

## Recommended Resonance Integrals in EXFOR V1001+V1002 (A52)

(N. Otsuka, 2017-02-24, Memo CP-D/924)

Regarding Action 52 from the NRDC 2016 meeting,

“Check V1001.532, V1002.082, V1002.126, V1002.173 and V1002.572 against Mughabghab’s Atlas (c.f. slide #23 of Cabellos’s presentation “Provide a list of erroneous and suspicious outliers by using various statistical approaches”).

I checked each case with Mughabghab’s Atlas and the resonance integral values calculated from ENDF/B-VII.1, JEFF-3.2, JENDL-4.0u2 and TENDL-2014 by Oscar.

### General remark

The highest energy of the resonances listed in the Atlas is often coded under EN-MAX (i.e., upper boundary of integration). But this is not correct even if the resonance integral is constructed from the listed parameters. The Atlas defines the resonance integral with the energy integration from 0.5 eV to infinity (cf. Eq.2.85 of the Atlas), and we always should see EN-MIN=0.5 eV without EN-MAX in these EXFOR entries. Consequently REACTION SF8=LIM should not be used. Corrections are probably necessary not only for these five subentries but more systematically in the two EXFOR entries.

In the following comments,

ENDF/B	ENDF/B-VII.1
JEFF	JEFF-3.2
JENDL	JENDL-4.0u2
TENDL	TENDL-2014

### V1001.532.2

REACTION: (50-SN-124 (N, G) 50-SN-125-G, , RI, , LIM, RECOM)

EN-MIN (eV)	EN-MAX (eV)	EXFOR (mb)	Evaluated data (b) calculated by Oscar			
			ENDF/B	JEFF	JENDL	TENDL
0.5	314750	0.083(25)	N/A	1.87E-1	N/A	3.57E-1

- EN-MAX and LIM in EXFOR must be deleted.
- The unit “mb” printed in the Atlas must be “b”. (Oscar’s comment is right and also confirmed by Dr. Mughabghab on 23 Feb. 2017.)
- EXFOR 22632.009 (0.083±0.025 b) is adopted.

### V1002.082.2

REACITON: (55-CS-135 (N,G) 55-CS-136, , RI, , LIM, CALC)

EN-MIN (eV)	EN-MAX (eV)	EXFOR (b)	Evaluated data (b) Upper: calculated by Oscar. Lower: taken from text of the ENDF file.			
			ENDF/B	JEFF	JENDL	TENDL
0.5	219.5	3	4.11E+1	4.11E+1	4.58E+1	4.11E+1
0.5	$\infty$		5.09E+1	5.09E+1	5.35E+1	5.04E+1

- EN-MAX and LIM in EXFOR must be deleted.
- I could not find the source of the Atlas value. The Atlas gives a complete resonance parameter set for only one resonance at 42.2 eV.

### V1002.126

REACITON: (58-CE-138 (N,G) 58-CE-139, , RI, , LIM, RECOM)

EN-MIN (eV)	EN-MAX (eV)	EXFOR (b)	Evaluated data (b) Upper: calculated by Oscar. Lower: taken from text of the ENDF file.			
			ENDF/B	JEFF	JENDL	TENDL
0.5	10	6.7(34)	2.97E-1	4.20E-1	N/A	4.20E-1
0.5	$\infty$		9.12E+0	6.76E+0	N/A	6.90E+0

- EN-MAX and LIM in EXFOR must be deleted.
- This value is very close to EXFOR 12866.129 (6.7 $\pm$ 3.1 b).

### V1002.173

REACTION: (61-PM-148-M (N,G) 61-PM-149, , RI, , LIM, RECOM)

EN-MIN (eV)	EN-MAX (eV)	EXFOR (b)	Evaluated data (b) Upper: calculated by Oscar. Lower: taken from text of the ENDF file.			
			ENDF/B	JEFF	JENDL	TENDL
0.0253		3600(2400)	5.47E+4	5.47E+4	5.32E+4	5.13E+4
0.5	$\infty$		4.79E+3	4.79E+3	4.20E+3	8.27E+2

- EN-MIN must be 0.5 eV according to the definition of the resonance integral in the Atlas.
- I could not find the source of the Atlas value. The Atlas gives a complete resonance parameter set for only one resonance at 0.169 eV.

**V1002.572.4**

REACTION: (91-PA-233 (N,G) 91-PA-234, , RI, , LIM, CALC)

EN-MIN (eV)	EN-MAX (eV)	EXFOR (b)	Evaluated data (b) calculated by Oscar			
			ENDF/B	JEFF	JENDL	TENDL
0.5	17	3.0	7.02E+2	7.02E+2	7.03E+2	7.63E+2

- EN-MAX and LIM in EXFOR must be deleted.
- (N,G) must be (N,F). Oscar's comment is right.
- I could not find the source of the Atlas value. The Atlas does not give any fission width. Also there is no experimental resonance integral in EXFOR.