

## Zero values in EXFOR data base

(M. Mikhailiukova, 2024-04-18, 4C-4/0239)

At correction of old Entries it was found that in EXFOR data base there are Entries containing zero values of data errors given as DATA-ERR, ERR-T, ERR-S with zero value of DATA. I checked EXFOR master file by a string “0.0000E+00 0.0000E+00”.

Typical examples were found:

- 1) **Blanks at initial compilation** were replaced by **zero values** – probably at EXFOR transformation at past years from one computer (or operating system or data format) to other.

### Example 1:

EN-MIN	EN-MAX	E	LVL-FIN	DATA	DATA-ERR	DATA-MAX
KEV	KEV	KEV	KEV	PC/INC	PC/INC	PC/INC
4.2100E+01	4.2100E+01	8.3640E+03	0.0000E+00	0.0000E+00	0.0000E+00	1.0000E+00

In initial compilation ( EN is given in COMMON block):

E	E-LVL-FIN	DATA	DATA-ERR	DATA-MAX
KEV	KEV	GAM/100N	GAM/100N	GAM/100N
8364.	0.			1.

In Table 6 of the article : DATA-MAX is given “<1.”.

### Example 2:

Now:

ANG	E	DATA	ERR-T
ADEG	MEV	MB/SR/MEV	MB/SR/MEV
4.0000E+01	3.0000E+00	0.0000E+00	0.0000E+00
4.0000E+01	3.5000E+00	0.0000E+00	0.0000E+00
4.0000E+01	4.0000E+00	0.0000E+00	0.0000E+00
4.0000E+01	4.5000E+00	0.0000E+00	0.0000E+00
4.0000E+01	9.7500E+00	0.0000E+00	0.0000E+00

...and other lines.

These fields are the **blanks in initial compilation** (ANG 1,2,3,4,5 are given in Common block):

EN	ANG	1ANG	2ANG	3ANG	4ANG	5
MEV	ADEG	ADEG	ADEG	ADEG	ADEG	
14.8	30.	40.	45.	60.	75.	
ENDCOMMON		3				
DATA		11	11			
E	DATA	1DATA-ERR	1DATA	2DATA-ERR	2DATA	3
DATA-ERR	3DATA	4DATA-ERR	4DATA	5DATA-ERR	5	
MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV
MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV	MB/SR/MEV
3.0	11.8	1.2				
	1.8	0.2	0.6	0.1		
3.5	14.5	1.4				
	2.0	0.2	3.9	0.4		
4.0	13.2	1.3				
	2.4	0.2	4.8	0.5		
4.5	13.3	1.3				10.4
1.0	3.8	0.2	4.0	0.4		
5.0	14.8	1.5	10.5	1.1		9.8
1.0	4.03	0.4	3.0	0.3		
5.5	13.8	1.4	10.8	1.1		10.7
1.1	3.4	0.4	3.5	0.4		
6.0	12.7	1.3	9.2	0.9		11.7
1.2	3.3	0.3				

6.75	10.5	1.1	8.9	0.9	8.9
0.9					
7.75	7.9	0.8	7.7	0.8	7.4
0.7					
8.75	6.9	0.7	6.6	0.7	6.9
0.7					
9.75	6.9	0.7			

2) Total uncertainty ERR-T=0.%, but there are partial uncertainties > 0. .

Example:

```
COMMON      1      3
MONIT-ERR
PER-CENT
6.0
```

```
...
ERR-ANALYS (DATA-ERR1) probably total uncertainty
           (DATA-ERR2) Probably the statistical uncertainty
```

```
EN          DATA      DATA-ERR1  DATA-ERR2
MEV         B          PER-CENT     PER-CENT
7.4000E-03  1.0000E-03  0.0000E+00 0.0000E+00
```

Comment in the article:

“The capture yields versus energy are listed in the CCDN file (Neutron Data Compilation Center, B.P. 9, F-91190, Gif-surYvette, France) along with the statistical and total estimated uncertainties.”

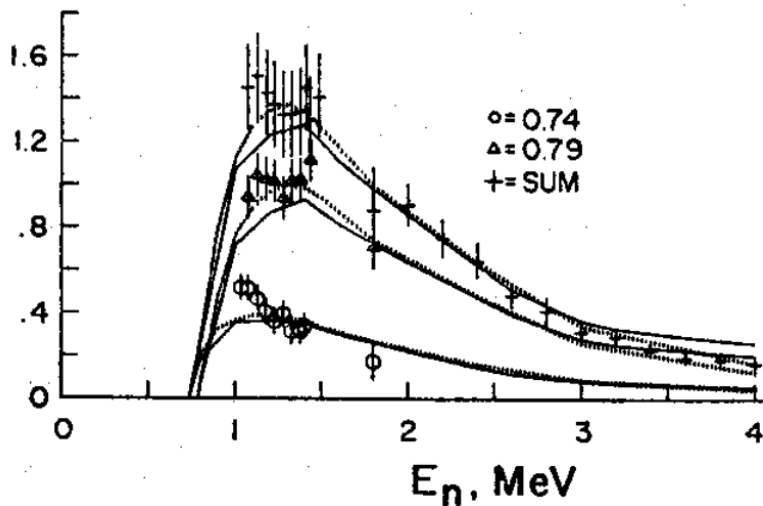
3) Zero values are given in data received from authors.

Example:

```
STATUS      (APRVD) Approved by author 1976/1/19.
           Data received on magnetic tape, Smith, 1975/8
```

```
E          EN          DATA      DATA-ERR
MEV        MEV        B          B
7.8000E-01 7.8700E-01  0.0000E+00 0.0000E+00
7.8000E-01 8.0000E-01  7.1300E-02 0.0000E+00
7.8000E-01 1.0000E+00  7.1760E-01 0.0000E+00
```

In the article on figure (triangles) data for this E=0.79 MeV are presented with error bars, so uncertainties are not equal to zero.



(Fig. 5c.)

All such cases (found by me) were analysed and the result of this analysis is presented in Tables 1, 2.

Table 1. Correction is proposed

Entry .Subent	Data source	Zero values in columns	Correction proposed	Additional comment
10524.012	from author	DATA&DATA-ERR at E=0.78, DATA-ERR=0. at 7.8	Delete zero uncertainty, add uncertainty of E from Table 2 of the article.	on Fig.5c uncertainties are not equal to zero.
10788.002	from author	DATA&DATA-ERR at 2.26,2.5,2.74,3.5	correct as in Table of the article	negative ERR-S, at 3.5, 4.98, 12.45, 14.94; negative DATA (DA/DE) could be explained?
14239 .022, .035, .044	from author	EN&DATA&DATA-ERR	delete these lines (3, 3, 7 at end of data block in corresponding Subents)	Negative RYL, negative TRN could be explained?
20555.002	from author	ERR-T&ERR-S for 7.4 keV	Delete zero ERR-T	MONIT-ERR=6.%, MONIT-ERR -> ERR-1 (no MONIT given)?
21801.002	Table	FLAG FLAG	delete zero FLAG values from DATA block	Zero FLAG is not defined in BIB block (1563.9 res.energy)
21865.005	from author	DATA&DATA-ERR	delete line with Leg. coefficients ratio =0. for NUMBER=4	Ratio a4/a0 is absent on Fig.8
22138.006	Table Abstract text	EN	0.-> 0.55 milli-eV	Neutron beam energy 0.55 milli-eV
22030.003	TABLE	all DATA&ERR-T for E=112.1	replace by data from Table 1 of article	
22848.004	from author	E&DATA	delete these lines	Egamma=0. is out of physical meaning for MLT/DE
22961.022	from author TABLE D1	DATA/ERR-T	delete this line – absent in Table D1 ; Add “Table D1” in STATUS	ERR-1&ERR-2 are given in Subent 001, so ERR-T can not be =0.
30395.005	TABLE	DATA&DATA-ERR& DATA-MAX	correct data as in Table 6	delete lines with 0.0. - they are blanks in Table 6
30470.002	from author	DATA&DATA-ERR	delete these lines	no such zero data on figures and in initial compilation
30532.039	TABLE	DATA&ERR-T	delete this line	blanks in the article
G0003 .006-.007	TABLE	DATA/DATA-ERR	delete these lines	blanks in initial compilation and absent in the article

Table 2. Suspicious cases, correction is proposed for discussion at responsible center

Entry.Subent	Data source	Zero values	Correction proposed/Comment
10297.006- .009	from	DATA&ERR-S,	delete lines with zero DATA&ERR-S?/

	author	several times	negative values of DA/DE could be explained?
10929.002	from author	DATA&ERR-S at 0.1135, 0.11975, 0.12019, 0.12226, 0.127, 0.1276 MeV	zero ERR-S could be deleted?/ Negative C-S values could be explained?
13198.002	from author	DATA&DATA-ERR =0. at 67.581, 4.2916 eV	Delete these lines ? Zero point at 4.2916 is absent on Fig.5. Figures < 60 eV. DATA-ERR -> ERR-S
20332.006	from author	DATA&DATA-ERR	delete DATA-ERR =0. ? Or estimate from Fig.5(1) lower - /first point has not-zero uncertainty; Negative values of DA/DE data could be explained?
20422.002-.004	DATA -from author, Errors-Table	ERR-3/4	ERR-4: "sample thickness" -> "sample thickness correction". ERR-T -> DATA-ERR(does not contain some partial errors)
21834.006,.007	Table	E.g. MASS 1.5950E+02 TKE(A)1.4680E+02 ERR-S 0.0000E+00 MISC 0.0000E+00	Data are given as in Table. Lines with zero TKE/KE can be deleted? /NU negative in article Tables VIII, IX could be explained?
21978.003	from author	ERR-S\$ERR-SYS	zero errors could be deleted? "no errors given for EN<600 eV" does not mean that errors=0.?
21986.018,.061	Quasi-EXFOR entry LI6.CBA LI7.CBA	DATA&DATA-ERR	lines with zero data could be deleted?/ negative DA/DE could be explained?; STATUS could be clarified – authors' data?
22077.017,.032,.046	from author	DATA&DATA-ERR	Zero data could be deleted?/ Ref.C,88MITO,,291,1988 is given twice – in Subent 001 and in data Subents.
22155.018,.019,.036,.054,.055	from author	DATA&ERR-S	could be deleted?
22157.059,.074,.088	from author	DATA&DATA-ERR	could be deleted? /Ref.C,88MITO,,209,1988 is in Subent 001, in data Subents C,88MITO,,209,1988(tis.ref. in 22077);
22158.003,.005	from author	DATA&ERR-S	could be deleted?
22660.002	from author	DATA/DATA-ERR	could be deleted?/
22780.003	from author	DATA-ERR/ MISC/MISC-ERR	Misprint? Delete? PDF in EXFOR for this Entry is wrong. No error bars for this point on Fig3.of main.article.
22850.007,.008	from author	E&DATA& DATA-ERR	Delete lines with E=0 /E=0 for MLT/DE means that gamma are absent?
23065.004,.005,.010-.018	from author	DATA/DATA-ERR	First and last points are zeros, could be deleted? /DATA-ERR are blank in initial compilation of .004,.005

32001.019	from author	DATA&ERR-T	Delete ERR-T=0.? ERR-T=0. looks not-physical ERR-1=5%, ERR-2=4%...
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**Proposals:**

1. Correct Entries given in Table 1.
2. Check suspicious cases given in Table 2 and make decision of correction, consult with authors (if possible).
3. At future compilations, check data received from authors and discuss zero values of data uncertainties, add authors' comments, correct zero values if authors agree.
4. Check all Subents in EXFOR, where:
  - a. EN=0. ( can be >0.)
  - b. E=0. ( can be >0.)
  - c. PARITY=0.( can be +1. or -1., corrected in 20828 in past)
  - d. ERR-T=0.
  - e. DATA-ERR=0.And then analyse and correct if possible.