



INTERNATIONAL ATOMIC ENERGY AGENCY

**NUCLEAR DATA SERVICES**

DOCUMENTATION SERIES OF THE IAEA NUCLEAR DATA SECTION

Short Guide to EXFOR

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Abstract: EXFOR is the agreed exchange format for the magnetic-tape transmission of experimental nuclear reaction data between national and international nuclear data centers for the benefit of nuclear data users in all countries.

This document gives a brief introduction to recipients of EXFOR data retrieved from the EXFOR data base. It describes the two output formats, "standard" and "edited", that are available from the IAEA Nuclear Data Section, either on magnetic tape or as printed listing, both free of charge.

This document describes EXFOR in its original version for neutron nuclear data. A similar guide to the more general EXFOR which includes also charged-particle nuclear data and photonuclear data, is in preparation.

The IAEA EXFOR system is documented in detail in the following reports:

- IAEA-NDS-2: EXFOR Dictionaries
- IAEA-NDS-3: NDS EXFOR Manual
- IAEA-NDS-4: System Specifications for the NDS EXFOR System
- IAEA-NDS-5: System Specifications for the NDS EXFOR Dictionary Sub-system
- IAEA-NDS-6: System Specifications for the NDS Data Index System

SHORT GUIDE TO EXFOR

EXFOR - a computerized EXchange FORmat - presents in a convenient compact form experimental numerical data as well as physical information necessary to understand the experiment and interpret the data. Keywords and codes make the information computer intelligible. The structure of EXFOR is briefly described in the following.

Each EXFOR "entry" consists of two or more "subentries". The first subentry of an entry contains information which is common to all the following subentries of that entry. Each subentry may include two types of information: Descriptive text information and numerical data. Each item of descriptive text information is identified by keywords such as TITLE, STANDARD, ISO-QUANT, which may exhibit a code within parenthesis, such as (GELI), (SCIN) for the keyword DETECTOR or (TOF), (COINC) for the keyword METHOD. The meaning of most keywords is self-explanatory. The meaning of most codes is given in the free text following the code. Of particular importance is the keyword "ISO-QUANT". Under this keyword are coded the "isotope and quantity" or, in other words, the reaction and parameter measured.

EXFOR information is available in two formats:

- the "standard format" primarily designed for the international exchange of data in computer processable form, and
- the "edited format" in which coded information and data tables are edited in an easily legible form.

The EXFOR structure, the standard and edited formats are illustrated in example 1.

There are several categories of numerical data:

- In the DATA TABLE the numerical data of the quantity defined above under ISO-QUANT are given under DATA (or RATIO) together with the columns of independent variables, errors, etc.
- Constant numerical values which are common to the entire data table of a given subentry, are given in the CONSTANT PARAMETERS (also called COMMON in the standard format) section.
- Constant numerical values which are common to all subentries of a given entry, are given in the CONSTANT PARAMETERS (resp. COMMON) section of the first subentry of that entry.

All numerical data are defined by Data-heading keywords (e.g. DATA, EN = incident neutron energy, STAND = standard) and by Data-unit keywords (e.g. EV, MB). The list of Data-heading keywords presently used is given on page 6.

Some data tables may have a more complex structure, for example there may be several ISO-QUANT per subentry; in this case each ISO-QUANT is connected to its pertinent column in the DATA TABLE by means of a "pointer", as illustrated in example 2. More generally a pointer can be used to connect related pieces of information (see example 3).

**BIBLIOGRAPHY, EXPERIMENTAL DESCRIPTION, EXPLANATIONS**  
 TITLE ACTIVATION CROSS-SECTIONS OF PT-198 WITH FAST NEUTRONS  
 AUTHOR (LURAY, A SZALAY)  
 INSTITUTE ATOMKI, CSEREKES, HUNGARY  
 (3MLAD00)  
 REFERENCE ATOMKI(ATCHNAG KUT;INTEZ;PROZLER, IS; (3J; 10) (MAR,1973) ; FULL INFORMATION;  
 PROGRAEY; INDCINUM=11; 34 (SEP,1973) ; ABSTRACT ONLY  
 SAMPLE MEASUREMENTS WERE MADE SIMULTANEOUSLY WITH NATURAL AND  
 ENRICHED Pt SAMPLES (87.68 PERCENT Pt-198).  
 STANDARD I 78-PT-108 PARTIAL (N,GAMMA) CS POPULATING A METASTABLE  
 STATE OF THE RESIDUAL NUCLEUS  
 (78-PT-108,N0,M0) NUMERICAL VALUE FROM P-REINSTATEMENT  
 NUCLEUS A (881970) ; BRANCHING RATIOS AND CONVERSION  
 COEFFICIENT WERE TAKEN FROM N.B.LEWIS,NUCL.DATA  
 SHEETS BT(1972) 186.  
 HALF-LIFE (M,1,78-PT-197-M) THE HALF-LIFE OF THE STANDARD 340  
 KEV ISOMERIC TRANSITION WAS MEASURED BY AUTHOR.  
 FACILITY 240 KEV NEUTRON GENERATOR OF ATOMKI  
 N-SOURCE (D-7) TID,NALPHA REACTION, THE NEUTRON YIELD WAS  
 ABOUT 540000 NEUTRONS/SEC.  
 METHOD (GEL) 12 CM3 (GEL) DETECTOR WITH A RESOLUTION (FWHM)  
 OF 3.5 KEV AT 601 KEV. ENERGY CALIBRATION WAS PERFORMED  
 WITH AEA STANDARD SOURCE.  
 DETECTOR (GEL) 12 CM3 (GEL) DETECTOR WITH A RESOLUTION (FWHM)  
 OF 3.5 KEV AT 601 KEV. ENERGY CALIBRATION WAS PERFORMED  
 WITH AEA STANDARD SOURCE.  
 STATUS DATA TAKEN FROM ATOMKI KOELENENYK 15(1973)101.  
 HISTORY 478120C) CA.  
 \*\*\*\*\*  
 CONSTANT PARAMETERS  
 EN = 10.0 KEV  
 EN-DEL = 0.0 KEV  
 STAND = 0.000 MB  
 STAND-ERR = 101.0 MB  
 MLI = 50.4 MB  
 MLI-ERR = 0.0 MB  
 \*\*\*\*\*  
 STAND DEFINED ABOVE UNDER STANDARD.

**"EDITED" LISTING**

**"STANDARD" LISTING**

**FIRST SUBENTRY 30282.001**

INFORMATION COMMON  
 TO THE ENTIRE ENTRY

SUBENT	30282001	741205	3028200100001
BIB	4	23	3028200100002
FILE	(LURAY,A,SZALAY)		3028200100003
INSTITUTE	(3000000)		3028200100004
REF-YEAR	1973		3028200100005
REFERENCE	(J,AN,1973;3J;10) (1973) ; FULL INFORMATION; (P,ENDICINUM=11;14;7300) ; ABSTRACT ONLY		3028200100006
SAMPLE	MEASUREMENTS WERE MADE SIMULTANEOUSLY WITH NATURAL AND ENRICHED Pt SAMPLES (87.68 PERCENT Pt-198).		3028200100007
STANDARD	I 78-PT-108,N0,M0) NUMERICAL VALUE FROM P-REINSTATEMENT, NUCL.PHYS.A 15(1970)177.		3028200100008
HALF-LIFE	(M,1,78-PT-197-M) THE HALF-LIFE OF THE STANDARD 340 KEV ISOMERIC TRANSITION WAS MEASURED BY AUTHOR.		3028200100009
FACILITY	240 KEV NEUTRON GENERATOR OF ATOMKI		3028200100010
N-SOURCE	(D-7) TID,NALPHA REACTION, THE NEUTRON YIELD WAS ABOUT 540000 NEUTRONS/SEC.		3028200100011
METHOD	(GEL) 12 CM3 (GEL) DETECTOR WITH A RESOLUTION (FWHM) OF 3.5 KEV AT 601 KEV. ENERGY CALIBRATION WAS PERFORMED WITH AEA STANDARD SOURCE.		3028200100012
DETECTOR	(GEL) 12 CM3 (GEL) DETECTOR WITH A RESOLUTION (FWHM) OF 3.5 KEV AT 601 KEV. ENERGY CALIBRATION WAS PERFORMED WITH AEA STANDARD SOURCE.		3028200100013
STATUS	DATA TAKEN FROM ATOMKI KOELENENYK 15(1973)101. HISTORY 478120C) CA.		3028200100014
HISTORY	478120C) CA.		3028200100015
ENDSUBENT	30		3028200100016

KEYWORDS  
 STANDARD  
 HALF-LIFE  
 FACILITY  
 N-SOURCE  
 METHOD  
 DETECTOR

CODES  
 STATUS  
 HISTORY  
 COMMON  
 EN-REL  
 KEV  
 EN-DEL  
 ENDCOMMON  
 ENDSUBENT

CONSTANT PARAMETERS  
 TO ALL SUBENTRIES  
 IN ENTRY 30282

EN-REL	STAND	STAND-ERR	MLI	MLI-ERR
0	0	0	0	0
0.0	0.000	101.0	50.4	0.0
0	0	0	0	0
0	0	0	0	0

THE ABOVE INFORMATION APPLIES TO ALL SUB-ACCESSION NUMBERS STARTING WITH 30282.

**BIBLIOGRAPHY, EXPERIMENTAL DESCRIPTION, EXPLANATIONS**  
 SUB-ACCESSION NUMBER EXFOR 30282.002  
**100000001**  
 I 78-PT-108 PARTIAL (N,GAMMA) CS TC METASTABLE STATE  
 (78-PT-108,N0,M0) MEASURED BY AUTHOR  
 (D0) THE TOTAL INTERNAL CONVERSION COEFFICIENT OF THE  
 340 KEV TRANSITION IS ABOUT 0.16 (FROM M.A.SZALAY, GREN,  
 NUCLEONIC PHYS. REV. 115(1959)101)  
 \*\*\*\*\*  
 CONSTANT PARAMETERS  
 MLI = 13.2 SEC  
 MLI-ERR = 0.2 SEC  
 \*\*\*\*\*  
 DATA TABLE  
 DATA DEFINED ABOVE UNDER ISO-QUANT  
 DATA DATA-ERR  
 NO NO  
 1 1 0.0

**SECOND SUBENTRY 30282.002**

SUBENT	30282002	741205	3028200200001
BIB <td>3</td> <td>5</td> <td>3028200200002</td>	3	5	3028200200002
ISO-QUANT <td>(78-PT-108,N0,M0)</td> <td></td> <td>3028200200003</td>	(78-PT-108,N0,M0)		3028200200003
HALF-LIFE <td>(M,1,78-PT-108-M) MEASURED BY AUTHOR</td> <td></td> <td>3028200200004</td>	(M,1,78-PT-108-M) MEASURED BY AUTHOR		3028200200004
PART-DET <td>(D0) THE TOTAL INTERNAL CONVERSION COEFFICIENT OF THE 340 KEV TRANSITION IS ABOUT 0.16 (FROM M.A.SZALAY, GREN, NUCLEONIC PHYS. REV. 115(1959)101)</td> <td></td> <td>3028200200005</td>	(D0) THE TOTAL INTERNAL CONVERSION COEFFICIENT OF THE 340 KEV TRANSITION IS ABOUT 0.16 (FROM M.A.SZALAY, GREN, NUCLEONIC PHYS. REV. 115(1959)101)		3028200200005
ENDJOB <td>5</td> <td></td> <td>3028200200006</td>	5		3028200200006
COMMON <td>3</td> <td></td> <td>3028200200007</td>	3		3028200200007
MLI <td>MLI-ERR</td> <td></td> <td>3028200200008</td>	MLI-ERR		3028200200008
SEC	SEC		3028200200009
13.2	0.2		3028200200010
ENDCOMMON <td>3</td> <td></td> <td>3028200200011</td>	3		3028200200011
DATA <td>DATA-ERR</td> <td>1</td> <td>3028200200012</td>	DATA-ERR	1	3028200200012
NO	NO		3028200200013
0.0	0.0		3028200200014
ENDDATA <td>3</td> <td></td> <td>3028200200015</td>	3		3028200200015
ENDSUBENT <td>17</td> <td></td> <td>3028200200016</td>	17		3028200200016

CONSTANT PARAMETERS  
 VALID FOR SUBENTRY  
 30282.002 ONLY

"DATA" DEFINED UNDER  
 ISO-QUANT OF  
 SUBENTRY 30282.002

**BIBLIOGRAPHY, EXPERIMENTAL DESCRIPTION, EXPLANATIONS**  
 SUB-ACCESSION NUMBER EXFOR 30282.003  
**100000001**  
 I 78-PT-108 (N,GAMMA) CROSS-SECTION  
 (78-PT-108,N0) GIVEN BY COMPILER  
 (D0) THE 310, 493 AND 542 KEV TRANSITIONS WERE MEASURED  
 FOR THE DETERMINATION OF THE TOTAL (N,GAMMA) CROSS-SEC-  
 TION.  
 \*\*\*\*\*  
 CONSTANT PARAMETERS  
 MLI = 30.0 MB  
 \*\*\*\*\*  
 DATA TABLE  
 DATA DEFINED ABOVE UNDER ISO-QUANT  
 DATA DATA-ERR  
 NO NO  
 1 1 0.0

**THIRD SUBENTRY 30282.003**

SUBENT	30282003	741205	3028200300001
BIB <td>3</td> <td>5</td> <td>3028200300002</td>	3	5	3028200300002
ISO-QUANT <td>(78-PT-108,N0)</td> <td></td> <td>3028200300003</td>	(78-PT-108,N0)		3028200300003
HALF-LIFE <td>(M,1,78-PT-108-M) GIVEN BY COMPILER</td> <td></td> <td>3028200300004</td>	(M,1,78-PT-108-M) GIVEN BY COMPILER		3028200300004
PART-DET <td>(D0) THE 310, 493 AND 542 KEV TRANSITIONS WERE MEASURED FOR THE DETERMINATION OF THE TOTAL (N,GAMMA) CROSS-SEC- TION.</td> <td></td> <td>3028200300005</td>	(D0) THE 310, 493 AND 542 KEV TRANSITIONS WERE MEASURED FOR THE DETERMINATION OF THE TOTAL (N,GAMMA) CROSS-SEC- TION.		3028200300005
ENDJOB <td>5</td> <td></td> <td>3028200300006</td>	5		3028200300006
COMMON <td>1</td> <td>3</td> <td>3028200300007</td>	1	3	3028200300007
MLI <td>MLI-ERR</td> <td></td> <td>3028200300008</td>	MLI-ERR		3028200300008
NO	NO		3028200300009
ENDCOMMON <td>3</td> <td></td> <td>3028200300010</td>	3		3028200300010
DATA <td>DATA-ERR</td> <td>1</td> <td>3028200300011</td>	DATA-ERR	1	3028200300011
NO	NO		3028200300012
0.0	0.0		3028200300013
ENDDATA <td>3</td> <td></td> <td>3028200300014</td>	3		3028200300014
ENDSUBENT <td>17</td> <td></td> <td>3028200300015</td>	17		3028200300015

CONSTANT PARAMETERS  
 VALID FOR SUBENTRY  
 30282.003 ONLY

"DATA" DEFINED UNDER  
 ISO-QUANT OF  
 SUBENTRY 30282.003.

EXAMPLE 1

## "EDITED" LISTING

SUB-ACCESSION NUMBER **EXFOR 10499.002**

DIAGNOSTIC: EXPERIMENTAL DESCRIPTION, EXPLANATIONS  
 .....

ISO-QUANT	RESONANCE ENERGY	NEUTRON WIDTH	SPIN J
410	9-F-10		
420	9-F-10		
430	9-F-10		

1(9-F-10.EN.RES)  
 2(9-F-10.EL/WID)  
 3(9-F-10.J.RES)

ANALYSIS INLA) R-MATRIX MULTI-LEVEL ANALYSIS  
 .....

CONSTANT PARAMETERS  
 MOMENTUM L = 1, NO-DIM  
 .....

DATA TABLE	DATA	DATA-ERR	NO-DIM
1	26.99	0.325	0.020
2	48.78	1.67	0.10
3	97.59	14.5	0.8

.....

\*10 = 'POINTER', WHICH LINKS RELATED PIECES OF NUMERICAL AND/OR TEXT INFORMATION

POINTERS LINK RELATED PIECES OF NUMERICAL AND/OR TEXT INFORMATION. IN THIS EXAMPLE, A POINTER (E.G. 3) LINKS AN ISO-QUANT WITH ITS CORRESPONDING DATA COLUMN.

## "STANDARD" LISTING

SUBENT	10499002	750514	
BIB	2		
ISO-QUANT	1(9-F-10.EN.RES)		
	2(9-F-10.EL/WID)		
	3(9-F-10.J.RES)		
ANALYSIS	INLA) R-MATRIX MULTI-LEVEL ANALYSIS		
ENDSUB	4		
COMMON	1	3	
MOMENTUM L			
NO-DIM			
1.			
ENDCOMMON	3		
DATA	4	3	
KEY	10DATA	2DATA-ERR	3DATA
	KEY	KEY	NO-DIM
26.99	0.325	0.020	2.
48.78	1.67	0.10	1.
97.59	14.5	0.8	1.
ENDDATA	5		
ENDSUBENT	10		

## "EDITED" LISTING

SUB-ACCESSION NUMBER EXPOS\_30275\_045

### BIBLIOGRAPHY, EXPERIMENTAL DESCRIPTION, EXPLANATIONS

122-YI-0 DIFF PARTL NEUTRON EMISSION CROSS-SECT IDN

(22-YI-0) NEW (DA, PAR)  
 STATUS DATA WERE OBTAINED BY INTEGRATING OVER A 1 MEV INTERVAL  
 FROM 2 TO 11 MEV THE DOUBLE DIFFERENTIAL CROSS-SECTION  
 GIVEN IN SUBENTRY 11.

### CONSTANT PARAMETERS

210 ANG = 40e ADEG  
 220 ANG = 60e ADEG  
 230 ANG = 80e ADEG  
 240 ANG = 100e ADEG  
 250 ANG = 120e ADEG  
 EN-APRX = 14.6 MEV

\* 2 \*

### DATA TABLE DERIVED ABOVE UNDER 150-GUANT

1	2	3	4	5	6	7	8	9	10
E-MIN	E-MAX	DATA-CM	DATA-ERR	DATA-CM	DATA-ERR	DATA-CM	DATA-ERR	DATA-CM	DATA-ERR
MEV	MEV	MB/SR	MB/SR	MB/SR	MB/SR	MB/SR	MB/SR	MB/SR	MB/SR
1 2e	3e	30e08	0e57	24e00	0e25	20e08	0e39	25e19	0e44
2 3e	4e	22e01	0e50	14e99	0e20	14e00	0e24	13e00	0e27
3 4e	5e	13e92	0e30	9e30	0e14	7e94	0e15	0e14	0e13
4 5e	6e	10e17	0e25	7e02	0e11	0e12	0e13	2e79	0e06
5 6e	7e	8e53	0e23	5e73	0e10	4e45	0e12	2e35	0e06
6 7e	8e	7e47	0e22	5e27	0e09	3e43	0e11	1e94	0e05
7 8e	9e	5e94	0e17	4e18	0e08	2e50	0e09	1e04	0e05
8 9e	10e	3e98	0e11	3e02	0e06	1e76	0e06	0e47	0e02
9 10e	11e	2e94	0e08	2e10	0e05	0e95	0e04	0e27	0e01

11	12
DATA-CM	DATA-ERR
MB/SR	MB/SR
1 18e06	0e29
2 8e52	0e24
3 3e11	0e46
4 2e50	0e24
5 2e70	0e36
6 1e46	0e14
7 2e48	0e28
8 1e50	0e21
9 0e42	0e18

\*10 = 'POINTER', WHICH LINKS RELATED PIECES OF NUMERICAL AND/OR TEXT INFORMATION

## "STANDARD" LISTING

SUBENT 30275045 750521 3027504500001  
 010 2 4 3027504500002  
 150-QUANT [22-YI-0) NEW (DA, PAR) 3027504500003  
 STATUS DATA WERE OBTAINED BY INTEGRATING OVER A 1 MEV INTERVAL 3027504500004  
 FROM 2 TO 11 MEV THE DOUBLE DIFFERENTIAL CROSS-SECTION 3027504500005  
 GIVEN IN SUBENTRY 11. 3027504500006  
 3027504500007  
 3027504500008  
 3027504500009  
 3027504500010  
 3027504500011  
 3027504500012  
 3027504500013  
 3027504500014  
 3027504500015  
 3027504500016  
 3027504500017  
 3027504500018  
 3027504500019  
 3027504500020  
 3027504500021  
 3027504500022  
 3027504500023  
 3027504500024  
 3027504500025  
 3027504500026  
 3027504500027  
 3027504500028  
 3027504500029  
 3027504500030  
 3027504500031  
 3027504500032  
 3027504500033  
 3027504500034  
 3027504500035  
 3027504500036  
 3027504599999  
 3027509999999

2

IN THIS EXAMPLE, A POINTER LINKS AN ANGLE AND THE CORRESPONDING DIFFERENTIAL CROSS-SECTION. ALSO NOTE THAT TABLES WITH MORE THAN 6 COLUMNS WHICH ARE TEDIOUS TO DECIPHER IN "STANDARD" FORMAT, ARE CLEARLY PRESENTED IN THE "EDITED" LISTING.

## LIST OF DATA-HEADING KEYWORDS

KEYWORD	EXPLANATION	KEYWORD	EXPLANATION (cont'd)
EN	INCIDENT NEUTRON ENERGY, LAB-SYSTEM	COS-MAX	HIGH LIMIT OF COSINE-RANGE OF ANGLE, LAB-SYSTEM
EN-APRX	APPROXIMATE VALUE OF INCIDENT NEUTRON ENERGY	COS-CR-MAX	HIGH LIMIT OF COSINE-RANGE OF ANGLE, C-M-SYSTEM
EN-CK	INCIDENT NEUTRON ENERGY, C-M-SYSTEM	COS-RSL	COSINE OF ANGULAR RESOLUTION
EN-MIN	LOW LIMIT OF INCIDENT NEUTRON ENERGY RANGE, LAB-SYSTEM	COS-ERR	COSINE OF ANGLE ERROR
EN-CN-MIN	LOW LIMIT OF INCIDENT NEUTRON ENERGY RANGE, C-M-SYSTEM	DATA	HEADING FOR COLUMN GIVING THE QUANTITY SPECIFIED UNDER 'ISO-QUANT'
EN-MAX	HIGH LIMIT OF INCIDENT NEUTRON ENERGY RANGE, LAB-SYSTEM	DATA-CH	DATA GIVEN IN THE CENTRE OF MASS SYSTEM
EN-CN-MAX	HIGH LIMIT OF INCIDENT NEUTRON ENERGY RANGE, C-M-SYSTEM	DATA-APRX	APPROXIMATE VALUE OF DATA
EN-DUMMY	DUMMY ENERGY, USED AS THE NUMERICAL EQUIVALENT OF AN INCIDENT NEUTRON SPECTRUM WHEN NO NUMERICAL ENERGY VALUE IS GIVEN BY THE AUTHOR	DATA-MIN	LOW LIMIT OF DATA
EN-RSL	INCIDENT-NEUTRON ENERGY-RESOLUTION	DATA-MAX	HIGH LIMIT OF DATA
+EN-RSL	ASYMMETRIC ENERGY RESOLUTION	DATA-ERR	DATA-ERROR, EXPLANATION TO BE GIVEN UNDER 'ERR-ANALYS'
-EN-RSL	UNSYMMETRIC ENERGY RESOLUTION	DATA-ERR1	FIRST DATA-ERROR, IF MORE THAN ONE ERROR-COL IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
EN-ERR	ERROR OF MONOCHROMATIC INCIDENT-NEUTRON ENERGY OR UNCERTAINTY OF THE CENTRAL ENERGY IN AN INCIDENT NEUTRON-SPECTRUM	DATA-ERR2	SECOND DATA-ERROR, IF MORE THAN ONE ERROR-COL IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
EN-ERR1	ENERGY ERROR, IF MORE THAN ONE ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	DATA-ERR3	THIRD DATA-ERROR, IF MORE THAN ONE ERROR-COL IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
EN-ERR2	SECOND ENERGY ERROR, IF MORE THAN ONE ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'	+DATA-ERR	+ UNSYMMETRIC DATA-ERROR, EXPLANATION UNDER 'ERR-ANALYS'
+EN-FRR	+ UNSYMMETRIC ENERGY-ERROR	-DATA-ERR	- UNSYMMETRIC DATA-ERROR, EXPLANATION UNDER 'ERR-ANALYS'
-EN-FRR	- UNSYMMETRIC ENERGY-ERROR	RATIO	HEADING FOR COLUMN GIVING THE RATIO SPECIFIED UNDER 'ISO-QUANT', OR THE QUANTITY/STANDARD RATIO
EN-NRM	NORMALIZATION ENERGY, TO BE USED WHEN A DATA SET IS NORMALIZED TO ONE ENERGY ONLY.	RATIO-MIN	LOW LIMIT OF RATIO
EN-RSE	RESONANCE ENERGY	RATIO-MAX	HIGH LIMIT OF RATIO
EN-RSE-ERR	ERROR OF RESONANCE-ENERGY	RATIO-ERR	RATIO-ERROR
MU-ADLER	MU IN ADLER-ADLER RESONANCE-ANALYSIS, EQUIVALENT TO RESONANCE ENERGY	RATIO-ERR1	FIRST RATIO-ERROR, IF MORE THAN ONE RATIO-ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
E	ENERGY OF OUTGOING PARTICLE, LAB-SYSTEM	RATIO-ERR2	SECOND RATIO-ERROR, IF MORE THAN ONE RATIO-ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
F1	ENERGY OF OUTGOING PARTICLE, AS DEFINED IN BIR-SECTION	RATIO-ERR3	THIRD RATIO-ERROR, IF MORE THAN ONE RATIO-ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
E2	ENERGY OF OUTGOING PARTICLE, AS DEFINED IN BIR-SECTION	RATIO-ERR4	FOURTH RATIO-ERROR, IF MORE THAN ONE RATIO-ERROR IS GIVEN. EXPLANATION UNDER 'ERR-ANALYS'
F-APRX	ENERGY OF OUTGOING PARTICLE, C-M-SYSTEM	STAND-ERR	STANDARD-ERROR
E-CK	LOW LIMIT OF OUTGOING-PARTICLE E-RANGE, LAB-SYSTEM	STAND1	FIRST STANDARD-VALUE IF MORE THAN ONE IS GIVEN. EXPLANATION UNDER 'STANDARD'
E-CN-MIN	LOW LIMIT OF OUTGOING-PARTICLE E-RANGE, C-M-SYSTEM	STAND2	SECOND STANDARD-VALUE IF MORE THAN ONE IS GIVEN. EXPLANATION UNDER 'STANDARD'
E-MAX	HIGH LIMIT OF OUTGOING-PARTICLE E-RANGE, LAB-SYSTEM	STAND3	THIRD STANDARD-VALUE IF MORE THAN ONE IS GIVEN. EXPLANATION UNDER 'STANDARD'
E-CN-MAX	HIGH LIMIT OF OUTGOING-PARTICLE E-RANGE, C-M-SYSTEM	STAND1-ERR	ERROR OF FIRST STANDARD-VALUE
E-RSL	OUTGOING-PARTICLE ENERGY-RESOLUTION	STAND2-ERR	ERROR OF SECOND STANDARD-VALUE
E-ERR	OUTGOING-PARTICLE ENERGY-ERROR	STAND3-ERR	ERROR OF THIRD STANDARD-VALUE
E-EC	EXCITATION-ENERGY	TEMP	SAMPLE TEMPERATURE
E-EC-MIN	LOW LIMIT OF EXCITATION-ENERGY	TEMP-FRR	ERROR OF SAMPLE TEMPERATURE
E-EC-MAX	HIGH LIMIT OF EXCITATION-ENERGY	TEMP-ERR	Z-NUMBER OF ELEMENTS, FOR FISSION-PRODUCT YIELDS ONLY
E-LVL	LEVEL-ENERGY	MASS	A-NUMBER OF ISOTOPIES, FOR FISSION-PRODUCT YIELDS ONLY
E-LVL-INI	INITIAL LEVEL OF GAMMA-TRANSITION	HL	HALF-LIFE OF RESONANT NUCLEUS
E-LVL-FIN	FINAL LEVEL OF GAMMA-TRANSITION	HL1	ERROR OF HALF-LIFE OF RESONANT NUCLEUS
E-LVL-ERR	LEVEL-ENERGY ERROR	HL2-ERR	ERROR OF HALF-LIFE OF NUCLEUS SPECIFIED IN BIO-SECTION
E-LVL-MIN	LOW ENERGY-LIMIT OF A DISCRETE LEVEL-GROUP	HL3-ERR	ERROR OF HALF-LIFE OF NUCLEUS SPECIFIED IN BIO-SECTION
E-LVL-MAX	HIGH ENERGY-LIMIT OF A DISCRETE LEVEL-GROUP	FLAG	FLAG, MEANING OF FLAGS GIVEN UNDER THIS HEADING TO BE EXPLAINED IN BIO-SECTION UNDER 'FLAG'
LVL-NUMD	LEVEL-NUMBER, TO BE USED ONLY IF OTHER INFORMATION IS NOT AVAILABLE.	NUMBER	COEFFICIENT-NUMBER OF LEGENDRE OF COSINE COEFFICIENTS
Q-VAL-APRX	APPROXIMATE Q-VALUE	NUMBER-CN	COEFFICIENT-NUMBER OF LEGENDRE OF COSINE COEFFICIENTS WHEN THE FIT HAS BEEN DEGRADED FROM AN ANGULAR DISTRIBUTION IN WHICH THE PARAMETERS ARE GIVEN IN THE CENTRE OF MASS SYSTEM
Q-VAL	Q-VALUE	SPIN J	SPIN J OF RESONANCES, STRENGTH-FUNCTIONS, ETC.
Q-VAL-RSL	Q-VALUE RESOLUTION	MOMENTUM L	ANGULAR MOMENTUM L OF RESONANCES, STRENGTH-F'S, ETC.
Q-VAL-ERR	Q-VALUE ERROR	PARITY	PARITY OF RESONANCE
Q-VAL-MIN	LOWER LIMIT OF Q-VALUE	STAT-W G	STATISTICAL-WEIGHT FACTOR G
Q-VAL-MAX	UPPER LIMIT OF Q-VALUE	MIN	MINIMUM LINEAR MOMENTUM OF INCOMING PARTICLES
E-GAIN	GAIN IN NEUTRON ENERGY	MIN-MIN	MINIMUM LINEAR MOMENTUM OF INCOMING PARTICLES
E-GAIN-ERR	ERROR OF GAIN IN NEUTRON ENERGY	MIN-MAX	MAXIMUM LINEAR MOMENTUM OF INCOMING PARTICLES
E-DDG	DEGRADATION IN NEUTRON ENERGY	MISC	HEADING FOR A COLUMN WITH SUPPLEMENTARY INFORMATION FOR WHICH NO DATA-HEADING KEYWORD HAS BEEN DEFINED. EXPLANATION TO BE GIVEN UNDER 'MISC-COL' KEYWORD
E-DDG-ERR	ERROR OF DEGRADATION IN NEUTRON ENERGY	MISC1	FIRST MISCELLANEOUS COLUMN - IF MORE THAN ONE IS GIVEN SAME USAGE AS -MISC-(SEE ABOVE)
ANG	ANGLE, LAB-SYSTEM	MISC2	SECOND MISCELLANEOUS COLUMN - IF MORE THAN ONE IS GIVEN SAME USAGE AS -MISC-(SEE ABOVE)
ANG1	ANGLE, DEFINITION SPECIFIED IN THE BIO-SECTION		
ANG2	ANGLE, DEFINITION SPECIFIED IN THE BIO-SECTION		
ANG3	ANGLE, DEFINITION SPECIFIED IN THE BIO-SECTION		
ANG-CN	ANGLE, C-M-SYSTEM		
ANG-MIN	LOW LIMIT OF ANGLE RANGE, LAB-SYSTEM		
ANG-CN-MIN	LOW LIMIT OF ANGLE RANGE, C-M-SYSTEM		
ANG-MAX	HIGH LIMIT OF ANGLE RANGE, LAB-SYSTEM		
ANG-CN-MAX	HIGH LIMIT OF ANGLE RANGE, C-M-SYSTEM		
ANG-RSL	ANGULAR RESOLUTION		
ANG-ERR	ANGLE-ERROR		
COS	COSINE OF ANGLE, LAB-SYSTEM		
COS-CN	COSINE OF ANGLE, C-M-SYSTEM		
COS-MIN	LOW LIMIT OF COSINE-RANGE OF ANGLE, LAB-SYSTEM		
COS-CN-MIN	LOW LIMIT OF COSINE-RANGE OF ANGLE, C-M-SYSTEM		