470	467	476
2749 -	474	466	477	473	476	486	497	496	500	504	502	489	488	485	471	480	479	478	475	483
2769 -	470	473	462	474	485	503	503	504	481	479	475	476	476	489	496	506	509	500	493	489
2789 -	476	472	485	500	519	524	506	498	489	481	493	495	488	500	508	497	503	499	485	498
2809 -	509	508	526	530	529	525	519	505	520	523	521	509	519	508	514	503	493	490	498	499
2829 -	514	514	530	530	530	526	536	536	528	527	517	510	512	526	536	545	538	543	533	521
2849 -	526	526	533	554	559	541	549	538	542	551	566	563	561	533	529	540	543	539	535	521
2869 -	529	554	546	549	556	541	527	526	508	518	535	526	520	532	522	523	522	516	525	529
2889 -	521	516	497	502	517	516	513	516	489	489	497	482	484	489	465	469	459	442	446	431
2909 -	419	410	391	379	373	361	375	358	355	364	366	368	375	364	339	331	333	333	338	339
2929 -	326	325	336	324	308	297	302	318	324	323	322	318	317	317	305	307	316	310	305	304
2949 -	297	304	295	291	284	288	305	372	472	644	855	1051	1161	1167	1040	835	632	458	342	301
2969 -	285	276	278	267	262	260	253	251	250	246	258	271	283	291	275	256	254	257	264	266
2989 -	264	254	258	252	242	241	243	243	253	251	247	243	241	239	248	253	255	252	253	253
3009 -	250	239	231	225	224	234	239	239	242	229	220	224	235	240	241	228	227	232	235	239
3029 -	232	219	227	233	234	227	211	204	213	216	223	215	205	203	204	206	212	225	237	242
3049 -	262	289	299	317	315	285	258	233	214	215	213	208	200	194	200	202	202	201	0	0
3069 -	0	0	0	0																

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 2049-3072

BY BOB75 *************** 71-A-008- 8

*** RESULTS OF PEAK RECOGNITION ***

PEAK NO.	MIN	PEAK CH.	MAX	PEAK AREA	BK.GD.	STD.DEV.	PK.FT.1	PK.FT.2	JFIT	JFFT	FWHM
1	2108	2116,85	2126	24059	20510	1,1	0,1245E+04	0,1172E+04	0	0	5,179
2	2237	2243,71	2251	2315	10387	6,6	0,7837E+03	0,8146E+03	0	0	5,267
3	2254	2260,93	2267	1283	9527	11,1	0,8146E+03	0,7652E+03	0	0	4,548
4	2343	2353,22	2363	74624	12895	0,4	0,7452E+03	0,6050E+03	0	0	5,321
5	2428	2431,98	2437	355	4379	26,9	0,5593E+03	0,5355E+03	0	0	4,376
6	2445	2453,58	2462	3846	8354	3,7	0,5351E+03	0,5091E+03	0	0	5,439
7	2641	2650,92	2669	54057	14781	0,5	0,5993E+03	0,5144E+03	1	1	5,434
8	2701	2715,01	2725	61878	11547	0,5	0,5376E+03	0,4483E+03	0	1	5,517
9	2953	2961,46	2971	5740	4770	2,2	0,2835E+03	0,2780E+03	0	0	5,782
10	3045	3051,98	3058	607	2558	12,5	0,2116E+03	0,2149E+03	0	0	5,414

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 3073-4096

BY BOB75 *************** 71-A-009- 9

***** DATE OF MEASUREMENT 710906 TIME OF MEASUREMENT 920 *****

71-A-009 = BOB75 IDENTIFICATION
3073 = INITIAL CHANNEL OF DATA
4096 = FINAL CHANNEL OF DATA
1024 = NUMBER OF DATA POINTS
3080 = INITIAL CHANNEL OF ANALYSIS
4090 = FINAL CHANNEL OF ANALYSIS
1011 = NUMBER OF ANALYZING POINTS
7 = POINTS USED IN SMOOTHING
7 = POINTS USED IN DERIVATIVE
YES = STORED STANDARD
YES = PEAK FITTING

NO = LIVE TIME CORRECTION
40 = COUNTING DURATION (LIVE TIME) (KSEC)
0,72 = PERCENT DEAD TIME
NO = PLOTTING
NO = ENERGY ASSIGNMENT
NO = EFFICIENCY CORRECTION
0 = ORDER OF ENERGY ASSIGNMENT POLYNOMIAL
0 = ORDER OF EFFICIENCY CORRECTION POLYNOMIAL
NO = COEFFICIENTS EVALUATED INTERNALLY
NO = COEFFICIENTS GIVEN EXTERNALLY

ALL PEAKS WERE FITTED TO THE FUNCTION WITH FOLLOWING PROPERTIES

1/99 POWER = BACK-GROUND SHAPE
0,9400 = SKEWNESS OF GAUSSIAN FUNCTION
0,00500000 = PEAK RATIO OF TAIL TO MAIN-PEAK
6,5000000 = DISTANCE(CH.NO.) BETWEEN THE CENTRES OF TAIL AND MAIN-PEAK
BUILT-IN WT.= WEIGHT IN FITTING PROCESS

FILTRATION OF SMALL PEAKS

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 3073-4096

BY BOB75 *************** 71-A-009- 10

INPUT DATA (FROM 3073 CH. TO 4096 CH.)

CH. NO.																				
3073 -	40000	181	197	181	192	197	219	228	205	185	217	188	185	172	191	164	181	171	166	174
3093 -	180	176	165	166	178	159	145	173	162	154	179	148	149	164	168	202	229	269	315	326
3113 -	311	294	266	222	191	161	151	145	157	140	129	156	142	137	131	138	122	146	124	137
3133 -	137	148	133	134	141	129	116	125	123	117	111	134	104	129	101	117	129	113	121	134
3153 -	127	125	134	171	187	190	150	139	155	120	104	126	119	142	159	253	403	613	881	1105
3173 -	1117	984	806	559	369	204	137	131	96	87	90	87	90	90	78	99	73	86	80	78
3193 -	85	77	95	62	76	113	75	73	88	75	75	89	78	66	71	80	76	90	73	76
3213 -	67	74	80	82	62	63	68	76	77	82	63	62	66	56	73	75	74	78	62	79
3233 -	63	49	55	71	66	69	74	57	81	49	60	61	52	58	47	60	61	52	53	61
3253 -	64	59	51	59	48	62	63	67	69	71	43	58	59	60	66	54	55	65	56	52
3273 -	50	66	59	63	56	66	56	75	50	55	57	59	79	55	55	51	63	55	70	78
3293 -	67	70	78	58	59	62	66	50	63	62	48	51	57	71	50	61	47	55	52	72
3313 -	62	67	50	60	62	48	63	65	50	62	58	64	64	60	66	81	83	70	65	75
3333 -	56	79	64	63	72	59	77	66	64	61	52	77	54	57	51	66	69	72	62	63
3353 -	68	68	65	60	53	50	54	64	60	53	67	70	60	49	57	67	67	69	61	62
3373 -	70	47	73	62	63	63	68	60	47	75	84	72	75	81	80	74	60	80	67	59
3393 -	80	107	87	61	80	82	100	69	90	73	79	96	80	95	79	89	101	90	88	96
3413 -	90	98	105	107	91	98	119	103	123	116	125	110	121	130	156	137	157	183	273	452
3433 -	839	1666	3433	5730	8460	10829	11773	11169	8853	5952	3289	1657	683	235	83	28	12	10	7	6
3453 -	5	3	3	5	10	2	6	11	11	12	2	11	11	6	4	5	8	7	4	3
3473 -	4	6	2	3	7	10	13	6	7	7	7	6	8	6	6	16	11	7	7	5
3493 -	6	10	8	6	8	6	11	6	5	6	9	5	8	6	7	13	6	9	8	7
3513 -	4	4	3	5	5	6	6	2	3	11	6	5	14	7	6	4	11	5	7	2
3533 -	7	8	4	7	5	3	4	11	7	6	8	8	5	6	4	8	9	15	9	14
3553 -	18	11	36	70	127	186	256	260	275	198	174	125	101	113	128	103	107	87	56	50
3573 -	14	13	2	5	7	6	6	2	4	7	3	4	7	2	0	2	1	4	3	3
3593 -	5	5	7	4	1	3	6	2	5	2	5	2	2	1	1	2	1	4	2	4
3613 -	3	5	5	1	4	4	4	7	2	3	2	4	2	3	0	3	4	8	6	3
3633 -	4	8	8	3	5	4	2	5	2	4	1	3	9	4	3	9	3	8	8	10
3653 -	3	8	7	5	3	1	3	6	5	4	5	2	4	3	7	4	2	5	6	6
3673 -	3	5	4	2	1	2	7	3	6	4	4	9	5	8	6	6	4	5	5	2
3693 -	8	4	3	5	3	0	3	2	4	4	5	3	2	3	6	5	3	1	5	4
3713 -	6	5	1	5	3	3	5	4	3	6	3	3	5	8	19	34	56	93	112	131
3733 -	117	119	60	45	28	15	9	4	2	0	1	7	3	4	3	2	5	3	4	3
3753 -	2	1	3	0	3	5	2	2	3	3	2	3	0	2	3	4	2	3	3	2
3773 -	4	1	3	2	3	6	3	2	4	7	1	5	3	1	4	3	5	3	0	2
3793 -	1	0	3	2	3	3	3	1	9	4	5	1	0	3	0	5	3	3	2	4
3813 -	3	1	7	5	3	3	2	3	1	2	3	1	2	0	5	1	3	3	5	3
3833 -	1	2	2	2	3	6	3	2	1	1	5	4	6	1	3	4	2	2	2	5
3853 -	2	4	1	3	6	2	4	0	2	4	6	6	3	6	4	2	5	1	5	4
3873 -	3	4	3	1	0	7	3	9	4	4	3	2	2	6	4	6	7	5	6	2
3893 -	6	4	2	8	6	5	10	9	12	7	6	3	6	4	3	1	5	2	2	4
3913 -	1	0	2	1	1	7	7	14	6	5	8	1	6	3	6	4	7	3	6	3
3933 -	4	2	4	0	5	3	2	3	4	3	3	3	5	3	1	0	3	1	1	1
3953 -	2	1	4	3	1	2	3	2	2	4	5	1	5	2	3	6	2	2	1	6
3973 -	1	3	1	1	1	0	3	2	3	2	0	4	1	9	2	1	3	2	2	2
3993 -	4	0	4	3	2	2	1	1	0	4	3	3	1	2	1	2	1	0	3	0
4013 -	2	2	0	3	4	0	2	4	5	5	5	2	4	2	5	2	2	2	3	3
4033 -	5	0	1	1	0	1	2	1	2	2	1	0	2	0	4	2	3	2	4	7
4053 -	2	3	2	2	4	3	0	0	3	3	0	0	0	1	3	3	3	2	5	5
4073 -	4	2	2	1	1	3	2	4	4	0	2	1	4	4	1	4	0	3	1	0
4093 -	5	1	2	1																

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 3073-4096

BY BOB75 *************** 71-A-009- 11

SMOOTHED DATA (FROM 3073 CH, TO 4096 CH,)

CH, NO.																				
3073 -	0	0	0	0	0	0	0	213	212	203	197	191	190	177	178	177	174	169	173	173
3093 -	175	173	172	170	163	163	161	156	164	167	158	157	154	156	175	198	233	275	305	321
3113 -	317	293	261	226	191	164	153	149	144	143	143	142	142	142	131	133	132	133	132	138
3133 -	137	140	139	138	132	129	125	121	118	122	117	120	118	115	114	118	115	123	124	124
3153 -	126	130	143	167	181	176	165	150	132	126	117	113	118	133	170	258	412	644	884	1052
3173 -	1099	996	797	572	370	225	146	108	99	92	85	89	87	89	87	85	84	82	79	80
3193 -	84	82	76	81	85	113	89	83	74	80	82	78	76	74	70	77	81	82	78	74
3213 -	71	76	76	75	69	66	67	76	78	74	70	63	60	65	68	74	75	74	73	68
3233 -	60	59	57	62	70	68	70	68	64	61	59	55	56	53	55	57	55	57	56	59
3253 -	60	60	55	53	55	59	62	70	66	62	57	54	57	62	59	59	59	57	56	55
3273 -	55	59	60	63	59	63	63	62	58	55	58	64	65	61	58	52	56	63	68	70
3293 -	75	72	67	65	63	58	60	61	59	55	54	55	56	61	59	56	50	55	57	65
3313 -	64	62	59	57	55	60	58	58	60	58	60	63	61	64	71	76	77	76	68	67
3333 -	68	67	67	67	65	68	69	68	63	61	62	62	59	58	56	64	67	69	66	65
3353 -	66	67	65	59	54	53	56	57	59	62	64	63	60	57	57	63	67	66	66	61
3373 -	61	62	63	62	67	64	60	59	63	68	74	80	78	78	76	74	72	67	65	74
3393 -	83	87	86	78	77	80	88	84	79	79	83	85	88	86	87	92	90	94	92	90
3413 -	94	100	101	100	102	101	106	113	119	117	119	116	125	131	140	142	150	173	243	391
3433 -	851	1827	3512	5892	8501	10635	11570	10894	8805	6099	3547	1720	680	224	83	28	12	10	6	6
3453 -	4	3	5	5	10	6	7	9	10	9	9	9	11	8	5	6	6	6	5	4
3473 -	4	6	4	4	7	9	10	9	7	6	7	7	8	7	10	16	11	9	6	6
3493 -	7	10	8	7	7	8	11	7	7	6	7	7	6	7	8	13	9	9	7	7
3513 -	5	4	4	4	6	6	6	5	5	11	8	9	14	8	8	6	11	6	6	5
3533 -	6	8	7	5	4	5	6	11	8	8	7	7	6	5	5	8	10	15	13	12
3553 -	18	18	37	72	131	189	245	265	254	215	168	126	116	109	114	115	101	84	64	41
3573 -	22	11	3	5	7	6	5	4	4	7	5	5	7	3	2	1	2	4	3	4
3593 -	5	6	7	4	4	3	6	4	4	3	5	3	2	1	1	2	2	4	3	3
3613 -	4	4	5	4	4	4	5	7	4	3	2	3	2	2	1	3	5	6	5	5
3633 -	5	8	6	6	4	4	4	5	3	4	3	5	9	6	5	9	6	8	7	8
3653 -	7	7	6	5	3	2	3	6	5	5	4	3	4	4	7	4	4	4	5	5
3673 -	5	4	3	2	2	3	7	5	5	5	6	9	7	7	6	6	5	4	4	5
3693 -	8	5	5	5	3	2	2	2	4	4	4	3	3	4	5	4	4	3	5	5
3713 -	5	4	4	5	3	4	5	4	4	6	4	3	4	9	18	36	60	90	111	128
3733 -	122	102	74	47	25	17	8	4	1	1	2	7	5	4	3	3	5	4	4	3
3753 -	3	2	1	2	3	5	3	3	2	3	2	2	1	2	2	3	3	3	3	3
3773 -	4	2	2	3	4	6	3	4	3	7	4	5	2	3	4	4	5	3	2	1
3793 -	1	1	2	2	3	2	3	4	9	5	4	2	1	1	2	5	3	3	3	4
3813 -	3	4	7	5	4	3	2	2	2	2	2	1	2	2	5	2	3	3	5	3
3833 -	2	1	2	3	4	6	4	2	1	2	4	4	6	3	3	4	3	3	2	5
3853 -	3	4	3	3	6	4	4	1	2	4	5	5	5	6	4	3	5	3	5	4
3873 -	4	3	2	2	2	7	6	9	5	4	2	3	3	6	5	6	6	6	5	5
3893 -	6	4	5	8	6	7	8	10	10	8	6	5	5	3	4	3	5	3	3	4
3913 -	2	1	1	1	3	6	9	14	9	7	8	4	6	4	5	5	5	5	5	4
3933 -	4	2	4	3	5	3	3	3	3	3	3	4	5	3	2	1	1	1	2	1
3953 -	2	2	4	2	2	2	2	2	3	3	5	4	5	3	4	6	3	3	2	6
3973 -	3	2	1	1	1	1	2	3	2	2	1	4	4	9	4	3	1	2	3	2
3993 -	4	3	4	3	3	2	1	1	2	4	3	3	2	2	1	1	1	1	1	2
4013 -	1	1	2	2	4	2	2	3	5	5	4	3	3	3	5	3	2	2	3	3
4033 -	5	2	1	1	1	1	1	2	2	1	1	1	1	2	4	2	3	3	4	7
4053 -	4	3	2	3	4	2	1	1	2	2	1	1	1	1	2	3	3	3	4	4
4073 -	4	3	1	1	1	2	3	3	4	2	1	2	4	3	3	4	2	1	0	0
4093 -	0	0	0	0																

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 3073-4096

BY BOB75 *************** 71-A-009- 12

*** RESULTS OF PEAK RECOGNITION ***

PEAK NO.	MIN	PEAK CH.	MAX	PEAK AREA	BK.GD.	STD.DEV.	PK.FT.1	PK.FT.2	JFIT	JFFT	FWHM
1	3105	3112.34	3121	1180	2234	6.4	0.1601E+03	0.1391E+03	0	0	6.315
2	3152	3157.57	3163	327	1171	15.8	0.1189E+03	0.1153E+03	0	0	4.374
3	3164	3172.82	3183	6389	1776	1.6	0.1153E+03	0.8527E+02	0	0	5.809
4	3425	3439.05	3453	74515	1687	0.4	0.1145E+03	0.6667E+01	0	0	5.900
5	3546	3555.00	3577	2379	195	2.2	0.7238E+01	0.5661E+01	1	1	5.836
6	3723	3732.25	3742	786	74	3.9	0.4476E+01	0.3762E+01	0	0	5.879

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 1025-2048

BY BOB75 *************** 71-A-007- 13

***** DATE OF MEASUREMENT 710905 TIME OF MEASUREMENT 912 *****

71-A-007 = BOB75 IDENTIFICATION
1025 = INITIAL CHANNEL OF DATA
2048 = FINAL CHANNEL OF DATA
1024 = NUMBER OF DATA POINTS
1032 = INITIAL CHANNEL OF ANALYSIS
2042 = FINAL CHANNEL OF ANALYSIS
1011 = NUMBER OF ANALYZING POINTS
7 = POINTS USED IN SMOOTHING
7 = POINTS USED IN DERIVATIVE
YES = STORED STANDARD
YES = PEAK FITTING

NO = LIVE TIME CORRECTION
40 = COUNTING DURATION (LIVE TIME) (KSEC)
0.67 = PERCENT DEAD TIME
NO = PLOTTING
NO = ENERGY ASSIGNMENT
NO = EFFICIENCY CORRECTION
0 = ORDER OF ENERGY ASSIGNMENT POLYNOMIAL
0 = ORDER OF EFFICIENCY CORRECTION POLYNOMIAL
NO = COEFFICIENTS EVALUATED INTERNALLY
NO = COEFFICIENTS GIVEN EXTERNALLY

ALL PEAKS WERE FITTED TO THE FUNCTION WITH FOLLOWING PROPERTIES

1/99 POWER = BACK-GROUND SHAPE
0.9400 = SKEWNESS OF GAUSSIAN FUNCTION
0.00500000 = PEAK RATIO OF TAIL TO MAIN-PEAK
6.5000000 = DISTANCE(CH.NO.) BETWEEN THE CENTRES OF TAIL AND MAIN-PEAK
BUILT-IN WT.= WEIGHT IN FITTING PROCESS

FILTRATION OF SMALL PEAKS

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 1025-2048

BY BOB75 *************** 71-A-007- 14

INPUT DATA (FROM 1025 CH, TO 2048 CH,)

CH, NO.																				
1025 -	40000	1712	1786	1766	1740	1770	1720	1684	1773	1763	1760	1748	1784	1836	1745	1854	1794	1818	1754	1783
1045 -	1860	1840	1774	1694	1719	1812	1767	1798	1741	1766	1835	1765	1760	1771	1756	1743	1759	1848	1818	1791
1065 -	1758	1755	1820	1791	1794	1876	1764	1826	1807	1832	1771	1844	1898	2172	2959	4407	6241	7430	7707	6629
1085 -	4639	3250	2349	1883	1699	1748	1726	1665	1666	1709	1761	1675	1688	1681	1721	1682	1709	1662	1650	1671
1105 -	1767	1679	1831	1775	1692	1778	1751	1772	1741	1729	1731	1688	1730	1780	1722	1740	1664	1667	1657	1736
1125 -	1699	1684	1662	1716	1699	1640	1685	1701	1652	1688	1637	1612	1720	1663	1720	1747	1705	1653	1692	1750
1145 -	1738	1709	1724	1744	1726	1693	1724	1695	1686	1647	1732	1721	1707	1715	1765	1733	1729	1723	1613	1700
1165 -	1675	1688	1642	1735	1726	1753	1616	1689	1814	1686	1776	1863	1743	1736	1777	1797	1697	1674	1808	1757
1185 -	1689	1720	1750	1879	2005	2179	2393	2413	2255	2148	1925	1908	1712	1756	1709	1789	1719	1755	1793	1753
1205 -	1730	1774	1812	1690	1722	1710	1771	1688	1716	1664	1767	1656	1702	1708	1688	1735	1621	1780	1798	1813
1225 -	1825	1967	1965	1950	1957	1835	1801	1714	1760	1710	1661	1682	1736	1742	1687	1753	1732	1734	1873	1904
1245 -	1866	1901	1889	1898	1859	1811	1782	1656	1757	1667	1692	1855	1748	1629	1644	1743	1708	1684	1872	1734
1265 -	1744	1793	1910	1748	1830	1794	1742	1789	1765	1784	1713	1740	1831	1730	1714	1813	1769	1671	1716	1805
1285 -	1703	1748	1832	1759	1774	1752	1692	1744	1748	1783	1746	1687	1722	1771	1699	1774	1834	1757	1812	1835
1305 -	1788	1810	1758	1823	1700	1730	1765	1642	1742	1704	1778	1735	1736	1789	1824	1731	1790	1817	1657	1798
1325 -	1764	1717	1753	1790	1820	1689	1764	1777	1794	1821	1802	1669	1747	1761	1738	1690	1794	1739	1765	1761
1345 -	1808	1769	1720	1836	1807	1789	1716	1704	1760	1821	1827	1784	1879	1793	1768	1842	1804	1778	1835	1762
1365 -	1760	1808	1782	1840	1793	1825	1891	1944	2181	2380	2515	2577	2414	2172	2002	2063	1985	1999	1969	1920
1385 -	1832	1816	1728	1797	1808	1781	1746	1748	1757	1811	1807	1779	1824	1764	1797	1745	1801	1826	1862	1871
1405 -	1837	1802	1834	1790	1752	1763	1820	1782	1749	1834	1755	1781	1779	1717	1807	1747	1797	1799	1779	1809
1425 -	1819	1876	1995	2175	2348	2427	2353	2193	1869	1785	1667	1633	1646	1614	1620	1545	1661	1658	1618	1647
1445 -	1694	1584	1639	1570	1563	1544	1582	1590	1560	1558	1589	1633	1524	1586	1526	1583	1553	1589	1564	1558
1465 -	1587	1625	1571	1515	1603	1505	1530	1481	1496	1621	1491	1520	1556	1510	1532	1566	1512	1528	1520	1543
1485 -	1532	1551	1517	1589	1554	1491	1446	1576	1563	1528	1466	1500	1602	1545	1561	1625	1535	1523	1555	1499
1505 -	1510	1488	1496	1538	1507	1489	1553	1510	1504	1526	1486	1476	1461	1501	1515	1485	1485	1429	1484	1455
1525 -	1530	1505	1525	1525	1459	1536	1462	1492	1518	1566	1417	1555	1503	1507	1470	1462	1534	1446	1498	1543
1545 -	1470	1461	1469	1491	1501	1484	1457	1474	1526	1454	1476	1469	1430	1487	1509	1575	1492	1545	1484	1619
1565 -	1494	1514	1463	1478	1517	1519	1530	1477	1535	1443	1533	1519	1437	1474	1481	1487	1436	1493	1415	1511
1585 -	1508	1501	1464	1498	1568	1503	1523	1457	1422	1455	1479	1443	1418	1472	1577	1616	1629	1612	1712	1588
1605 -	1523	1541	1524	1482	1533	1452	1475	1485	1495	1465	1472	1561	1455	1461	1530	1512	1516	1534	1475	1320
1625 -	1410	1443	1434	1529	1468	1479	1500	1445	1471	1487	1444	1430	1435	1497	1491	1527	1537	1474	1568	1572
1645 -	1650	1628	1671	1529	1571	1493	1492	1623	1740	1852	2048	2006	1984	1742	1669	1500	1384	1456	1358	1363
1665 -	1435	1435	1376	1415	1410	1476	1449	1492	1402	1471	1511	1535	1862	2028	2354	2603	2453	2170	1938	1624
1685 -	1451	1436	1403	1420	1442	1454	1417	1454	1524	1422	1414	1385	1440	1484	1412	1416	1450	1457	1420	1395
1705 -	1440	1403	1412	1405	1432	1403	1376	1425	1420	1427	1455	1474	1412	1459	1416	1428	1413	1454	1473	1403
1725 -	1490	1501	1461	1410	1409	1379	1467	1433	1422	1383	1381	1541	1518	1530	1555	1627	1542	1414	1471	1412
1745 -	1511	1487	1409	1426	1428	1512	1497	1527	1734	1802	1949	1885	1767	1684	1502	1429	1505	1543	1596	1611
1765 -	1635	1636	1567	1523	1527	1499	1499	1409	1529	1505	1473	1517	1478	1442	1494	1430	1464	1467	1437	1507
1785 -	1526	1371	1410	1412	1390	1466	1445	1452	1440	1469	1466	1520	1474	1440	1489	1548	1432	1494	1479	1465
1805 -	1499	1516	1529	1499	1469	1443	1554	1510	1446	1510	1507	1543	1449	1406	1469	1476	1443	1472	1535	1514
1825 -	1512	1489	1502	1468	1418	1460	1453	1541	1483	1521	1527	1498	1476	1590	1524	1546	1542	1405	1486	1588
1845 -	1496	1499	1471	1544	1500	1535	1436	1464	1548	1499	1420	1484	1408	1420	1419	1353	1417	1395	1445	1526
1865 -	1558	1558	1583	1600	1559	1365	1377	1328	1294	1390	1487	1469	1453	1409	1387	1323	1347	1405	1341	1338
1885 -	1275	1388	1307	1335	1336	1359	1412	1385	1369	1486	1894	2803	4952	8168	12193	15492	15770	13389	9455	5669
1905 -	3174	1897	1405	1233	1219	1205	1245	1173	1176	1229	1188	1155	1127	1204	1172	1263	1225	1149	1225	1190
1925 -	1210	1195	1204	1129	1159	1222	1186	1177	1161	1190	1116	1203	1232	1214	1225	1224	1220	1213	1174	1185
1945 -	1164	1189	1198	1199	1193	1254	1150	1113	1182	1124	1195	1183	1198	1115	1163	1177	1230	1123	1223	1210
1965 -	1148	1200	1231	1168	1166	1196	1249	1231	1191	1326	1348	1414	1494	1515	1489	1392	1317	1215	1194	1123
1985 -	1160	1164	1203	1169	1223	1131	1106	1209	1222	1194	1165	1245	1189	1151	1181	1125	1187	1151	1192	1197
2005 -	1242	1157	1206	1173	1235	1149	1193	1178	1219	1182	1154	1234	1127	1218	1196	1134	1209	1129	1102	1186
2025 -	1201	1237	1238	1134	1162	1102	1266	1188	1207	1224	1136	1140	1126	1120	1190	1173	1177	1176	1162	1208
2045 -	1142	1155	1155	1203																

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 1025-2048

BY BOB75 *************** 71-A-007- 15

SMOOTHED DATA (FROM 1025 CH, TO 2048 CH.)

CH, NO,																				
1025 -	0	0	0	0	0	0	0	1731	1738	1754	1763	1774	1775	1796	1807	1814	1802	1796	1784	1810
1045 -	1825	1818	1770	1739	1734	1764	1785	1774	1773	1783	1781	1788	1776	1754	1748	1762	1784	1808	1815	1793
1065 -	1772	1775	1778	1813	1817	1813	1815	1819	1798	1808	1789	1781	1862	2242	3146	4555	6148	7315	7411	6445
1085 -	4919	3400	2357	1892	1718	1686	1689	1688	1691	1701	1714	1705	1696	1683	1702	1700	1687	1661	1679	1673
1105 -	1716	1762	1763	1757	1762	1743	1755	1763	1748	1731	1711	1723	1730	1746	1745	1717	1676	1675	1679	1699
1125 -	1695	1695	1689	1685	1681	1686	1671	1678	1684	1651	1650	1654	1661	1699	1726	1710	1702	1692	1699	1717
1145 -	1732	1732	1728	1723	1726	1717	1707	1687	1685	1687	1700	1708	1728	1727	1736	1751	1721	1692	1676	1672
1165 -	1662	1683	1682	1719	1716	1699	1702	1701	1709	1775	1788	1773	1785	1776	1756	1741	1737	1737	1732	1741
1185 -	1726	1712	1764	1867	2026	2215	2335	2376	2282	2137	1970	1855	1762	1744	1724	1744	1752	1767	1753	1759
1205 -	1771	1760	1757	1737	1728	1715	1733	1709	1715	1697	1702	1701	1698	1700	1694	1689	1707	1742	1766	1833
1225 -	1871	1918	1967	1968	1921	1854	1797	1751	1725	1696	1693	1696	1705	1726	1731	1714	1735	1792	1830	1877
1245 -	1901	1894	1893	1886	1865	1804	1762	1722	1682	1706	1758	1748	1730	1702	1668	1667	1730	1758	1757	1763
1265 -	1802	1787	1823	1832	1803	1774	1752	1772	1766	1752	1756	1763	1749	1765	1773	1748	1738	1744	1722	1724
1285 -	1766	1765	1762	1783	1757	1729	1732	1734	1754	1758	1734	1733	1715	1721	1759	1768	1778	1811	1806	1808
1305 -	1806	1805	1783	1763	1756	1728	1708	1709	1713	1723	1745	1742	1773	1769	1779	1802	1766	1753	1765	1744
1325 -	1736	1759	1766	1768	1770	1759	1751	1765	1816	1792	1767	1746	1734	1720	1747	1738	1743	1752	1773	1774
1345 -	1769	1771	1782	1792	1798	1777	1731	1731	1760	1788	1826	1834	1813	1812	1815	1791	1812	1811	1785	1785
1365 -	1779	1784	1802	1806	1812	1824	1873	2002	2173	2371	2519	2519	2384	2220	2070	2005	2000	2000	1952	1917
1385 -	1845	1794	1776	1782	1782	1784	1756	1752	1771	1786	1805	1803	1796	1782	1776	1771	1797	1826	1859	1853
1405 -	1845	1828	1804	1782	1780	1777	1775	1794	1789	1779	1789	1772	1760	1763	1762	1775	1789	1784	1795	1795
1425 -	1820	1891	2014	2183	2331	2408	2330	2157	1947	1771	1672	1644	1629	1608	1602	1609	1621	1630	1665	1644
1445 -	1646	1637	1609	1573	1569	1560	1571	1571	1570	1584	1579	1589	1574	1560	1547	1567	1566	1572	1564	1581
1465 -	1591	1581	1585	1562	1544	1533	1507	1510	1528	1529	1546	1536	1513	1540	1538	1533	1533	1528	1522	1538
1485 -	1532	1543	1555	1558	1523	1513	1507	1529	1539	1524	1509	1518	1536	1579	1586	1564	1566	1544	1520	1517
1505 -	1501	1497	1510	1504	1517	1520	1513	1522	1521	1502	1490	1479	1480	1491	1502	1490	1474	1455	1465	1479
1525 -	1504	1520	1516	1510	1502	1488	1483	1518	1497	1513	1510	1507	1500	1502	1486	1482	1476	1498	1504	1492
1545 -	1492	1475	1469	1488	1489	1478	1483	1480	1483	1488	1467	1451	1459	1488	1508	1538	1521	1536	1531	1546
1565 -	1526	1506	1474	1489	1505	1514	1524	1501	1494	1503	1501	1484	1486	1472	1463	1481	1460	1456	1466	1490
1585 -	1490	1495	1497	1506	1525	1531	1499	1459	1454	1448	1448	1441	1450	1487	1552	1597	1644	1654	1635	1604
1605 -	1569	1514	1519	1509	1490	1480	1483	1474	1475	1492	1496	1487	1494	1494	1489	1523	1540	1490	1444	1409
1625 -	1383	1420	1472	1479	1493	1489	1468	1477	1472	1460	1450	1443	1447	1474	1509	1513	1514	1522	1548	1581
1645 -	1641	1636	1627	1583	1529	1498	1539	1598	1745	1887	1996	2009	1944	1798	1634	1511	1443	1382	1381	1402
1665 -	1395	1415	1409	1409	1421	1460	1458	1455	1450	1440	1494	1618	1803	2094	2371	2479	2447	2219	1903	1658
1685 -	1493	1407	1404	1426	1429	1433	1456	1464	1464	1447	1417	1413	1433	1437	1441	1437	1435	1436	1433	1418
1705 -	1411	1411	1417	1414	1409	1405	1404	1403	1419	1446	1444	1453	1447	1436	1422	1426	1435	1437	1443	1463
1725 -	1473	1471	1468	1420	1405	1413	1431	1432	1407	1402	1434	1475	1516	1562	1576	1563	1535	1474	1437	1456
1745 -	1473	1459	1443	1428	1444	1462	1512	1584	1698	1830	1697	1880	1794	1640	1531	1476	1480	1536	1590	1622
1765 -	1633	1610	1580	1541	1520	1488	1479	1478	1480	1494	1512	1482	1482	1471	1455	1460	1454	1450	1489	1481
1785 -	1463	1444	1399	1393	1425	1436	1445	1456	1446	1467	1484	1483	1472	1489	1478	1488	1494	1476	1465	1487
1805 -	1496	1513	1518	1488	1482	1491	1492	1499	1498	1497	1510	1498	1466	1453	1439	1451	1474	1485	1505	1518
1825 -	1516	1502	1481	1463	1443	1453	1472	1498	1513	1522	1496	1515	1518	1530	1559	1537	1484	1494	1494	1509
1845 -	1522	1510	1490	1518	1513	1493	1481	1496	1433	1498	1473	1437	1433	1416	1395	1392	1386	1410	1464	1503
1865 -	1548	1577	1600	1569	1515	1438	1351	1309	1347	1388	1444	1474	1459	1410	1369	1358	1357	1363	1347	1340
1885 -	1321	1327	1330	1337	1339	1372	1372	1355	1353	1420	1850	2978	5181	8553	12243	14861	15283	13230	9647	6046
1905 -	3379	1910	1336	1183	1189	1204	1202	1201	1201	1192	1180	1170	1149	1174	1212	1218	1212	1207	1190	1196
1925 -	1215	1192	1174	1169	1174	1182	1191	1191	1161	1157	1170	1188	1206	1231	1225	1224	1217	1205	1187	1176
1945 -	1175	1186	1186	1211	1215	1191	1178	1150	1136	1158	1185	1175	1174	1152	1170	1165	1187	1196	1188	1178
1965 -	1204	1192	1188	1188	1187	1201	1209	1228	1250	1284	1354	1434	1481	1504	1478	1400	1316	1229	1176	1147
1985 -	1155	1160	1193	1195	1169	1151	1161	1173	1192	1212	1205	1194	1195	1175	1155	1154	1161	1164	1198	1196
2005 -	1208	1193	1198	1186	1195	1182	1189	1187	1189	1196	1182	1176	1191	1183	1179	1188	1149	1140	1147	1158
2025 -	1211	1225	1210	1163	1153	1160	1190	1216	1221	1182	1168	1133	1125	1145	1160	1177	1178	1178	0	0
2045 -	0	0	0	0																

77-01-18 *************** GAMMA SPECTRUM ANALYSIS OF EU-152 1025-2048

BY BOB75 *************** 71-A-007- 16

*** RESULTS OF PEAK RECOGNITION ***

PEAK NO.	MIN	PEAK CH.	MAX	PEAK AREA	BK.GD.	STD.DEV.	PK.FT.1	PK.FT.2	JFIT	JFFT	FWHM
1	1074	1082,60	1091	30645	27981	1,0	0,1808E+04	0,1689E+04	0	0	4,738
2	1185	1191,80	1199	3618	22424	6,1	0,1726E+04	0,1724E+04	0	0	5,053
3	1221	1227,35	1233	1530	18875	13,0	0,1707E+04	0,1725E+04	0	0	5,690
4	1241	1246,28	1252	1233	17283	15,3	0,1735E+04	0,1722E+04	0	0	7,197
5	1368	1375,62	1387	5059	32218	5,2	0,1806E+04	0,1776E+04	1	1	4,719
6	1423	1429,87	1437	3610	22339	6,1	0,1795E+04	0,1629E+04	0	0	4,786
7	1596	1602,11	1606	852	13294	19,4	0,1441E+04	0,1514E+04	0	0	4,939
8	1650	1655,67	1663	3220	17275	6,0	0,1498E+04	0,1381E+04	0	0	5,264
9	1673	1680,20	1688	5708	20131	3,8	0,1450E+04	0,1426E+04	0	0	4,847
10	1749	1755,29	1761	2042	16246	9,1	0,1474E+04	0,1480E+04	0	0	4,336
11	1861	1866,56	1872	1414	13552	11,9	0,1386E+04	0,1309E+04	0	0	5,605
12	1891	1900,64	1910	79768	23185	0,4	0,1372E+04	0,1204E+04	0	0	5,074
13	1971	1977,78	1984	1931	14195	9,0	0,1209E+04	0,1147E+04	0	0	5,643

RESULTS FROM PKFIT

NO.	PEAK POSITN.	PEAK AREA	STAND.DEV.
1	179.87	221,81	2.96
2	184.95	400,47	2.31
3	208,80	205,45	4,40
4	214.95	72,02	7,82
5	596,81	1554,87	0,66
6	721,80	118,42	5,53
7	803,42	28,34	18,55
8	839,46	6730,24	0,22
9	841,41	307,78	0,99
10	896,94	228,97	2,79
11	941,46	32,04	14,54
12	1002,61	578,48	1,19
13	2116,94	601,34	1,06
14	2243,69	57,45	6,61
15	2261,35	32,16	11,09
16	2353,27	1864,37	0,42
17	2432,60	8,87	26,91
18	2453,70	95,61	3,75
19	2650,98	1156,86	0,58
20	2660,49	196,15	1,42
21	2707,61	20,82	4,02
22	2715,07	1525,47	0,47
23	2961,53	143,28	2,16
24	3048,74	3,24	55,82
25	3112,75	29,69	6,33
26	3157,64	7,82	16,47
27	3172,99	159,21	1,56
28	3439,10	1859,41	0,37
29	3560,28	41,37	2,65
30	3567,96	17,55	4,09
31	3732,33	19,62	3,89
32	1082,69	768,64	0,96
33	1191,87	91,02	6,05
34	1227,29	37,97	13,05
35	1246,58	31,10	15,21
36	1375,59	97,84	5,89
37	1381,88	28,69	11,13
38	1430,40	90,44	6,07
39	1601,70	22,65	18,31
40	1656,14	80,72	6,02
41	1680,27	144,23	3,72
42	1755,34	52,64	8,83
43	1867,27	35,44	11,91
44	1900,72	1999,04	0,44
45	1978,22	48,78	8,93

ESTIMATED CHANNEL NUMBERS OF THE STANDARD GAMMA-RAYS

1	294,40
2	593,70
3	838,20
4	1081,23
5	1898,99
6	2114,70
7	2350,49
8	2711,45
9	3433,48
10	1001.85
11	1428,96
12	1678.87
13	2957,47
14	3167,69

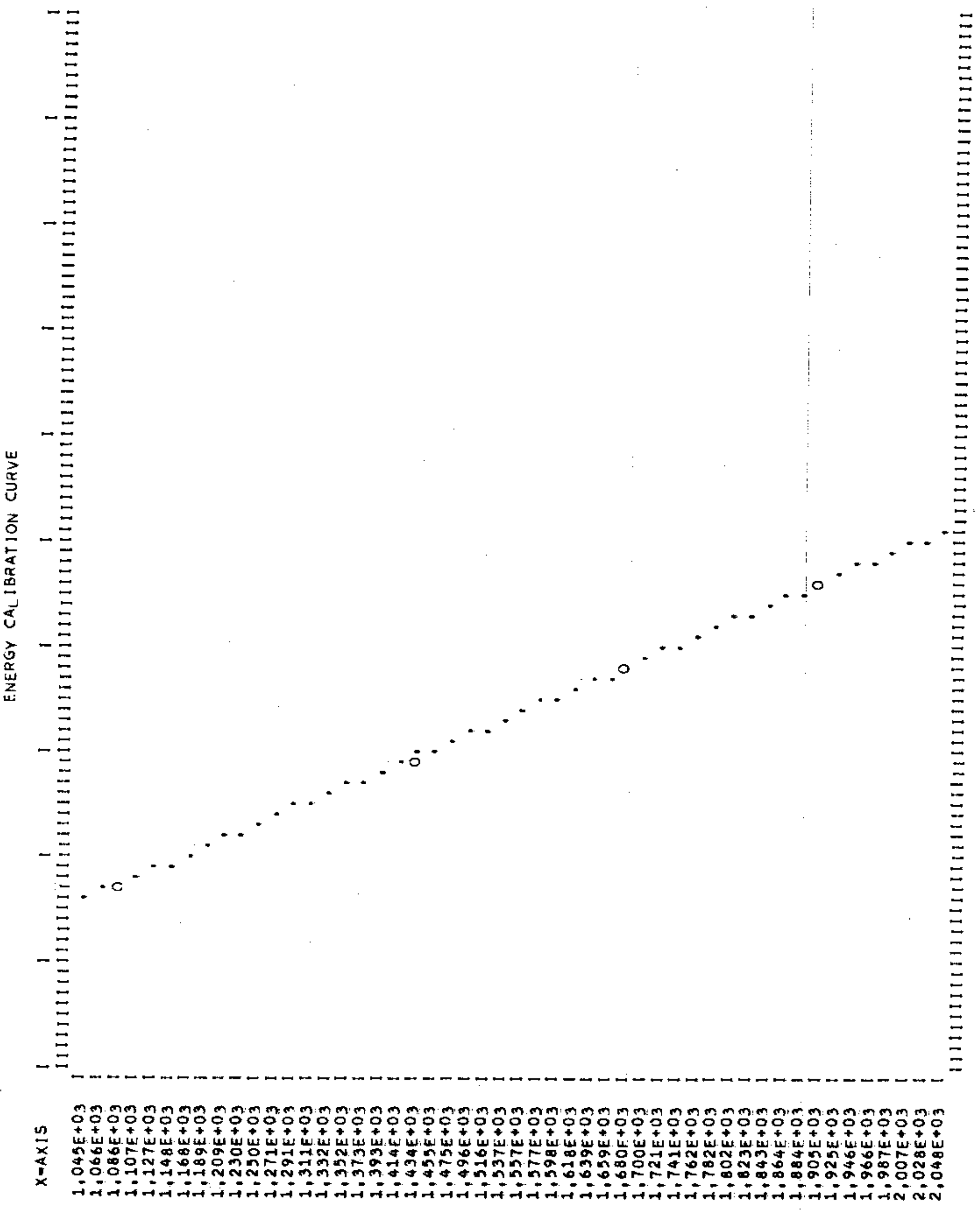
FITTING DONE USING 13 PEAKS WHERE 14 STANDARD ENERGIES GIVEN

```
MM =   5
   -0,38527E+01 0,41794E+00-0,55999E-05 0,15714E-08-0.16525E-12

MM =   5
          0,4771782904136641D+02  -0,1208741994650471D+00   0,1014461807395382D-03
         -0,3443779827455260D-07   0,4076650072223773D-11  -0,1208741994650471D+00
          0,3149270406279274D-03  -0,2700409920429339D-06   0,9317669181229265D-10
         -0,1116979853006883D-13   0,1014461807395382D-03  -0,2700409920429339D-06
          0,2361322637344423D-09  -0,8280100007437215D-13   0,1005606714022028D-16
         -0,3443779827455260D-07   0,9317669181229265D-10  -0,8280100007437215D-13
          0,2944512353726469D-16  -0,3618388075951379D-20   0,4076650072223773D-11
         -0,1116979853006883D-13   0,1005606714022028D-16  -0,3618388075951379D-20
          0,4491733463509161D-24

    VARIANCE OF FITTING S =  0,20743E-01
```

HI	VI	VO	SIG
0,596807E+03	0,243802E+03	0,243897E+03	0,135479E+00
0,839461E+03	0,344050E+03	0,343896E+03	0,761567E-01
0,108269E+04	0,443693E+03	0,443854E+03	0,794860E-01
0,190072E+04	0,778986E+03	0,778943E+03	0,747380E-01
0,211694E+04	0,867428E+03	0,867401E+03	0,753903E-01
0,235327E+04	0,964102E+03	0,964082E+03	0,731521E-01
0,271507E+04	0,111210E+04	0,111208E+04	0,814305E-01
0,343910E+04	0,140814E+04	0,140807E+04	0,136676E+00
0,100261E+04	0,411150E+03	0,410970E+03	0,787059E-01
0,143040E+04	0,586267E+03	0,586423E+03	0,713971E-01
0,168027E+04	0,688733E+03	0,688734E+03	0,709370E-01
0,296153E+04	0,121297E+04	0,121289E+04	0,885780E-01
0,317299E+04	0,129916E+04	0,129935E+04	0,845095E-01

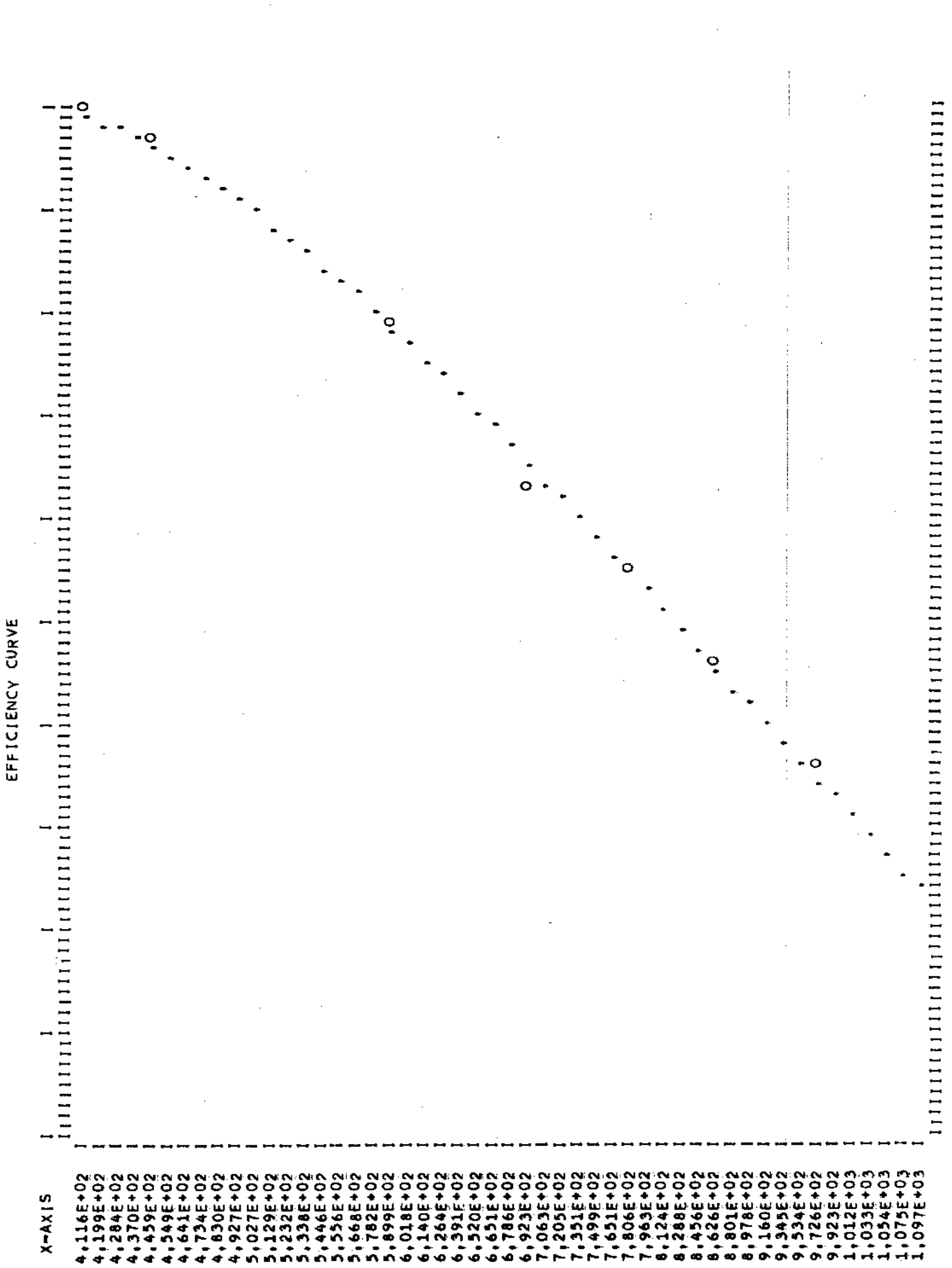

ENERGY CALIBRATION CURVE
X-AXIS
1,045E+03
1,066E+03
1,086E+03
1,107E+03
1,127E+03
1,148E+03
1,168E+03
1,189E+03
1,209E+03
1,230E+03
1,250E+03
1,271E+03
1,291E+03
1,311E+03
1,332E+03
1,352E+03
1,373E+03
1,393E+03
1,414E+03
1,434E+03
1,455E+03
1,475E+03
1,496E+03
1,516E+03
1,537E+03
1,557E+03
1,577E+03
1,598E+03
1,618E+03
1,639E+03
1,659E+03
1,680E+03
1,700E+03
1,721E+03
1,741E+03
1,762E+03
1,782E+03
1,802E+03
1,823E+03
1,843E+03
1,864E+03
1,884E+03
1,905E+03
1,925E+03
1,946E+03
1,966E+03
1,987E+03
2,007E+03
2,028E+03
2,048E+03

```
MM =    5
    -0,31519E+03 0,17974E+03-0,37227E+02 0,33888E+01-0,11491E+00

MM =    5
      0,2645933047204195D+06  -0,1680462388626317D+06   0,3989308607314286D+05
     -0,419552196474514D+04    0,1649402671374236D+03  -0,1680462388637525D+06
      0,1067527046303882D+06  -0,2534820954058201D+05   0,2666455597892195D+04
     -0,1048510074173751D+03   0,3989308607367454D+05  -0,2534820954075071D+05
      0,6020255750379732D+04  -0,6334329479451609D+03   0,2491360882680894D+02
     -0,4195521996558237D+04   0,2666455597927598D+04  -0,6334329479493534D+03
      0,6666296654078042D+02  -0,2622516583722914D+01   0,1649402671417999D+03
     -0,1048510074194559D+03   0,2491360882713732D+02  -0,2622516583740116D+01
      0,1031927134310121D+00

 VARIANCE OF FITTING S =  0.14042E+00
```

HI	VI	VO	SIG
0,549675E+01	0,594201E+01	0,593864E+01	0,140470E+01
0,584034E+01	0,615231E+01	0,616956E+01	0,288339E+01
0,609550E+01	0,613243E+01	0,612071E+01	0,280563E+01
0,665794E+01	0,568365E+01	0,568108E+01	0,183569E+01
0,676550E+01	0,559117E+01	0,557663E+01	0,182748E+01
0,687118E+01	0,548001E+01	0,547388E+01	0,284396E+01
0,701399E+01	0,531065E+01	0,533797E+01	0,226042E+00
0,724997E+01	0,510169E+01	0,512869E+01	0,153816E+01
0,601852E+01	0,616111E+01	0,615026E+01	0,161721E+01
0,637404E+01	0,594096E+01	0,593813E+01	0,149850E+01
0,653486E+01	0,576810E+01	0,579748E+01	0,205690E+01
0,710076E+01	0,526895E+01	0,525837E+01	0,987116E+00
0,716962E+01	0,523164E+01	0,519730E+01	0,125553E+01


EFFICIENCY CURVE
X-AXIS
4,116E+02
4,199E+02
4,284E+02
4,370E+02
4,459E+02
4,549E+02
4,641E+02
4,734E+02
4,830E+02
4,927E+02
5,027E+02
5,129E+02
5,232E+02
5,338E+02
5,446E+02
5,556E+02
5,668E+02
5,782E+02
5,899E+02
6,018E+02
6,140E+02
6,264E+02
6,391E+02
6,520E+02
6,651E+02
6,786E+02
6,923E+02
7,063E+02
7,205E+02
7,351E+02
7,499E+02
7,651E+02
7,806E+02
7,963E+02
8,124E+02
8,288E+02
8,456E+02
8,626E+02
8,801E+02
8,978E+02
9,160E+02
9,345E+02
9,534E+02
9,726E+02
9,923E+02
1,012E+03
1,033E+03
1,054E+03
1,075E+03
1,097E+03

77-01-18 ************** GAMMA SPECTRUM ANALYSIS OF THE SET OF 4 STANDARD SPECTRA

BY BOB75 ***************

. FINAL RESULTS .

UNIT OF THE ACTIVITY = 0,1000E+05 DPS

PEAK NO.	PEAK CH.	ENERGY(KEV)	PT. ERROR	PEAK AREA	PT. ERROR	ACTIVITY	PT. ERROR
1	179,87	71,150	0,856	221,81	2,96	0,53001E+03	588,79
2	184,95	73,263	0,818	400,47	2,31	0,68779E+03	513,68
3	208,80	83,182	0,671	205,45	4,40	0,95119E+02	293,75
4	214,95	85,739	0,639	72,02	7,82	0,25087E+02	258,90
5	596,81	243,897	0,056	1554,87	0,66	0,40981E+01	2,04
6	721,80	295,447	0,030	118,42	5,53	0,26082E+00	5,73
7	803,42	329,062	0,024	28,34	18,55	0,59755E-01	18,61
8	839,46	343,896	0,022	6730,24	0,22	0,14081E+02	1,36
9	841,41	344,699	0,022	307,78	0,99	0,64374E+00	1,67
10	896,94	367,541	0,021	228,97	2,79	0,47821E+00	3,04
11	941,46	385,844	0,020	32,04	14,54	0,67306E-01	14,58
12	1002,61	410,970	0,019	578,48	1,19	0,12338E+01	1,55
13	2116,94	867,401	0,009	601,34	1,06	0,22763E+01	1,54
14	2243,69	919,255	0,008	57,45	6,61	0,23010E+00	6,72
15	2261,35	926,478	0,008	32,16	11,09	0,12981E+00	11,15
16	2353,27	964,082	0,008	1864,37	0,42	0,78208E+01	1,34
17	2432,60	996,531	0,007	8,87	26,91	0,38413E-01	26,94
18	2453,70	1005,165	0,007	95,61	3,75	0,41750E+00	3,97
19	2650,98	1085,869	0,007	1156,86	0,58	0,54366E+01	1,46
20	2660,49	1089,758	0,007	196,15	1,42	0,92494E+00	1,95
21	2707,61	1109,035	0,007	20,82	4,02	0,99774E-01	4,24
22	2715,07	1112,083	0,007	1525,47	0,47	0,73308E+01	1,41
23	2961,53	1212,888	0,007	143,28	2,16	0,74560E+00	2,51
24	3048,74	1248,553	0,007	3,24	55,82	0,17324E-01	55,84
25	3112,75	1274,721	0,007	29,69	6,33	0,16149E+00	6,48
26	3157,64	1293,074	0,007	7,82	16,47	0,43067E-01	16,54
27	3172,99	1299,350	0,007	159,21	1,56	0,88067E+00	2,15
28	3439,10	1408,068	0,010	1859,41	0,37	0,11016E+02	2,42
29	3560,28	1457,526	0,015	41,37	2,65	0,25218E+00	4,05
30	3567,96	1460,659	0,016	17,55	4,09	0,10719E+00	5,13
31	3732,33	1527,679	0,027	19,62	3,89	0,12421E+00	5,75
32	1082,69	443,854	0,018	768,64	0,96	0,16886E+01	1,36
33	1191,87	488,652	0,016	91,02	6,05	0,21049E+00	6,14
34	1227,29	503,179	0,015	37,97	13,05	0,89434E-01	13,09
35	1246,58	511,089	0,015	31,10	15,21	0,74005E-01	15,25
36	1375,59	563,967	0,013	97,84	5,89	0,25008E+00	6,01
37	1381,88	566,545	0,013	28,69	11,13	0,73585E-01	11,19
38	1430,40	586,423	0,012	90,44	6,07	0,23848E+00	6,19
39	1601,70	656,569	0,011	22,65	18,31	0,65805E-01	18,34
40	1656,14	678,857	0,010	80,72	6,02	0,24178E+00	6,12
41	1680,27	688,734	0,010	144,23	3,72	0,43777E+00	3,88
42	1755,34	719,456	0,010	52,64	8,83	0,16640E+00	8,90
43	1867,27	765,259	0,010	35,44	11,91	0,11879E+00	11,96
44	1900,72	778,943	0,010	1999,04	0,44	0,68165E+01	1,12
45	1978,22	810,653	0,009	48,78	8,93	0,17286E+00	8,99

********** END OF BOB75

***** CALCULATION TIME 2 SEC **

Table 7.3 List of input data for the analysis of a ^{237}Pu spectrum.

```
12345678901234567890123456789012345678901234567890123456789012345678901234567890
 2 1   1 1   1     2    50 2 1   1 1   1
          0.86   -00          2.0    -031.3    +01          -6.0   -03
GEOS-3   PU-237                     50
   12048  71   2
          [Spectrum Data]  (cf. Table 7.4)
   11    6    5.1     180.7                      1.0
   11.886    13.944    17.749    20.826    26.34     33.20     59.54     97.077
  101.068   114.241   117.589
```

共通E 173

* 73～75 : DATAID / 76～80 : SEQUENTIAL NUMBER

Table 7.4 List of output of the analysis of a ^{237}Pu spectrum

```
77-01-19              ***************   GAMMA SPECTRUM ANALYSIS OF  PU-237

                                                        BY BOB75   ***************               GEOS-3  -   1

     ***** DATE OF MEASUREMENT          0         TIME OF MEASUREMENT      0 *****

  GEOS-3   = BOB75   IDENTIFICATION                            NO  = LIVE TIME CORRECTION
       1 = INITIAL CHANNEL OF DATA                              50 = COUNTING DURATION (LIVE TIME) (KSEC )
    2048 = FINAL CHANNEL OF DATA                               0,0 = PERCENT DEAD TIME
    2048 = NUMBER OF DATA POINTS                               NO  = PLOTTING
      75 = INITIAL CHANNEL OF ANALYSIS                         NO  = ENERGY ASSIGNMENT
    2044 = FINAL CHANNEL OF ANALYSIS                           NO  = EFFICIENCY CORRECTION
    1970 = NUMBER OF ANALYZING POINTS                            0 = ORDER OF ENERGY ASSIGNMENT POLYNOMIAL
       5 = POINTS USED IN SMOOTHING                              0 = ORDER OF EFFICIENCY CORRECTION POLYNOMIAL
       5 = POINTS USED IN DERIVATIVE                           NO  = COEFFICIENTS EVALUATED INTERNALLY
     NO  = STORED STANDARD                                     NO  = COEFFICIENTS GIVEN EXTERNALLY
     YES = PEAK FITTING

  ALL PEAKS WERE FITTED TO THE FUNCTION WITH FOLLOWING PROPERTIES

  1/99 POWER   = BACK-GROUND SHAPE
  0,8600       = SKEWNESS OF GAUSSIAN FUNCTION
  0,00200000   = PEAK RATIO OF TAIL TO MAIN-PEAK
  13,0000000   = DISTANCE(CH,NO.) BETWEEN THE CENTRES OF TAIL AND MAIN-PEAK
  BUILT-IN WT.= WEIGHT IN FITTING PROCESS

  FILTRATION OF SMALL PEAKS
```

77-01-19 *************** GAMMA SPECTRUM ANALYSIS OF PU-237

BY BOB75 *************** GEOS-3 - 2

INPUT DATA (FROM 1 CH. TO 2048 CH.)

CH. NO.																				
1 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 -	0	0	0	0	0	2	230	1691	2798	1846	1161	927	1062	1071	1083	1162	1257	1428	1546	1572
81 -	1562	1442	1272	1241	1249	1317	1596	1990	2447	3369	3790	3876	3469	2757	2017	1598	1464	1761	2571	4079
101 -	4954	4820	3463	2515	1862	1200	993	960	1199	1189	1120	1005	892	783	783	779	752	730	739	768
121 -	823	875	913	914	834	868	886	909	988	1052	1233	1336	1238	1189	1475	1522	1466	1281	1188	1206
141 -	1315	1407	1682	2291	3851	6138	7181	5940	3731	2068	1383	1142	1143	1243	1328	1310	1190	1133	1149	1236
161 -	1377	1558	2014	2655	4351	7942	16161	33197	62129	86411	85193	56508	25381	8368	2819	1352	1002	832	838	780
181 -	756	734	753	738	771	753	910	869	958	1358	1887	2263	2623	2720	2938	2849	2425	2351	2461	4074
201 -	8357	16201	24646	29176	27717	22641	16323	10571	8064	9955	17813	31585	44051	45465	35407	23845	14737	7840	3739	1857
221 -	1371	1473	1803	1996	1752	1364	932	755	566	505	545	546	531	569	517	648	696	839	1221	1436
241 -	1506	1294	1144	1516	3112	6385	10045	11375	10012	7723	6647	6337	6558	6742	6230	4919	3302	1889	1152	965
261 -	1175	1674	2337	2471	2020	1480	960	659	521	424	424	394	393	396	403	392	451	391	468	396
281 -	427	409	371	447	405	394	428	447	429	409	400	406	413	421	421	443	393	444	410	425
301 -	429	415	411	413	387	450	523	770	1233	1529	1500	1127	760	500	385	388	363	370	361	396
321 -	382	391	346	364	374	336	361	363	346	366	342	354	372	340	311	335	286	331	349	342
341 -	300	333	317	316	324	273	293	294	306	306	268	298	286	293	281	292	295	274	269	309
361 -	270	274	295	309	289	265	269	284	303	301	284	270	273	261	274	273	274	245	274	282
381 -	265	274	286	290	397	462	601	610	507	406	306	241	272	260	270	223	260	242	249	242
401 -	249	237	234	233	249	251	238	253	247	242	257	231	237	211	233	257	251	230	238	234
421 -	241	222	211	243	196	215	211	199	223	209	220	215	200	220	197	226	218	213	221	193
441 -	226	205	207	211	199	206	185	222	183	215	194	187	177	213	181	192	192	201	206	195
461 -	170	209	193	213	209	196	202	213	163	194	202	227	201	195	190	208	187	213	193	198
481 -	232	163	209	213	193	202	210	217	212	199	214	204	205	205	213	221	223	194	201	196
501 -	197	219	220	198	226	208	181	200	192	224	188	198	222	187	192	184	201	209	193	210
521 -	232	220	217	217	192	190	212	187	194	198	196	200	213	211	212	228	204	241	218	211
541 -	183	218	210	192	209	218	225	206	185	203	250	213	223	206	210	205	219	219	218	267
561 -	263	214	225	232	225	204	226	224	250	250	283	300	294	276	281	263	236	213	241	238
581 -	228	236	238	228	255	265	268	270	244	258	277	269	241	262	276	276	274	285	243	287
601 -	301	269	274	259	287	302	280	272	259	254	222	266	253	232	277	278	245	273	245	261
621 -	271	251	244	246	235	233	263	263	231	268	231	253	259	243	257	255	242	281	270	245
641 -	255	272	246	253	272	275	244	258	269	254	227	266	266	255	258	276	296	290	281	305
661 -	285	296	299	337	288	320	301	290	323	323	331	325	326	361	370	348	388	508	748	1374
681 -	3307	6251	10096	13439	13959	11105	7254	3653	1517	679	360	260	272	292	232	250	266	260	262	257
701 -	270	279	255	242	271	266	259	260	236	267	271	274	301	268	279	313	276	258	296	320
721 -	289	256	279	295	261	279	316	264	287	293	286	294	273	285	288	275	291	292	262	264
741 -	271	268	290	264	297	328	294	303	292	287	310	266	320	306	273	302	299	309	291	314
761 -	303	289	310	330	317	351	331	345	359	365	346	306	290	320	328	348	379	322	333	306
781 -	337	317	351	348	368	385	438	471	453	460	399	398	376	367	390	395	388	384	379	380
801 -	395	371	392	402	407	389	440	423	440	426	477	391	425	434	465	459	464	440	502	505
821 -	504	523	517	535	623	622	630	762	1008	1326	1992	2922	3564	3734	3566	2739	1884	1231	863	730
841 -	613	621	538	607	617	556	624	574	610	602	697	818	1090	1682	2646	3891	5285	6056	5744	4795
861 -	3429	2152	1307	837	671	533	495	476	493	464	476	459	468	467	464	481	470	450	478	412
881 -	457	432	462	507	482	453	465	488	561	480	525	540	513	476	485	510	494	482	465	492
901 -	476	476	504	459	519	516	479	511	461	505	501	490	487	519	533	499	499	524	526	534
921 -	535	472	474	540	536	527	482	489	488	489	476	463	515	530	516	498	534	480	473	488
941 -	478	465	443	477	501	455	504	468	483	478	461	428	454	466	461	480	469	460	497	545
961 -	648	737	968	1077	1235	1300	1319	1468	1595	1672	1646	1438	1188	899	649	539	481	424	438	367
981 -	391	392	406	362	412	352	373	363	366	409	377	490	522	590	722	769	838	847	718	688
1001 -	617	501	469	480	441	363	357	345	348	350	326	372	337	370	364	327	339	335	330	386
1021 -	309	331	323	318	361	377	367	365	385	343	381	359	381	384	353	343	373	401	396	430
1041 -	467	361	374	399	344	365	392	377	347	333	366	352	367	335	350	355	355	386	388	376
1061 -	377	359	371	343	389	369	374	381	379	385	422	400	399	401	388	453	428	414	446	473
1081 -	467	471	474	468	542	537	558	607	596	578	649	655	718	791	849	1032	1097	1327	1643	2199
1101 -	3154	5161	8430	12965	18559	23428	25246	24050	19995	14717	9463	5643	3321	2016	1279	977	834	626	588	577
1121 -	558	538	525	524	488	477	516	531	510	542	502	601	625	640	671	758	818	800	925	1000
1141 -	1090	1251	1559	2060	2937	4704	7869	12767	19715	27126	33966	36988	35078	28867	20951	13834	8074	4544	2546	1517
1161 -	1081	766	592	524	437	348	330	293	266	275	209	205	198	192	160	210	186	167	185	185
1181 -	209	195	219	169	160	166	141	140	136	121	117	88	109	88	102	106	108	113	117	102
1201 -	94	108	82	98	114	119	146	170	183	206	151	159	91	103	93	80	100	75	75	77
1221 -	92	92	77	78	90	85	92	67	98	98	89	69	66	92	89	82	81	74	99	101
1241 -	94	78	88	95	92	80	75	93	85	86	97	93	79	119	103	103	110	127	126	121
1261 -	115	115	137	125	127	114	131	114	131	122	160	164	149	138	183	194	181	204	213	239
1281 -	285	331	496	702	1044	1544	2090	2877	3430	3714	3371	3045	2520	2151	2169	2656	3567	4770	5933	6480
1301 -	6434	5784	4529	3242	2192	1467	1099	772	649	529	452	314	216	190	166	117	119	91	129	124
1321 -	108	125	131	118	117	134	155	192	217	342	511	728	1045	1396	1777	1988	2228	2245	2058	1793
1341 -	1387	1038	830	682	608	690	746	738	765	600	492	405	234	142	94	80	64	42	30	25
1361 -	27	24	12	23	28	20	18	21	23	30	24	27	14	17	14	11	10	13	17	20
1381 -	17	14	13	10	16	16	12	15	14	13	6	16	11	7	9	2	9	8	11	9
1401 -	11	13	20	9	10	7	13	9	13	14	8	9	7	10	6	8	12	7	15	5
1421 -	11	8	13	12	8	8	8	8	6	6	7	9	6	11	10	7	10	9	4	9
1441 -	7	12	6	11	7	7	9	5	6	11	9	9	9	7	12	8	6	10	15	7
1461 -	6	5	9	6	9	11	6	4	8	7	8	10	5	11	4	10	7	10	9	6
1481 -	8	6	8	4	6	8	8	7	6	14	15	10	6	4	4	10	11	6	8	5
1501 -	13	7	7	9	12	13	4	8	8	7	9	8	5	8	1	9	8	7	5	7
1521 -	9	9	9	6	7	5	9	9	6	6	6	8	8	4	8	5	5	4	7	6
1541 -	4	6	3	8	8	6	1	10	4	5	5	8	7	5	6	4	8	4	10	10
1561 -	3	7	4	6	5	9	11	5	5	9	4	8	6	5	4	5	4	9	8	7
1581 -	4	5	4	7	9	8	5	6	5	5	5	5	4	5	7	7	6	10	7	5
1601 -	6	3	7	5	11	5	5	6	7	5	4	7	9	5	8	3	7	7	5	4
1621 -	9	4	5	0	8	9	8	9	8	6	7	5	10	7	3	4	6	7	7	6
1641 -	7	7	7	13	6	3	9	6	6	3	6	11	4	10	5	5	5	4	2	2
1661 -	6	4	4	4	6	7	4	4	6	7	5	6	6	5	3	0	7	5	4	5
1681 -	3	6	9	6	1	1	5	5	6	6	8	3	7	6	3	6	8	1	11	10
1701 -	1	5	4	7	8	8	4	5	3	5	5	5	5	9	5	5	7	1	7	5
1721 -	6	5	5	3	5	6	5	5	8	9	4	7	5	6	4	8	3	6	9	4
1741 -	4	8	5	11	6	4	8	4	8	1	5	4	5	7	4	5	5	3	1	6
1761 -	6	3	6	2	1	7	4	6	7	4	11	6	7	4	13	10	7	6	10	5
1781 -	5	6	5	7	9	4	3	5	5	1	5	4	2	5	5	3	1	3	2	2
1801 -	3	7	4	11	5	5	7	6	5	5	4	3	5	6	10	4	3	6	7	15
1821 -	7	10	6	6	9	6	4	5	5	6	3	7	7	2	6	0	1	9	5	5
1841 -	2	7	7	4	4	2	5	2	4	2	5	4	6	3	5	7	3	4	3	2
1861 -	8	3	4	7	5	4	5	3	5	3	4	6	4	5	7	6	6	7	6	4
1881 -	5	5	3	2	6	5	5	5	7	3	2	7	6	5	5	6	3	5	5	6
1901 -	5	6	9	2	3	4	2	1	2	5	2	4	5	5	2	2	2	2	2	4
1921 -	5	1	0	4	6	5	3	4	1	3	6	6	5	2	3	3	4	4	4	7
1941 -	3	5	4	4	5	5	7	1	4	3	8	6	7	6	6	4	2	2	8	3
1961 -	4	3	5	3	2	3	4	1	5	6	5	1	3	2	5	1	6	6	4	1
1981 -	4	4	7	4	7	0	3	6	1	2	0	3	4	3	6	6	2	6	4	6
2001 -	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2041 -	0	0	0	0	0	0	0	0												

77-01-19 *************** GAMMA SPECTRUM ANALYSIS OF PU-237

BY BOB75 *************** GEOS-3 - 3

SMOOTHED DATA (FROM 1 CH, TO 2048 CH,)

CH, NO,																				
1 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1093	1152	1273	1420	1538	1583
81 -	1551	1431	1297	1231	1238	1338	1592	1951	2564	3272	3818	3846	3461	2751	2050	1582	1469	1752	2701	3997
101 -	4940	4662	3613	2531	1796	1264	961	1013	1138	1204	1117	1009	883	802	775	775	752	733	738	771
121 -	821	876	915	694	862	855	883	919	971	1080	1227	1304	1235	1263	1414	1536	1445	1298	1191	1214
141 -	1289	1411	1642	2363	4001	6058	6979	5923	3824	2151	1355	1137	1141	1241	1320	1296	1203	1134	1150	1236
161 -	1356	1586	1932	2658	4189	7817	16256	34879	62498	84792	82879	57234	27027	8774	2440	1178	922	852	809	792
181 -	751	744	739	754	743	803	857	891	996	1365	1851	2296	2569	2790	2904	2788	2498	2224	2474	4098
201 -	8687	16334	24437	28795	27717	22690	16248	10702	8028	10094	18427	31802	43252	44575	35922	24205	14666	7940	3760	1856
221 -	1333	1473	1797	1945	1769	1347	981	720	580	515	531	542	549	533	563	610	699	886	1184	1450
241 -	1465	1264	1123	1537	3261	6507	9843	11192	9980	7945	6629	6366	6566	6694	6179	4918	3305	1940	1154	961
261 -	1176	1723	2282	2424	2053	1472	982	665	506	440	408	401	391	398	394	416	413	437	422	431
281 -	411	400	402	414	417	400	425	442	431	410	402	405	414	418	432	420	424	417	427	420
301 -	426	418	414	400	404	429	533	806	1214	1517	1468	1148	765	506	395	370	372	361	374	382
321 -	395	374	362	361	361	353	353	359	358	352	351	356	363	340	326	310	311	320	350	332
341 -	320	317	323	321	307	292	283	299	306	295	287	283	294	286	287	291	290	275	282	288
361 -	283	274	295	304	289	269	268	286	300	300	284	274	267	268	269	277	264	259	268	277
381 -	270	272	276	312	375	489	582	602	517	403	304	258	255	272	251	247	241	252	243	247
401 -	242	247	242	244	245	247	246	247	247	249	246	243	225	222	232	253	249	237	233	239
421 -	235	222	224	220	216	206	209	209	211	218	216	212	211	205	213	215	221	218	208	211
441 -	210	213	207	206	206	195	204	198	206	199	201	181	191	194	195	186	195	201	205	188
461 -	187	191	206	207	208	200	206	195	184	182	211	215	209	191	197	195	202	199	199	208
481 -	209	205	201	208	200	199	211	216	209	207	206	208	203	206	213	223	215	204	195	196
501 -	202	216	214	212	215	206	192	188	207	205	201	202	207	200	184	190	199	203	200	211
521 -	225	224	219	210	196	196	199	197	191	197	197	202	209	212	218	215	223	224	228	201
541 -	199	206	209	200	205	221	221	205	189	212	229	231	213	213	205	210	215	216	231	257
561 -	255	228	220	231	220	215	216	233	240	261	282	300	292	283	276	263	233	224	232	238
581 -	232	234	233	237	250	265	271	262	253	258	274	264	252	258	274	276	281	267	265	277
601 -	299	291	271	267	284	296	286	269	263	242	242	250	251	248	267	271	263	254	258	259
621 -	265	255	246	242	235	240	258	254	252	244	249	247	254	251	253	250	256	269	269	252
641 -	257	261	254	254	271	267	253	263	276	255	241	255	266	257	259	277	292	289	291	292
661 -	295	289	313	312	314	304	303	300	313	328	327	324	333	356	362	354	386	489	692	1478
681 -	3291	6362	10175	13267	13708	11202	7257	3771	1569	638	343	260	271	271	252	245	262	264	259	261
701 -	271	273	256	251	262	268	263	250	250	258	271	283	285	279	285	297	281	267	294	312
721 -	289	266	277	283	273	285	293	286	279	291	292	285	282	282	284	283	289	285	270	261
741 -	274	285	288	286	304	312	309	295	292	297	288	294	302	303	288	290	306	300	303	305
761 -	302	295	310	320	333	335	341	343	360	363	342	308	298	311	331	356	357	344	316	324
781 -	319	334	338	355	362	393	436	462	467	441	417	388	377	373	385	394	390	383	379	385
801 -	383	383	387	404	398	409	420	437	426	452	438	425	409	443	456	467	451	462	485	508
821 -	510	515	517	553	601	621	641	765	981	1357	2032	2890	3537	3773	3484	2773	1897	1242	877	702
841 -	641	582	577	590	599	594	585	603	586	621	680	814	1100	1694	2650	3946	5258	5978	5763	4770
861 -	3443	2146	1308	855	641	546	487	484	479	477	465	467	464	466	470	475	467	467	448	445
881 -	431	446	466	494	484	459	459	509	520	517	513	536	511	483	487	501	499	477	477	478
901 -	487	495	487	487	502	510	501	483	488	489	503	489	494	517	523	507	502	517	530	538
921 -	519	462	484	522	544	517	495	483	490	486	472	477	506	529	513	515	510	494	475	482
941 -	480	459	454	476	482	485	477	486	476	479	454	441	448	462	469	473	468	467	490	555
961 -	629	773	931	1104	1219	1289	1347	1457	1597	1675	1628	1450	1181	897	665	536	471	443	409	393
981 -	378	401	387	393	378	378	360	364	378	380	415	461	530	605	700	785	838	820	750	676
1001 -	606	516	473	469	439	389	355	346	349	340	347	346	359	360	358	339	332	331	352	349
1021 -	340	317	322	328	354	374	369	373	366	367	360	373	377	378	356	348	372	392	405	438
1041 -	439	402	380	376	364	360	381	373	348	344	351	365	352	348	345	352	363	380	387	381
1061 -	370	369	355	365	369	379	373	379	378	395	407	408	399	391	410	430	434	421	444	467
1081 -	472	471	466	489	519	546	566	595	592	599	625	669	716	777	882	987	1128	1307	1643	2155
1101 -	3199	5187	6462	13108	18612	23224	25236	23923	20028	14703	9578	5690	3318	1989	1291	973	795	658	579	573
1121 -	558	538	529	515	491	485	511	522	528	513	538	577	629	639	682	755	795	835	903	1001
1141 -	1088	1254	1547	2032	2938	4719	7871	12930	19668	27316	33783	36838	34910	28875	21118	13807	8209	4532	2530	1525
1161 -	1039	771	600	512	432	362	320	293	278	254	226	199	199	187	192	197	188	174	177	194
1181 -	197	211	200	181	162	157	148	138	133	126	107	102	95	98	97	106	109	114	113	103
1201 -	101	96	93	95	110	124	145	168	192	166	175	134	113	93	92	90	87	83	72	80
1221 -	90	89	80	80	85	91	81	82	89	100	86	70	72	85	90	84	77	82	93	102
1241 -	91	83	86	94	91	80	81	86	88	88	94	88	94	103	110	102	113	123	127	121
1261 -	114	121	128	132	121	123	120	125	120	135	152	163	147	150	174	190	190	197	215	241
1281 -	273	348	481	708	1055	1518	2147	2839	3458	3628	3445	2996	2531	2164	2180	2663	3584	4791	5882	6483
1301 -	6433	5735	4555	3258	2197	1497	1058	803	628	541	434	320	225	186	157	130	104	109	117	123
1321 -	116	122	128	120	119	132	158	180	231	337	507	738	1040	1413	1743	2027	2205	2236	2074	1771
1341 -	1397	1052	822	676	631	678	734	766	724	624	498	382	251	140	96	77	62	44	30	26
1361 -	26	21	17	21	26	22	18	20	25	27	28	22	19	15	14	11	10	13	17	19
1381 -	17	15	12	12	15	15	14	14	15	11	11	16	12	9	9	6	9	10	9	10
1401 -	10	15	15	13	8	10	10	11	12	12	10	7	9	8	7	9	9	12	15	10
1421 -	11	11	12	12	9	8	8	7	6	6	8	7	8	9	10	9	9	8	7	9
1441 -	10	12	10	11	8	8	7	6	7	9	10	9	8	9	10	9	7	11	12	9
1461 -	5	6	7	8	9	10	7	5	6	8	9	8	9	11	8	10	9	9	9	7
1481 -	7	6	6	6	6	8	8	6	8	13	14	11	6	4	5	9	10	8	8	9
1501 -	13	9	7	9	12	10	7	6	8	8	8	8	8	8	5	9	9	6	6	7
1521 -	9	9	7	8	6	6	8	9	7	6	7	8	7	6	8	6	4	5	6	6
1541 -	5	6	5	7	8	6	5	10	7	4	6	7	7	6	5	6	8	7	9	8
1561 -	6	7	6	5	6	9	9	6	6	9	7	6	7	5	5	4	6	7	9	6
1581 -	5	4	5	7	9	8	6	5	5	5	5	5	4	5	7	7	8	8	8	6
1601 -	6	5	7	8	11	7	5	6	6	5	5	7	7	7	8	6	6	7	5	6
1621 -	9	6	5	3	8	9	9	9	8	7	6	7	8	7	4	4	6	7	7	7
1641 -	7	7	9	10	7	5	9	8	5	4	7	11	8	10	7	5	5	4	2	3
1661 -	6	5	4	4	6	6	5	4	6	6	6	6	6	5	2	3	7	6	5	4
1681 -	4	6	8	6	2	2	4	6	6	7	8	6	6	6	4	6	8	6	8	8
1701 -	4	5	5	6	8	7	5	5	4	4	5	5	6	7	6	6	7	4	7	6
1721 -	5	6	4	4	5	6	5	6	8	7	6	6	7	5	6	8	5	6	7	5
1741 -	5	8	8	11	7	5	8	7	8	4	5	5	5	6	5	5	5	3	3	5
1761 -	5	5	6	3	3	7	6	6	6	7	11	8	7	7	10	11	7	7	8	7
1781 -	5	5	6	7	7	5	3	5	4	3	5	4	3	4	5	3	2	2	2	2
1801 -	4	7	7	11	7	5	6	6	5	5	4	4	4	7	8	5	3	5	10	15
1821 -	11	8	7	7	8	6	5	4	6	5	5	6	6	5	6	1	3	9	7	5
1841 -	4	6	7	5	4	4	5	4	4	4	5	5	6	4	5	6	5	3	3	4
1861 -	8	5	4	6	5	5	4	4	5	4	4	5	5	5	6	6	6	7	6	5
1881 -	5	5	3	3	5	6	5	6	6	4	3	5	6	5	5	5	4	4	6	5
1901 -	5	7	9	4	3	3	2	1	3	5	3	3	5	4	3	2	2	2	2	4
1921 -	4	2	1	3	6	5	4	4	2	3	5	6	4	3	2	3	4	4	5	7
1941 -	5	4	4	4	5	6	7	4	4	5	6	7	6	7	6	4	2	4	8	5
1961 -	4	4	4	3	2	3	4	3	4	6	4	3	2	4	5	4	5	6	3	2
1981 -	4	5	7	6	7	3	3	6	3	1	1	2	3	4	5	5	4	6	6	6
2001 -	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2021 -	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2041 -	1	1	1	1	0	0	0	0												

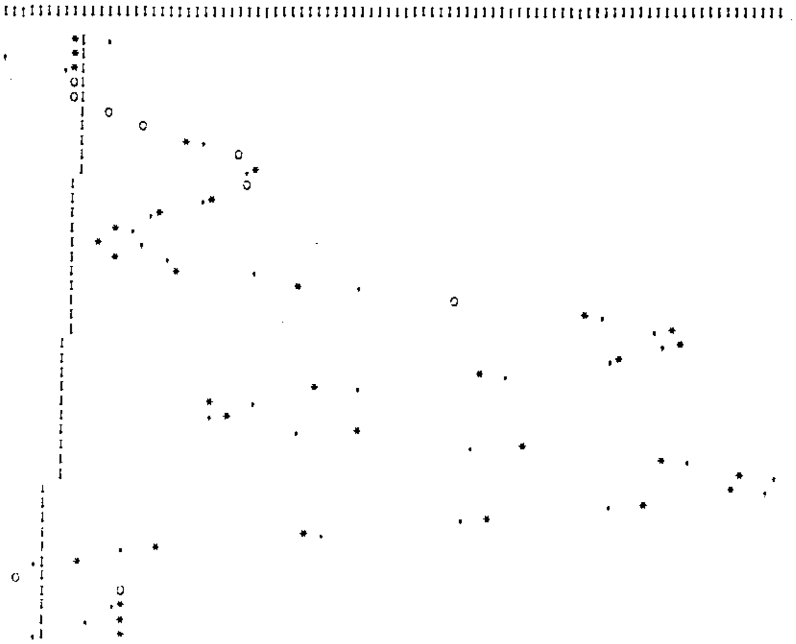
***** FIRST PEAK SHOULD BE CHECKED *****

RESULTS OF THE GAUSSIAN FITTING OF PHOTOPEAKS

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
1	75	101,37	108	37605	34033,6	325,1	3901,2

********** ID NO, 1 FROM 75 TO 108 CHANNEL

YMIN= 927,0 LOGARITHMIC SCALE YMAX= 4954,0



CH	BG	CAL	OBS
71	1092,9	1071,0	1161,0
72	1092,9	1071,0	927,0
73	1092,9	1071,0	1062,0
74	1092,9	1071,0	1071,0
75	1092,9	1083,0	1083,0
76	1092,8	1162,4	1162,0
77	1092,8	1252,5	1257,0
78	1092,8	1387,1	1428,0
79	1092,7	1528,3	1546,0
80	1092,7	1610,2	1572,0
81	1087.2	1576,3	1562,0
82	1087,1	1445,9	1442,0
83	1087,1	1291,6	1272,0
84	1087,1	1181,4	1241,0
85	1087,0	1140,2	1249,0
86	1087,0	1182,0	1317,0
87	1086,9	1358,7	1596,0
88	1086,9	1763,7	1990,0
89	1086,8	2450,9	2447,0
90	1086,7	3297,0	3369,0
91	1086,5	3963,0	3790,0
92	1054,0	4054,8	3876,0
93	1053,7	3500,4	3469,0
94	1053,6	2604,1	2757,0
95	1053,5	1841,7	2017,0
96	1053,4	1467,4	1598,0
97	1053,3	1525,2	1464,0
98	1053,2	2011,4	1761,0
99	1053,2	2878,8	2571,0
100	1053,0	3890,4	4079,0
101	1052,8	4596,2	4954,0
102	1013,7	4549,5	4820,0
103	1013,4	3757,5	3463,0
104	1013,3	2661,8	2515,0
105	1013,2	1779,9	1862,0
106	1013,2	1289,1	1200,0
107	1013,1	1090,0	993,0
108	1013,1	960,0	960,0
109	1013,0	1199,0	1199,0
110	1013,0	1199,0	1189,0
111	1012,9	1199,0	1120,0
112	1012,9	1199,0	1005,0

SYMBOL .=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

3 PEAKS WITH FWHM = 0.48360E+01 MEASURE OF FIT = 0,40729E-02
DEGREE OF THE OVERALL FIT = 0.75500E-03 AND BACKGROUND = 34033.6 COUNTS
CONVERGENCE LIMIT = 0.42231E-01 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0.123918E+02
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
1	80,30	516,71	2626,	85,30
2	91.70	3032,22	15640,	209.96
3	101,51	3646,29	18788.	231,87

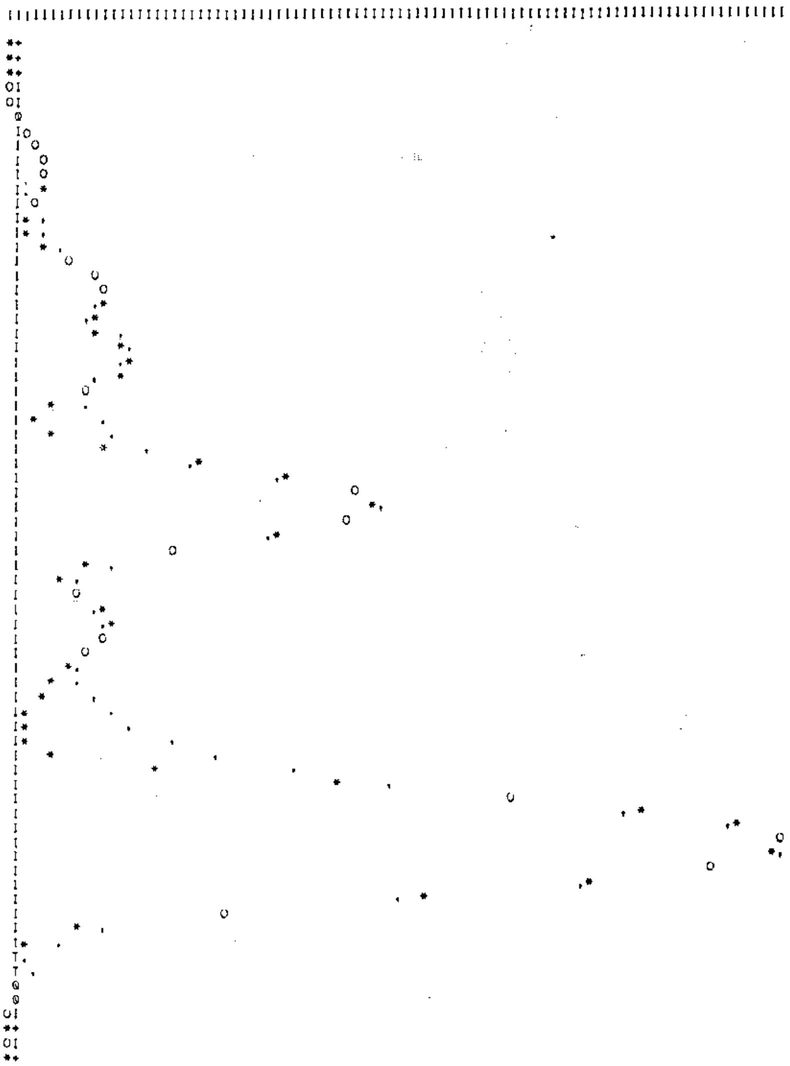
PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
2	108	109,95	116	1535	5436,4	111,4	411,8

2 GROUP---PEAK FITTING FAILED

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
3	119	170,40	181	424718	46975,1	720,2	85638,7

*********** ID NO, 3 FROM 119 TO 181 CHANNEL

YMIN= 730,0 LOGARITHMIC SCALE YMAX= 86411,0



CH	BG	CAL	OBS
115	775,0	730,0	783,0
116	775,0	730,0	779,0
117	775,0	730,0	752,0
118	775,0	730,0	730,0
119	775,0	739,0	739,0
120	775,0	789,4	768,0
121	775,0	813,6	823,0
122	775,0	854,7	875,0
123	775,0	898,4	913,0
124	774,9	917,2	914,0
125	774,9	893,8	834,0
126	774,9	847,2	868,0
127	774,9	816,9	886,0
128	774,9	833,0	909,0
129	774.9	917,9	988,0
130	774.9	1073,8	1052,0
131	774,9	1244,6	1233,0
132	774,8	1331,1	1336,0
133	774,8	1287,1	1238,0
134	774,8	1215,4	1189,0
135	774.7	1266,4	1475,0
136	774,7	1432,7	1522,0
137	774.7	1548,0	1466,0
138	774,5	1463,7	1281,0
139	774,5	1212,3	1188,0
140	774,5	974,9	1206,0
141	774,5	865,0	1315,0
142	774.5	934,0	1407,0
143	774.5	1336,6	1682,0
144	774.5	2374,3	2291,0
145	774,5	4162.2	3851,0
146	774,5	6089,6	6138,0
147	774,4	6950,9	7181,0
148	772,9	5960,5	5940,0
149	772.9	3848,3	3731,0
150	772.9	2071,8	2068,0
151	772,9	1209,6	1383,0
152	772.9	1015,0	1142,0
153	772,9	1123,2	1143,0
154	772,9	1297,5	1243,0
155	772.7	1384,2	1328,0
156	772.7	1317,6	1310.0
157	772.7	1171,3	1190.0
158	772,7	1049,5	1133,0
159	772.7	965,2	1149,0
160	772,7	889,1	1236,0
161	772.7	826,8	1377,0
162	772,7	793,0	1558,0
163	772.6	800,5	2014,0
164	772.6	959,7	2655,0
165	772,6	1865,2	4351,0
166	772,6	5515,9	7942,0
167	772.6	16023,9	16161,0
168	772.5	37088,9	33197,0
169	772.5	64815,1	62129,0
170	772,3	84411,0	86411,0
171	751.2	80910,2	85193,0
172	751,1	55131,4	56508,0
173	751,0	26768,8	25381,0
174	751.0	9529,8	8368,0
175	751.0	2840,0	2819,0
176	751,0	1101,5	1352,0
177	750,9	792,4	1002,0
178	750,9	754,4	832,0
179	750,9	751,1	838,0
180	750,9	750,9	780,0
181	750.9	758,0	758,0
182	750.9	734,0	734,0
183	750,9	734,0	753,0
184	750,9	734,0	738,0
185	750,8	734,0	771,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

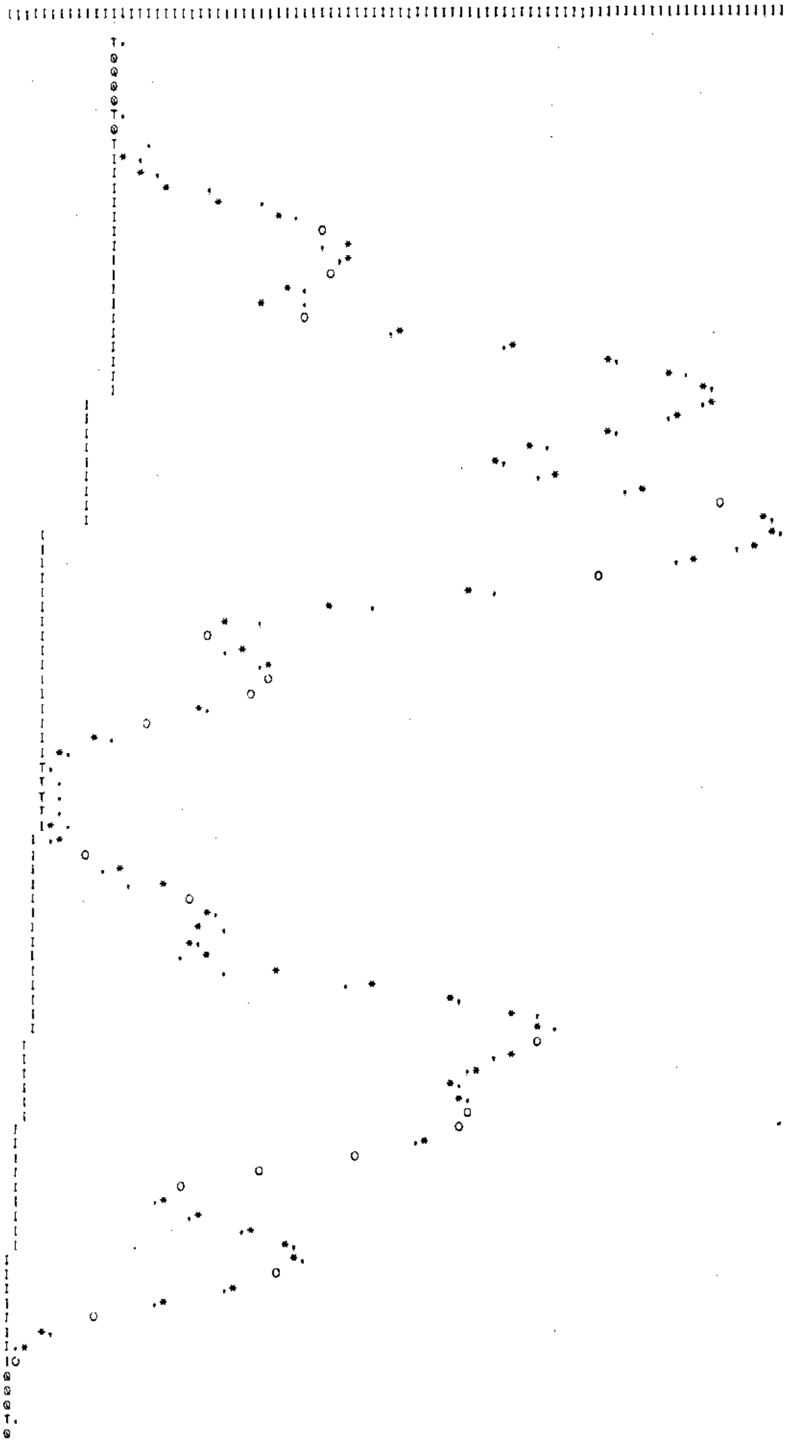
6 PEAKS WITH FWHM = 0,41409E+01 MEASURE OF FIT = 0,13716E-01
DEGREE OF THE OVERALL FIT = 0,15673E-03 AND BACKGROUND = 46975,1 COUNTS
CONVERGENCE LIMIT = 0,86072E-02 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,119776E+02
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
5	123,97	140,96	618,	27,48
6	131,99	540,17	2384,	54,00
7	137,21	765,14	3380,	64,29
8	147,00	6176,30	27279,	182,76
9	154,91	582,40	2573,	56,41
10	170,39	85559,94	377872,	680,93

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
4	184	213,68	272	518609	46674,3	782,3	44983,2

********** ID NO, 4 FROM 184 TO 272 CHANNEL

YMIN= 392,0 LOGARITHMIC SCALE YMAX= 45465,0



CH	BG	CAL	OBS
180	751,1	753,0	780,0
181	751,1	753,0	758,0
182	751,0	753,0	734,0
183	750,9	753,0	753,0
184	750,9	738,0	738,0
185	750,8	754,2	771,0
186	750,8	754,3	753,0
187	750,7	760,2	910,0
188	750,6	785,1	889,0
189	750,5	862,0	958,0
190	750,4	1052,1	1358,0
191	750,4	1426,8	1887,0
192	750,3	2003,1	2263,0
193	750,2	2662,8	2623,0
194	750,0	3152,5	2720,0
195	741,2	3220,4	2938,0
196	741,0	2807,6	2849,0
197	740,9	2184,9	2425,0
198	740,7	1842,3	2351,0
199	740,6	2354,7	2461,0
200	740,4	4444,9	4074,0
201	740,2	8860,8	8357,0
202	739,9	15665,9	16201,0
203	739,6	23314,5	24646,0
204	739,0	28762,2	29176,0
205	636,2	29107,0	27717,0
206	635,5	23796,9	22641,0
207	635,1	15867,2	16323,0
208	634,6	9570,4	10571,0
209	634,5	7646,5	8064,0
210	634,2	11061,7	9955,0
211	633,8	19451,2	17813,0
212	533,4	30627,2	31585,0
213	632,7	40234,7	44051,0
214	481,8	43399,4	45465,0
215	480,0	37897,5	35407,0
216	479,9	26376,4	23845,0
217	479,0	14719,3	14737,0
218	478,8	6741,4	7840,0
219	478,5	2798,4	3739,0
220	478,4	1467,3	1857,0
221	478,2	1357,8	1371,0
222	478,0	1657,6	1473,0
223	477,9	1942,7	1803,0
224	473,6	1985,2	1996,0
225	473,5	1723,0	1752,0
226	473,4	1293,7	1364,0
227	473,2	901,3	932,0
228	473,1	651,1	755,0
229	473,0	532,5	566,0
230	472,9	489,5	505,0
231	472,9	477,7	545,0
232	472,8	477,1	546,0
233	472,7	483,4	531,0
234	472,6	502,0	569,0
235	472,5	547,5	517,0
236	472,4	641,6	648,0
237	472,3	800,7	696,0
238	472,3	1009,1	839,0
239	472,2	1204,2	1221,0
240	472,1	1304,0	1436,0
241	468,8	1267,9	1506,0
242	468,7	1195,4	1294,0
243	468,6	1350,9	1144,0
244	468,5	2092,9	1516,0
245	468,4	3709,5	3112,0
246	468,2	6133,4	6385,0
247	468,1	8699,8	10045,0
248	467,8	10345,9	11375,0
249	432,2	10258,8	10012,0
250	432,0	8656,0	7723,0
251	431,8	6867,2	6647,0
252	431,7	6075,4	6337,0
253	431,6	6324,0	6558,0
254	431,3	6734,5	6742,0
255	409,3	6373,3	6230,0
256	409,1	5009,7	4919,0
257	409,0	3255,6	3302,0
258	408,9	1854,7	1889,0
259	408,8	1125,6	1152,0
260	408,8	1002,0	965,0
261	408,7	1286,1	1175,0
262	408,6	1759,8	1674,0
263	408,5	2177,7	2337,0
264	401,7	2308,9	2471,0
265	401,6	2055,0	2020,0
266	401,5	1539,4	1480,0
267	401,4	1023,0	960,0
268	401,4	670,8	659,0
269	401,3	494,1	521,0
270	401,3	426,6	424,0
271	401,2	406,7	424,0
272	401,2	394,0	394,0
273	401,2	393,0	393,0
274	401,1	393,0	396,0
275	401,1	393,0	403,0
276	401,0	393,0	392,0

SYMBOL .=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

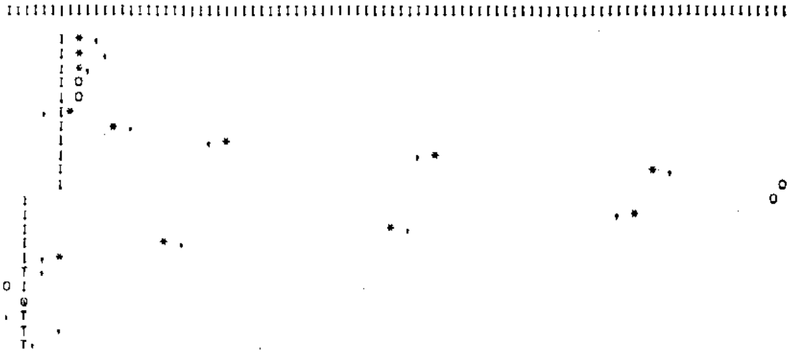
8 PEAKS WITH FWHM = 0,50912E+01 MEASURE OF FIT = 0,62503E-02
DEGREE OF THE OVERALL FIT = 0,67480E-04 AND BACKGROUND = 46674,3 COUNTS
CONVERGENCE LIMIT = 0,74303E-02 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,117179E+02
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
11	194,70	2467,56	13380,	124,05
12	204,60	28963,17	157280,	427,79
13	213,91	42957,96	233279,	523,57
14	223,68	1529,53	8306,	97,48
15	240,12	812,51	4412,	73,94
16	248,38	9915,72	53843,	256,92
17	254,41	6142,18	33353,	202,87
18	[illegible]	[illegible]	10372,	113,66

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
5	304	310.43	317	4918	4633.9	119.1	1129.3

********** ID NO. 5 FROM 304 TO 317 CHANNEL

YMIN= 361.0 LOGARITHMIC SCALE YMAX= 1529.0



CH	BG	CAL	OBS
300	400.1	411.0	425.0
301	400.1	411.0	429.0
302	400.1	411.0	415.0
303	400.1	411.0	411.0
304	400.1	413.0	413.0
305	400.0	406.7	387.0
306	400.0	436.3	450.0
307	400.0	542.1	523.0
308	399.9	797.0	770.0
309	399.9	1191.3	1233.0
310	399.7	1525.7	1529.0
311	372.6	1509.4	1500.0
312	372.5	1154.2	1127.0
313	372.4	735.6	760.0
314	372.3	486.3	500.0
315	372.3	396.5	385.0
316	372.3	375.7	388.0
317	372.3	363.0	363.0
318	372.2	370.0	370.0
319	372.2	370.0	361.0
320	372.2	370.0	396.0
321	372.2	370.0	382.0

SYMBOL .=OBS. *=CAL. I=BG. O=.AND*. +=.ANDI. T=*ANDI.@=.AND*ANDI

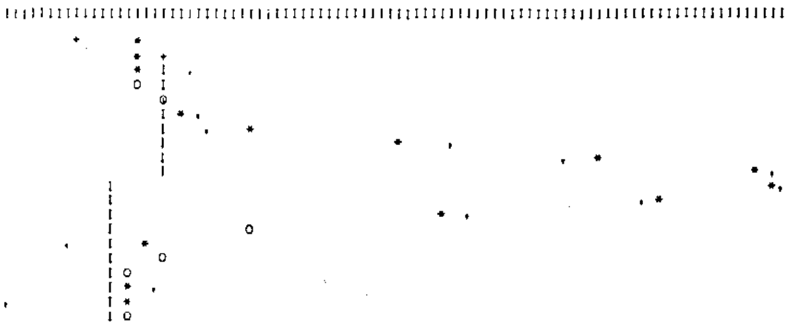
1 PEAKS WITH FWHM = 0.39075E+01 MEASURE OF FIT = -0.29696E-03
DEGREE OF THE OVERALL FIT = 0.12674E-02 AND BACKGROUND = 4633.9 COUNTS
CONVERGENCE LIMIT = 0.15606E+00 IBG = 50 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0.111374E+02
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
19	310.55	1183.84	4923.	119.12

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
6	382	387.63	393	1472	2634.1	82.1	355.2

********** ID NO. 6 FROM 382 TO 393 CHANNEL

YMIN= 223.0 LOGARITHMIC SCALE YMAX= 610.0



CH	BG	CAL	OBS
378	245.0	263.0	245.0
379	272.3	263.0	274.0
380	272.3	263.0	282.0
381	272.3	263.0	263.0
382	272.3	274.0	274.0
383	272.3	280.9	286.0
384	272.2	306.8	290.0
385	272.2	372.6	397.0
386	272.2	482.6	462.0
387	272.1	591.2	601.0
388	254.8	604.2	610.0
389	254.6	521.4	507.0
390	254.6	394.2	406.0
391	254.6	304.7	306.0
392	254.5	266.9	241.0
393	254.5	272.0	272.0
394	254.5	260.0	260.0
395	254.5	260.0	270.0
396	254.5	260.0	223.0
397	254.5	260.0	260.0

SYMBOL .=OBS. *=CAL. I=BG. O=.AND*. +=.ANDI. T=*ANDI.@=.AND*ANDI

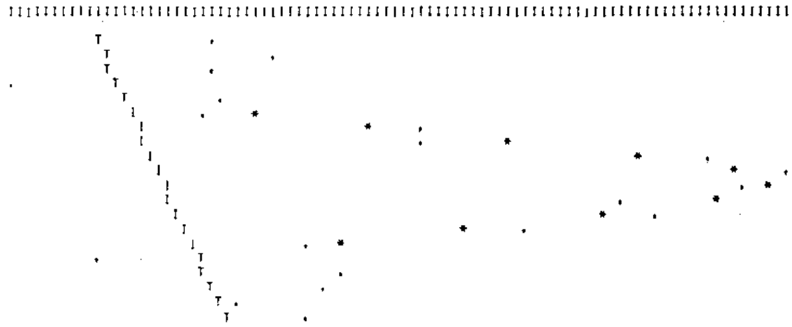
1 PEAKS WITH FWHM = 0.39849E+01 MEASURE OF FIT = -0.48798E-03
DEGREE OF THE OVERALL FIT = 0.35033E-02 AND BACKGROUND = 2634.1 COUNTS
CONVERGENCE LIMIT = 0.27279E+00 IBG = 50 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0.106742E+02
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
20	387.78	352.52	1492.	82.22

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
7	567	572.65	578	463	2199.0	69.7	73.7

********** ID NO. 7 FROM 567 TO 578 CHANNEL

YMIN= 204.0 LOGARITHMIC SCALE YMAX= 300.0



CH	BG	CAL	OBS
563	212.9	212.9	225.0
564	213.6	213.6	232.0
565	214.3	214.3	225.0
566	215.1	215.1	204.0
567	215.8	215.8	226.0
568	216.5	230.6	224.0
569	217.3	243.7	250.0
570	218.0	261.0	250.0
571	218.8	279.1	288.0
572	219.5	292.7	300.0
573	220.3	297.1	294.0
574	221.0	289.6	276.0
575	221.8	273.4	281.0
576	222.5	255.4	263.0
577	223.3	240.9	236.0
578	224.1	224.1	213.0
579	224.6	224.8	241.0
580	225.6	225.6	238.0
581	226.4	226.4	228.0
582	227.1	227.1	236.0

SYMBOL .=OBS, *=CAL, I=BG, O=.AND*, +=.ANDI, T=*ANDI,@=.AND*ANDI

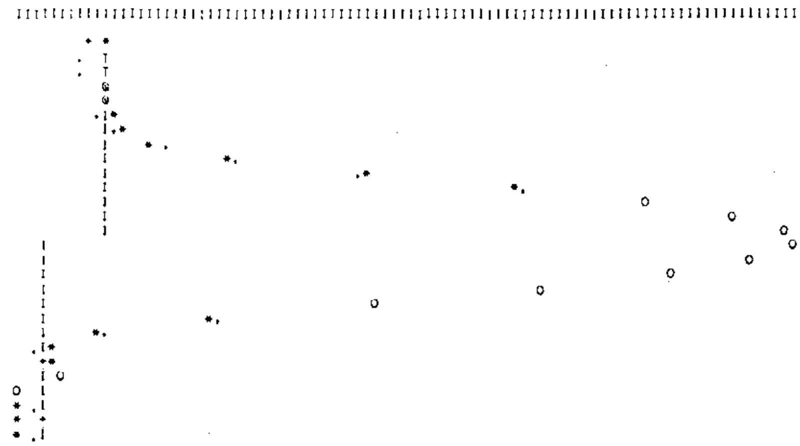
1 PEAKS WITH FWHM = 0.59422E+01 MEASURE OF FIT = -0.16852E-02
DEGREE OF THE OVERALL FIT = 0.66651E-02 AND BACKGROUND = 2199.0 COUNTS
CONVERGENCE LIMIT = 0.43059E+00 IBG = 0 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0.956411E+01
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
21	572.83	76.99	464.	69.73

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
8	675	664.63	694	69825	5693.3	285.0	13686.5

********** ID NO. 8 FROM 675 TO 694 CHANNEL

YMIN= 232.0 LOGARITHMIC SCALE YMAX= 13959.0



CH	BG	CAL	OBS
671	331.0	361.0	331.0
672	361.0	361.0	325.0
673	361.0	361.0	326.0
674	361.0	361.0	361.0
675	361.6	370.0	370.0
676	361.6	391.4	348.0
677	361.5	400.9	388.0
678	361.4	460.4	508.0
679	361.4	710.5	748.0
680	361.3	1472.7	1374.0
681	361.2	3233.1	3307.0
682	361.0	6297.4	6251.0
683	360.6	10159.2	10096.0
684	360.4	13272.4	13439.0
685	272.5	13837.5	13959.0
686	271.8	11345.7	11105.0
687	271.6	7229.0	7254.0
688	271.4	3635.4	3653.0
689	271.3	1523.1	1517.0
690	271.2	629.7	679.0
691	271.1	350.1	360.0
692	271.0	284.4	260.0
693	271.0	272.7	272.0
694	270.9	292.0	292.0
695	270.9	232.0	232.0
696	270.6	232.0	250.0
697	270.8	232.0	266.0
698	270.7	232.0	260.0

SYMBOL .=OBS, *=CAL, I=BG, O=.AND*, +=.ANDI, T=*ANDI,@=.AND*ANDI

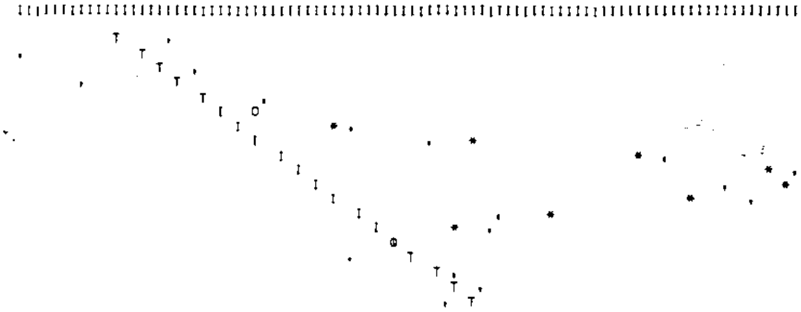
1 PEAKS WITH FWHM = 0.47818E+01 MEASURE OF FIT = 0.22047E-03
DEGREE OF THE OVERALL FIT = 0.15763E-03 AND BACKGROUND = 5693.3 COUNTS
CONVERGENCE LIMIT = 0.50549E-01 IBG = 50 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0.889225E+01
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
22	684.73	13699.75	69813.	284.95

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
9	783	788,68	793	505	3215,5	83,3	91,9

*********** ID NO. 9 FROM 783 TO 793 CHANNEL

YMIN= 306.0 LOGARITHMIC SCALE YMAX= 471,0



CH	BG	CAL	OBS
779	323,5	323,5	333,0
780	327,1	327,1	306,0
781	330,7	330,7	337,0
782	334,4	334,4	317,0
783	338,1	338,1	351,0
784	341,8	348,0	348,0
785	345,6	364,8	368,0
786	349,4	394,2	385,0
787	353,2	432,5	438,0
788	357,1	463,4	471,0
789	361,1	468,5	453,0
790	365,1	444,3	460,0
791	369,1	411,4	399,0
792	373,2	389,5	398,0
793	377.3	377,3	376,0
794	381.5	381,5	367,0
795	385.7	385,7	390,0
796	389,9	389,9	395,0
797	394,2	394,2	388,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

1 PEAKS WITH FWHM = 0.43065E+01 MEASURE OF FIT = -0,10555E-02
DEGREE OF THE OVERALL FIT = 0,79300E-02 AND BACKGROUND = 3215.5 COUNTS
CONVERGENCE LIMIT = 0.42876E+00 IBG = 0 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,826789E+01
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
23	788.56	110.96	501,	83,26

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
10	818	833,93	843	20098	12417,6	212,0	3201,3

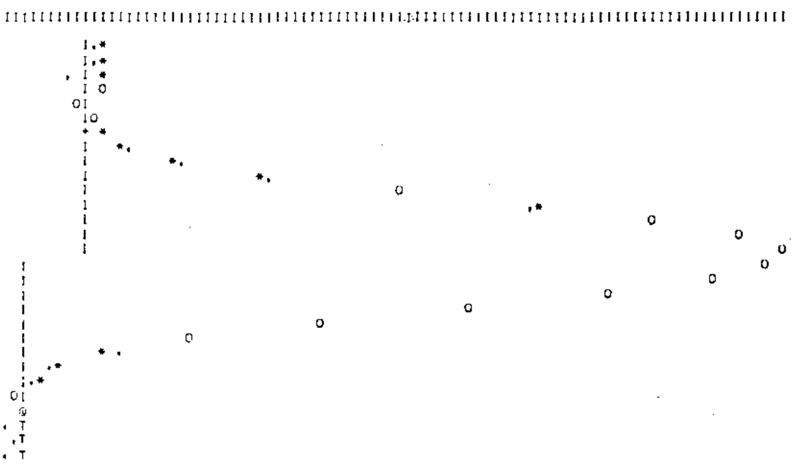
1 PEAKS WITH FWHM = 0.56345E+01 MEASURE OF FIT = 0,23032E-02
DEGREE OF THE OVERALL FIT = 0.63687E-03 AND BACKGROUND = 12417.6 COUNTS
CONVERGENCE LIMIT = 0.58438E-01 IBG = 0 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,799642E+01
BACK GROUND SLOPE = 0,0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
24	833,99	3238.28	19459,	210.46

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
11	848	858,31	868	32942	10397.7	231,8	5455.3

*********** ID NO. 11 FROM 848 TO 868 CHANNEL

YMIN= 459.0 LOGARITHMIC SCALE YMAX= 6056.0



CH	BG	CAL	OBS
844	602.8	624,0	607,0
845	602.6	624,0	617,0
846	602,7	624,0	556,0
847	602,7	624,0	624.0
848	602.6	574,0	574,0
849	602,6	614,7	610.0
850	602,5	627,7	602,0
851	602.4	667,9	697,0
852	602.3	785,8	818,0
853	602.2	1078,5	1090,0
854	602.1	1676,3	1682,0
855	602,0	2665,6	2646,0
856	601,8	3960,6	3891,0
857	601.5	5227,9	5285,0
858	600.7	5994,7	6056,0
859	489.1	5791,5	5744,0
860	488.5	4806,8	4795,0
861	488.2	3412,4	3429,0
862	488,0	2155,8	2152,0
863	484.9	1307,7	1307,0
864	484,8	850,9	837,0
865	484,7	638,9	671,0
866	484,6	547,6	533,0
867	484,6	508,9	495,0
868	484.5	476,0	476,0
869	484.4	493,0	493,0
870	484.4	493,0	464,0
871	484.3	493,0	476,0
872	484.3	493,0	459,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

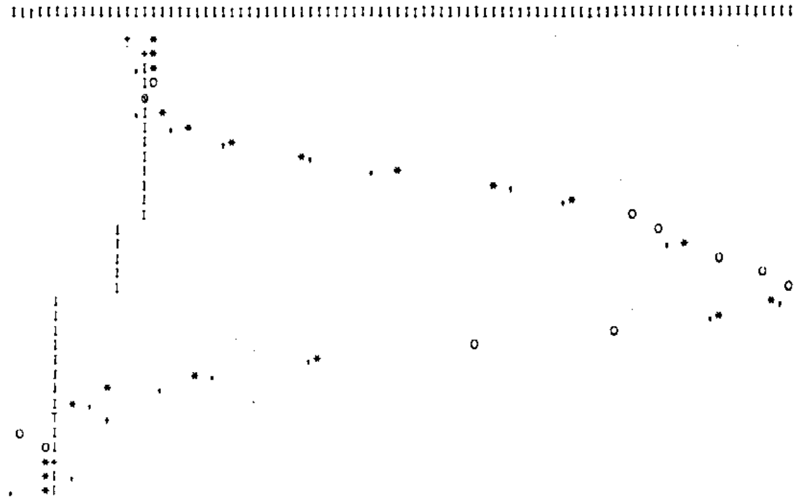
2 PEAKS WITH FWHM = 0,55377E+01 MEASURE OF FIT = -0,10792E-03
DEGREE OF THE OVERALL FIT = 0.20027E-03 AND BACKGROUND = 10397,7 COUNTS
CONVERGENCE LIMIT = 0,63107E-01 IBG = 30 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,785015E+01
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
25	858,40	5444,52	32143,	228,87
26	862,61	133,86	780,	36,56

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
12	957	970,02	980	11736	9488,7	175,3	1230,2

********** ID NO, 12 FROM 957 TO 980 CHANNEL

YMIN= 362,0 LOGARITHMIC SCALE YMAX= 1674,3



CH	BG	CAL	OBS
953	454,0	480,0	454,0
954	468,1	480,0	466,0
955	468,0	480,0	461,0
956	468,0	480,0	480,0
957	468,0	469,0	469,0
958	467,9	483,2	460,0
959	467,9	506,6	497,0
960	467,9	555,5	545,0
961	467,8	642,5	648,0
962	467,7	771,5	737,0
963	467,7	929,8	968,0
964	467,5	1088,1	1077,0
965	467,3	1218,1	1235,0
966	442,5	1287,5	1300,0
967	442,4	1363,0	1319,0
968	442,2	1459,4	1468,0
969	442,1	1580,2	1595,0
970	441,8	1674,3	1672,0
971	393,6	1621,0	1648,0
972	393,1	1464,8	1438,0
973	393,0	1193,0	1188,0
974	392,9	899,7	899,0
975	392,8	664,5	649,0
976	392,7	515,8	539,0
977	392,7	439,8	481,0
978	392,6	407,8	424,0
979	392,6	396,7	438,0
980	392,5	367,0	367,0
981	392,5	391,0	391,0
982	392,5	391,0	392,0
983	392,4	391,0	406,0
984	392,4	391,0	362,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

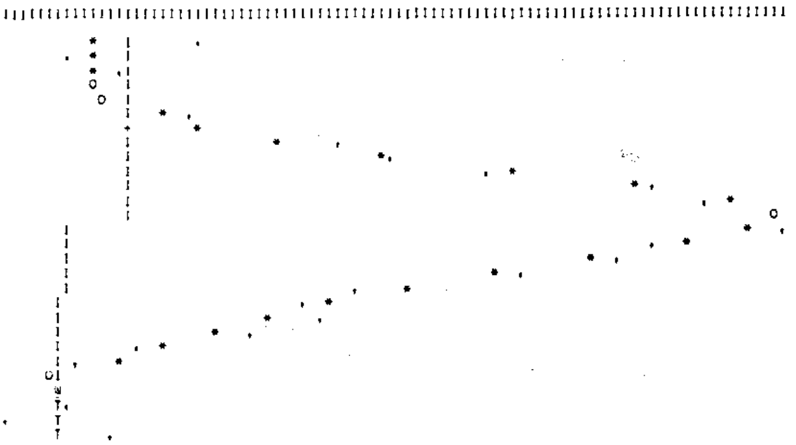
2 PEAKS WITH FWHM = 0,59518E+01 MEASURE OF FIT = -0,23557E-04
DEGREE OF THE OVERALL FIT = 0,49287E-03 AND BACKGROUND = 9488,7 COUNTS
CONVERGENCE LIMIT = 0,85381E-01 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,717990E+01
BACK GROUND SLOPE = 0,0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
27	965.28	651,12	4124,	101,90
28	970,82	1189,55	7551,	142,36

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
13	989	997.31	1008	3700	6518,5	129,4	460,3

********** ID NO, 13 FROM 989 TO 1008 CHANNEL

YMIN= 326,0 LOGARITHMIC SCALE YMAX= 847,0



CH	BG	CAL	OBS
985	378,2	363,0	412,0
986	378,2	363,0	352,0
987	378,2	363,0	373,0
988	378,2	363,0	363,0
989	378,2	366,0	366,0
990	378,2	394,1	409,0
991	378,1	414,9	377,0
992	378,1	454,3	490,0
993	378,1	518,3	522,0
994	378,0	605,9	590,0
995	378,0	704,6	722,0
996	377,9	791,2	769,0
997	377,7	840,6	838,0
998	352,5	811,6	847,0
999	352,4	755,0	718,0
1000	352,3	672,1	688,0
1001	352,3	592,2	617,0
1002	352,2	531,4	501,0
1003	346,6	484,0	469,0
1004	346,6	452,0	480,0
1005	346,5	423,0	441,0
1006	346,5	396,7	383,0
1007	346,5	375,6	357,0
1008	346,5	345,0	345,0
1009	346,4	348,0	348,0
1010	346,4	348,0	350,0
1011	346,4	348,0	326,0
1012	346,4	348,0	372,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

2 PEAKS WITH FWHM = 0,63401E+01 MEASURE OF FIT = 0,58245E-03
DEGREE OF THE OVERALL FIT = 0,17680E-02 AND BACKGROUND = 6518,5 COUNTS
CONVERGENCE LIMIT = 0,15313E+00 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,701616E+01
BACK GROUND SLOPE = 0,0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
29	997,30	455,29	3069,	117,05
30	1002,96	96,94	632,	55,09

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
14	1036	1040,38	1044	289	2533,5	73,2	68,1

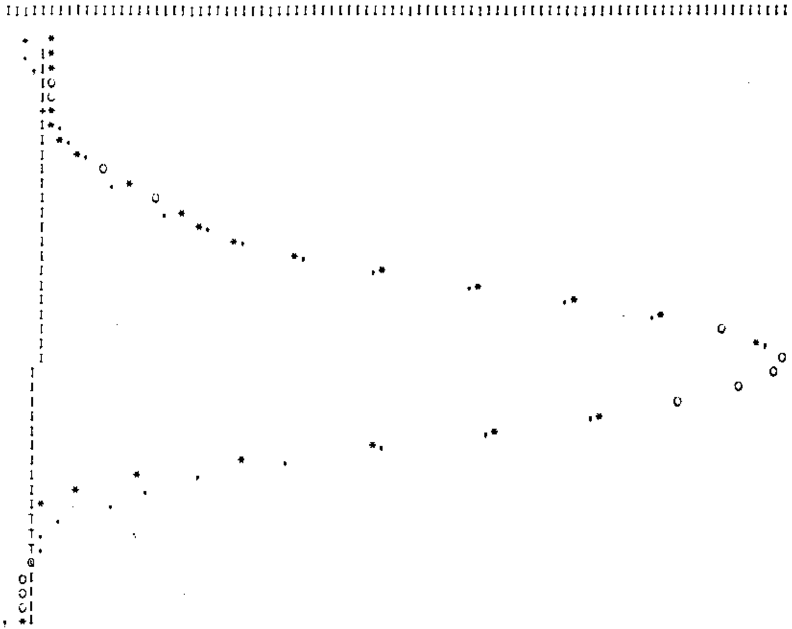
1 PEAKS WITH FWHM = 0,33133E+01 MEASURE OF FIT = 0,14646E-01
DEGREE OF THE OVERALL FIT = 0,34206E-01 AND BACKGROUND = 2533,5 COUNTS
CONVERGENCE LIMIT = 0,60797E+00 IBG = 0 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,675770E+01
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
31	1040,23	80,06	279,	73,12

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
15	1089	1107,14	1121	174701	17906,5	458,8	24655,1

*********** ID NO, 15 FROM 1089 TO 1121 CHANNEL

YMIN= 488,0 LOGARITHMIC SCALE YMAX= 25246,0



CH	BG	CAL	OBS
1085	542,0	607,0	542,0
1086	592,3	607,0	537,0
1087	592,3	607,0	558,0
1088	592,3	607,0	607,0
1089	592,3	596,0	596,0
1090	592,3	602,0	578,0
1091	592.3	616,0	649,0
1092	592.3	644,9	655,0
1093	592,3	697,2	718,0
1094	592,3	779,7	791,0
1095	592,2	891,7	849,0
1096	592,2	1022,7	1032,0
1097	592,2	1160,7	1097,0
1098	592.2	1317,0	1327,0
1099	591,4	1565,8	1643,0
1100	591,4	2093,2	2199,0
1101	591,4	3225,0	3154,0
1102	591,3	5353,7	5181,0
1103	591,3	8750,6	8430,0
1104	591.3	13298,6	12985,0
1105	591,2	18295,2	18559,0
1106	591,1	22531,4	23428,0
1107	590,9	24730,5	25246,0
1108	558,4	24010,5	24050,0
1109	558,3	20395,0	19995,0
1110	558,2	15152,4	14717,0
1111	558,1	9897,2	9463,0
1112	558,1	5756,1	5643,0
1113	558,1	3074,4	3321,0
1114	558,0	1617,6	2016,0
1115	558,0	946,0	1279,0
1116	558.0	681,6	977,0
1117	558,0	592,2	834,0
1118	558.0	566,2	626,0
1119	557.9	559,7	588,0
1120	557,9	558,2	577,0
1121	557,9	558,0	558,0
1122	557.9	538,0	538,0
1123	557,9	538,0	525,0
1124	557,9	538,0	524,0
1125	557.9	538,0	488,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

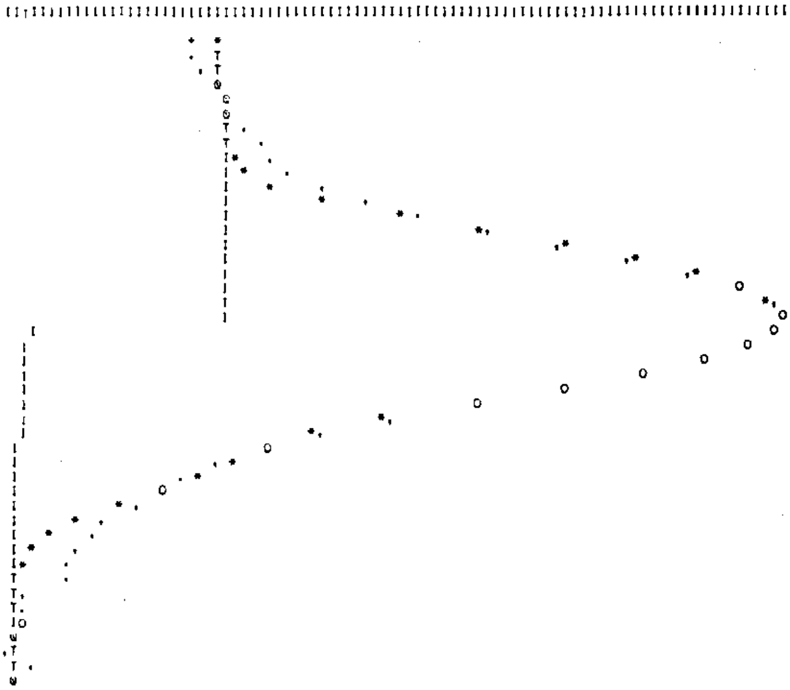
2 PEAKS WITH FWHM = 0,65512E+01 MEASURE OF FIT = 0,23941E-02
DEGREE OF THE OVERALL FIT = 0,18480E-03 AND BACKGROUND = 17906,5 COUNTS
CONVERGENCE LIMIT = 0,24719E-01 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,635718E+01
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
32	1098,33	564,24	3937,	68,82
33	1107,30	24284,04	169541,	452,28

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
16	1137	1152.11	1173	259681	15813.3	539.7	36205.8

*********** ID NO. 16 FROM 1137 TO 1173 CHANNEL

YMIN= 180.0 LOGARITHMIC SCALE YMAX= 36988,0



CH	BG	CAL	OBS
1133	625,0	758,0	625,0
1134	758,0	758,0	640,0
1135	758,0	758,0	671,0
1136	758,0	758,0	758,0
1137	794,7	818,0	818,0
1138	794,5	796,3	800,0
1139	794,3	799,4	925,0
1140	794,0	808,3	1000,0
1141	793,8	833,3	1090,0
1142	793,5	903,4	1251,0
1143	793,2	1090,7	1559,0
1144	792,8	1553,6	2060,0
1145	792,4	2584,7	2937,0
1146	792,0	4622,2	4704,0
1147	791,5	8151,1	7869,0
1148	790,8	13448,1	12767,0
1149	790,0	20229,4	19715,0
1150	788,9	27418,7	27126,0
1151	787,2	33305,9	33966,0
1152	782,2	36171,5	36988,0
1153	210,8	34344,2	35078,0
1154	208,4	29026,9	28867,0
1155	207,0	21520,9	20951,0
1156	206,1	14065,0	13834,0
1157	205,4	8211,8	8074,0
1158	204,8	4436,6	4544,0
1159	204,3	2401,6	2546,0
1160	203,9	1466,5	1517,0
1161	192,5	1058,1	1081,0
1162	192,1	847,4	766,0
1163	191,7	676,5	592,0
1164	191,5	518,3	524,0
1165	191,2	386,6	437,0
1166	191,0	293,5	348,0
1167	190,7	237,9	330,0
1168	190,5	209,5	293,0
1169	190,3	197,0	266,0
1170	190,2	192,2	275,0
1171	190,0	190,5	209,0
1172	189,8	190,0	205,0
1173	189,7	198,0	198,0
1174	189,5	192,0	192,0
1175	189,4	192,0	180,0
1176	189,3	192,0	210,0
1177	189,1	192,0	186,0

SYMBOL .=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

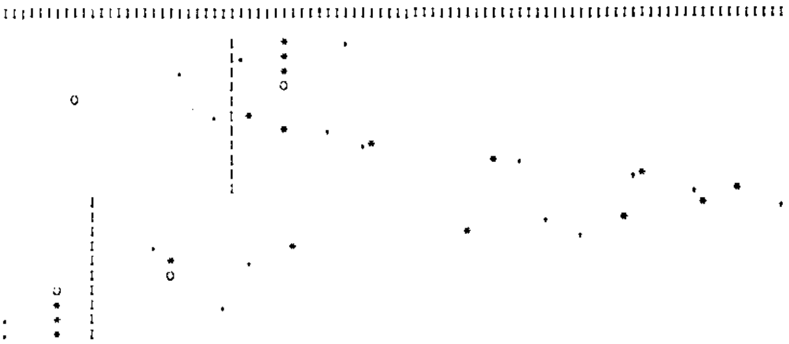
2 PEAKS WITH FWHM = 0,66752E+01 MEASURE OF FIT = 0,27754E-02
DEGREE OF THE OVERALL FIT = 0,10134E-03 AND BACKGROUND = 15813,3 COUNTS
CONVERGENCE LIMIT = 0,19587E-01 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,608732E+01
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
34	1152,23	35484,03	252631,	532,43
35	1160,72	666,26	4744,	74,32

PK.GROUP	MIN.CH.	PEAK CH.	MAX.CH.	PEAK AREA	BK.GD.	STD.DEV.	PK.HEIGHT
17	1203	1209.48	1215	514	1026.1	50.7	82.2

*********** ID NO. 17 FROM 1203 TO 1215 CHANNEL

YMIN= 75.0 LOGARITHMIC SCALE YMAX= 206,0



CH	BG	CAL	OBS
1199	101.1	108,0	117,0
1200	101.0	108,0	102,0
1201	101.0	108,0	94,0
1202	101.0	108,0	108,0
1203	101.0	82,0	82,0
1204	101.0	103,2	98,0
1205	101.0	108,2	114,0
1206	101.0	120,2	119,0
1207	100.9	142,1	146,0
1208	100.9	171,1	170,0
1209	100.8	195,7	183,0
1210	84.3	185,7	206,0
1211	84.1	167,8	151,0
1212	84.1	136,6	159,0
1213	84.0	109,2	91,0
1214	84.0	93,2	103,0
1215	84.0	93,0	93,0
1216	84.0	80,0	80,0
1217	84.0	80,0	100,0
1218	84.0	80,0	75,0
1219	84.0	80,0	75,0

SYMBOL .=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

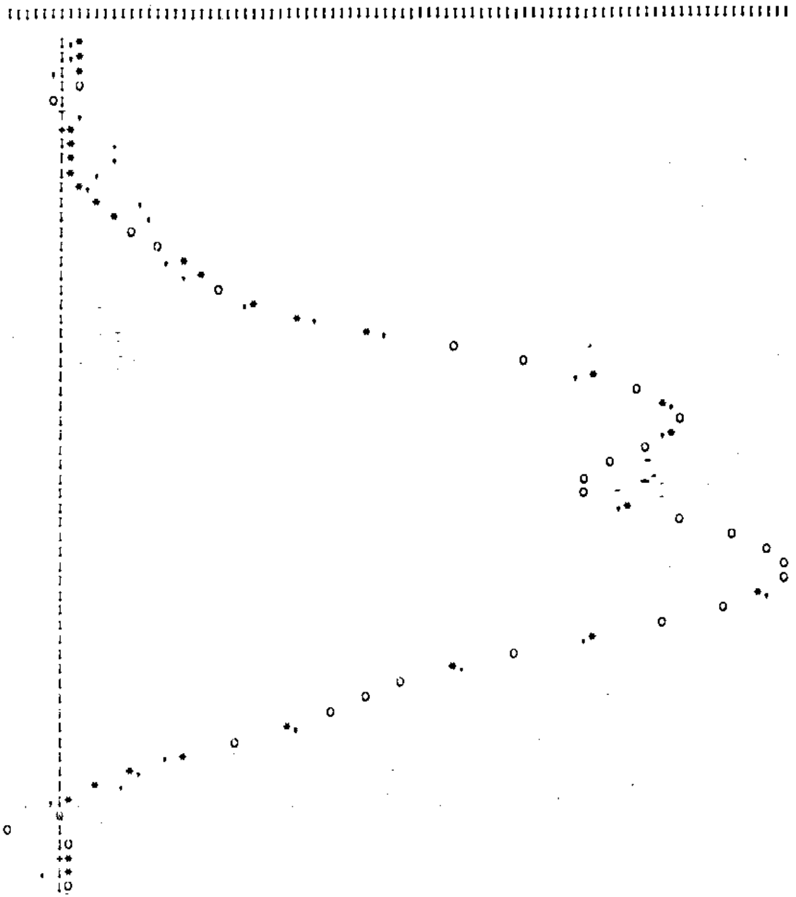
1 PEAKS WITH FWHM = 0.46961E+01 MEASURE OF FIT = 0,31844E-02
DEGREE OF THE OVERALL FIT = 0.87193E-02 AND BACKGROUND = 1026.1 COUNTS
CONVERGENCE LIMIT = 0,35674E+00 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0.574309E+01
BACK GROUND SLOPE = 0.0

PEAK NO.	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
36	1209,79	102,05	507,	50,59

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
18	1268	1300,42	1318	77549	5975,0	299,2	6357,8

*********** ID NO, 18 FROM 1268 TO 1318 CHANNEL

YMIN= 91.0 LOGARITHMIC SCALE YMAX= 6480,0



CH	BG	CAL	OBS
1264	124,1	131,0	125,0
1265	124,1	131,0	127,0
1266	124,1	131,0	114,0
1267	124,1	131,0	131,0
1268	124,1	114,0	114,0
1269	124,1	124,1	131,0
1270	124,0	124,3	122,0
1271	124,0	124,8	160,0
1272	124,0	126,1	164,0
1273	124,0	128,9	149,0
1274	124,0	134,6	138,0
1275	124,0	144,6	183,0
1276	124,0	160,2	194,0
1277	124,0	181,5	181,0
1278	124,0	206,7	204,0
1279	124,0	232,8	213,0
1280	124,0	258,5	239,0
1281	124,0	289,1	285,0
1282	124,0	341,3	331,0
1283	124,0	449,6	496,0
1284	124,0	662,8	702,0
1285	124,0	1026,6	1044,0
1286	124,0	1556,3	1544,0
1287	124,0	2208,3	2090,0
1288	124,0	2869,9	2877,0
1289	124,0	3384,6	3430,0
1290	123,9	3612,9	3714,0
1291	122,3	3476,5	3371,0
1292	122,3	3031,1	3045,0
1293	122,3	2495,7	2520,0
1294	122,3	2137,0	2151,0
1295	122,3	2169,5	2169,0
1296	122,3	2686,0	2656,0
1297	122,3	3626,0	3567,0
1298	122,3	4778,6	4770,0
1299	122,3	5829,9	5933,0
1300	122,2	6460,7	6480,0
1301	119,2	6452,0	6434,0
1302	119,2	5739,6	5784,0
1303	119,2	4561,4	4529,0
1304	119,2	3283,8	3242,0
1305	119,2	2207,7	2192,0
1306	119,2	1465,9	1467,0
1307	119,2	1032,6	1099,0
1308	119,2	801,4	772,0
1309	118,9	661,1	649,0
1310	118,9	541,4	529,0
1311	118,9	424,1	452,0
1312	118,9	317,4	314,0
1313	118,9	233,8	216,0
1314	118,9	177,8	190,0
1315	118,9	145,6	166,0
1316	118,9	129,6	117,0
1317	118,9	122,7	119,0
1318	118,9	91,0	91,0
1319	118,9	129,0	129,0
1320	118,9	129,0	124,0
1321	118,9	129,0	108,0
1322	118,9	129,0	125,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

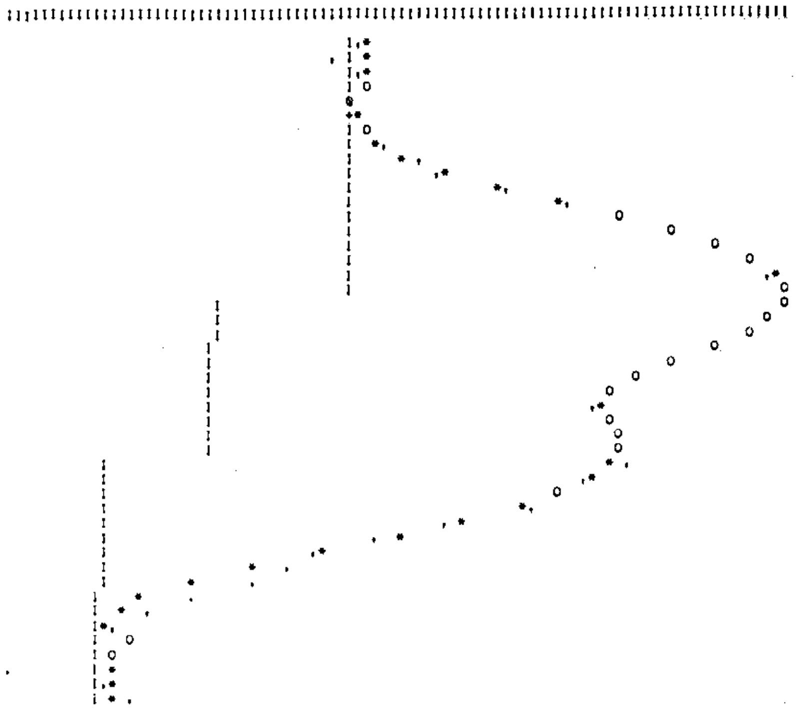
4 PEAKS WITH FWHM = 0,69197E+01 MEASURE OF FIT = 0,42667E-03
DEGREE OF THE OVERALL FIT = 0,52384E-04 AND BACKGROUND = 5975.0 COUNTS
CONVERGENCE LIMIT = 0,23335E-01 IBG = 50 SKEWNESS FACTOR = 0.86
TAIL-TO-PEAK RATIO = 0.200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,519749E+01
BACK GROUND SLOPE = 0.0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
37	1280.78	122,08	901,	32,19
38	1290.10	3469,03	25604,	171,86
39	1300.50	6397,63	47219,	233,53
40	1306.17	493,44	3641,	64,86

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
19	1324	1337,58	1361	24249	2368,8	170,3	2196,5

************ ID NO, 19 FROM 1324 TO 1361 CHANNEL

YMIN= 12,0 LOGARITHMIC SCALE YMAX= 2259,0



CH	BG	CAL	OBS
1320	121,8	131,0	124,0
1321	121,7	131,0	108,0
1322	121,7	131,0	125,0
1323	121,7	131,0	131,0
1324	121,6	118,0	118,0
1325	121,6	125,3	117,0
1326	121,6	131,2	134,0
1327	121,5	144,7	155,0
1328	121,5	173,5	192,0
1329	121,4	229,5	217,0
1330	121,4	329,1	342,0
1331	121,3	490,2	511,0
1332	121,3	726,2	728,0
1333	121,2	1036,6	1045,0
1334	121,1	1398,8	1396,0
1335	120,9	1765,8	1777,0
1336	120,7	2073,5	1988,0
1337	120,4	2259,0	2228,0
1338	48,5	2208,8	2245,0
1339	48,1	2045,1	2058,0
1340	47,9	1742,2	1793,0
1341	47,8	1383,9	1387,0
1342	47,7	1055,8	1038,0
1343	47,6	817,4	830,0
1344	47,5	689,5	682,0
1345	47,4	657,4	608,0
1346	47,3	683,9	690,0
1347	47,2	725,6	746,0
1348	46,9	745,6	738,0
1349	22,8	696,7	765,0
1350	22,7	618,5	600,0
1351	22,6	503,1	492,0
1352	22,5	375,3	405,0
1353	22,5	258,2	234,0
1354	22,4	165,7	142,0
1355	22,4	101,6	94,0
1356	22,3	62,1	80,0
1357	22,3	40,5	64,0
1358	22,3	29,8	42,0
1359	22,2	25,1	30,0
1360	22,2	23,2	25,0
1361	22,2	27,0	27,0
1362	22,2	24,0	24,0
1363	22,1	24,0	12,0
1364	22,1	24,0	23,0
1365	22,1	24,0	28,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

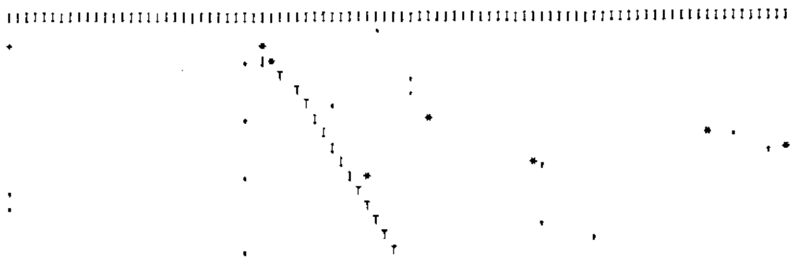
2 PEAKS WITH FWHM = 0,79459E+01 MEASURE OF FIT = 0,69527E-03
DEGREE OF THE OVERALL FIT = 0,12737E-03 AND BACKGROUND = 2368,8 COUNTS
CONVERGENCE LIMIT = 0,44282E-01 IBG = 50 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,497455E+01
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
41	1337,61	2165,03	18347,	146,56
42	1348,25	687,11	5823,	86,18

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD,DEV,	PK,HEIGHT
20	1488	1490,71	1494	16	34,9	9,3	8,0

************ ID NO, 20 FROM 1488 TO 1494 CHANNEL

YMIN= 4,0 LOGARITHMIC SCALE YMAX= 15,4



CH	BG	CAL	OBS
1484	4,0	6,2	4,0
1485	6,2	6,3	6,0
1486	6,4	6,4	8,0
1487	6,5	6,5	8,0
1488	6,7	6,7	7,0
1489	6,8	8,3	6,0
1490	6,9	13,4	14,0
1491	7,0	15,4	15,0
1492	7,1	9,9	10,0
1493	7,2	7,4	6,0
1494	7,3	7,3	4,0
1495	7,5	7,5	4,0
1496	7,6	7,6	10,0
1497	7,7	7,7	11,0
1498	7,8	7,8	6,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

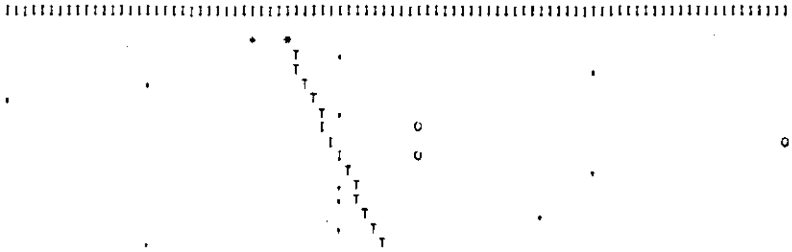
1 PEAKS WITH FWHM = 0,20730E+01 MEASURE OF FIT = -0,35689E-01
DEGREE OF THE OVERALL FIT = 0,19091E-01 AND BACKGROUND = 34,9 COUNTS
CONVERGENCE LIMIT = 0,16458E+01 IBG = 0 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,405576E+01
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
43	1490,71	8,89	20,	9,46

PK,GROUP	MIN,CH,	PEAK CH,	MAX,CH,	PEAK AREA	BK,GD,	STD.DEV,	PK,HEIGHT
21	1817	1820,34	1823	16	29,4	8,6	9,1

********** ID NO, 21 FROM 1817 TO 1823 CHANNEL

YMIN= 3,0 LOGARITHMIC SCALE YMAX= 15,0



CH	BG	CAL	OBS
1813	5,0	5,3	5,0
1814	5,4	5,4	6,0
1815	5,5	5,5	10,0
1816	5,6	5,6	4,0
1817	5,6	5,6	3,0
1818	5,7	5,7	6,0
1819	5,8	7,0	7,0
1820	5,9	15,0	15,0
1821	6,0	7,0	7,0
1822	6,0	6,0	10,0
1823	6,1	6,1	6,0
1824	6,2	6,2	6,0
1825	6,3	6,3	9,0
1826	6,4	6,4	6,0
1827	6,5	6,5	4,0

SYMBOL ,=OBS, *=CAL, I=BG, O=,AND*, +=,ANDI, T=*ANDI,@=,AND*ANDI

1 PEAKS WITH FWHM = 0,11527E+01 MEASURE OF FIT = -0,94175E-02
DEGREE OF THE OVERALL FIT = 0,75729E-01 AND BACKGROUND = 29,4 COUNTS
CONVERGENCE LIMIT = 0,16327E+01 IBG = 0 SKEWNESS FACTOR = 0,86
TAIL-TO-PEAK RATIO = 0,200000E-02 SEPARATION BETWEEN PEAK AND TAIL = 0,207795E+01
BACK GROUND SLOPE = 0,0

PEAK NO,	PK POSITION	PK HEIGHT	PEAK AREA	STANDARD DEVIATION
44	1820,02	9,13	11,	6,38

77-01-19 *************** GAMMA SPECTRUM ANALYSIS OF PU-237

BY 80875 *************** GEOS-3 - 4

*** RESULTS OF PEAK RECOGNITION ***

PEAK NO,	MIN	PEAK CH,	MAX	PEAK AREA	BK,GD,	STD,DEV,	PK,FT,1	PK,FT,2	JFIT	JFFT	FWHM
1	75	80,05	108	37605	34033	0,9	0,1093E+04	0,1013E+04	2	2	4,836
2	108	109,95	116	1535	5436	7,3	0,1013E+04	0,7750E+03	0	0	FAIL
3	117	123,51	161	424718	46975	0,2	0,7750E+03	0,7509E+03	5	5	4,141
4	184	194,90	272	518609	46674	0,2	0,7509E+03	0,4017E+03	7	7	5,091
5	304	310,43	317	4918	4633	2,4	0,4001E+03	0,3723E+03	0	0	3,907
6	382	387,63	393	1472	2634	5,6	0,2723E+03	0,2545E+03	0	0	3,985
7	567	572,65	578	463	2199	15,1	0,2158E+03	0,2241E+03	0	0	5,942
8	675	684,63	694	69825	5693	0,4	0,3616E+03	0,2709E+03	0	0	4,782
9	763	768,68	793	505	3215	16,5	0,3381E+03	0,3773E+03	0	0	4,306
10	816	821,00	843	20098	12417	1,1	0,4623E+03	0,5769E+03	2	0	5,634
11	848	858,31	868	32942	10397	0,7	0,6026E+03	0,4845E+03	0	1	5,538
12	957	966,00	980	11736	9488	1,5	0,4680E+03	0,3925E+03	1	1	5,952
13	989	997,31	1008	3700	6518	3,5	0,3782E+03	0,3465E+03	1	1	6,340
14	1036	1040,36	1044	289	2533	25,3	0,3482E+03	0,3760E+03	0	0	3,313
15	1089	1107,14	1121	174701	17906	0,3	0,5923E+03	0,5579E+03	0	1	6,551
16	1137	1152,11	1173	259681	15813	0,2	0,7947E+03	0,1897E+03	1	1	6,675
17	1203	1209,48	1215	514	1026	9,9	0,1010E+03	0,8400E+02	0	0	4,696
18	1268	1277,00	1318	77549	5974	0,4	0,1241E+03	0,1189E+03	2	3	6,920
19	1324	1337,58	1361	24249	2368	0,7	0,1216E+03	0,2218E+02	1	1	7,946
20	1488	1490,71	1494	16	34	57,9	0,6651E+01	0,7338E+01	0	0	2,073
21	1817	1820,34	1823	16	29	53,9	0,5634E+01	0,6129E+01	0	0	1,153

RESULTS FROM PKFIT

NO.	PEAK POSITN.	PEAK AREA	STAND.DEV.
1	80,30	52,57	3,25
2	91,70	312,81	1,34
3	101,51	375,77	1,23
4	110,01	30,70	7,26
5	123,97	12,35	4,45
6	131,99	47,69	2,26
7	137,21	67,59	1,90
8	147,00	545,59	0,67
9	154,91	51,46	2,19
10	170,39	7557,45	0,18
11	194,70	267,59	0,93
12	204,60	3145,60	0,27
13	213,91	4665,58	0,22
14	223,68	166,13	1,17
15	240,12	88,25	1,68
16	248,38	1076,87	0,48
17	254,41	667,06	0,61
18	263,86	207,49	1,10
19	310,55	98,47	2,42
20	387,78	29,84	5,51
21	572,83	9,29	15,01
22	684,73	1396,26	0,41
23	788,56	10,02	16,61
24	833,99	389,19	1,08
25	858,40	642,87	0,71
26	862,61	15,60	4,69
27	965,28	82,49	2,47
28	970,82	151,02	1,89
29	997,30	61,37	3,81
30	1002,96	12,63	8,72
31	1040,23	5,58	26,19
32	1098,33	78,74	1,75
33	1107,30	3390,81	0,27
34	1152,23	5052,62	0,21
35	1160,72	94,88	1,57
36	1209,79	10,15	9,97
37	1280,78	18,03	3,57
38	1290,10	512,07	0,67
39	1300,50	944,37	0,49
40	1308,17	72,81	1,78
41	1337,61	366,95	0,80
42	1348,25	116,47	1,48
43	1490,71	0,39	48,45
44	1820,02	0,23	73,42

ESTIMATED CHANNEL NUMBERS OF THE STANDARD GAMMA-RAYS

1	147.40
2	170.57
3	213.41
4	248.05
5	310.13
6	387.37
7	683.92
8	1106.53
9	1151.46
10	1299.77
11	1337.46

FITTING DONE USING 11 PEAKS WHERE 11 STANDARD ENERGIES GIVEN

MM = 7
-0,48450E+00 0,79798E-01 0,41229E-04-0,92428E-07 0,10743E-09-0,62044E-13
0,14059E-16

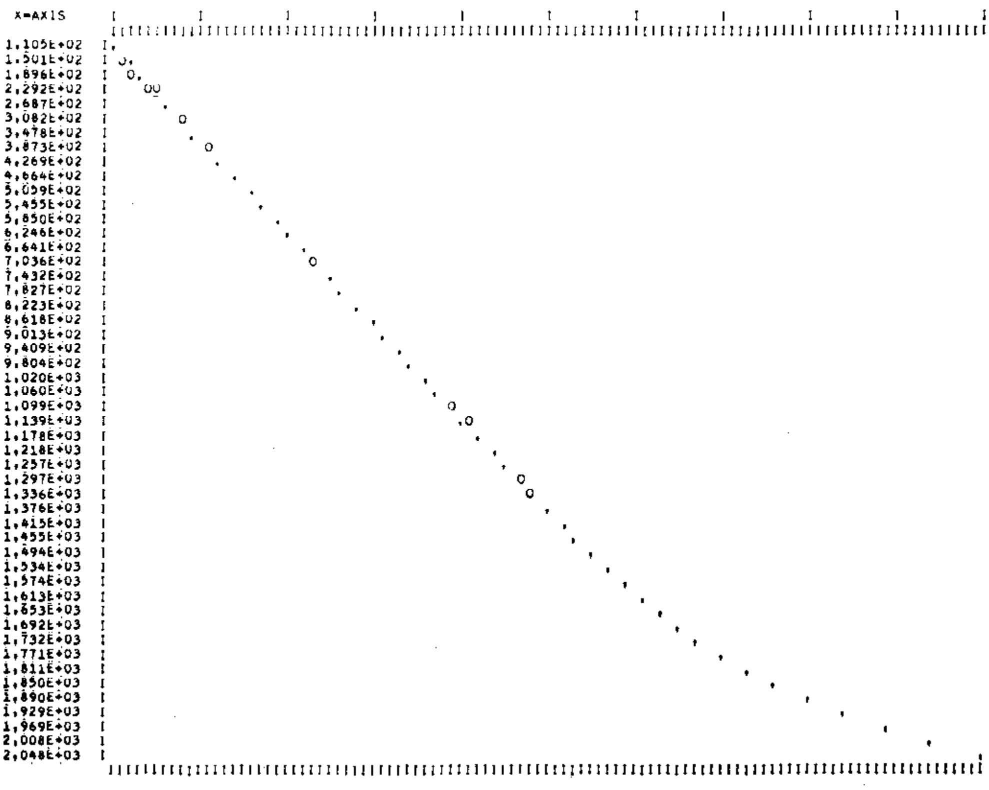
MM = 7

0,20829744756212570+03	-0,27322308001517270+01	0,12858095222963220-01
-0,28312389152509280-04	0,31646989726271620-07	-0,17421350830934880-10
0,37519911644936280-14	-0,27322308001516680+01	0,36350169716478640-01
-0,17334436971442870-03	0,38641894534919530-06	-0,43695942386285860-09
0,24314739339546770-12	-0,52887229449816810-16	0,12858095222962680-01
-0,17334436971442530-03	0,83864490672405030-06	-0,16973811077729520-08
0,21770232499821230-11	-0,12282248188322360-14	0,27056529958377810-18
-0,28312389152507610-04	0,38641894534918170-06	-0,16973811077729250-08
0,43637505475997660-11	-0,50911377027697730-14	0,29182975171684360-17
-0,65228990704067710-21	0,31646989726269340-07	-0,43695942386283850-09
0,21770232499820720-11	-0,50911377027697310-14	0,60420071968639670-17
-0,35195794124622230-20	0,79819786761587790-24	-0,17421350830933470-10
0,24314739339545490-12	-0,12282248188322040-14	0,29182975171684020-17
-0,35195794124622120-20	0,20810934615096020-23	-0,47825100610100110-27
0,37519911644932980-14	-0,52887229449813840-16	0,27056529958377010-18
-0,65228990704066920-21	0,79819786761587520-24	-0,47825100610100110-27
0,11117536485169390-30		

VARIANCE OF FITTING S = 0,13644E-03

HI	VI	VO	SIG
0,147000E+03	0.118860E+02	0.118892E+02	0,101738E-01
0,170389E+03	0,139440E+02	0.139340E+02	0,668829E-02
0,213906E+03	0.177490E+02	0.177652E+02	0,735950E-02
0,248383E+03	0.208260E+02	0.208168E+02	0,738248E-02
0,310545E+03	0,263400E+02	0,263370E+02	0,688336E-02
0,387784E+03	0.332000E+02	0.332032E+02	0,102878E-01
0,684725E+03	0,595400E+02	0.595392E+02	0,116559E-01
0,110730E+04	0,970770E+02	0,970819E+02	0,953279E-02
0,115223E+04	0,101068E+03	0.101062E+03	0,742370E-02
0,130050E+04	0,114241E+03	0,114244E+03	0,127424E-01
0,133761E+04	0,117569E+03	0,117587E+03	0,138728E-01

ENERGY CALIBRATION CURVE



77-01-19 *************** GAMMA SPECTRUM ANALYSIS OF PU-237 BY B0875 *************** GEOS-3 - 5

, FINAL RESULTS ,

PEAK NO.	PEAK CH.	ENERGY(KEV)	PT. ERROR	PEAK AREA	PT. ERROR
1	80,30	6,145	0,784	52,57	3,25
2	91,70	7,116	0,542	312,81	1,34
3	101,51	7.955	0,394	375,77	1,23
4	110,01	8,684	0,299	30,70	7,26
5	123,97	9,889	0.187	12,35	4,45
6	131,99	10,584	0.142	47,69	2,26
7	137,21	11,037	0.119	67,59	1,90
8	147,00	11,869	0,086	545,59	0,67
9	154,91	12,579	0,067	51,46	2,19
10	170,39	13,934	0,048	7557,45	0,18
11	194,70	16,070	0,043	267,59	0,93
12	204,60	16,943	0,042	3145,60	0,27
13	213,91	17,765	0,041	4665,58	0,22
14	223,68	18,629	0,040	166,13	1,17
15	240,12	20,085	0,037	88,25	1,68
16	248,38	20,817	0,035	1076,87	0,48
17	254,41	21,351	0,034	667,06	0,61
18	263,88	22,192	0,032	207,44	1,10
19	310,55	26,337	0,026	98,47	2,42
20	387,78	33,203	0,031	29,84	5,51
21	572,83	49,619	0,025	9,29	15,01
22	684,73	59,539	0,020	1396,26	0,41
23	788,56	68,759	0,023	10,02	16,61
24	833,99	72,799	0,026	389,19	1,08
25	858,40	74,971	0,026	642,87	0,71
26	862,61	75,345	0,026	15,60	4,69
27	965,28	84,477	0,025	82,49	2,47
28	970,82	84,969	0,024	151,02	1,89
29	997,30	87,322	0,022	61,37	3,81
30	1002,96	87,825	0,022	12,63	8,72
31	1040,23	91,135	0,018	5,58	26,19
32	1098,33	96,287	0,011	78,74	1,75
33	1107,30	97,082	0,010	3390,81	0,27
34	1152,23	101,062	0,008	5052,62	0,21
35	1160,72	101,814	0,009	94,88	1,57
36	1209,79	106,163	0,012	10,15	9,97
37	1280,78	112,479	0,012	18,03	3,57
38	1290,10	113,313	0,011	512,07	0,67
39	1300,50	114,244	0,009	944,37	0,49
40	1308,17	114,932	0,008	72,81	1,78
41	1337,61	117,587	0,010	366,95	0,80
42	1348,25	118,553	0,014	116,47	1,48
43	1490,71	131,981	0,202	0,39	48,45
44	1820,02	174,861	2,600	0,23	73,42

*********** END OF B0875

***** CALCULATION TIME 9 SEC **

8. Summary

This text has written by intention of giving the users explanations for usage of programs, BOB73, BOB73S, and BOB75, among which the input formats are unified as much as possible. Differences in the capability among the above programs are rather less. BOB73 and BOB73S differ to each other mainly in the maximum multiplicity acceptable for a compound of peaks; 18 (with tail) or 19 (without tail) for the former while 8 (with tail) or 9 (without tail) for the latter. The distictive feature of BOB75 lies in the introduction of a taperwise step function as the base line under the peak, which proved to be the most desirable base-line function[4]. The user is recommended to use BOB75 in many respects, unless he is content with rather simplified data analysis with plane Gaussian.

References

1. H.Baba, H.Okashita, S.Baba, T,Suzuki, H.Umezawa and H. Natsume, J. Nucl. Sci. Tech. (Tokyo) 8, 703 (1971).
2. H.Baba, T,Sekine, S.Baba and H.Okashita, JAERI report JAERI 1227 (1973).
3. A.Savitzky and M.J.Golay, Anal. Chem. 36, 1627 (1964).
4. H.Baba, S.Baba and T.Suzuki, to be published.

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References

1. H.Baba, H.Okashita, S.Baba, T,Suzuki, H.Umezawa and H. Natsume, J. Nucl. Sci. Tech. (Tokyo) 8, 703 (1971).
2. H.Baba, T,Sekine, S.Baba and H.Okashita, JAERI report JAERI 1227 (1973).
3. A.Savitzky and M.J.Golay, Anal. Chem. 36, 1627 (1964).
4. H.Baba, S.Baba and T.Suzuki, to be published.

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 3421     3554    3380    3427    3404    3462    3413    3498    3309    3325BE010160
 3489     3326    3286    3331    3339    3433    3324    3419    3229    3327BE010170
 3339     3227    3219    3296    3310    3278    3318    3273    3315    3336BE010180
 3348     3310    3296    3371    3349    3364    3424    3314    3339    3369BE010190
 3368     3378    3371    3745    4869    3773    3312    3383    3310    3225BE010200

   56      177      90      12       8       8       7       7      11      10BE010990
    9       10      13      11       5       7      11       4       9      11BE011000
   12        8       3       7      13      10       9       4      10       8BE011010
   12        7      11      10       9       7       7      10       7      10BE011020
    3        9       9       8       4       7      11       3      16      11BE011030
    8       14      13      55     122      25       9      12       6       9BE011040
    9        8       6       6                                              BE011050
999999999999999999999999999999999999999999999999999999999999999999999999BE011060
E02                                                                     BE020000
F-02    MN-56 PILFUP   TAU=0.8            1          7306261126         BE020010
  11024    5011                                                         BE020020
  1000   72016   75844  117802  118577   64046   63787   79107   85083   65300BE020030
 58024   57919   57259   57004   56121   55865   55372   54570   54404   53849BE020040
 54337   53312   52894   53198   52980   52320   52056   52002   51683   50982BE020050
 50711   50640   50551   49959   49640   49279   49281   48947   48781   48882BE020060
 48127   48619   48195   48065   48503   47897   47213   48296   48006   48393BE020070
 49242   51106   53029   52888   51419   50610   49204   48247   47326   46951BE020080
 45898   46014   45943   45460   44938   44977   44387   43705   43506   43218BE020090

  122      146     230     193     164     123     108     126     128     137BE020960
  133      118     115     132     113     114     125     120     124     117BE020970
   97      124     115     118     103     115     117     142     118     149BE020980
  424     1568     899     141      86      88      79      83      71      88BE020990
   96       80      87      93      61      78      86      74      91      77BE021000
   90       76      75      70      91      74      73      79      76      77BE021010
  110      114      93      69      76      83      81      74      79      95BE021020
   76       82      94      71      80      80      80      87      95      76BE021030
   94       91     124     498     957     287      75      75      60      59BE021040
   62       66      51      67                                              BE021050
999999999999999999999999999999999999999999999999999999999999999999999999BE021060
ND                                                                      BE021070
END OF FILE
```

Fig.1. Formats of the card-image data to be read in the subprogram MTREAD.

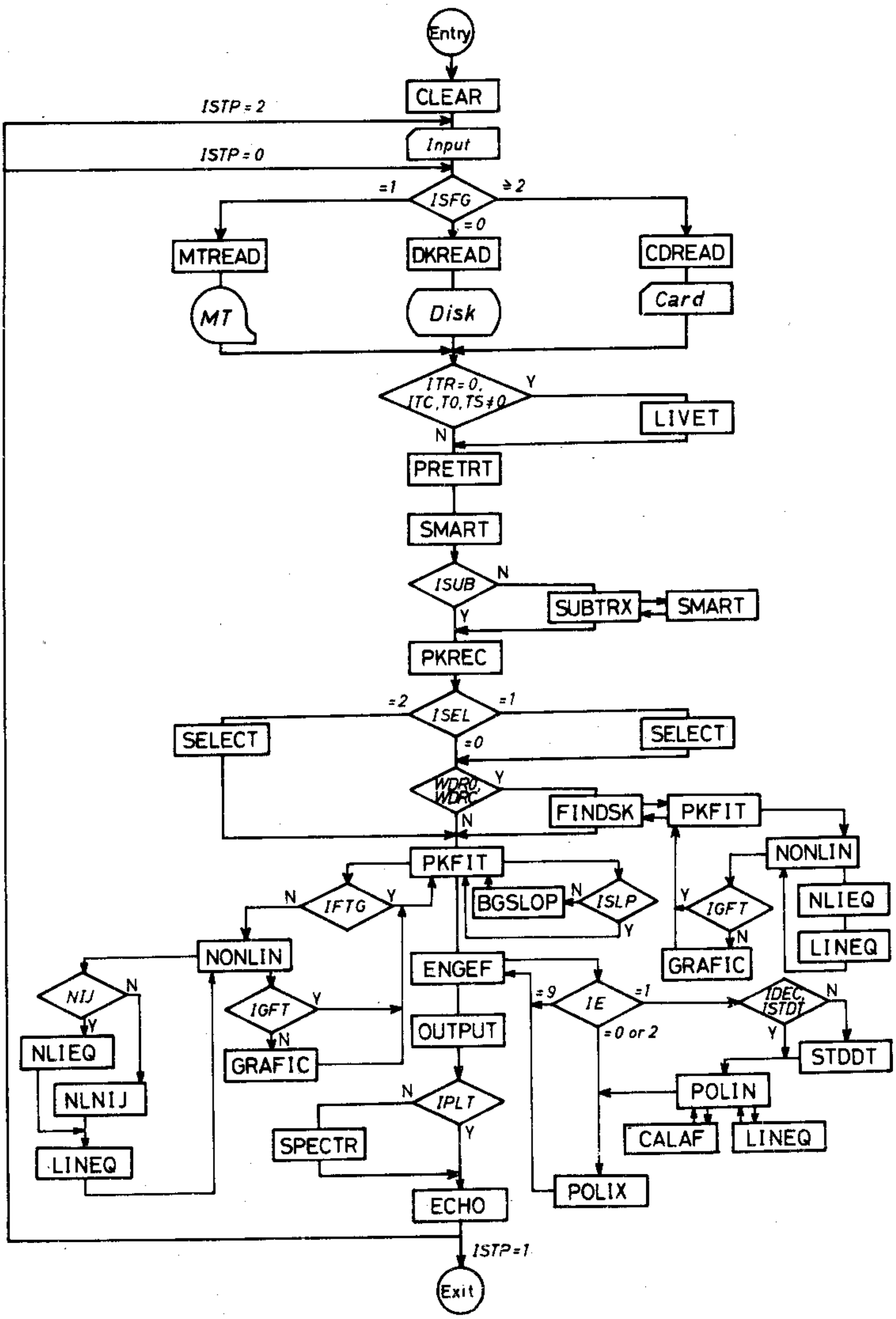

Fig.2. General flow chart of the BOB7-series programs.

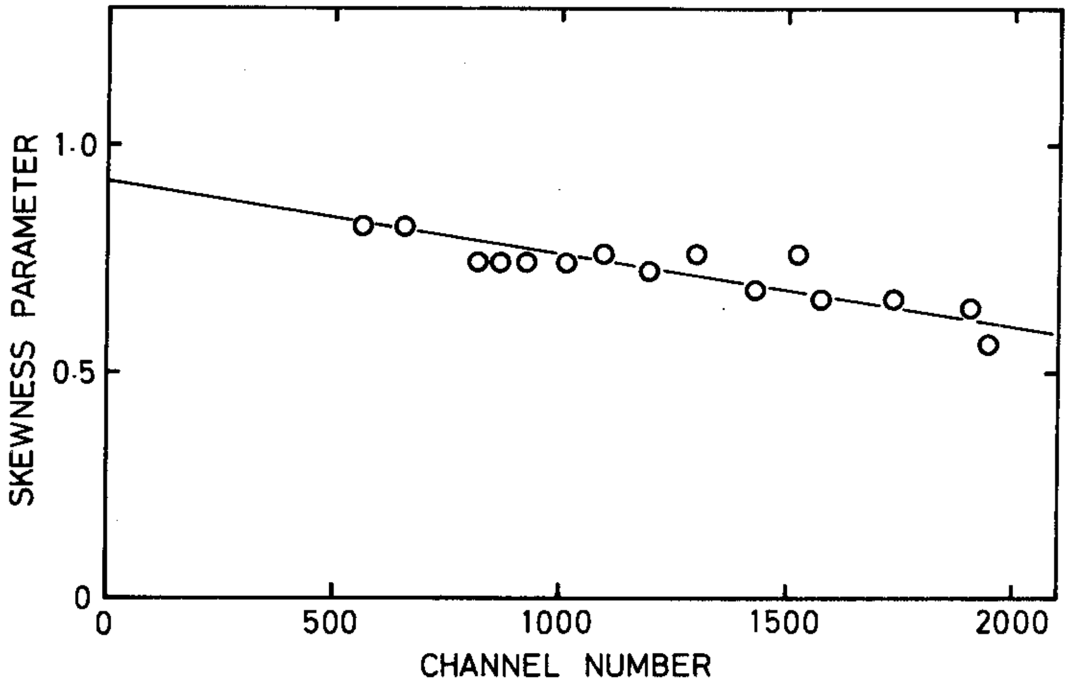

Fig.3. An example of the skewness parameter plotted versus channel number, that is defined by square of the width of the high-energy half Gaussian to that of the low-energy one. It is better determined without attaching the tail.

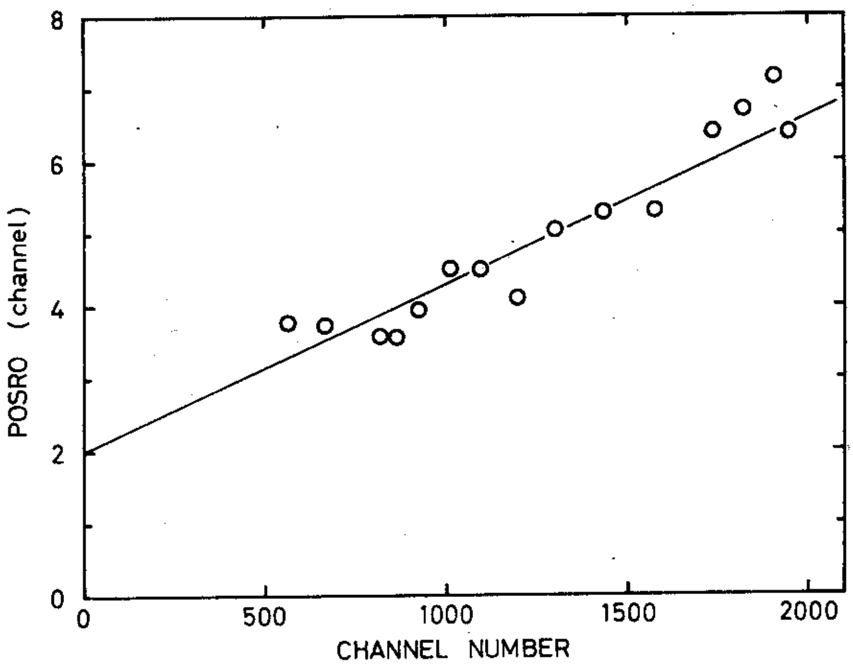

Fig.4a. Separation between the tail and the peak plotted versus channel number. It was determined by fixing the skewness parameter at the value obtained in Fig.3.

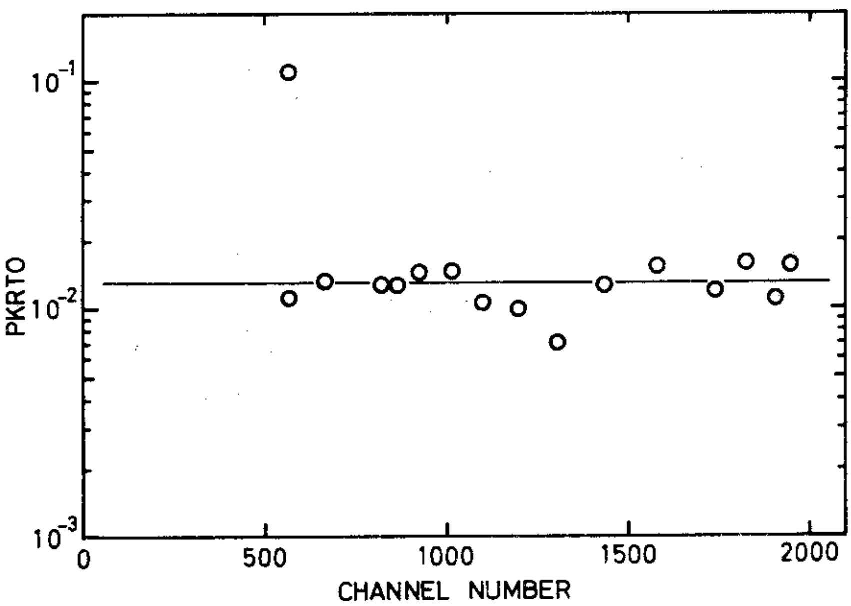

Fig.4b. Ratio of the tail to the peak plotted versus channel number. It was determined by fixing the skewness parameter at the value obtained in Fig.3.