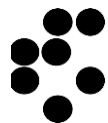


Origin of nuclear data for major evaluated nuclear data libraries JEFF-3.2, JENDL-4.0u2 and ENDF-B/VII.1

Status: FINAL

A. Brešan, B. Žefran, G. Žerovnik

Ljubljana, Januar 2016





IJS-DP-11967
januar 2016

NASLOV POROČILA:

Poročilo o pregledu izvorov jedrskih podatkov za knjižnice JEFF, JENDL in ENDF

Andrej Brešan, Bojan Žefran, Gašper Žerovnik

POVZETEK:

Za vsako od omenjenih knjižnic je opisan seznam izvorov jedrskih podatkov, iz katerih so bili podatki prevzeti in spremembe, ki se jih je opravilo za zadnjo verzijo te knjižnice. Seznami so urejeni po nuklidih.

IJS-DP-11967
Januar 2016

REPORT TITLE:

Report on the review of the sources of nuclear data for JEFF, JENDL and ENDF library

Andrej Brešan, Bojan Žefran, Gašper Žerovnik

ABSTRACT:

This report describes the lists of the sources of nuclear data from which the data have been taken and the modifications that have been done in order to update the last version of the treated library. The lists are arranged by nuclide.



List of Tables

Table I: Isotope and data source columns of JEFF-3.2, ENDF/B-VII.1, JENDL-4.0 list4

Contents

1	Introduction	1
2	Data review	2
2.1	Program for serching keywords	2
2.2	List for JEFF	2
2.3	List for JENDL	3
2.4	List for ENDF	3
3	Conclusions	31
4	References	32



1 Introduction

Evaluations for individual nuclides in contemporary major evaluated nuclear data libraries are often not original. In many cases, nuclear data are adopted either from older versions of the same library or from different libraries. In many other cases, the nuclear data are adopted from an older library but (more or less) slightly modified. As a general rule, the information about the origin of the evaluations is written in the header of the nuclear data file (the so-called File 1 in the ENDF-6 format [1]). However, there is no database where information for all available evaluations from different libraries would be available in one place. The purpose of this work is to gather all this information in a single document.

In this report, evaluations from the most recent versions of the major libraries JEFF-3.2 [2], ENDF/B-VII.1 [3] and JENDL-4.0 update 2 [4] have been considered. The report contains information on the original evaluations for all available nuclides. In cases where earlier evaluations were adopted with (minor) modifications, it is noted as »Modification« in the tables below. The modifications are described in detail in separate Excel spreadsheets.

The final purpose of the work is to establish a website where all this information will be stored and easily accessible for the users in a more user-friendly way. One consideration is also to extend the information from original evaluations to the regarded experimental data with possible link to the EXFOR database [5].

2 Data review

2.1 Program for searching keywords

The process of extracting the information about the origin of the evaluations has been partly automatized. The utility code written in C++ goes through all the selected nuclear data files. It searches for the text lines that describe the source of the data and the modifications applied.

Some examples of such lines are:

Original data taken from: (library)

The data were taken from (library)

modified parts for JENDL-(3.2, 3.3, 4.0)

JENDL-3.3 data were automatically transformed to JENDL-4.0.

JENDL-3.2 data were automatically transformed to JENDL-3.3. Interpolation of spectra: 22 (unit base interpolation) (3,251) deleted, T-matrix of (4,2) deleted, and others.

Resonance parameters in JENDL-3.3 were revised for JENDL-4.

They are defined at the beginning of the code as char objects. The code then opens one file at the time and reads through each line. If it finds a line that matches the previously defined ones, it writes the number of the file and all lines that have been found in the text to an Excel sheet. If it does not find any known line, it writes only the consecutive number of the text file that has been read and a »/« sign. Although the process of data extraction is faster using the code, all the files needed to be checked manually one more time, because the program could not always find the indicated lines. This happened in case of unexpected differences in syntax, for example when capital letters were used or when there was a different spacing between the words and the edge of the file or other variations of the imposed lines in the code.

2.2 List for JEFF-3.2

The list for JEFF-3.2 was together with the ENDF/B-VII.1 and JENDL-4.0 lists fitted to Table 1. The first line of the second column of Table 1 notes the previous version of the library from which (if) the data has been taken for the latest edition of the JEFF library, version 3.2. In the following line of the same column the modifications of the previous version are specified if the modification is noted in the ENDF-6 file header of the nuclide. The following lines then include the source library and the potential modifications for the previous version of the library and so on until the last column, which denotes the source library of the original evaluation.

In case no information is given on adoption of any data from another, »New evaluation« is written in the column.

If a certain nuclide was not listed in the library a »No data« has been written in the table.

2.3 List for JENDL-4.0u2

The lines in the JENDL table are arranged on the model of the JEFF table because the aim was to unify the notation for all the libraries. The reason was the different notation order of the sources than in JEFF. The first line of the fourth column of Table 1 notes if the data were taken from an older library (here only the library is written) or if the file comes from a new evaluation («New evaluation» is written in the column) or if there has been a new evaluation together with modifications of some parts of one or more previous libraries performed in order to update the most recent version. In the following lines these modifications are listed with some additional information or changes for the library in case.

2.4 List for ENDF/B-VII.1

The first two lines of the third column of Table 1 indicate the source of the data for the last version of the library, a new evaluation or a new evaluation with modified parts of previous libraries in order to update the last version in the similar way than the JENDL list. Next to the library name it is specified whether modifications have been made for JENDL-3.2 and JENDL-3.3 when the data were taken from them and also some additional changes or information regarding the treated library. The last column involves comments about the experiments, evaluation and calculation of the parameters, the ranges for energy taken into account in the evaluation and different other corrections or updates of the data.

If a certain nuclide was not listed in the library a «No data» has been written in the table.

Table 1: Origin of JEFF-3.2, ENDF/B-VII.1 and JENDL-4.0u2 incident neutron evaluated files for all available nuclides.

Nuclide	JEFF-3.2	ENDF/B-VII.1	JENDL-4.0u2
1-H-1	New evaluation	New evaluation	ENDF/B-VII.0
1-H-2	New evaluation	(modification) ENDF/B-VII ENDF/B-VI	(Modified) JENDL-3.3
1-H-3	New evaluation	New evaluation	No data
2-He-3	New evaluation	(Modification) ENDF/B-VII ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
2-He-4	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) ENDF/B-VII ENDF/B-VI	JENDL-3.3
3-Li-6	New evaluation	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
3-Li-7	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 EFF-2.4 (DIST-NOV94 REV-NOV94)	ENDF/B-VII ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
4-Be-7	No data	New evaluation	No data
4-Be-9	JEFF-3.1.1 JEFF-3.1 (Modification) EFF3 MOD6	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3
5-B-10	New evaluation	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-3.3
5-B-11	New evaluation	ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-3.3
6-C-0	JEFF-3.2T2 ENDF/B-VII.1	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
6-C-13	TENDL-2012	No data	No data
7-N-14	New evaluation	ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-3.3 (Modified) JENDL-3.2
7-N-15	New evaluation	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-3.3 (Modified) JENDL-3.2
8-O-16	JEFF-3.1.1 (Modification) JEFF-3.1 Updated	(Modification) ENDF/B-VII (Modification)	(Modified) JENDL-4.0 (Modified)

		ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
8-O-17	TENDL-2012	ENDF/B-VII ENDF/B-VI ENDF/B-V	No data
8-O-18	TENDL-2012	No data	No data
9-F-19	JEFF-3.1.2 (Modification) JEFF-3.1.1 JEFF-3.1 Pre-ENDF/B-VII	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
10-Ne-20	TENDL-2012	No data	No data
10-Ne-21	TENDL-2012	No data	No data
10-Ne-22	TENDL-2012	No data	No data
11-Na-22	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	JEFF-3.1 JEFF-3.0	No data
11-Na- 23	New evaluation	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	New evaluation
12-Mg- 24	JEFF-3.1.2 (Modification) JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modified) JENDL-3.3 (Modified) JENDL-3.2
12-Mg- 25	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3	(Modification) JENDL-3.3	JENDL-3.3
12-Mg- 26	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3	(Modification) JENDL-3.3	JENDL-3.3
12-Mg-27	TENDL-2012	No data	No data
13-Al- 27	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B (DIST-AUG99)	New evaluation	JENDL-3.3 (Modified) JENDL-3.2
14-Si- 28	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 EFF-3.0 (DIST-NOV01)	(Modification) ENDF/B-VI	New evaluation
14-Si- 29	New evaluation	(Modification) ENDF/B-VI	New evaluation
14-Si- 30	New evaluation	(Modification) ENDF/B-VI	New evaluation
14-Si- 31	TENDL-2012	No data	No data
14-Si- 32	TENDL-2012	No data	No data
15-P - 31	TENDL-2012	(Modification)	JENDL-3.3

		ENDF/B-VI	(Modified) JENDL-3.2
16-S - 32	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 (Modified) JENDL-3.2
16-S-33	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 (Modified) JENDL-3.2
16-S - 34	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 (Modified) JENDL-3.2
16-S - 36	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 (Modified) JENDL-3.2
17-CI- 35	JEFF-3.1.1 (Modification) JEFF-3.1 Updated Pre-ENDF/B-VII	New evaluation	JENDL-3.3
17-CI- 36	TENDL-2012	No data	No data
17-CI- 37	New evaluation	New evaluation	JENDL-3.3
18-Ar- 36	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	JEFF-3.1 JEFF-3.0	No data
18-Ar- 38	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	JEFF-3.1 JEFF-3.0	No data
18-Ar- 39	TENDL-2012	No data	No data
18-Ar- 40	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-3.3	JENDL-3.3
18-Ar- 41	TENDL-2012	No data	No data
19-K - 39	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 (Modified) JENDL-3.2
19-K - 40	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 JENDL-3.2
19-K - 41	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	JENDL-3.3 (Modified) JENDL-3.2
20-Ca- 40	JEFF-3.1.1 JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
20-Ca- 41	TENDL-2012	No data	No data
20-Ca- 42	JEFF-3.1.1 JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
20-Ca- 43	JEFF-3.1.1	JEFF-3.1	New evaluation

	JEFF-3.1 New evaluation		
20-Ca- 44	JEFF-3.1.1 JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
20-Ca- 45	TENDL-2012	No data	No data
20-Ca- 46	JEFF-3.1.1 (Modification) JEFF-3.1 Updated JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
20-Ca- 48	JEFF-3.1.1 JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
21-Sc- 45	JEFF-3.1.1 JEFF-3.1 New evaluation	ENDF/B-VII (Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
21-Sc- 46	TENDL-2012	No data	No data
22-Ti-46	JEFF-3.1.1 JEFF-3.1 New evaluation	(Modification) JENDL-3.3	(Modified) JENDL-3.3
22-Ti- 47	JEFF-3.1.1 JEFF-3.1 New evaluation	(Modification) JENDL-3.3	(Modified) JENDL-3.3
22-Ti- 48	JEFF-3.1.1 JEFF-3.1 New evaluation	(Modification) JENDL-3.3	(Modified) JENDL-3.3
22-Ti- 49	JEFF-3.1.1 JEFF-3.1 New evaluation	(Modification) JENDL-3.3	(Modified) JENDL-3.3
22-Ti- 50	JEFF-3.1.1 JEFF-3.1 New evaluation	(Modification) JENDL-3.3	(Modified) JENDL-3.3
23-V - 50	No data	JENDL-4.0 adopted	New evaluation
23-V - 51	No data	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	New evaluation
23-V - 0	JEFF-3.1.2 (Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 EFF-3.0 (DIST-OCT91 REV2- OCT91)	No data	No data
23-V - 49	TENDL-2012	No data	No data
24-Cr- 50	New evaluation	(Modification) ENDF/B-VI	New evaluation
24-Cr- 51	TENDL-2012	No data	No data
24-Cr- 52	New evaluation	(Modification) ENDF/B-VII.0	New evaluation
24-Cr- 53	New evaluation	(Modification) ENDF/B-VII.0	New evaluation
24-Cr- 54	New evaluation	(Modification) ENDF/B-VI	New evaluation
25-Mn- 53	TENDL-2012	No data	No data
25-Mn- 54	TENDL-2012	No data	No data
25-Mn- 55	New evaluation	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
26-Fe- 54	(Modification) JEFF-3.1.1 Updated	(Modification) ENDF/B-VI	(Modified) JENDL-3.3

	JEFF-3.1.1 JEFF-3.1 New evaluation		(Modified) JENDL-3.2
26-Fe- 56	JEFF-3.2b (Modification) JEFF-3.1.1 Updated (Modification) JEFF-3.1 Updated JEFF-3.1 New evaluation	(Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
26-Fe- 57	(Modification) JEFF-3.1.1 Updated JEFF-3.1 NRG-2004	(Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
26-Fe- 58	(Modification) JEFF-3.1.1 Updated JEFF-3.1 NRG-2004	ENDF/B-VII (Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
Fe059	No data	No data	New evaluation
27-Co- 57	TENDL-2012	No data	No data
27-Co- 58	JEFF-Beta JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	Original BNL evaluation	No data
27-Co- 58m1	No data	JEFF-3.1 JEFF-3.0	No data
27-Co- 58M	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	No data	No data
27-Co- 59	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B-VI.3 (DIST-JUN93 REV1-JUN92)	ENDF/B-VII ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3
27-Co- 60	TENDL-2012	No data	No data
28-Ni- 58	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) EFF-3.1 (DIST-AUG99 REV1-SEP00)	(Modification) ENDF/B-VII ENDF/B-VI	(Modified) JENDL-3.3 (Modified) JENDL-3.2
28-Ni- 59	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	JEFF-3.1 JEFF-3.0	New evaluation
28-Ni- 60	JEFF-3.1.2 (Modification) JEFF-3.1.1 Updated JEFF-3.1 JEFF-3.0 EFF-3.0 (DIST-JAN00 REV0-	(Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2

	MAR00)		
28-Ni- 61	JEFF-3.1.1 JEFF-3.1 ENDF/B-VI.8	(Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
28-Ni- 62	JEFF-3.1.1 JEFF-3.1 ENDF/B-VI.8	(Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
28-Ni- 63	TENDL-2012	No data	No data
28-Ni- 64	JEFF-3.1.1 JEFF-3.1 ENDF/B-VI.8	(Modification) ENDF/B-VI	JENDL-3.3 (Modified) JENDL-3.2
29-Cu- 63	New evaluation	(Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
29-Cu- 64	TENDL-2012	No data	No data
29-Cu- 65	New evaluation	(Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
29-Cu- 66	TENDL-2012	No data	No data
30-Zn- 64	TENDL-2012	JENDL-4.0 adopted	New evaluation
30-Zn- 65	No data	JENDL-4.0 adopted	New evaluation
30-Zn- 66	TENDL-2012	JENDL-4.0 adopted	New evaluation
30-Zn- 67	TENDL-2012	JENDL-4.0 adopted	New evaluation
30-Zn- 68	TENDL-2012	JENDL-4.0 adopted	New evaluation
30-Zn- 70	TENDL-2012	JENDL-4.0 adopted	New evaluation
31-Ga- 69	TENDL-2012	(Modification) JENDL-3.3	(Modified) JENDL-3.3
31-Ga- 71	TENDL-2012	CENDL-3	(Modified) JENDL-3.3
32-Ge- 70	TENDL-2012	New evaluation	ENDF/B-VII.0
32-Ge- 72	TENDL-2012	New evaluation	ENDF/B-VII.0
32-Ge- 73	TENDL-2012	New evaluation	ENDF/B-VII.0.
32-Ge- 74	TENDL-2012	New evaluation	ENDF/B-VII.0.
32-Ge- 76	TENDL-2012	New evaluation	ENDF/B-VII.0
33-As- 74	No data	New evaluation	No data
33-As- 75	TENDL-2012	New evaluation	New evaluation
34-Se- 74	TENDL-2012	(Modification) JENDL-3.3	New evaluation
34-Se- 76	TENDL-2012	(Modification) JENDL-3.3	New evaluation
34-Se- 77	TENDL-2012	(Modification) JENDL-3.3	New evaluation
34-Se- 78	TENDL-2012	(Modification) JENDL-3.3	New evaluation
34-Se- 79	TENDL-2012	(Modification) JENDL-3.3	New evaluation
34-Se- 80	TENDL-2012	(Modification) JENDL-3.2	New evaluation

34-Se- 82	TENDL-2012	(Modification) JENDL-3.3	New evaluation
35-Br- 79	TENDL-2012	(Modification) JENDL-3.3	New evaluation
35-Br- 81	TENDL-2012	(Modification) JENDL-3.3	New evaluation
36-Kr- 78	TENDL-2012	New evaluation	New evaluation
36-Kr- 80	TENDL-2012	(Modification) JENDL-3.3	New evaluation
36-Kr- 82	TENDL-2012	(Modification) JENDL-3.3	New evaluation
36-Kr- 83	TENDL-2012	CENDL-3	New evaluation
36-Kr- 84	TENDL-2012	(Modification) JENDL-3.3	New evaluation
36-Kr- 85	TENDL-2012	New evaluation	New evaluation
36-Kr- 86	TENDL-2012	(Modification) JENDL-3.3	New evaluation
37-Rb- 85	TENDL-2012	(Modification) JENDL-3.3	New evaluation
37-Rb- 86	TENDL-2012	New evaluation	New evaluation
37-Rb- 87	TENDL-2012	(Modification) JENDL-3.3	New evaluation
37-Rb- 88	TENDL-2012	No data	No data
38-Sr- 84	TENDL-2012	New evaluation	New evaluation
38-Sr- 86	TENDL-2012	(Modification) JENDL-3.3	New evaluation
38-Sr- 87	TENDL-2012	(Modification) JENDL-3.3	New evaluation
38-Sr- 88	TENDL-2012	(Modification) CENDL-3	New evaluation
38-Sr- 89	TENDL-2012	CENDL-3	New evaluation
38-Sr- 90	TENDL-2012	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
39-Y - 89	(Modification) ENDF/B-VII	(Modification) ENDF/B-VII.0 ENDF/B-VII	New evaluation
39-Y - 90	TENDL-2012	New evaluation	New evaluation
39-Y - 91	TENDL-2012	(Modification) JENDL-3.3	New evaluation
40-Zr- 90	TENDL-2012	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
40-Zr- 91	(Modification) JEFF/3.1.1 (Modification) JEFF-3.1 Updated (Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2

40-Zr- 92	TENDL-2012	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
40-Zr- 93	(Modification) JEFF-3.1.1 (Modification) ENDFB-7 +New Eval	New evaluation	New evaluation
40-Zr- 94	TENDL-2012	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
40-Zr- 95	(Modification) ENDF/B-VII	New evaluation	New evaluation
40-Zr- 96	JEFF-3.1.2 (Modification) JEFF-3.1.1 (Modification) JEFF-3.1 Updated (Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
41-Nb- 93	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
41-Nb- 94	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
41-Nb- 95	(Modification) JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
42-Mo- 92	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
42-Mo- 94	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
42-Mo- 95	(Modification) JEFF-3.1.1 (Modification)	New evaluation (covariances from COMMARA-2.0)	New evaluation

	JEFF-3.1 Updated Pre-ENDF/B-VII		
42-Mo- 96	(Modification) JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
42-Mo- 97	(Modification) ENDF/B-VII (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
42-Mo- 98	(Modification) JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
42-Mo- 99	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
42-Mo-100	(Modification) JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modification) JENDL-3.3	New evaluation
43-Tc- 98	TENDL-2012	No data	No data
43-Tc- 99	(Modification) JEFF-3.1.1 (Modification) JEFF-3.1 Updated	New evaluation	(Modified) JENDL-3.2
44-Ru- 96	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	(Modified) JENDL-4.0
44-Ru- 98	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	(Modified) JENDL-4.0
44-Ru- 99	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified) JENDL-3.3
44-Ru-100	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	(Modified) JENDL-4.0
44-Ru-101	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0	New evaluation (covariances from COMMARA-2.0)	(Modified) JENDL-4.0 (Modified) JENDL-3.2

	JEF-2.2 (DIST-JAN92)		
44-Ru-102	(Modification) ENDF/B-VII	(Modification) CENDL 3	(Modified) JENDL-4.0
44-Ru-103	(Modification) JEFF-3.1.1 (Modification) ENDFB-7 +New Eval	(Modification) CENDL 3	(Modified) JENDL-4.0
44-Ru-104	(Modification) ENDF/B-VII	(Modification) CENDL 3	(Modified) JENDL-4.0
44-Ru-105	(Modification) ENDF/B-VII	CENDL 3	New evaluation
44-Ru-106	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	(Modified) JENDL-4.0
45-Rh-103	(Modification) JEFF-3.1.1 (Modification) JEFF-3.1 Updated JEFF-3.1 New evaluation	New evaluation (covariances from COMMARA-2.0)	(Modified) JENDL-4.0 (Modified) JENDL-3.2
45-Rh-104	TENDL-2012	No data	No data
45-Rh-105	(Modification) ENDF/B-VII	CENDL 3	(Modified) JENDL-4.0
46-Pd-102	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) ENDF/B-VI	New evaluation
46-Pd-104	(Modification) ENDF/B-VII	(Modification) ENDF/B-VI	New evaluation
46-Pd-105	(Modification) ENDF/B-VII	New evaluation (covariances from COMMARA-2.0)	New evaluation
46-Pd-106	(Modification) ENDF/B-VII	(Modification) ENDF/B-VI	New evaluation
46-Pd-107	(Modification) ENDF/B-VII (Modification) JENDL-3.3	(Modification) JENDL-3.2	New evaluation
46-Pd-108	(Modification) ENDF/B-VII	(Modification) ENDF/B-VI	New evaluation
46-Pd-110	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) ENDF/B-VI	New evaluation
47-Ag-107	(Modification) JEFF-3.1.1 Updated JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.2	New evaluation
47-Ag-109	(Modification) JEFF-3.1.1 Updated JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
47-Ag-	New evaluation	(Modification)	New evaluation

110M		JENDL-3.3	
47-Ag-111	New evaluation	New evaluation	New evaluation
48-Cd-106	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST- APR94 REV3-AUG96)	(Modification) JENDL-3.3	New evaluation
48-Cd-108	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST- APR95 REV3-AUG96)	New evaluation + ENDF/B-VII (Modification) ENDF/B-VI	New evaluation
48-Cd-109	TENDL-2012	No data	No data
48-Cd-110	(Modification) JEFF-3.1.2 (Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST- APR95 REV3-AUG96)	New evaluation + ENDF/B-VII (Modification) ENDF/B-VI	New evaluation
48-Cd-111	(Modification) JEFF-3.1.2 (Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B-VI rel.4 (DIST- APR95)	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
48-Cd-112	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST- APR95 REV3-AUG96)	New evaluation + ENDF/B-VII (Modification) ENDF/B-VI	New evaluation
48-Cd-113	JEFF-Beta-CAD (Modification) (JEFFBTN4846_CAD_0 file Nov 2011) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B-VI rel.4 (DIST- APR95)	New evaluation	New evaluation
48-Cd-114	(Modification) JEFF-3.1.2	New evaluation + ENDF/B-VII.0	New evaluation

	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST- APR95 REV3-AUG96)	(Modification) ENDF/B-VI	
48-Cd-115M	New evaluation	New evaluation	No data
48-Cd-116	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST- APR95 REV3-AUG96)	New evaluation + ENDF/B-VII.0 (Modification) ENDF/B-VI	New evaluation
49-In-113	(Modification) JEFF-3.1.1 Updated JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
49-In-115	(Modification) JEFF-3.1.1 Updated JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.2	New evaluation
50-Sn-112	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-113	New evaluation	New evaluation	No data
50-Sn-114	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-115	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-116	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-117	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.2	New evaluation
50-Sn-118	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-119	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-120	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
50-Sn-122	TENDL-2012	(Modification) JENDL-3.3	New evaluation
50-Sn-123	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation

50-Sn-124	TENDL-2012	(Modification) JENDL-3.2	New evaluation
50-Sn-125	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	No data
50-Sn-126	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
51-Sb-121	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modified) CENDL 3	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
51-Sb-123	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3 (Modification) JENDL-3.2	(Modified) CENDL 3	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
51-Sb-124	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
51-Sb-125	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	(Modified) JENDL-4.0
51-Sb-126	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
52-Te-120	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	(Modified) JENDL-4.0
52-Te-122	TENDL-2012	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified) JENDL-3.2
52-Te-123	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified) JENDL-3.2
52-Te-124	TENDL-2012	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified) JENDL-3.2
52-Te-125	JEFF-3.1.1 JEFF-3.1 JEFF-3.0	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified)

	JEF-2.2 (DIST-JAN92)		JENDL-3.2
52-Te-126	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified) JENDL-3.2
52-Te-127M	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.2	No data
52-Te-128	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	(Modified) JENDL-4.0
52-Te-129M	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	No data
52-Te-130	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) CENDL-3	(Modified) JENDL-4.0
52-Te-131M	TENDL-2012	No data	No data
52-Te-132	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
53-I-126	TENDL-2012	No data	No data
53-I-127	(Modification) JEFF-3.1.1 (Modification) JEFF-3.1 Updated JEFF-3.1 New evaluation	(Modification) ENDF/B-VI	(Modified) JENDL-3.2
53-I-128	TENDL-2012	No data	No data
53-I-129	(Modification) JEFF-3.1.1 (Modification) JEFF-3.1 Updated JEFF-3.1 New evaluation	(Modification) JENDL-3.3	New evaluation
53-I-130	New evaluation	New evaluation	New evaluation
53-I-131	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
53-I-135	(Modification) ENDF/B-VII	(Modification) ENDF/B-VI	New evaluation
54-Xe-123	New evaluation	New evaluation	No data
54-Xe-124	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
54-Xe-126	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
54-Xe-128	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation

54-Xe-129	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
54-Xe-130	(Modification) ENDF/B-VII	(Modification) ENDF/B-V	New evaluation
54-Xe-131	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
54-Xe-132	(Modification) ENDF/B-VII	(Modification) CENDL-3	New evaluation
54-Xe-133	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
54-Xe-134	(Modification) ENDF/B-VII	(Modification) CENDL-3	New evaluation
54-Xe-135	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
54-Xe-136	(Modification) ENDF/B-VII	(Modification) CENDL-3	New evaluation
55-Cs-133	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B-VI rel.7 (DIST- APR00)	New evaluation (covariances from COMMARA-2.0)	New evaluation
55-Cs-134	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
55-Cs-135	(Modification) JEFF-3.1.1 (Modification) ENDFB-7 +New Eval	(Modification) JENDL-3.3	New evaluation
55-Cs-136	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
55-Cs-137	(Modification) ENDF/B-VII	(Modification) JENDL-3.2	New evaluation
56-Ba-130	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	(Modified) JENDL-4.0
56-Ba-132	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	(Modified) JENDL-4.0
56-Ba-133	TENDL-2012	New evaluation	No data
56-Ba-134	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	(Modified) JENDL-4.0
56-Ba-135	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.2	(Modified) JENDL-4.0 (Modified)

			JENDL-3.2
56-Ba-136	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	(Modified) JENDL-4.0
56-Ba-137	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	(Modified) JENDL-4.0 (Modified) JENDL-3.2
56-Ba-138	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) CENDL-3	(Modified) JENDL-4.0 (Modified) JENDL-3.2
56-Ba-139	TENDL-2012	No data	No data
56-Ba-140	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	JEFF-2.2	(Modified) JENDL-4.0
57-La-138	TENDL-2012	(Modification) JENDL-3.3	(Modified) JENDL-4.0
57-La-139	ENDF/B-VII	(Modification) CENDL-3	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
57-La-140	TENDL-2012	New evaluation	New evaluation
58-Ce-136	TENDL-2012	New evaluation	No data
58-Ce-138	TENDL-2012	New evaluation	No data
58-Ce-139	TENDL-2012	New evaluation	No data
58-Ce-140	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
58-Ce-141	(Modification) ENDF/B-VII	(Modification) CENDL-3	New evaluation
58-Ce-142	(Modification) ENDF/B-VII	(Modification) JENDL-3.3 (Modification) JENDL-3.2	New evaluation
58-Ce-143	TENDL-2012	New evaluation	New evaluation
58-Ce-144	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
59-Pr-141	(Modification) ENDF/B-VII	(Modification) ENDF/B-VII	(Modified) JENDL-4.0 (Modified) JENDL-3.2
59-Pr-142	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	No data
59-Pr-143	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	(Modified) JENDL-4.0
60-Nd-142	JEFF-3.1.1 JEFF-3.1 JEFF-3.0	New evaluation	New evaluation

	JEF-2.2 (DIST-JAN92)		
60-Nd-143	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
60-Nd-144	(Modification) ENDF/B-VII	New evaluation	New evaluation
60-Nd-145	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
60-Nd-146	(Modification) ENDF/B-VII	New evaluation (covariances from COMMARA-2.0)	New evaluation
60-Nd-147	(Modification) ENDF/B-VII	New evaluation	New evaluation
60-Nd-148	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
60-Nd-150	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
61-Pm-147	(Modification) JEFF-3.1.1 (Modification) ENDFB-7 +New Eval	(Modification) JENDL-3.3	New evaluation
61-Pm-148	(Modification) JEFF-3.1.1 (Modification) ENDFB-7 +New Eval	(Modification) JENDL-3.3	New evaluation
61-Pm-148M	(Modification) ENDF/B-VII	(Modification) CENDL-3	
61-Pm-149	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
61-Pm-151	(Modification) ENDF/B-VII	New evaluation	New evaluation
62-Sm-144	(Modification) ENDF/B-VII	New evaluation	New evaluation
62-Sm-147	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
62-Sm-148	(Modification) ENDF/B-VII	New evaluation	New evaluation
62-Sm-149	(Modification) JEFF-3.1.1 JEFF-3.1	New evaluation (covariances from COMMARA-2.0)	New evaluation

	JEFF-3.0 (Modification) ENDF/B-VI rel.4 (DIST-APR0)		
62-Sm-150	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
62-Sm-151	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
62-Sm-152	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
62-Sm-153	(Modification) ENDF/B-VII	New evaluation	New evaluation
62-Sm-154	(Modification) ENDF/B-VII	New evaluation	New evaluation
63-Eu-151	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	(Modification) JENDL-3.3	New evaluation
63-Eu-152	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JENDL-3.2 (DIST-DEC90)	(Modification) JENDL-3.3, ENDF/B-VI	New evaluation
63-Eu-152M	TENDL-2012	No data	No data
63-Eu-153	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JENDL-3.2 (DIST-OCT89 REV2-JAN94)	New evaluation	New evaluation
63-Eu-154	(Modification) JEFF-3.1.1 (Modification) JEFF-3.1+New Eval	(Modification) CENDL-3	New evaluation
63-Eu-155	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B-VI rel.7 (DIST-APR00)	(Modification) CENDL-3	New evaluation
63-Eu-156	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
63-Eu-157	(Modification)	New evaluation	New evaluation

	ENDF/B-VII		
64-Gd-148	TENDL-2012	No data	No data
64-Gd-152	ENDF/B-VII	New evaluation	New evaluation
64-Gd-153	TENDL-2012	New evaluation	New evaluation
64-Gd-154	ENDF/B-VII	New evaluation	New evaluation
64-Gd-155	(Modification) JEFF-3.1.1 Updated JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation	New evaluation
64-Gd-156	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
64-Gd-157	(Modification) JEFF-3.1.1 Updated JEFF-3.1 JEFF-3.0 JENDL-3.2 (DIST-SEP90 REV-SEP93)	New evaluation (covariances from COMMARA-2.0)	New evaluation
64-Gd-158	(Modification) JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
64-Gd-160	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	New evaluation (covariances from COMMARA-2.0)	New evaluation
64-Gd-161	TENDL-2012	No data	No data
65-Tb-159	(Modification) ENDF/B-VII	(Modification) JENDL-3.3	New evaluation
65-Tb-160	TENDL-2012	New evaluation	New evaluation
Dy154	No data	No data	New evaluation
66-Dy-156	TENDL-2012	New evaluation	New evaluation
66-Dy-158	TENDL-2012	New evaluation	New evaluation
Dy159	No data	No data	New evaluation
66-Dy-160	TENDL-2012	New evaluation	New evaluation
66-Dy-161	(Modification) ENDF/B-VII	New evaluation	New evaluation
66-Dy-162	(Modification) ENDF/B-VII	New evaluation	New evaluation
66-Dy-163	(Modification) ENDF/B-VII	New evaluation	New evaluation
66-Dy-164	New evaluation	New evaluation	New evaluation
66-Dy-165	TENDL-2012	No data	No data
67-Ho-165	New evaluation	(Modification) ENDF/B-VI	No data
67-Ho-166M	TENDL-2012	New evaluation	No data
68-Er-162	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	(Modification) JENDL-3.3	New evaluation
68-Er-164	JEFF-3.1.1	(Modification)	New evaluation

	JEFF-3.1 JENDL-3.3	JENDL-3.3	
68-Er-166	TENDL-2012	(Modification) JENDL-3.3	New evaluation
68-Er-167	TENDL-2012	(Modification) JENDL-3.3	New evaluation
68-Er-168	TENDL-2012	(Modification) JENDL-3.3	New evaluation
68-Er-169	TENDL-2012	No data	No data
68-Er-170	TENDL-2012	(Modification) JENDL-3.3	New evaluation
68-Er-171	TENDL-2012	No data	No data
68-Er-172	TENDL-2012	No data	No data
69-Tm-168	No data	New evaluation	No data
69-Tm-169	TENDL-2012	New evaluation	New evaluation
69-Tm-170	TENDL-2012	New evaluation	No data
69-Tm-171	TENDL-2012	No data	No data
70-Yb-168	TENDL-2012	No data	New evaluation
70-Yb-169	TENDL-2012	No data	No data
70-Yb-170	TENDL-2012	No data	New evaluation
70-Yb-171	TENDL-2012	No data	New evaluation
70-Yb-172	TENDL-2012	No data	New evaluation
70-Yb-173	TENDL-2012	No data	New evaluation
70-Yb-174	TENDL-2012	No data	New evaluation
70-Yb-176	TENDL-2012	No data	New evaluation
71-Lu-175	TENDL-2012	ENDF/B-VII (Modification) ENDF/B-VI	No data
71-Lu-176	TENDL-2012	ENDF/B-VII (Modification) ENDF/B-VI	No data
71-Lu-177	TENDL-2012	No data	No data
72-Hf-174	(Modification) JEFF-3.1.1 Updated JEFF-3.1.2 New evaluation	JENDL-3.3 + New eval	New evaluation
72-Hf-176	New evaluation	JENDL-3.3 + New eval	New evaluation
72-Hf-177	(Modification) JEFF-3.1.1 Updated JEFF-3.1.2 New evaluation	(Modified) JENDL-3.3 (Modified) JENDL-3.2	New evaluation
72-Hf-178	(Modification) JEFF-3.1.1 Updated JEFF-3.1.2 New evaluation	JENDL-3.3 + New eval	New evaluation
72-Hf-179	(Modification) JEFF-3.1.1 Updated JEFF-3.1.2 New evaluation	(Modified) JENDL-3.3 (Modified) JENDL-3.2	New evaluation
72-Hf-180	(Modification) JEFF-3.1.1 Updated JEFF-3.1.2 New evaluation	JENDL-3.3 + New eval	New evaluation
72-Hf-181	TENDL-2012	No data	New evaluation
Hf182	No data	No data	New evaluation
73-Ta-180M	TENDL-2012	No data	No data

73-Ta-180	No data	New evaluation	No data
73-Ta-181	JEFF-Beta	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
73-Ta-182	JEFF-3.1.1 JEFF-3.1 JEFF-3.0	ENDF/B-VII ENDF/B-VI	No data
74-W -180	Wevaluat	New evaluation	New evaluation
74-W -182	JEFF-3.2T1 (Modification) w-182IRS/	New evaluation	New evaluation
74-W -183	JEFF-3.2T1 (Modification) w-182IRS/	New evaluation	New evaluation
74-W -184	JEFF-3.2T1 (Modification) w-182IRS/	New evaluation	New evaluation
74-W -186	JEFF-3.2T1 (Modification) w-182IRS/	New evaluation	New evaluation
75-Re-185	TENDL-2012	New evaluation	No data
75-Re-187	TENDL-2012	New evaluation	No data
75-Re-188	TENDL-2012	No data	No data
76-Os-184	TENDL-2012	No data	New evaluation
76-Os-186	TENDL-2012	No data	New evaluation
76-Os-187	TENDL-2012	No data	New evaluation
76-Os-188	TENDL-2012	No data	New evaluation
76-Os-189	TENDL-2012	No data	New evaluation
76-Os-190	TENDL-2012	No data	New evaluation
76-Os-191	TENDL-2012	No data	No data
76-Os-192	TENDL-2012	No data	New evaluation
76-Os-193	TENDL-2012	No data	No data
77-Ir-191	ENDF/B-VII New evaluation	New evaluation	No data
77-Ir-192	TENDL-2012	No data	No data
77-Ir-193	JEFF-3.1.1 JEFF-3.1 Updated	New evaluation	No data
78-Pt-190	TENDL-2012	No data	No data
78-Pt-192	TENDL-2012	No data	No data
78-Pt-194	TENDL-2012	No data	No data
78-Pt-195	TENDL-2012	No data	No data
78-Pt-196	TENDL-2012	No data	No data
78-Pt-198	TENDL-2012	No data	No data
79-Au-197	(Modification) ENDF/B-VII.1 (Modification) ENDF/B-VII.0 JEFF-3.1.2 JEFF-3.1.1	New evaluation	New evaluation
80-Hg-196	New evaluation	New evaluation	(Modified) JENDL-4.0 (Modified)

			JENDL-3.3
80-Hg-198	New evaluation	New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
80-Hg-199	New evaluation	ENDF/B-VII JENDL-3.3 + New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
80-Hg-200	New evaluation	ENDF/B-VII JENDL-3.3 + New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
80-Hg-201	New evaluation	ENDF/B-VII JENDL-3.3 + New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
80-Hg-202	New evaluation	ENDF/B-VII JENDL-3.3 + New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
80-Hg-204	New evaluation	ENDF/B-VII JENDL-3.3 + New evaluation	(Modified) JENDL-4.0 (Modified) JENDL-3.3
81-Tl-203	TENDL-2012	New evaluation	No data
81-Tl-204	TENDL-2012	No data	No data
81-Tl-205	TENDL-2012	New evaluation	No data
82-Pb-204	(Modification) JEFF-3.2G JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
82-Pb-205	NRG-2007 New evaluation for JEFF-3.2	No data	No data
82-Pb-206	(Modification) JEFF-3.2G JEFF-3.1 New evaluation	JEFF-3.1	New evaluation
82-Pb-207	(Modification) JEFF-3.2G JEFF-3.1 New evaluation	JENDL-3.3	New evaluation
82-Pb-208	(Modification) JEFF-3.2G JEFF-3.1 New evaluation	(Modification) ENDF/B-VII (Modification) ENDF/B-VI	New evaluation
83-Bi-209	(Modification) JEFF-3.1 New evaluation	(Modification) ENDF/B-VII ENDF/B-VI	(Modified) JENDL-4.0 (Modified) JENDL-3.3 (Modified) JENDL-3.2
84-Po-209	TENDL-2012	No data	
88-Ra-223	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-3.3	New evaluation
88-Ra-224	JEFF-3.1.1 JEFF-3.1	JENDL-3.3	JENDL-3.3

	JENDL-3.3		
88-Ra-225	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-3.3	JENDL-3.3
88-Ra-226	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-3.3 (Modification) JENDL-3.2	(Modified) JENDL-3.2
89-Ac-225	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
89-Ac-226	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
89-Ac-227	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
90-Th-227	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
90-Th-228	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
90-Th-229	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JENDL-3.2 (DIST-SEP90 REV-SEP93)	JENDL-4.0 adopted	New evaluation
90-Th-230	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	JENDL-4.0 adopted	New evaluation
90-Th-231	No data	JENDL-4.0 adopted	New evaluation
90-Th-232	\$Rev.:23	New evaluation	New evaluation
90-Th-233	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
90-Th-234	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
91-Pa-229	No data	JENDL-4.0 adopted	New evaluation
91-Pa-230	No data	JENDL-4.0 adopted	New evaluation
91-Pa-231	Pa-231IAE	New evaluation	New evaluation
91-Pa-232	JENDL-4.0 adopted	JENDL-4.0 adopted	New evaluation
91-Pa-233	Pa-233IAE	New evaluation	New evaluation
92-U -230	No data	JENDL-4.0 adopted	New evaluation
92-U -231	No data	JENDL-4.0 adopted	New evaluation
92-U -232	JENDL-4.0 adopted	JENDL-4.0 adopted	New evaluation
92-U -233	(Modification) ENDF/B-VII.1	New evaluation	New evaluation
92-U -234	New evaluation	(Modification) ENDF/B-VI	New evaluation
92-U -235	New evaluation	(Modification) ENDF/B-VI	New evaluation
92-U -236	BRC2009	(Modification) ENDF/B-VI	New evaluation

92-U -237	BRC2009	(Modification) ENDF/B-VII.0, JENDL-3.3	New evaluation
92-U -238	New evaluation	(Modification) ENDF/B-VI	New evaluation
92-U-239	New evaluation	New evaluation	No data
92-U-240	New evaluation	New evaluation	No data
92-U-241	New evaluation	New evaluation	No data
93-Np-234	No data	JENDL-4.0 adopted	New evaluation
93-Np-235	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
93-Np-236	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
93-Np-237	JEFF-3.1.2 (Modification) JEFF-3.1.1 (Modification) JEFF-3.0 Modified (Modification) ENDF/B-VI rel.4 (DIST-SEP91 REV1-JUL91)	(Modification) ENDF/B-VI	New evaluation
93-Np-238	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92) ENDF/B-VI.4 (MF1MT452,455,456 MF5MT455)	JENDL-4.0 adopted	New evaluation
93-Np-239	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 ENDF/B-VI.4 (DIST-FEB90) JENDL-3.2 (MF1MT452,455,456)	JENDL-4.0 adopted	New evaluation
94-Pu-236	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3	JENDL-4.0 adopted	New evaluation
94-Pu-237	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	JENDL-4.0 adopted	New evaluation
94-Pu-238	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JENDL-3.2 (DIST-SEP89 REV2-JUN94)	New evaluation	New evaluation
94-Pu-239	New evaluation	(Modification) ENDF/B-VI	New evaluation
94-Pu-240	New evaluation	New evaluation	New evaluation
94-Pu-241	(Modification) JEFF-3.1.2 JEFF-3.1	New evaluation	New evaluation

	JEFF-3.0 JENDL-3.2 (DIST-SEP89 REV2-MAY93)		
94-Pu-242	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JENDL-3.2 (DIST-SEP89)	New evaluation (covariances from COMMARA-2.0)	New evaluation
94-Pu-243	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	ENDF/B-VII (Modification) ENDF/B-VI	No data
94-Pu-244	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 (Modification) JEF-2.2 (DIST-JAN92)	JENDL-4.0 adopted	New evaluation
94-Pu-246	(Modification) JEFF-3.1.2 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
95-Am-240	No data	JENDL-4.0 adopted	New evaluation
95-Am-241	New evaluation	(Modification) ENDF/B-VII ENDF/B-VI	New evaluation
95-Am-242	No data	ENDF/B-VII (Modification) New evaluation + JENDL-3.3	New evaluation
95-Am-242G	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	No data	No data
95-Am-242M	JEFF-3.1.1 JEFF-3.1 (Modification) JENDL-3.3	New evaluation (covariances from COMMARA-2.0)	No data
95-Am-243	JEFF-3.1.1 JEFF-3.1	(Modification) ENDF/B-VII	New evaluation
95-Am-244	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-3.3	New evaluation
95-Am-244M	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-3.3	No data
96-Cm-240	Data < 3.2 eV : JENDL-4.0 Data 3.2 eV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-241	Data < 1.1 eV : JENDL-4.0 Data 1.1 eV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-242	Data < 0.1 MeV : JENDL-4.0 Data 0.1 MeV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-243	Data < 40 keV : JENDL-4.0 Data 40 keV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation

	evaluation		
96-Cm-244	Data < 0.1 MeV : JENDL-4.0 Data 0.1 MeV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-245	Data < 40 keV : JENDL-4.0 Data 40 keV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-246	Data < 0.14 MeV : JENDL-4.0 Data 0.14 MeV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-247	Data < 40 keV : JENDL-4.0 Data 40 keV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-248	Data < 0.2 MeV : JENDL-4.0 Data 0.2 MeV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-249	Data < 3.1 eV : JENDL-4.0 Data 3.1 eV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
96-Cm-250	Data < 0.2 MeV : JENDL-4.0 Data 0.2 MeV - 20 MeV : New evaluation	JENDL-4.0 adopted	New evaluation
97-Bk-245	No data	JENDL-4.0 adopted	New evaluation
97-Bk-246	No data	JENDL-4.0 adopted	New evaluation
97-Bk-247	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
97-Bk-248	No data	JENDL-4.0 adopted	New evaluation
97-Bk-249	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
97-Bk-250	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JENDL-3.2 (DIST-SEP89)	JENDL-4.0 adopted	New evaluation
98-Cf-246	No data	JENDL-4.0 adopted	New evaluation
98-Cf-248	No data	JENDL-4.0 adopted	New evaluation
98-Cf-249	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
98-Cf-250	(Modification) JEFF-3.1.2 JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
98-Cf-251	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92) ENDF/B-VI.4 (MF1 MT452,455,456)	JENDL-4.0 adopted	New evaluation

98-Cf-252	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JEF-2.2 (DIST-JAN92)	JENDL-4.0 adopted	New evaluation
98-Cf-253	JENDL-4.0 adopted	JENDL-4.0 adopted	New evaluation
98-Cf-254	JEFF-3.1.1 JEFF-3.1 JEFF-3.0 JENDL-3.2 (DIST-SEP89 REV-JUN94)	JENDL-4.0 adopted	New evaluation
99-Es-251	No data	JENDL-4.0 adopted	New evaluation
99-Es-252	No data	JENDL-4.0 adopted	New evaluation
99-Es-253	JEFF-3.1.1 JEFF-3.1 JEF-2.2	JENDL-4.0 adopted	New evaluation
99-Es-254	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
99-Es-254m1	No data	JENDL-4.0 adopted	New evaluation
99-Es-255	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation
100-Fm-255	JEFF-3.1.1 JEFF-3.1 JENDL-3.3	JENDL-4.0 adopted	New evaluation

3 Conclusions

The review of the origin of nuclear data has been made in the form of a table for each library specifying, for each nuclide, the sources with potential modifications applied and new evaluations that have been made. A more detailed overview with descriptions of modifications is available on a separate spreadsheet. To make the review faster, a software for searching keywords has been developed and an additional manual check has been performed in order to ensure that all the required data have been extracted from the headers. The next step of the review is to create a website where all this data will be accessible from the internet.

We would like to suggest to the evaluators of the nuclear data libraries to unify the annotations of the data sources for the most recent edition of the library and their modifications. From the available nuclear data libraries JEFF-3.2 seems to have the most user-friendly notation. On the top of their headers the name of the current edition is written and in the box below the origin of the data along with possible modifications applied is given. The next box has the name of the previous library written on the top like the first, the source of the data and potential modifications within the box and so on until the oldest version of a previous library is reached. In that case »New evaluation« is written in the box. In JENDL-4.0u2 and ENDF/B-VII.1 is often more difficult or unclear to understand which was the source of the data for the current edition or if there has been made a new evaluation. In the files with the heading »Modified part for (library name)« is unclear, if the modification has been performed in the mentioned library or in the previous version of that library for the mentioned version. It is also unclear, where this heading is used and no data source or »New evaluation« written, if the file has been produced using that previous library with the only difference that the mentioned modifications were applied, or if there has been made a new evaluation and only those modified parts of the previous version have been included in the current one. Sometimes it is unclear how the file has been produced. This is the case when a new evaluation has been made but also small parts from other sources were added to the file. Those sources are often indistinctly mentioned and easy to overlook. There are also cases when most of the data were taken from a previous version of the library, but a small amount of data have been added from a new evaluation. An example for this is when the new version contains data for an energy region that was not in the previous one but this supplement is not clearly characterized.

The unification would not only make the files easier to understand, but also it would help the developed software to find data it is searching for. It would only have to search for the same pattern in all the libraries to find where the data of the source library are written and which modifications have been made. Now the program needs to be modified every time the library changes and still it is unable to find all the required data, so a manual check must be done in addition. This is a problem, because the final aim is to completely automatize the check for data sources in the future versions of the libraries, store them in an Excel sheet and update the website where they are accessible. With differences between the files and ambiguous notation the software will not always work properly.

4 References

- [1] Cross Sections Evaluation Working Group (Edited by M. Herman and A. Trkov), "ENDF-6 Formats Manual, Data formats and procedures for the Evaluated Nuclear Data File ENDF/B-VI and ENDF/BVII," *Document ENDF-102, Report BNL-90365-2009, Rev. 2*, National Nuclear Data Center (NNDC), Brookhaven National Laboratory, Upton, USA, November 2011.
- [2] OECD/NEA, The JEFF-3.2 Nuclear Data Library, NEA Data Bank, Available at <https://www.oecd-nea.org/dbforms/data/eva/evatapes/je_32/>, 2014.
- [3] M.B. Chadwick, et. al., "ENDF/B-VII.1 Nuclear Data for Science and Technology: Cross Sections, Covariances, Fission Product Yields and Decay Data," *Special Issue on ENDF/B-VII.1 Library, Nucl. Data Sheets* (N.Y. N.Y.), **112** (2011), 2887-2996.
- [4] K. Shibata, et. al., "JENDL-4.0: A New Library for Nuclear Science and Engineering," *J. Nucl. Sci. Technol.*, **48** (2011), 1-30.
- [5] EXchange FOrmat database (EXFOR) is maintained by the Network of Nuclear Reaction Data Centers (<http://www-nds.iaea.org/nrdc/>). Available at: <http://www-nds.iaea.org/exfor/> (19.11.2015).