JANIS Book

of photon-induced cross-sections

Comparison of evaluated and experimental data from

ENDF/B-VIII.0, IAEA/PD-2019, JENDL/PD-2016.1, TENDL-2019 and EXFOR

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Introduction

This document compares evaluated cross-sections with corresponding experimental data from the EXFOR database for a number of evaluated libraries (Table 1), nuclear reactions and associated reaction products (Table 3). This document was produced using tools based on the NEA Java-based nuclear information software (JANIS) and associated databases; up-to-date plots are available from online JANIS Books [1].

Caveat: When studying plots, please take into account that the energy resolution of experimental data is not always comparable with the resolution of the evaluated data.

Graphical comparison of nuclear data

Experimental data sets are identified by the year and first author of the main reference compiled in EXFOR. The colors give an indication on the publication year, from black/blue for the oldest data to orange/red for the most recent ones (Table 2). All experimental data are plotted on the graph but the legend will ignore all of them if there are more than 20 data sets.

Evaluated data are plotted with full lines for exclusive cross-sections explicitly defined by a MT number, whereas dashed lines indicate residual production cross-sections given in MT5. A star '*' after the name of the library indicates additional operations performed by JANIS, e.g. summation over the ground and metastable yields, reconstruction of residual production cross-sections over the whole energy range.

The data are plotted in log-log scale (on the left hand side) and lin-log scale (on the right hand side). The best representation depends on the Q value of the reaction and/or the magnitude of the variation in the cross-section values.

Table of reactions and Q values

In order to identify individual contributions in residual production cross-sections, reactions leading to the same product are listed along with their associated Q values. The latter are calculated using mass excess from the NUBASE2016 evaluation of nuclear properties [2].

Navigation in this document

The data are sorted by element, then by isotope and finally by reaction. In order to facilitate access to the information, two navigation modes are available in addition to the usual bookmark. At the top of each page, on the first row, the previous (<<) and next (>>) "Isotope links" allow the reader to move from one isotope to another while staying on the same MT reaction. On the second row, the "MT links" allow scanning all reactions of a given isotope. The latter navigation mode is actually similar to the use of the page up and page down keys.

References

[1] N. Soppera *et al.*, *Nuclear Data Sheets 120* (2014), 294. See also www.oecd-nea.org/janis.

[2] G. Audi *et al.*, *Chinese Physics C, 41* (3), 030001, 2017.

Table 1: list of databases used in the inter-comparison

Library	Release date
ENDF/B-VIII.0	February 2018
IAEA/PD-2019	August 2020
JENDL/PD-2016.1	February 2020
TENDL-2019	December 2019
EXFOR	September 2020

Table 2: experimental data sets color code

Color	Publication year
red	2005 ≤ year
orange	2000 ≤ year < 2005
light orange	1995 ≤ year < 2000
khaki	1990 ≤ year < 1995
light green	1985 ≤ year < 1990
green	1980 ≤ year < 1985
light blue	1970 ≤ year < 1980
dark blue	1960 ≤ year < 1970
black	year < 1960

Table 3: list of exclusive reactions used in the inter-comparison

MT	Reaction	MT	Reaction	MT	Reaction	MT	Reaction
4	n	102	gamma	159	2n+p+a	181	3n+p+a
11	2n+d	103	p	160	7n	182	d+t
16	2n	104	d	161	8n	183	n+p+d
17	3n	105	t	162	5n+p	184	n+p+t
18	fission	106	h	163	6n+p	185	n+d+t
22	n+a	107	a	164	7n+p	186	n+p+h
23	n+3a	108	2a	165	4n+a	187	n+d+h
24	2n+a	109	3a	166	5n+a	188	n+t+h
25	3n+a	111	2p	167	6n+a	189	n+t+a
28	n+p	112	p+a	168	7n+a	190	2n+2p
29	n+2a	113	t+2a	169	4n+d	191	p+h
30	2n+2a	114	d+2a	170	5n+d	192	d+h
32	n+d	115	p+d	171	6n+d	193	h+a
33	n+t	116	p+t	172	3n+t	194	4n+2p
34	n+h	117	d+a	173	4n+t	195	4n+2a
35	n+d+2a	152	5n	174	5n+t	196	4n+p+a
36	n+t+2a	153	6n	175	6n+t	197	3p
37	4n	154	2n+t	176	2n+h	198	n+3p
41	2n+p	155	t+a	177	3n+h	199	3n+2p+a
42	3n+p	156	4n+p	178	4n+h	200	5n+2p
44	n+2p	157	3n+d	179	3n+2p		
45	n+p+a	158	n+d+a	180	3n+2a		

1-H-2	3-Li-6 >>
MT4 (γ,n) or MT5 (H1 production)	2-He-3 MT28 (γ,n+p) >>

H2 (γ,n) or H1 production log-log

H2 (γ,n) or H1 production lin-log
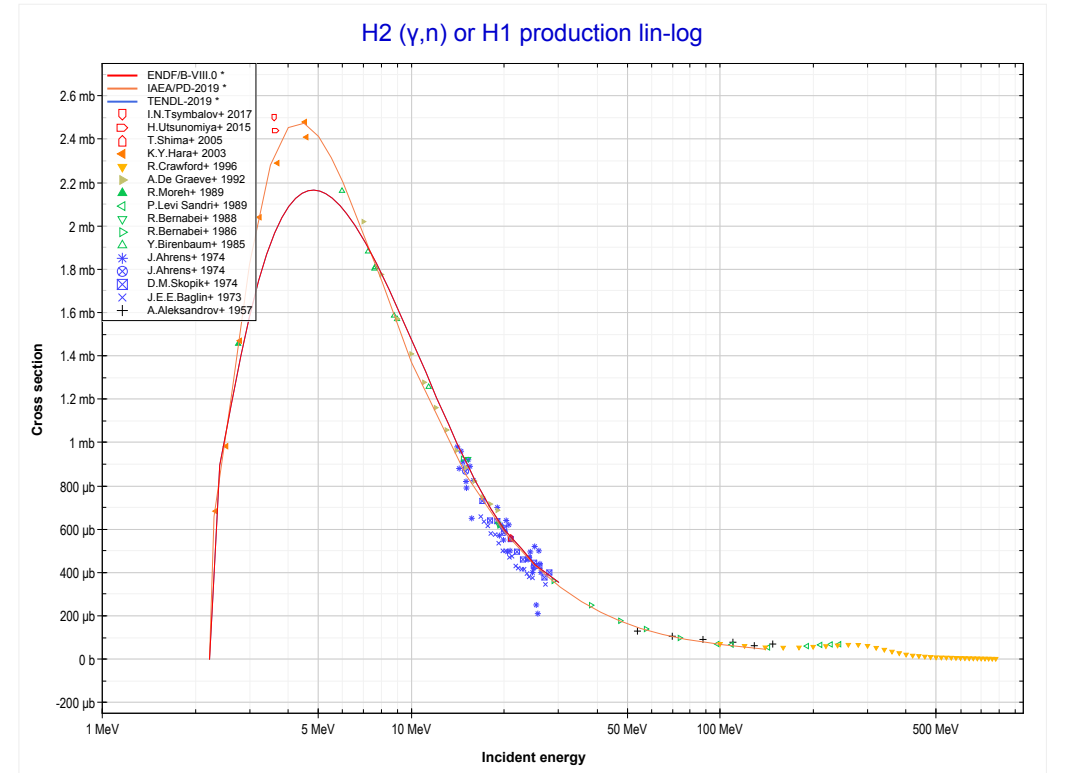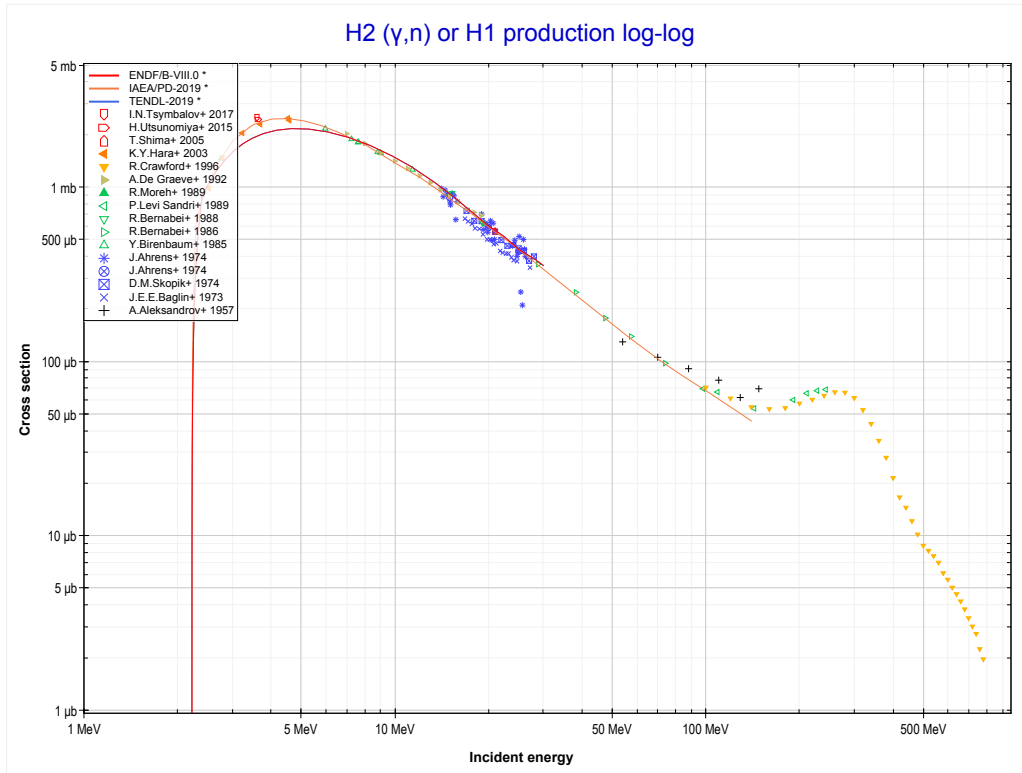
Reaction	Q-Value
H2(γ,n)H1	-2224.57 keV

3-Li-6 >>
MT103 (γ,p) >>

	2-He-3	
<< 1-H-2 MT4 (γ,n)	MT28 (γ,n+p) or MT5 (H1 production)	

He3 (γ,n+p) or H1 production log-log

He3 (γ,n+p) or H1 production lin-log
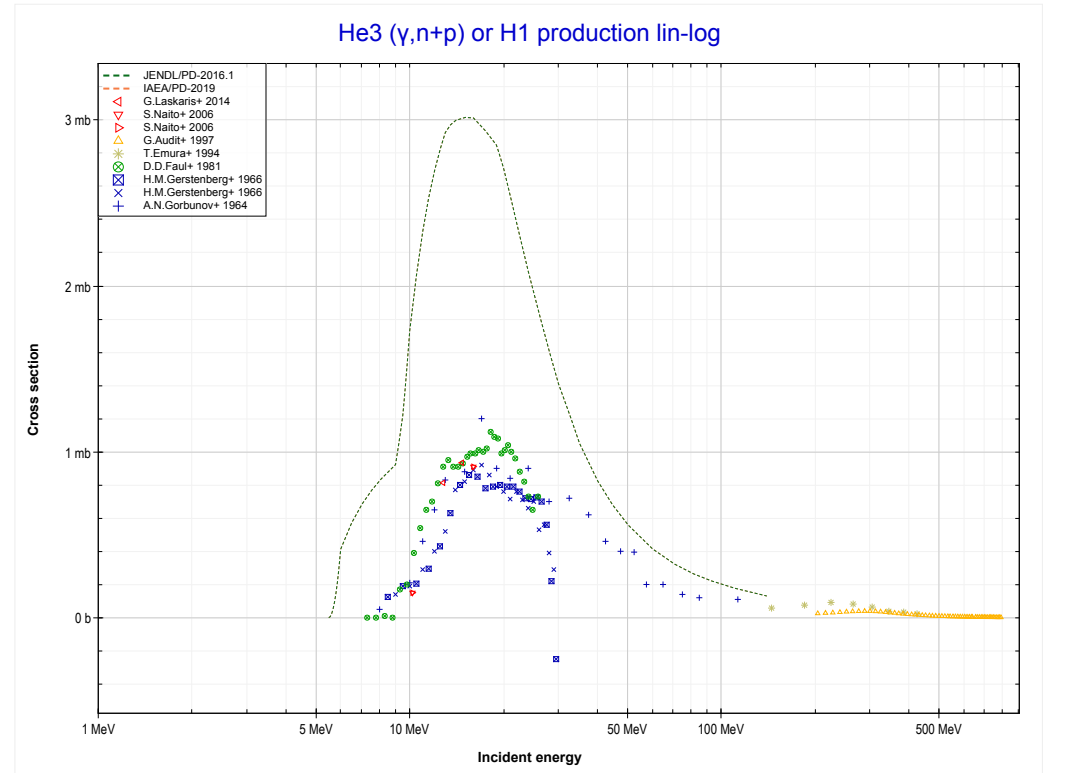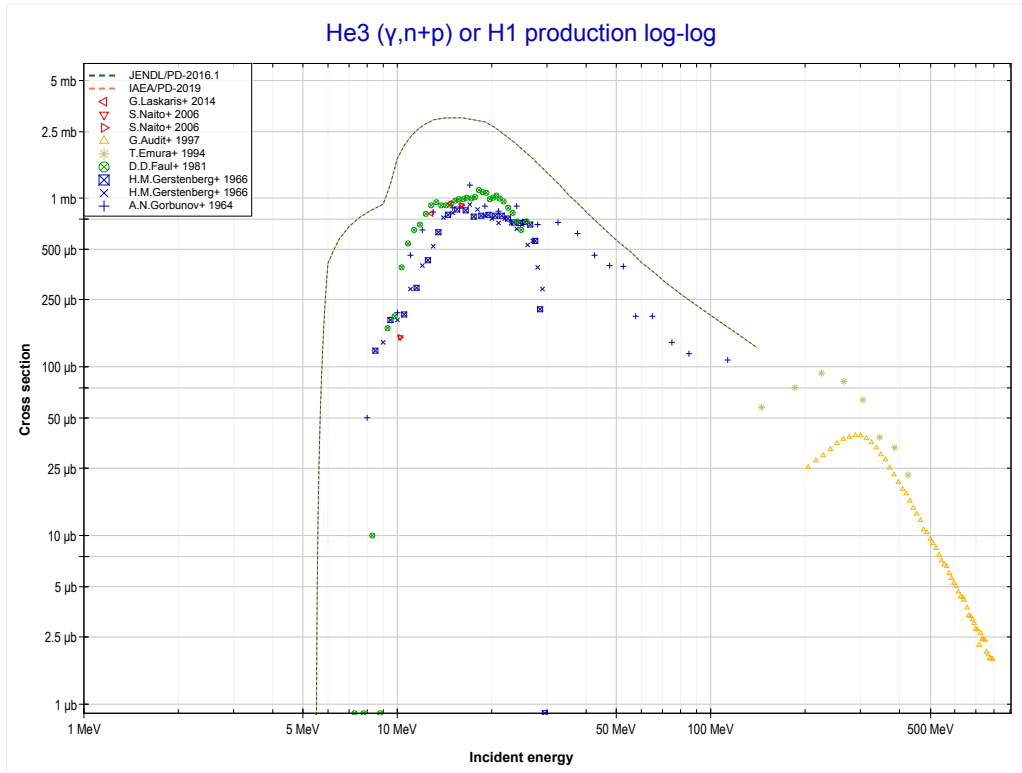
Reaction	Q-Value
He3(γ,d)H1	-5493.47 keV
He3(γ,n+p)H1	-7718.04 keV

3-Li-6 >>
2-He-3	
<< MT28 (γ,n+p)	MT103 (γ,p) or MT5 (H2 production)	MT111 (γ,2p) >>

He3 (γ,p) or H2 production log-log

He3 (γ,p) or H2 production lin-log
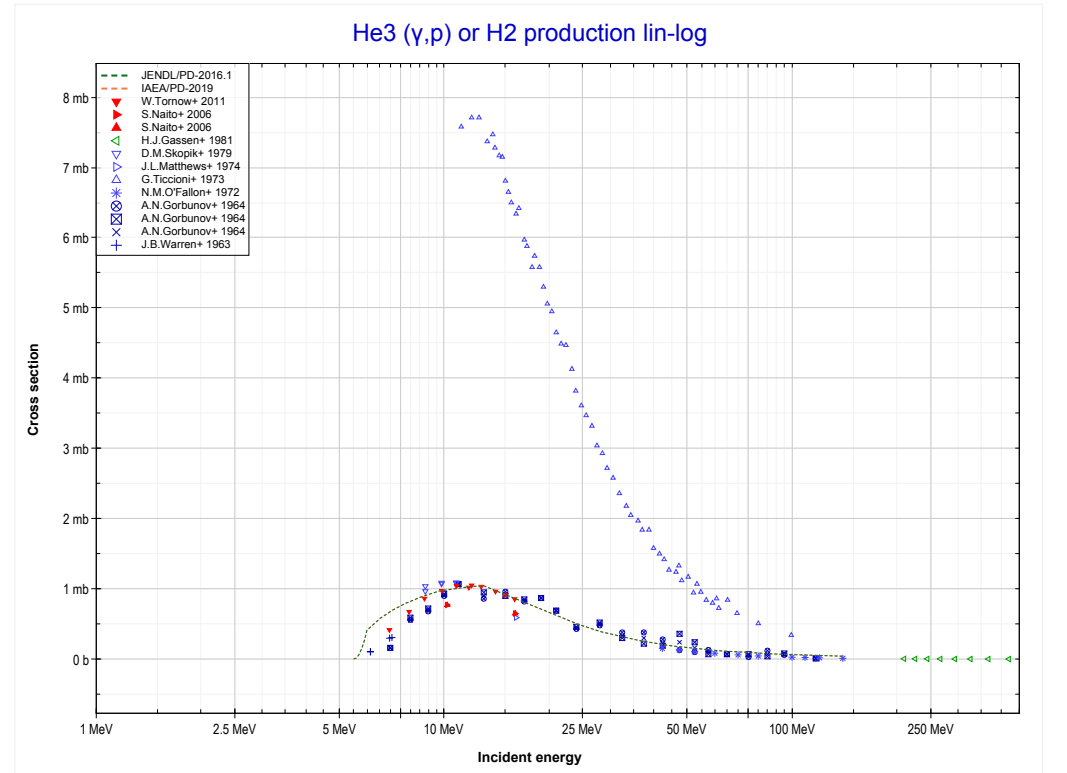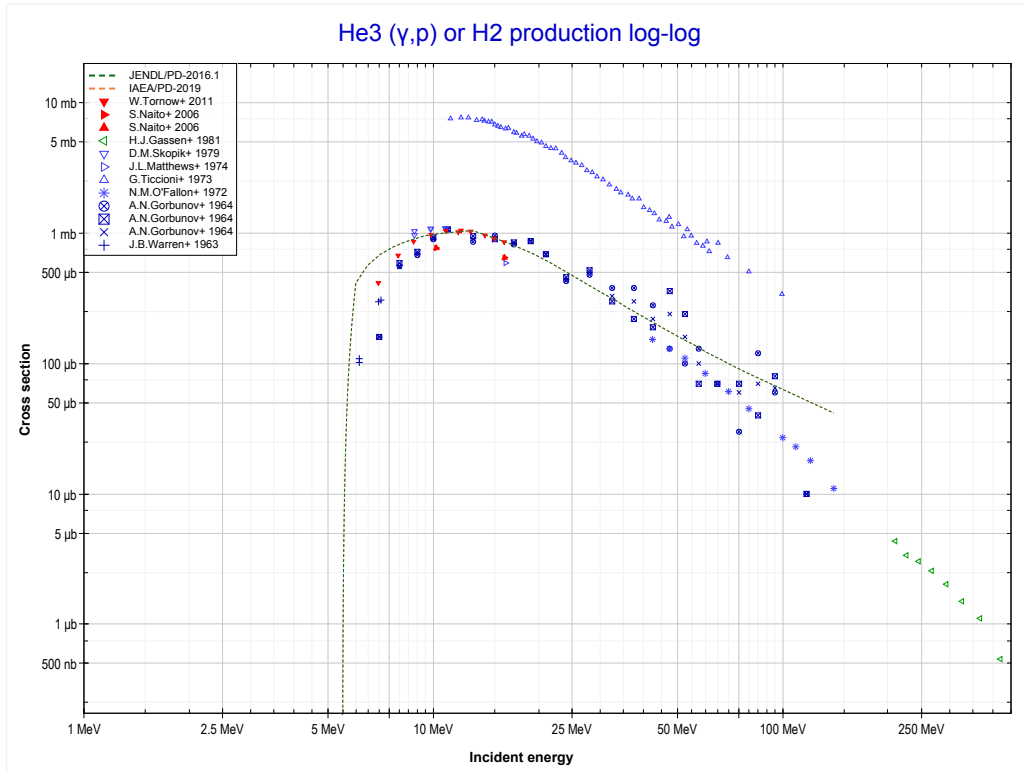
Reaction	Q-Value
He3(γ,p)H2	-5493.47 keV

2-He-3		29-Cu-63 >>
<< MT103 (γ,p)	**MT111 (γ,2p) or MT5 (n production)**	3-Li-6 MT4 (γ,n) >>

He3 (γ,2p) or n production log-log

He3 (γ,2p) or n production lin-log
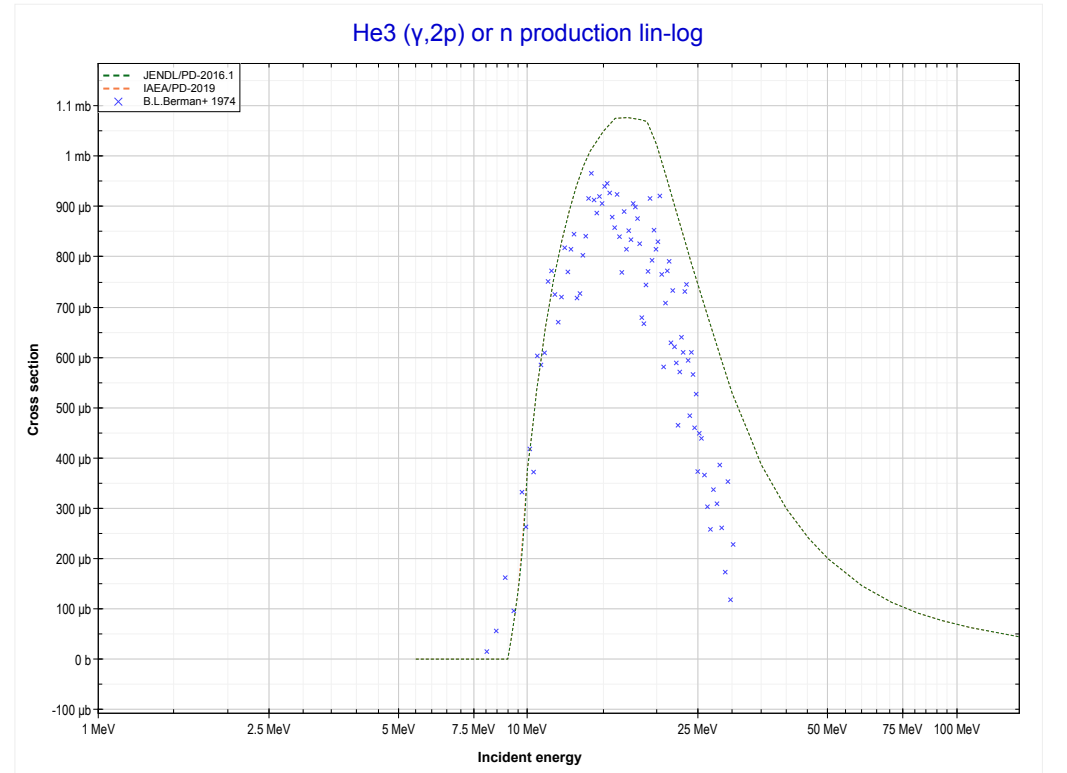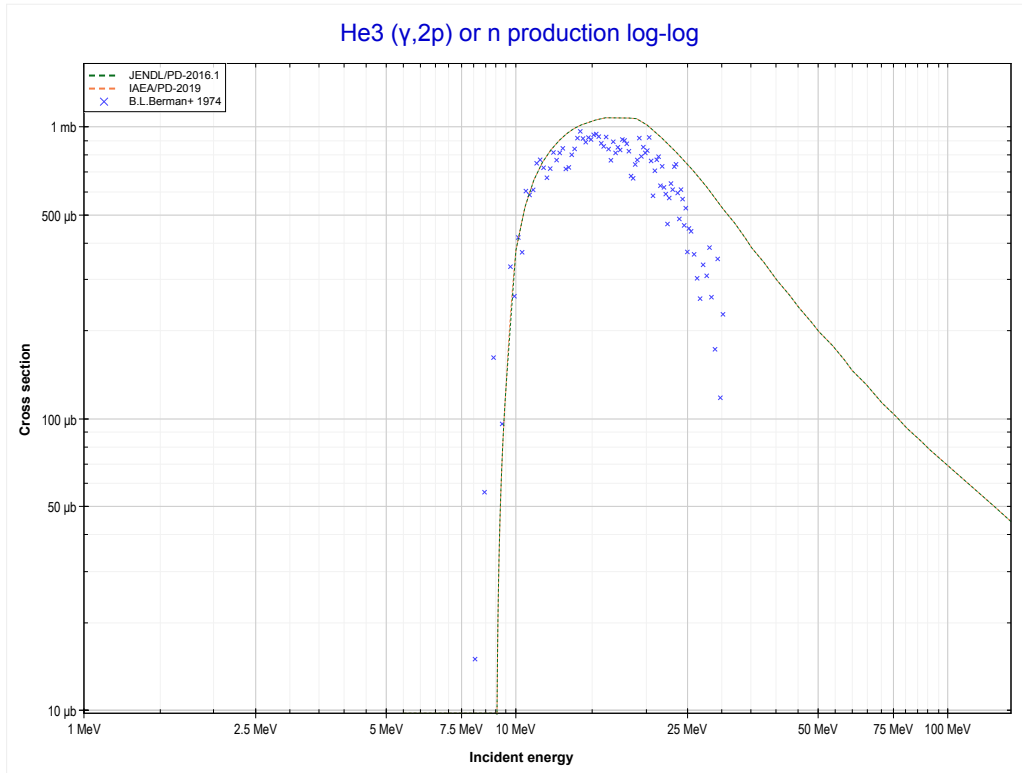
Reaction	Q-Value
He3(γ,2p)n	-7718.04 keV

<< 1-H-2	3-Li-6	3-Li-7 >>
<< 2-He-3 MT111 (γ,2p)	MT4 (γ,n) or MT5 (Li5 production)	MT28 (γ,n+p) >>

Li6 (γ,n) or Li5 production log-log

Legend: JENDL/PD-2016.1, IAEA/PD-2019, TENDL-2019 *, W.A.Wurtz+ 2014

Li6 (γ,n) or Li5 production lin-log

Legend: JENDL/PD-2016.1, IAEA/PD-2019, TENDL-2019 *, W.A.Wurtz+ 2014
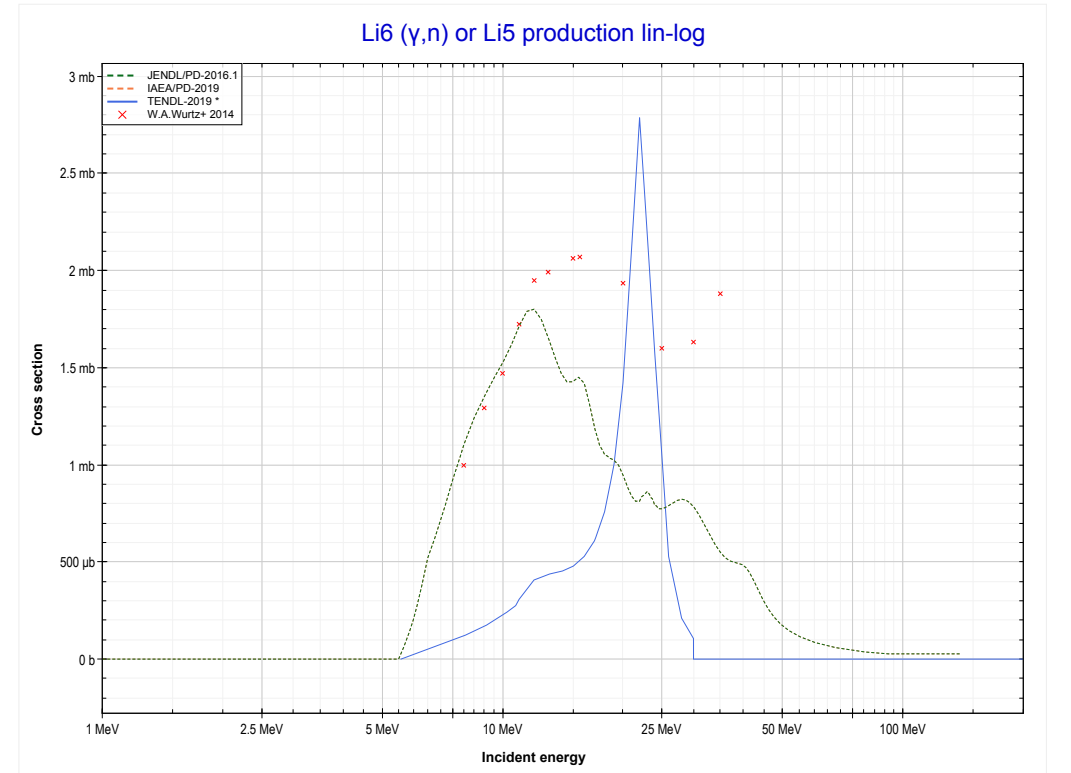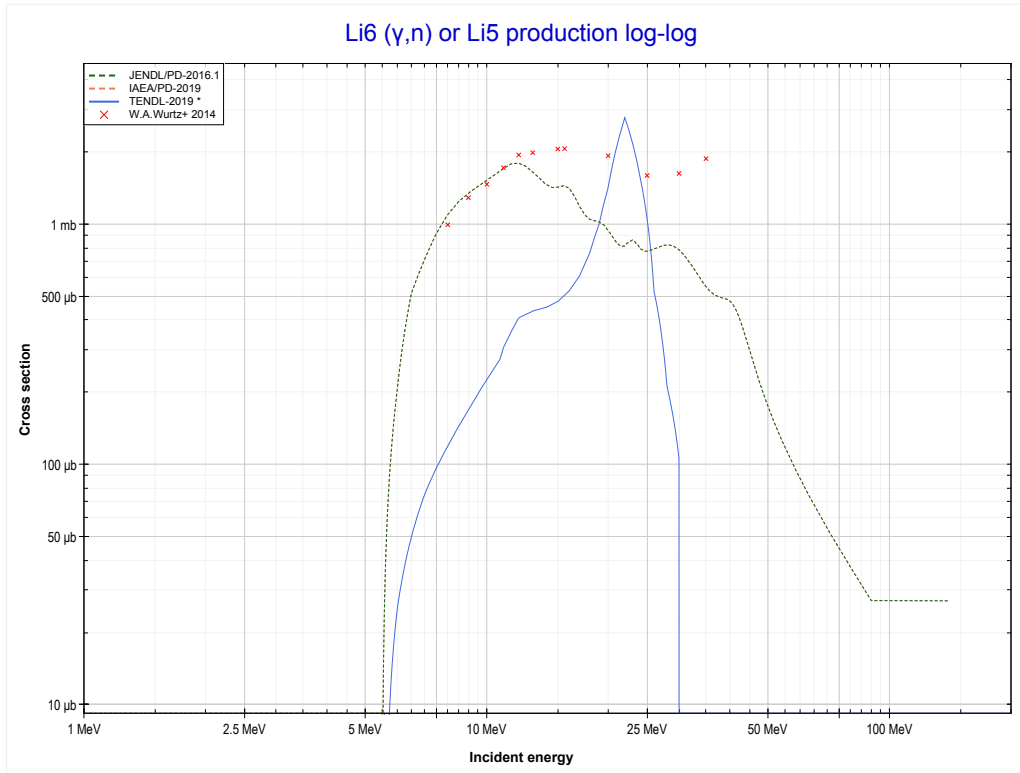
Reaction	Q-Value
Li6(γ,n)Li5	-5664.44 keV

<< 2-He-3	**3-Li-6**	6-C-12 >>
<< MT4 (γ,n)	**MT28 (γ,n+p) or MT5 (He4 production)**	MT41 (γ,2n+p) >>

Li6 (γ,n+p) or He4 production log-log

Li6 (γ,n+p) or He4 production lin-log

- - - JENDL/PD-2016.1
- - - IAEA/PD-2019
- - - TENDL-2019
× V.V.Varlamov+
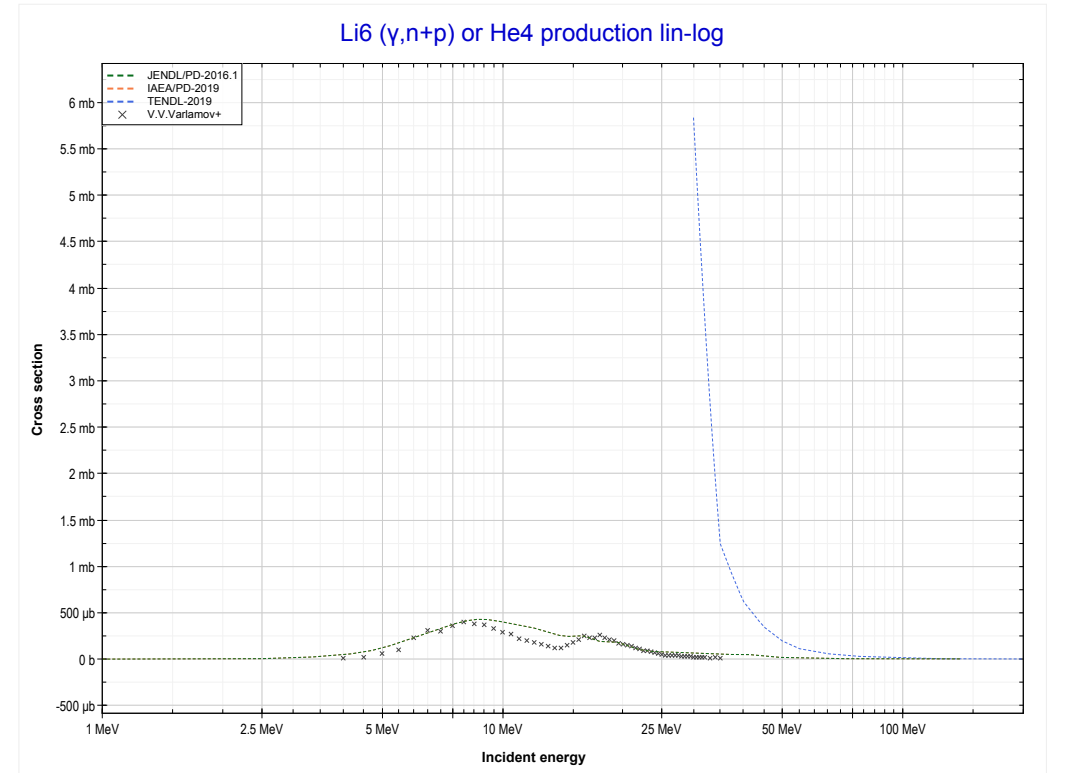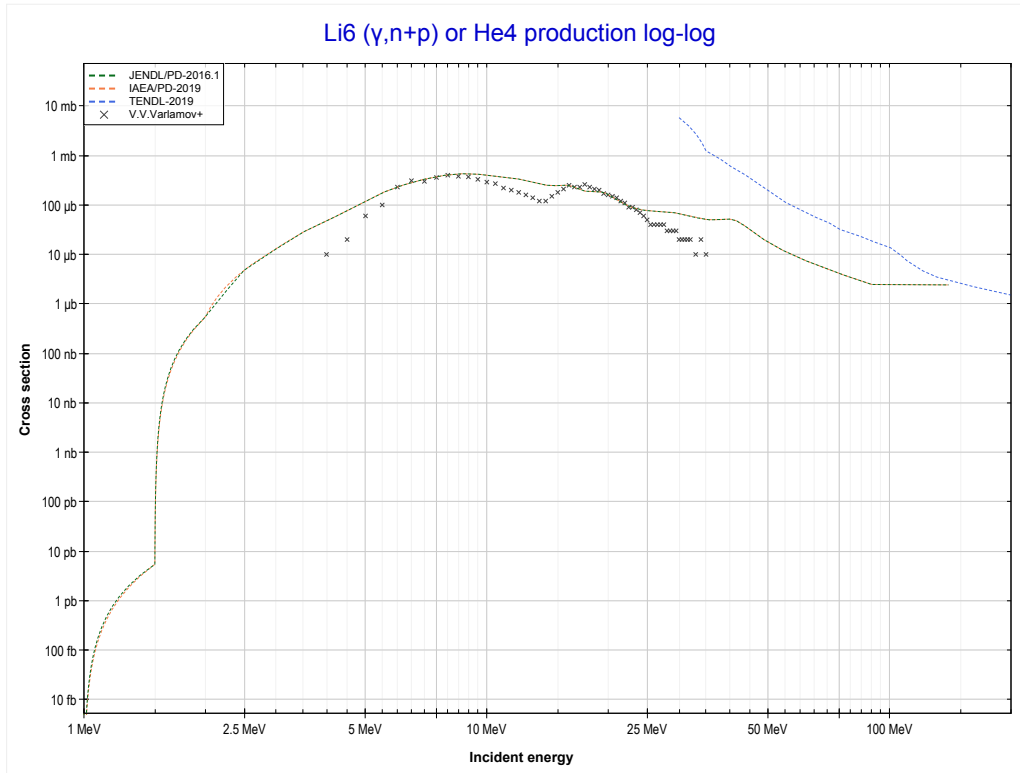
Reaction	Q-Value
Li6(γ,d)He4	-1473.76 keV
Li6(γ,n+p)He4	-3698.32 keV

3-Li-6		3-Li-7 >>
<< MT28 (γ,n+p)	**MT41 (γ,2n+p) or MT5 (He3 production)**	MT103 (γ,p) >>

Li6 (γ,2n+p) or He3 production log-log

Li6 (γ,2n+p) or He3 production lin-log
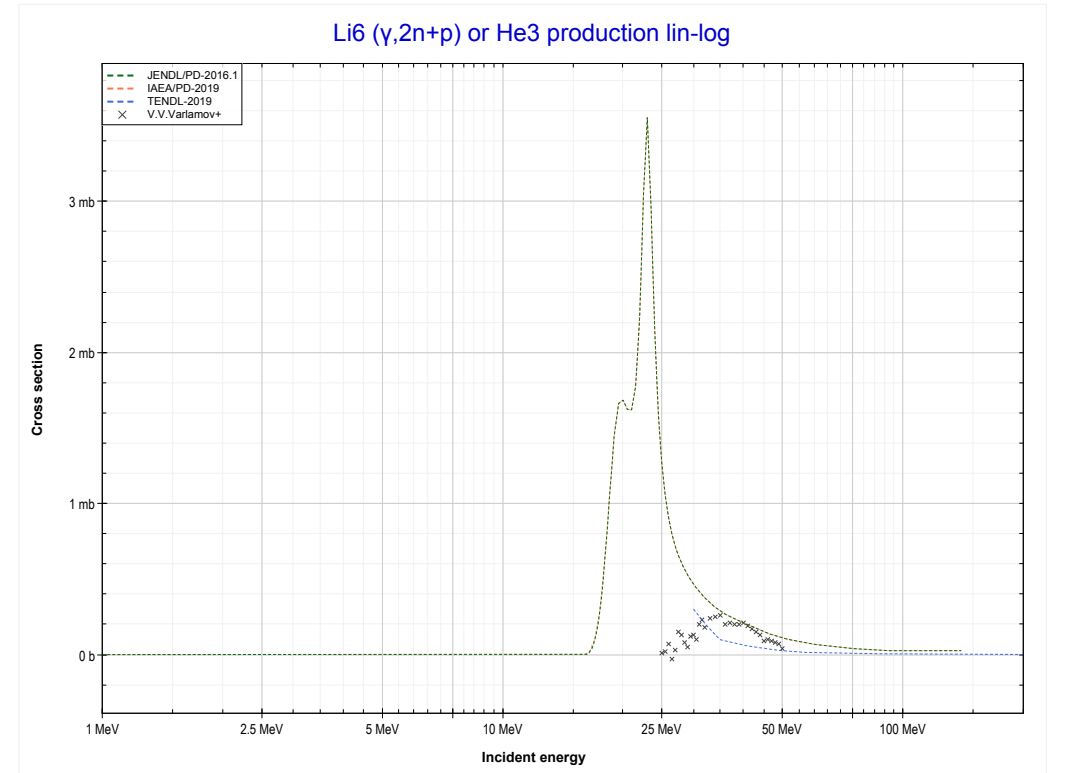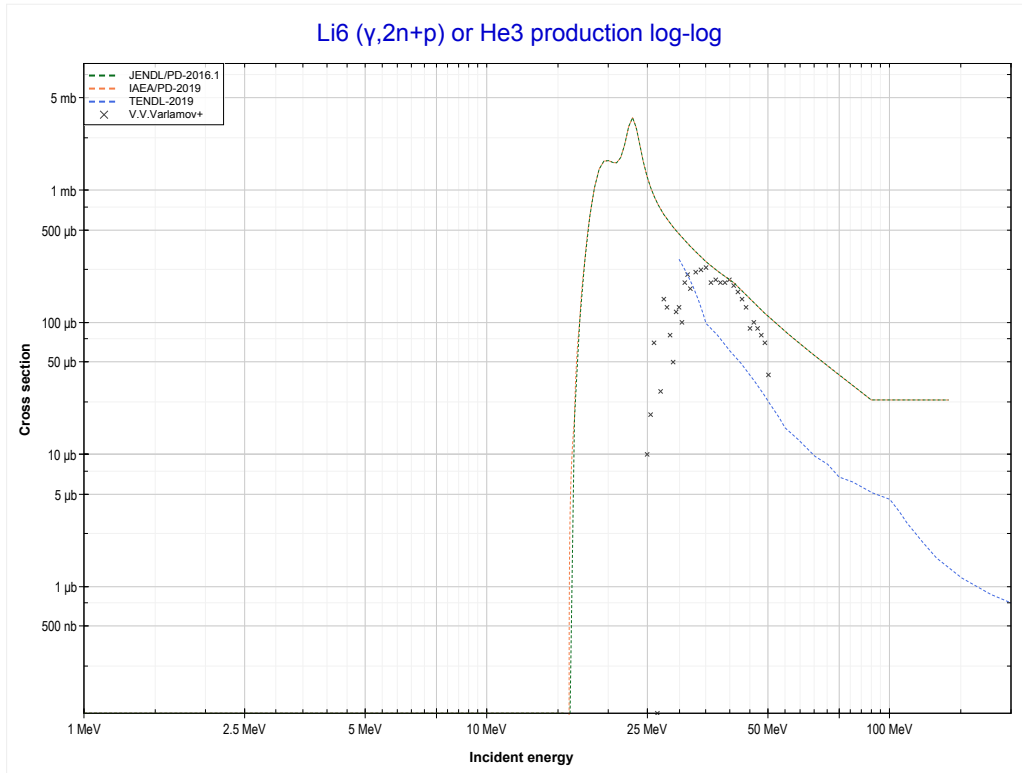
Reaction	Q-Value
Li6(γ,t)He3	-15794.15 keV
Li6(γ,n+d)He3	-22051.38 keV
Li6(γ,2n+p)He3	-24275.94 keV

<< 2-He-3	3-Li-6	3-Li-7 >>
<< MT41 (γ,2n+p)	**MT103 (γ,p) or MT5 (He5 production)**	MT105 (γ,t) >>

Li6 (γ,p) or He5 production log-log

Li6 (γ,p) or He5 production lin-log
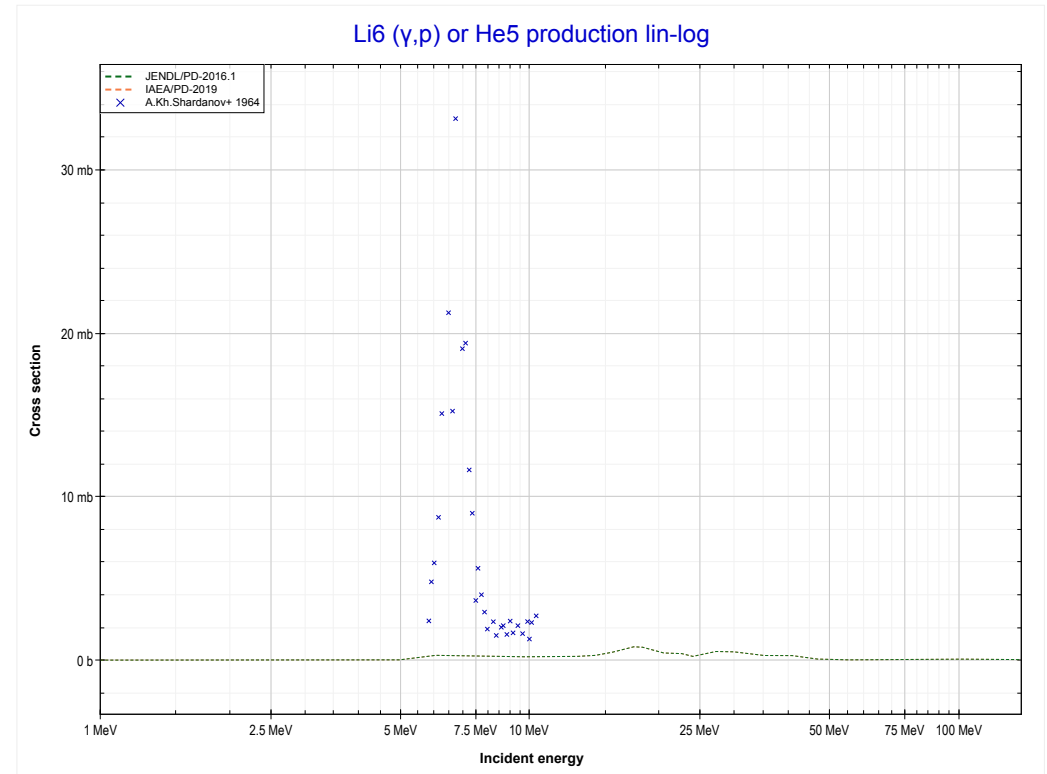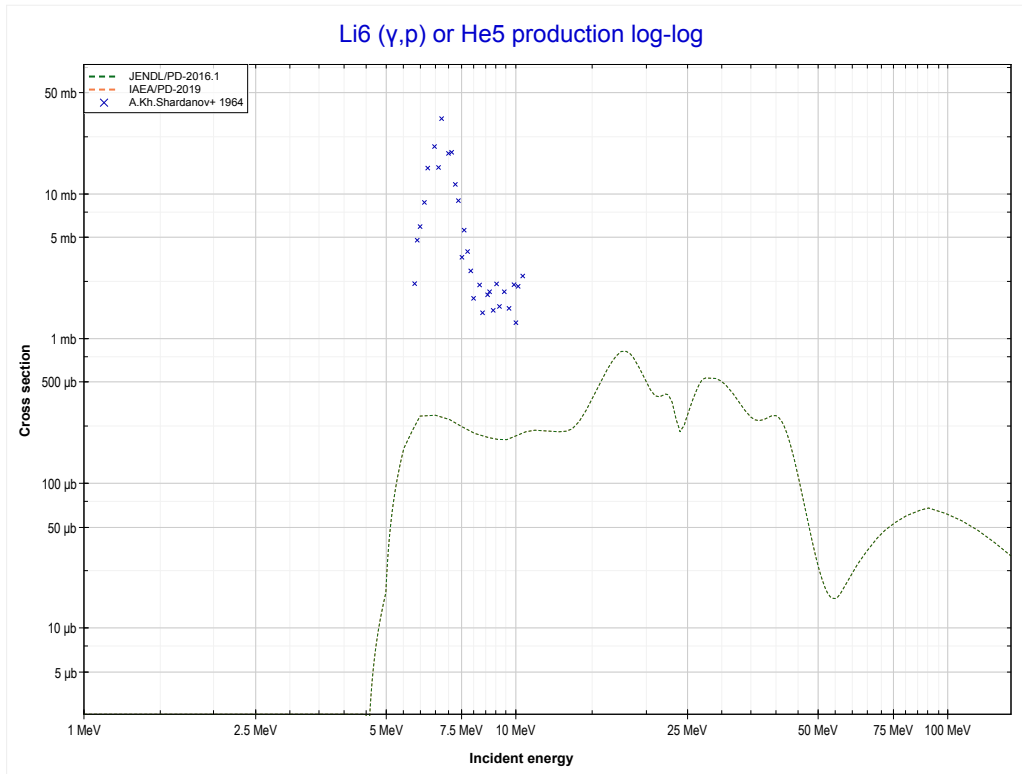
Reaction	Q-Value
Li6(γ,p)He5	-4433.09 keV

3-Li-6		3-Li-7 >>
<< MT103 (γ,p)	**MT105 (γ,t) or MT5 (He3 production)**	MT112 (γ,p+α) >>

Li6 (γ,t) or He3 production log-log

Li6 (γ,t) or He3 production lin-log
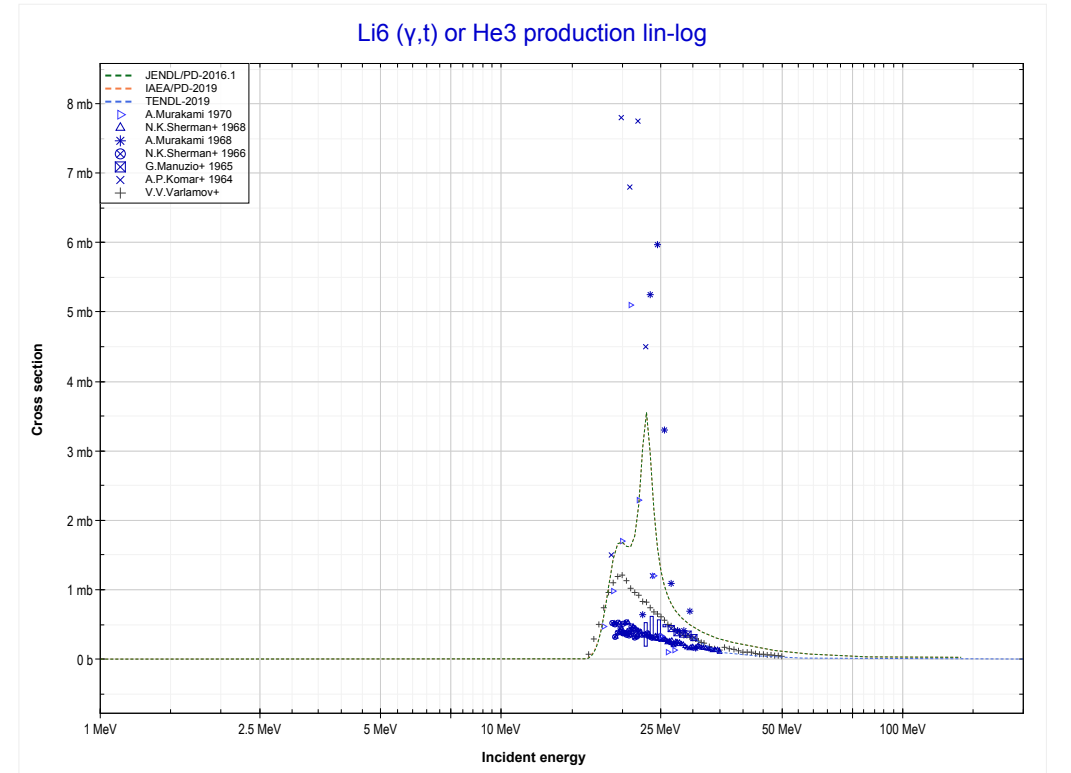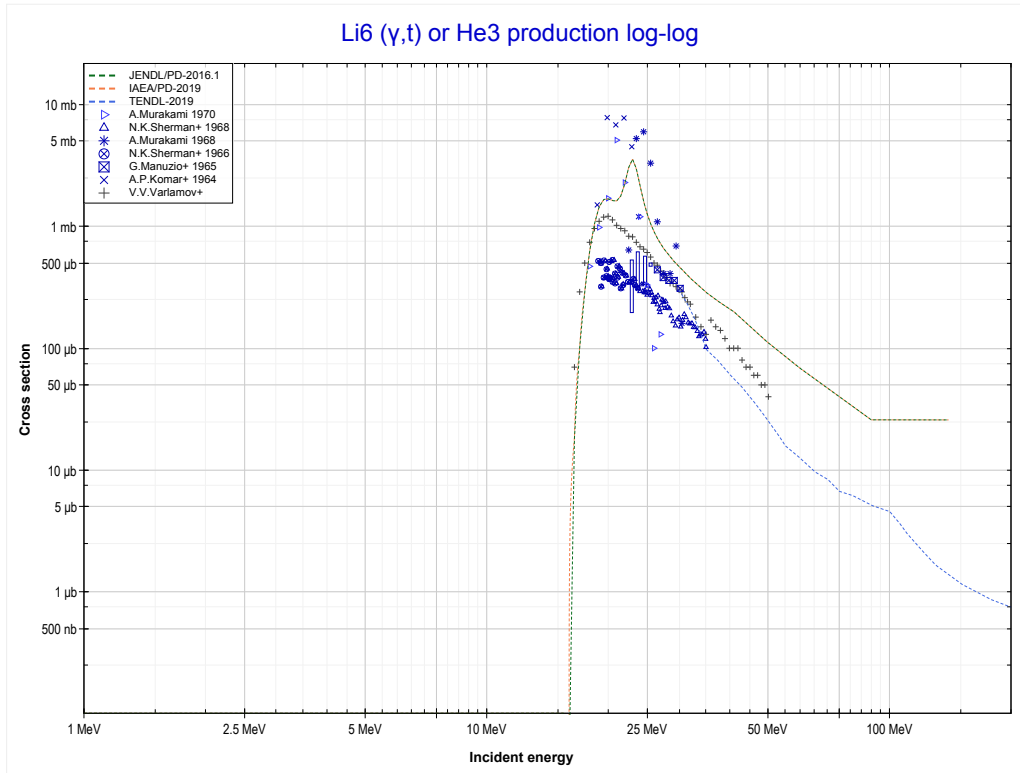
Reaction	Q-Value
Li6(γ,t)He3	-15794.15 keV
Li6(γ,n+d)He3	-22051.38 keV
Li6(γ,2n+p)He3	-24275.94 keV

3-Li-6		6-C-12 >>
<< MT105 (γ,t)	**MT112 (γ,p+α) or MT5 (n production)**	MT115 (γ,p+d) >>

Li6 (γ,p+α) or n production log-log

Li6 (γ,p+α) or n production lin-log

Reaction	Q-Value
Li6(γ,p+α)n	-3698.32 keV
Li6(γ,d+He3)n	-22051.38 keV
Li6(γ,2p+t)n	-23512.19 keV
Li6(γ,n+p+He3)n	-24275.94 keV
Li6(γ,p+2d)n	-27544.85 keV
Li6(γ,n+2p+d)n	-29769.42 keV
Li6(γ,2n+3p)n	-31993.98 keV

<< MT112 (γ,p+α)	**3-Li-6**	13-Al-27 >>
	MT115 (γ,p+d) or MT5 (H3 production)	MT186 (γ,n+p+³He) >>

Li6 (γ,p+d) or H3 production log-log

Li6 (γ,p+d) or H3 production lin-log

Reaction	Q-Value
Li6(γ,He3)H3	-15794.15 keV
Li6(γ,p+d)H3	-21287.62 keV
Li6(γ,n+2p)H3	-23512.19 keV

	3-Li-6	
<< MT115 (γ,p+d)	**MT186 (γ,n+p+³He) or MT5 (n production)**	MT192 (γ,d+³He) >>

Li6 (γ,n+p+³He) or n production log-log

Li6 (γ,n+p+³He) or n production lin-log

Reaction	Q-Value
Li6(γ,p+α)n	-3698.32 keV
Li6(γ,d+He3)n	-22051.38 keV
Li6(γ,2p+t)n	-23512.19 keV
Li6(γ,n+p+He3)n	-24275.94 keV
Li6(γ,p+2d)n	-27544.85 keV
Li6(γ,n+2p+d)n	-29769.42 keV
Li6(γ,2n+3p)n	-31993.98 keV

	3-Li-6	
<< MT186 (γ,n+p+³He)	**MT192 (γ,d+³He) or MT5 (n production)**	3-Li-7 MT4 (γ,n) >>

Li6 (γ,d+h) or n production log-log

Li6 (γ,d+h) or n production lin-log

Reaction	Q-Value
Li6(γ,p+α)n	-3698.32 keV
Li6(γ,d+He3)n	-22051.38 keV
Li6(γ,2p+t)n	-23512.19 keV
Li6(γ,n+p+He3)n	-24275.94 keV
Li6(γ,p+2d)n	-27544.85 keV
Li6(γ,n+2p+d)n	-29769.42 keV
Li6(γ,2n+3p)n	-31993.98 keV

<< 3-Li-6	**3-Li-7**	4-Be-9 >>
<< 3-Li-6 MT192 (γ,d+³He)	**MT4 (γ,n) or MT5 (Li6 production)**	MT32 (γ,n+d) >>

Li7 (γ,n) or Li6 production log-log

Li7 (γ,n) or Li6 production lin-log
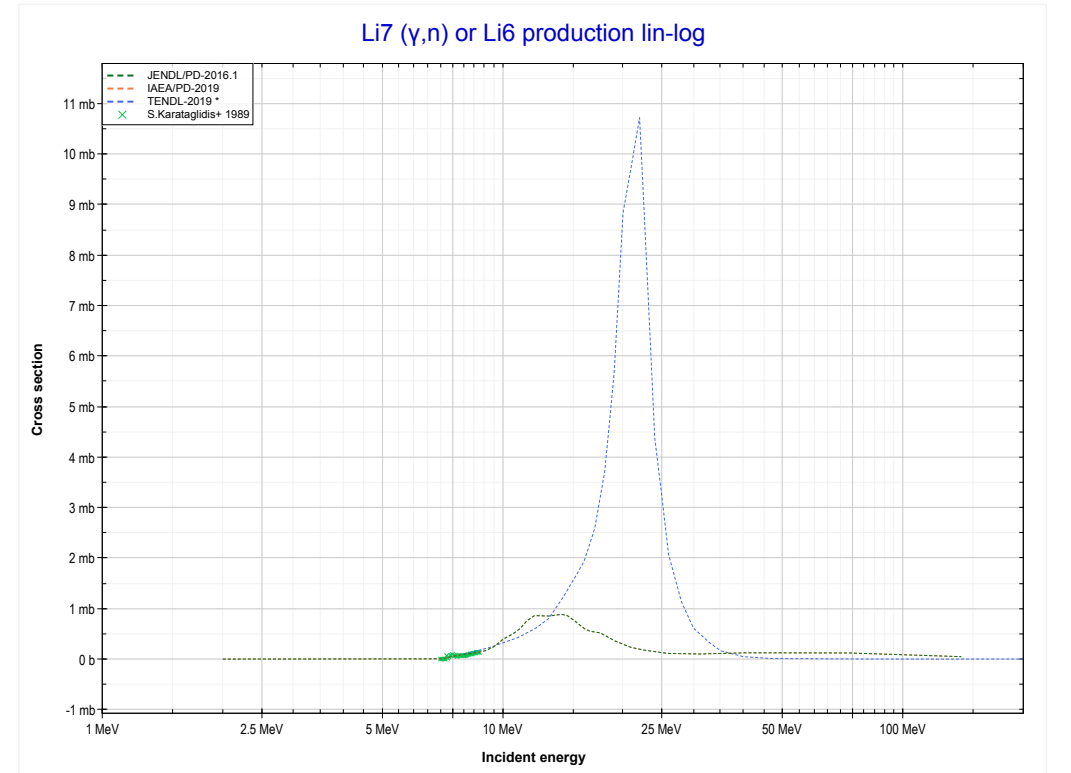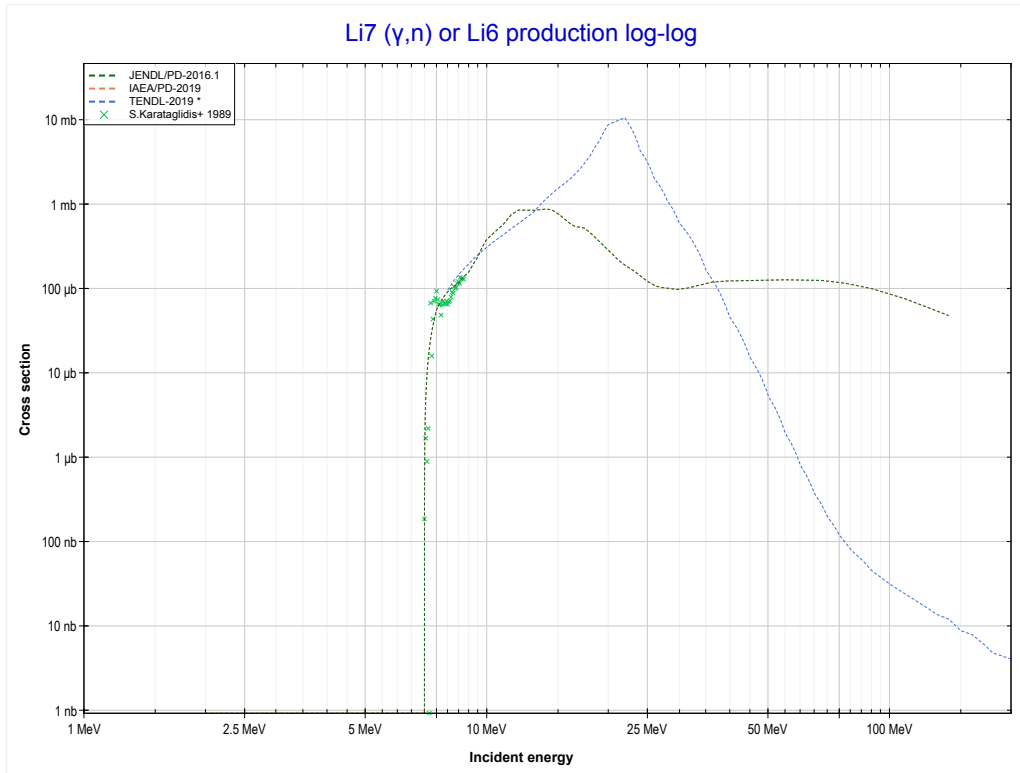
Reaction	Q-Value
Li7(γ,n)Li6	-7251.09 keV

	3-Li-7	
<< MT4 (γ,n)	**MT32 (γ,n+d) or MT5 (He4 production)**	MT41 (γ,2n+p) >>

Li7 (γ,n+d) or He4 production log-log

Li7 (γ,n+d) or He4 production lin-log
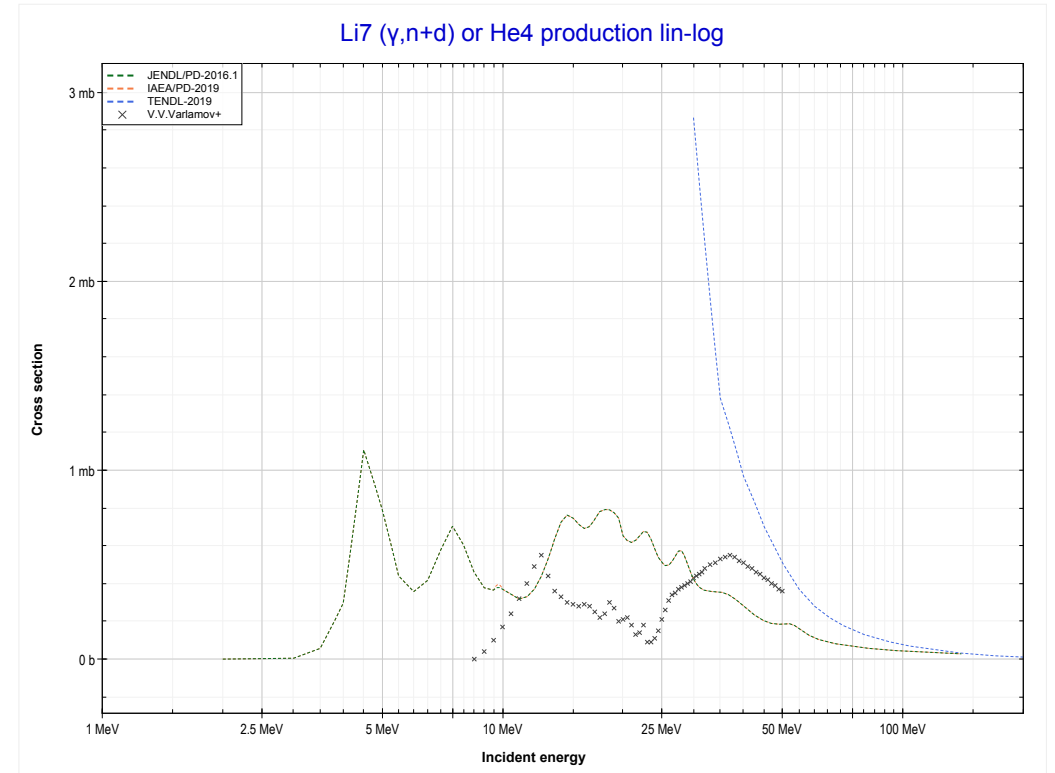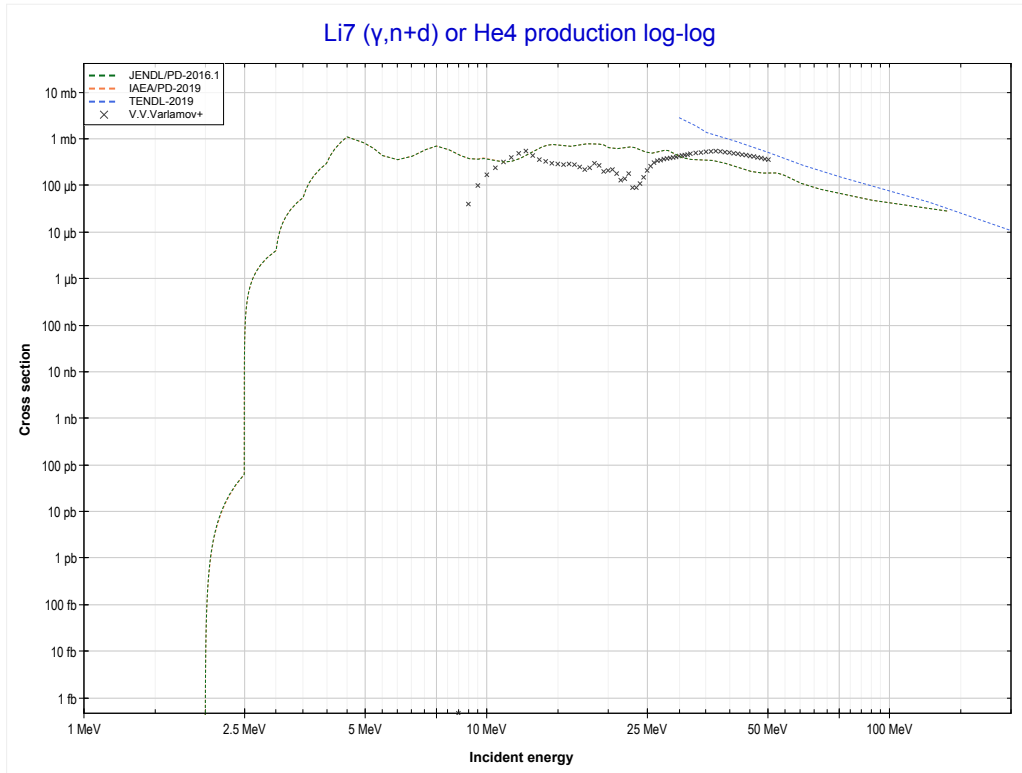
Reaction	Q-Value
Li7(γ,t)He4	-2467.62 keV
Li7(γ,n+d)He4	-8724.85 keV
Li7(γ,2n+p)He4	-10949.42 keV

<< 3-Li-6	3-Li-7	
<< MT32 (γ,n+d)	**MT41 (γ,2n+p) or MT5 (He4 production)**	MT45 (γ,n+p+α) >>

Li7 (γ,2n+p) or He4 production log-log

Li7 (γ,2n+p) or He4 production lin-log
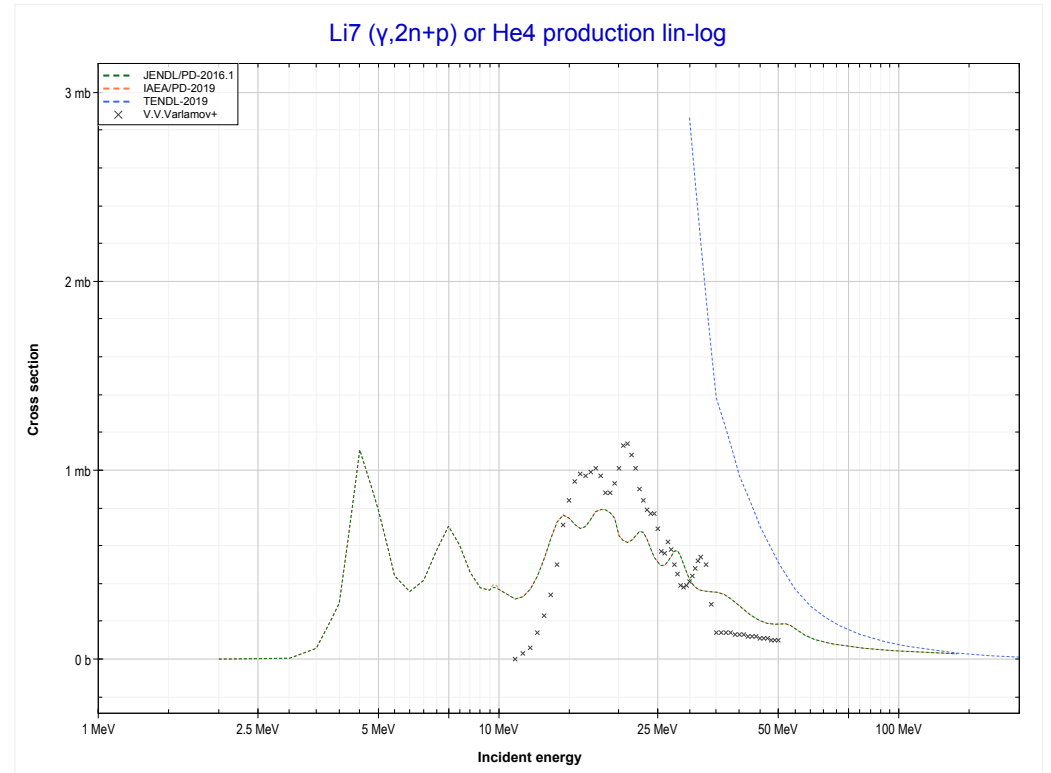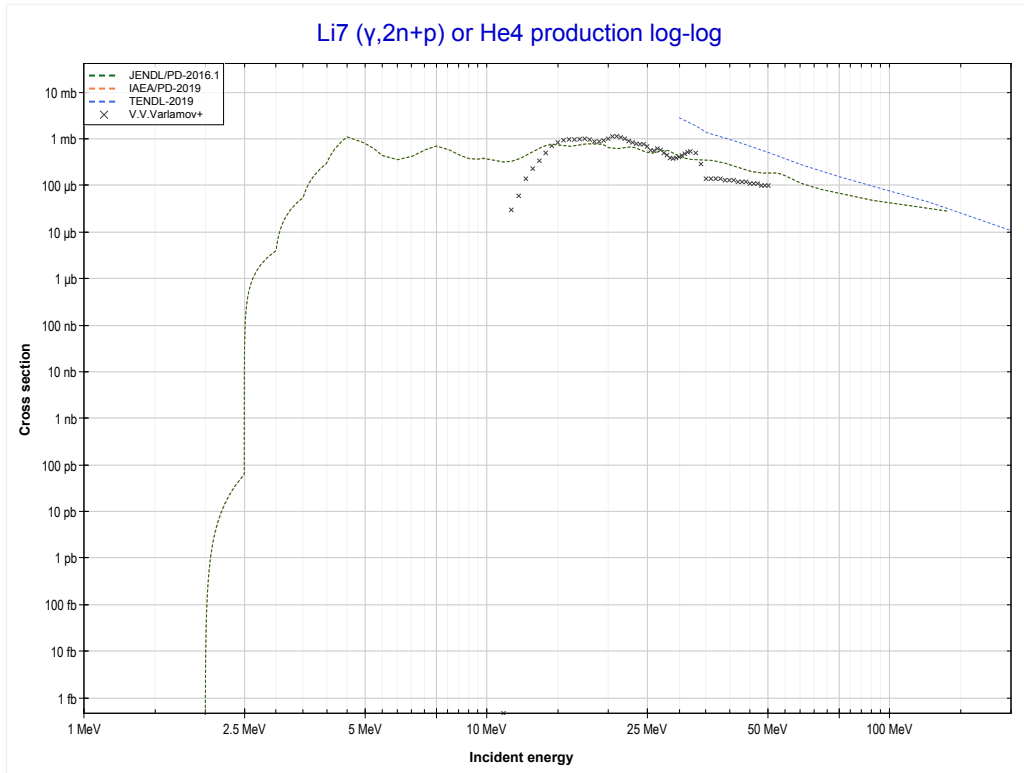
Reaction	Q-Value
Li7(γ,t)He4	-2467.62 keV
Li7(γ,n+d)He4	-8724.85 keV
Li7(γ,2n+p)He4	-10949.42 keV

	3-Li-7	6-C-12 >>
<< MT41 (γ,2n+p)	**MT45 (γ,n+p+α) or MT5 (n production)**	MT103 (γ,p) >>

Li7 (γ,n+p+α) or n production log-log

Li7 (γ,n+p+α) or n production lin-log

Reaction	Q-Value	Reaction	Q-Value
Li7(γ,d+α)n	-8724.85 keV	Li7(γ,n+p+2d)n	-34795.94 keV
Li7(γ,n+p+α)n	-10949.42 keV	Li7(γ,2n+2p+d)n	-37020.51 keV
Li7(γ,t+He3)n	-23045.24 keV	Li7(γ,3n+3p)n	-39245.08 keV
Li7(γ,p+d+t)n	-28538.71 keV		
Li7(γ,n+d+He3)n	-29302.47 keV		
Li7(γ,n+2p+t)n	-30763.28 keV		
Li7(γ,2n+p+He3)n	-31527.03 keV		
Li7(γ,3d)n	-32571.38 keV		

<< 3-Li-6	3-Li-7	4-Be-9 >>
<< MT45 (γ,n+p+α)	MT103 (γ,p) or MT5 (He6 production)	MT105 (γ,t) >>

Li7 (γ,p) or He6 production log-log

Li7 (γ,p) or He6 production lin-log
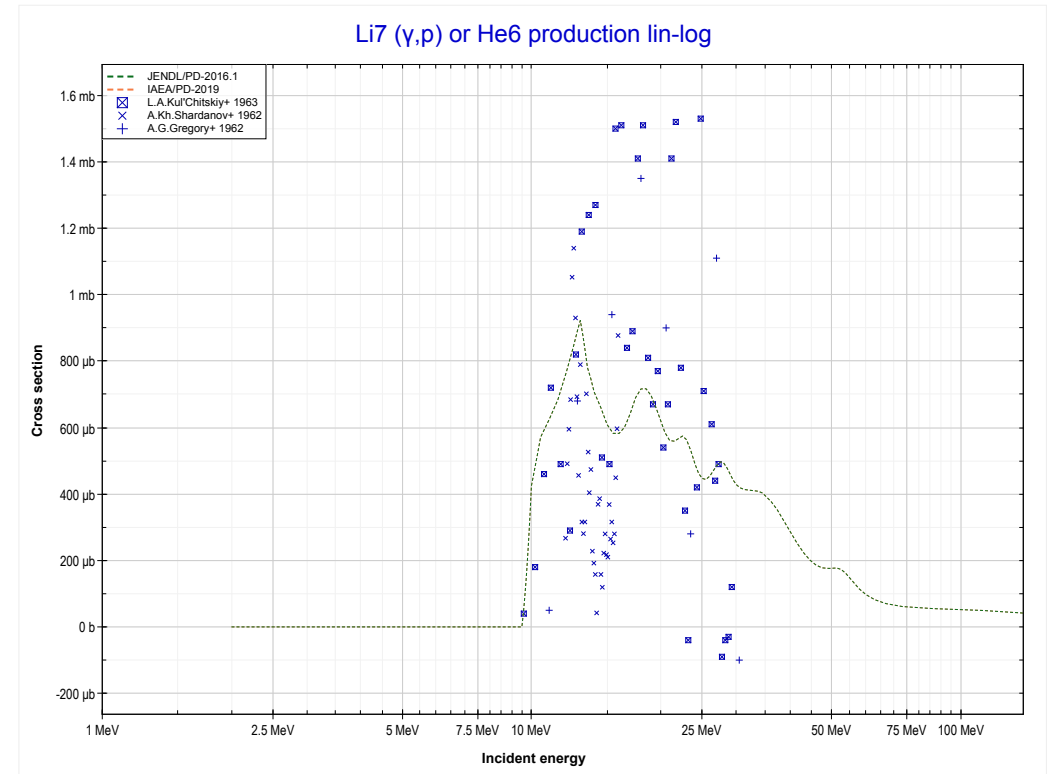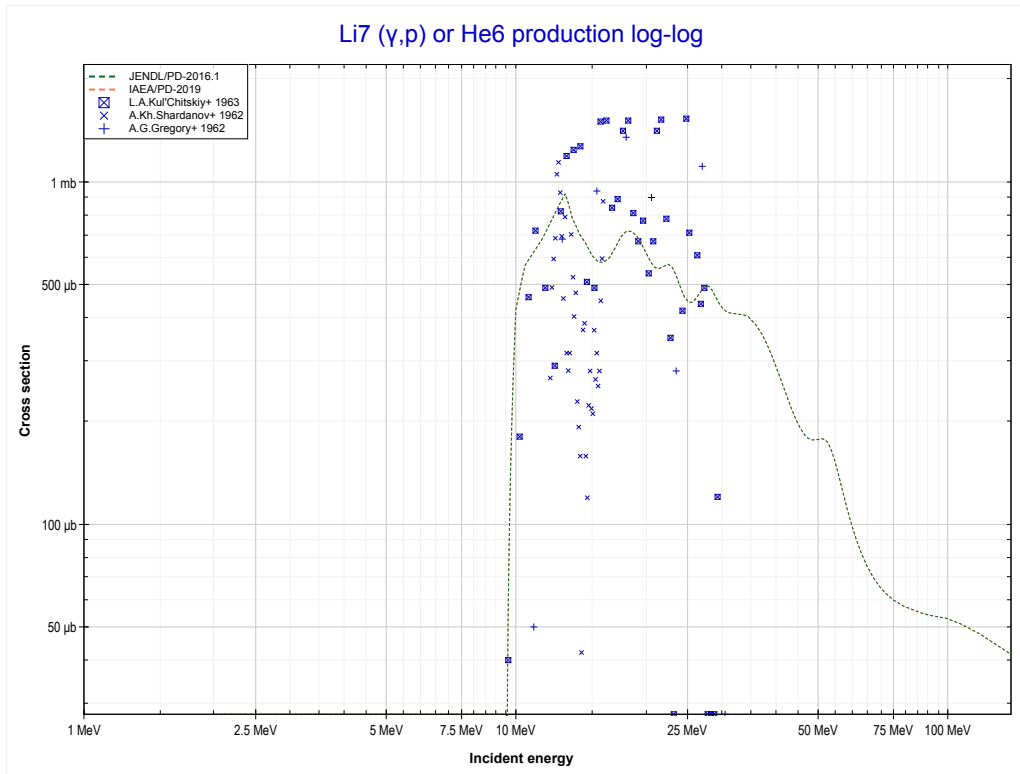
Reaction	Q-Value
Li7(γ,p)He6	-9973.97 keV

<< 3-Li-6	3-Li-7	
<< MT103 (γ,p)	MT105 (γ,t) or MT5 (He4 production)	MT116 (γ,p+t) >>

Li7 (γ,t) or He4 production log-log

Li7 (γ,t) or He4 production lin-log
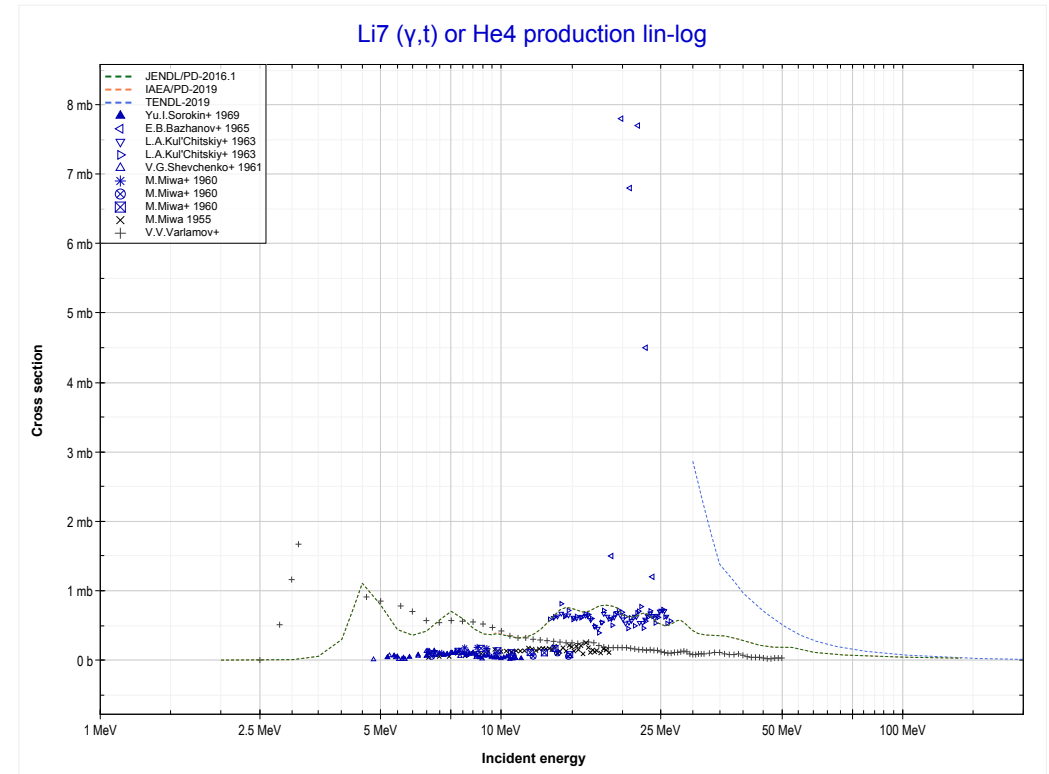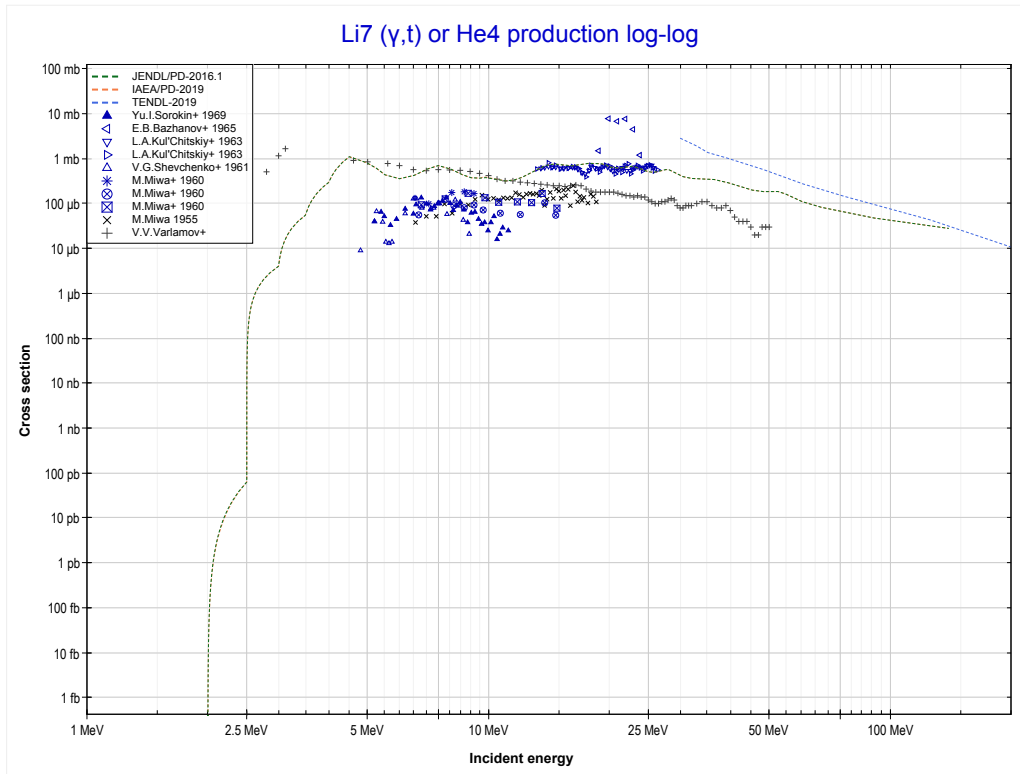
Reaction	Q-Value
Li7(γ,t)He4	-2467.62 keV
Li7(γ,n+d)He4	-8724.85 keV
Li7(γ,2n+p)He4	-10949.42 keV

	3-Li-7	
<< MT105 (γ,t)	**MT116 (γ,p+t) or MT5 (H3 production)**	MT117 (γ,d+α) >>

Li7 (γ,p+t) or H3 production log-log

Li7 (γ,p+t) or H3 production lin-log
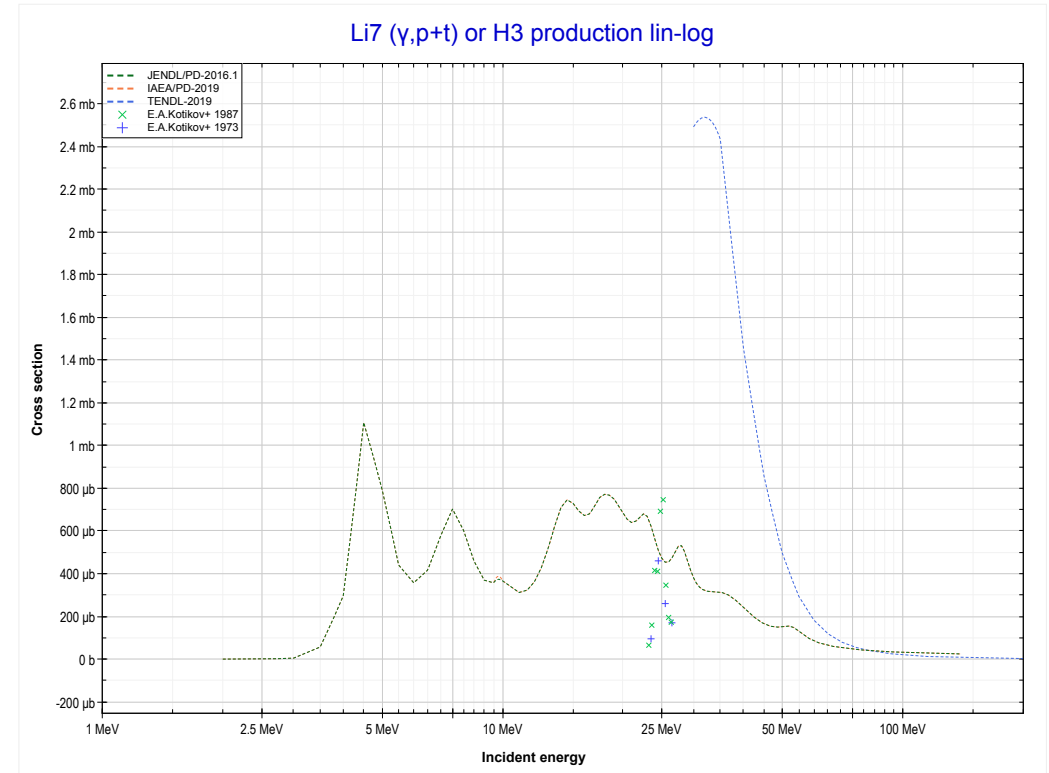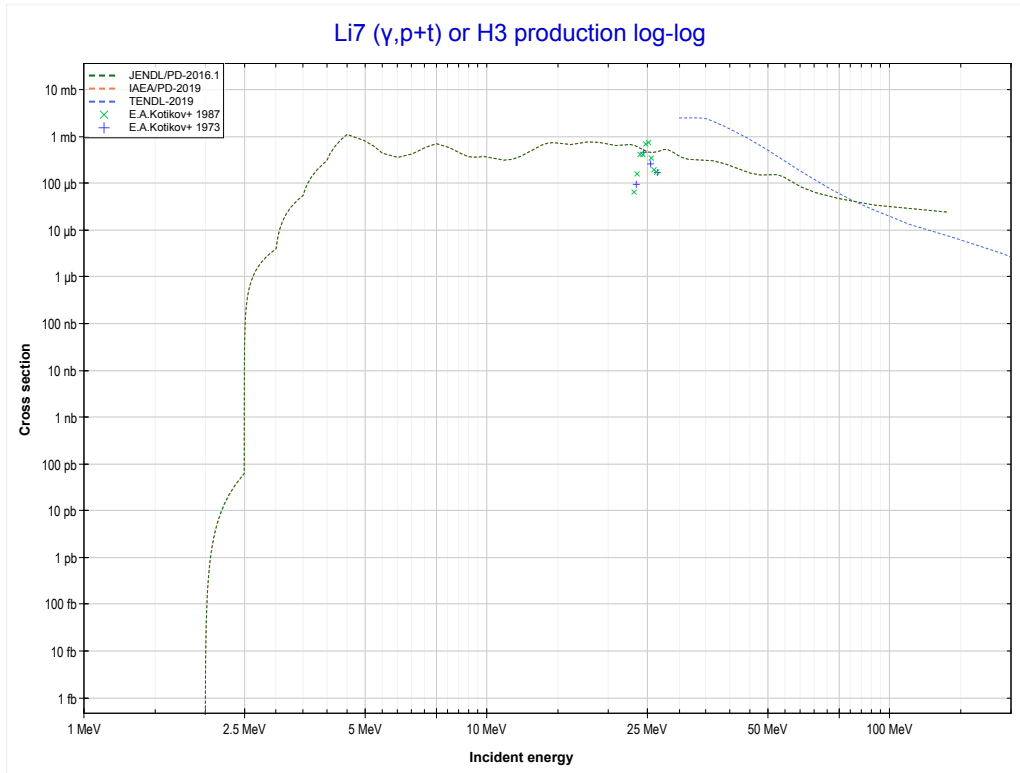
Reaction	Q-Value
Li7(γ,α)H3	-2467.62 keV
Li7(γ,p+t)H3	-22281.49 keV
Li7(γ,n+He3)H3	-23045.24 keV
Li7(γ,2d)H3	-26314.15 keV
Li7(γ,n+p+d)H3	-28538.71 keV
Li7(γ,2n+2p)H3	-30763.28 keV

3-Li-7		12-Mg-24 >>
<< MT116 (γ,p+t)	**MT117 (γ,d+α) or MT5 (n production)**	MT187 (γ,n+d+³He) >>

Li7 (γ,d+α) or n production log-log

Li7 (γ,d+α) or n production lin-log

Reaction	Q-Value	Reaction	Q-Value
Li7(γ,d+α)n	-8724.85 keV	Li7(γ,n+p+2d)n	-34795.94 keV
Li7(γ,n+p+α)n	-10949.42 keV	Li7(γ,2n+2p+d)n	-37020.51 keV
Li7(γ,t+He3)n	-23045.24 keV	Li7(γ,3n+3p)n	-39245.08 keV
Li7(γ,p+d+t)n	-28538.71 keV		
Li7(γ,n+d+He3)n	-29302.47 keV		
Li7(γ,n+2p+t)n	-30763.28 keV		
Li7(γ,2n+p+He3)n	-31527.03 keV		
Li7(γ,3d)n	-32571.38 keV		

3-Li-7	12-Mg-24 >>
<< MT117 (γ,d+α)	**MT187 (γ,n+d+³He) or MT5 (n production)**	4-Be-9 MT4 (γ,n) >>

Li7 (γ,n+d+³He) or n production log-log

Li7 (γ,n+d+³He) or n production lin-log

Reaction	Q-Value	Reaction	Q-Value
Li7(γ,d+α)n	-8724.85 keV	Li7(γ,n+p+2d)n	-34795.94 keV
Li7(γ,n+p+α)n	-10949.42 keV	Li7(γ,2n+2p+d)n	-37020.51 keV
Li7(γ,t+He3)n	-23045.24 keV	Li7(γ,3n+3p)n	-39245.08 keV
Li7(γ,p+d+t)n	-28538.71 keV		
Li7(γ,n+d+He3)n	-29302.47 keV		
Li7(γ,n+2p+t)n	-30763.28 keV		
Li7(γ,2n+p+He3)n	-31527.03 keV		
Li7(γ,3d)n	-32571.38 keV		

<< 3-Li-7	**4-Be-9**	6-C-12 >>
<< 3-Li-7 MT187 (γ,n+d+³He)	**MT4 (γ,n) or MT5 (Be8 production)**	MT22 (γ,n+α) >>

Be9 (γ,n) or Be8 production log-log

Be9 (γ,n) or Be8 production lin-log
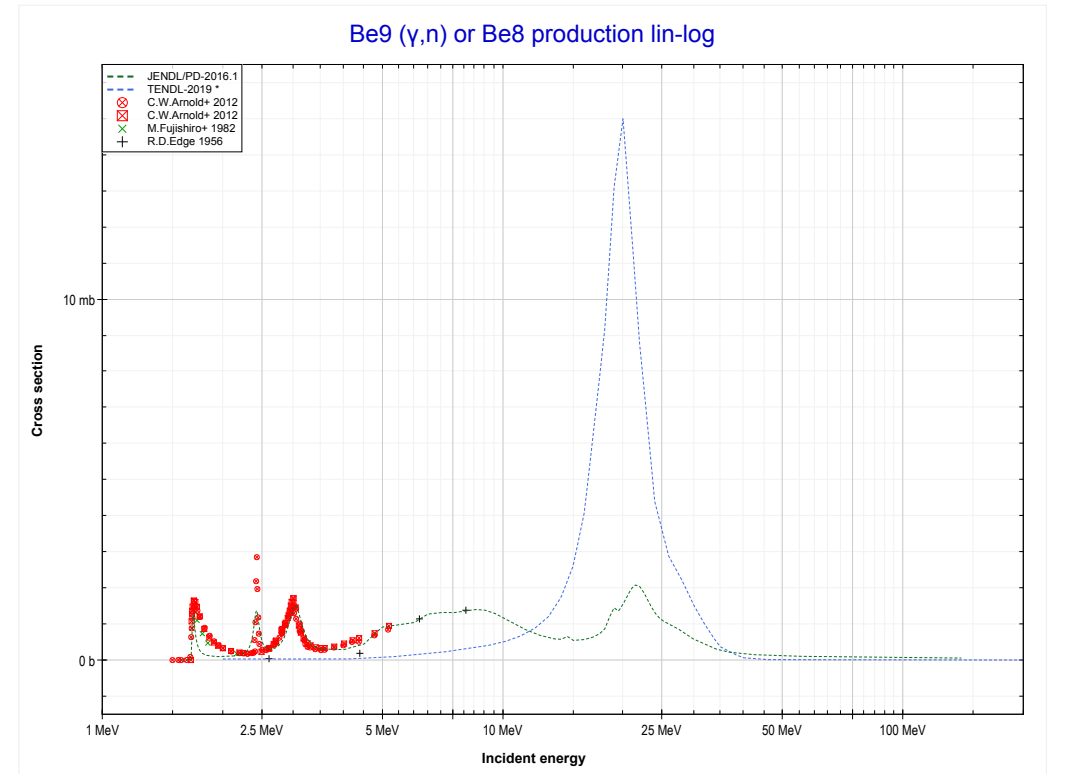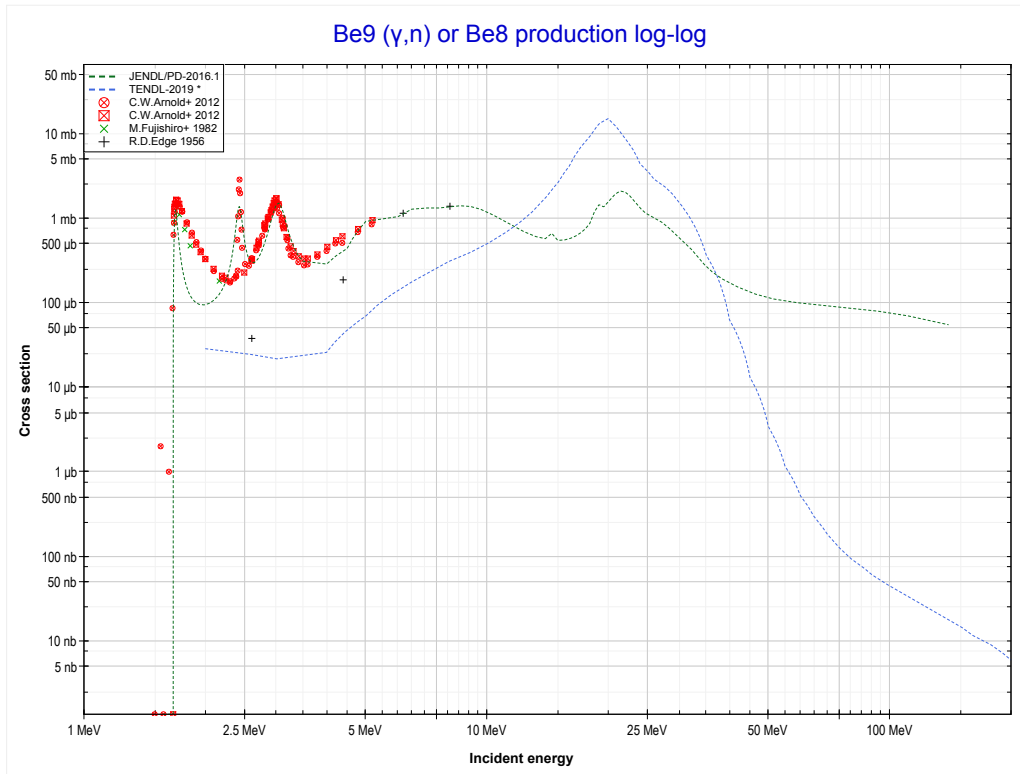
Reaction	Q-Value
Be9(γ,n)Be8	-1664.54 keV

4-Be-9		6-C-12 >>
<< MT4 (γ,n)	**MT22 (γ,n+α) or MT5 (He4 production)**	MT103 (γ,p) >>

Be9 (γ,n+α) or He4 production log-log

Be9 (γ,n+α) or He4 production lin-log
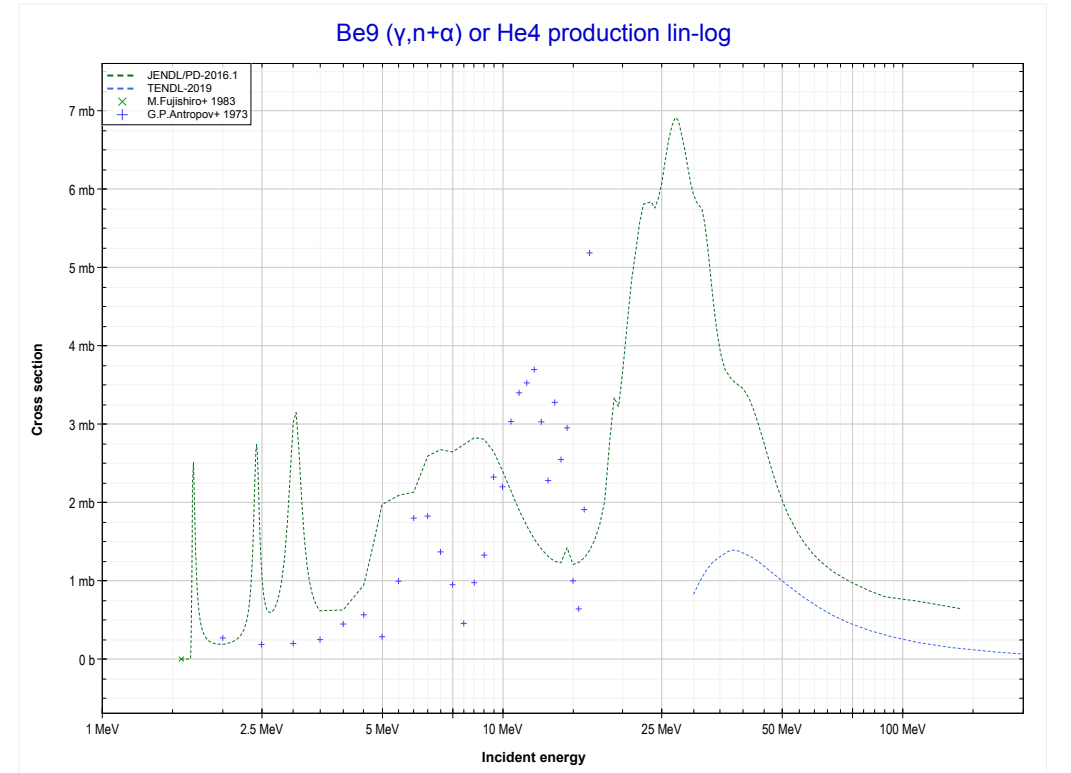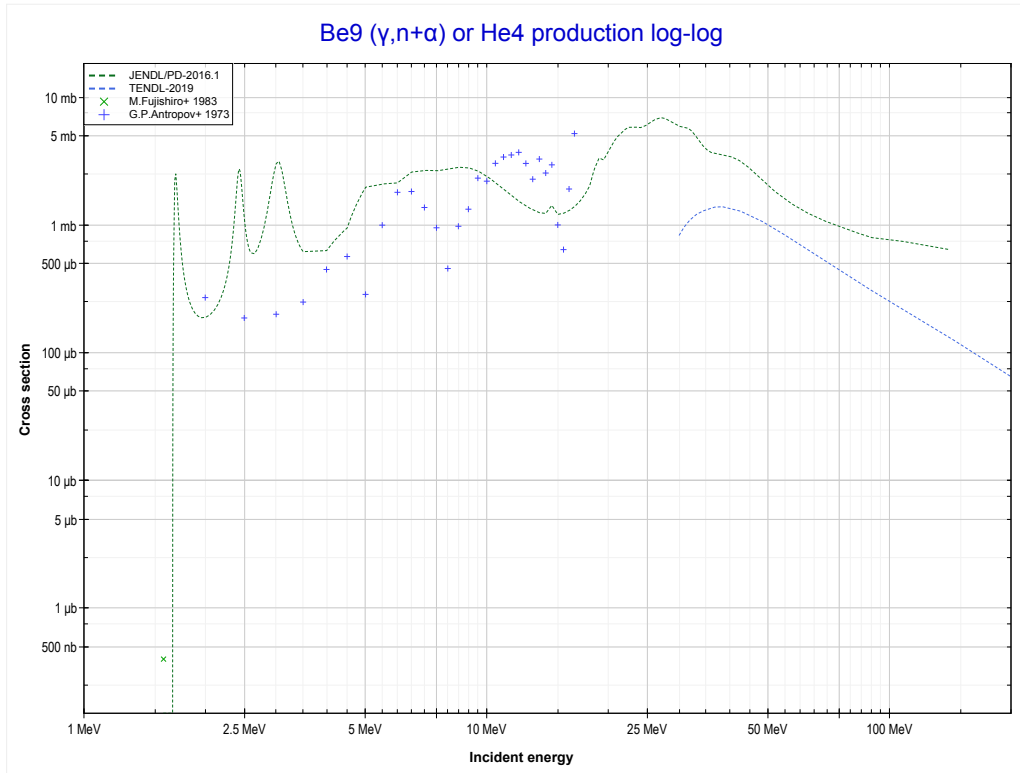
Reaction	Q-Value
Be9(γ,n+α)He4	-1572.70 keV
Be9(γ,d+t)He4	-19162.00 keV
Be9(γ,n+p+t)He4	-21386.56 keV
Be9(γ,2n+He3)He4	-22150.32 keV
Be9(γ,n+2d)He4	-25419.23 keV
Be9(γ,2n+p+d)He4	-27643.79 keV
Be9(γ,3n+2p)He4	-29868.36 keV

<< 3-Li-7	4-Be-9	5-B-11 >>
<< MT22 (γ,n+α)	MT103 (γ,p) or MT5 (Li8 production)	MT108 (γ,2α) >>

Be9 (γ,p) or Li8 production log-log

Be9 (γ,p) or Li8 production lin-log
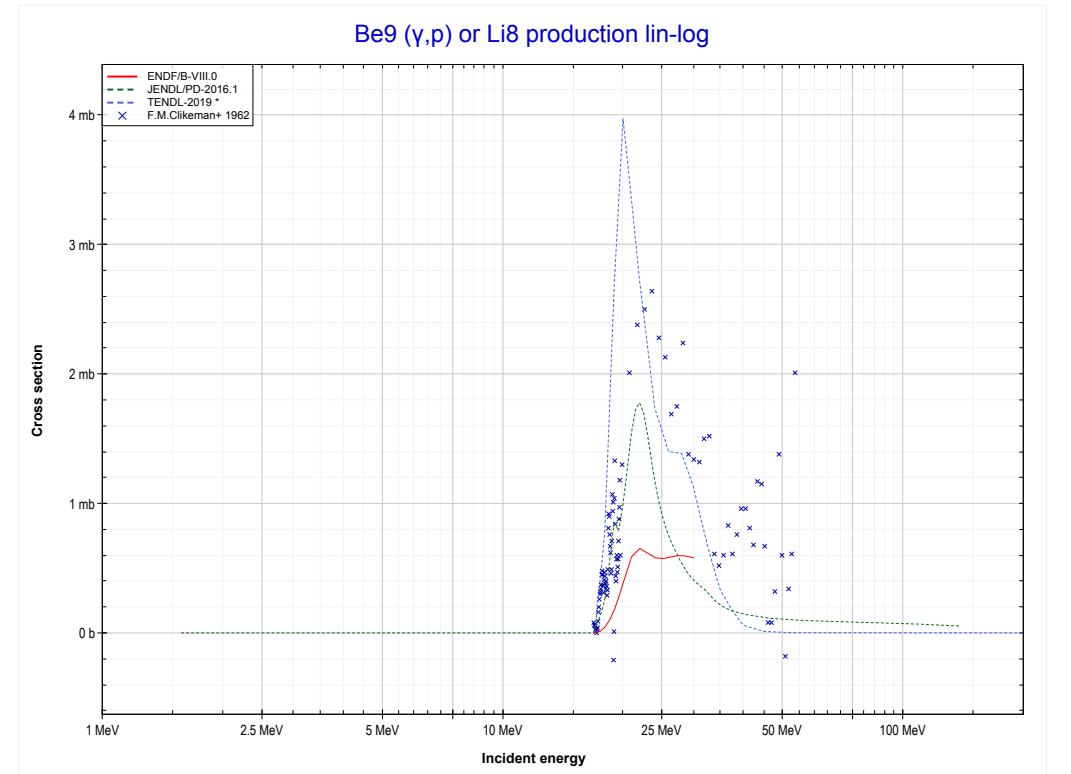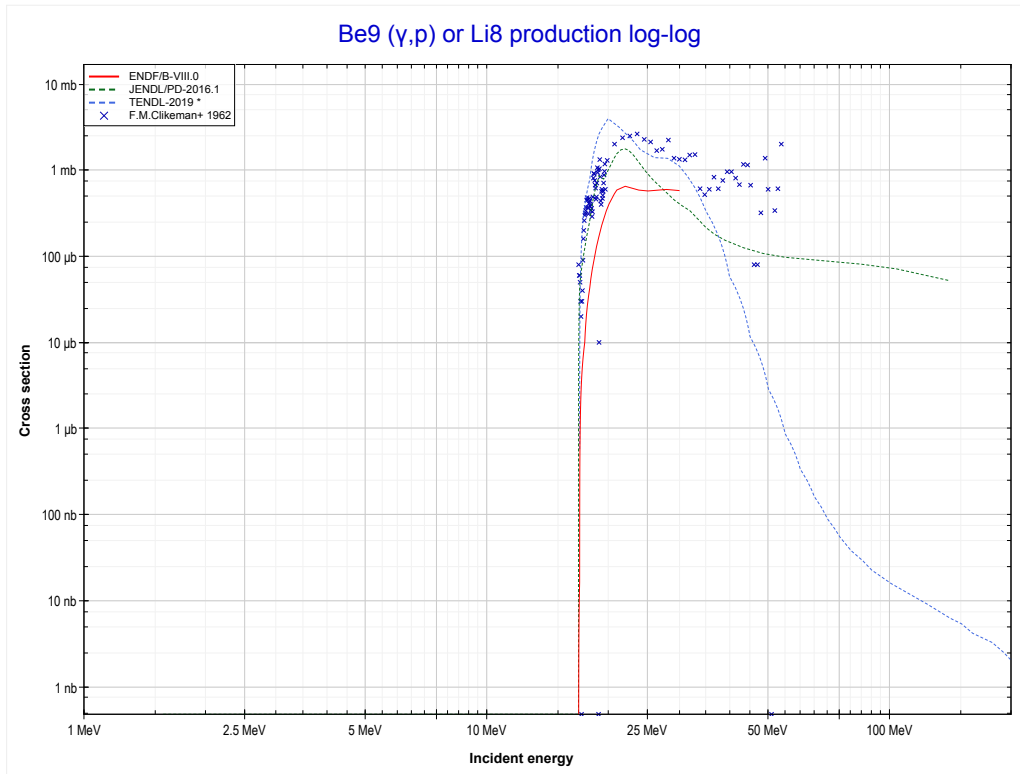
Reaction	Q-Value
Be9(γ,p)Li8	-16886.32 keV

4-Be-9		6-C-12 >>
<< MT103 (γ,p)	**MT108 (γ,2α) or MT5 (n production)**	5-B-11 MT16 (γ,2n) >>

Be9 (γ,2α) or n production log-log

Be9 (γ,2α) or n production lin-log
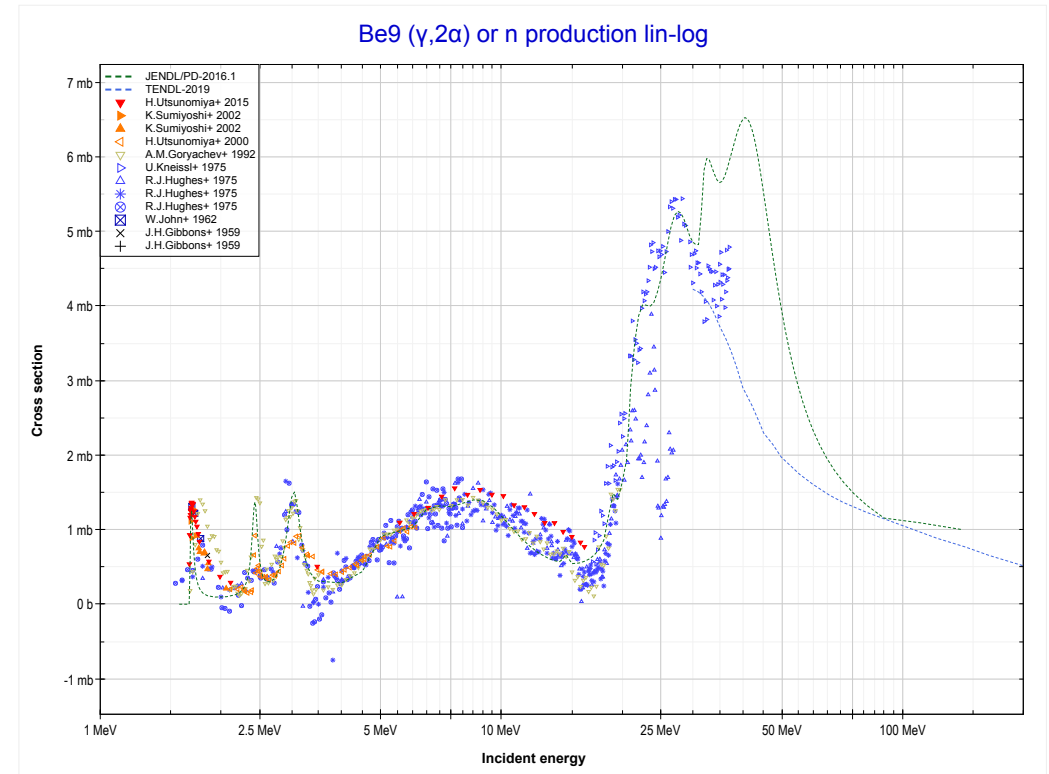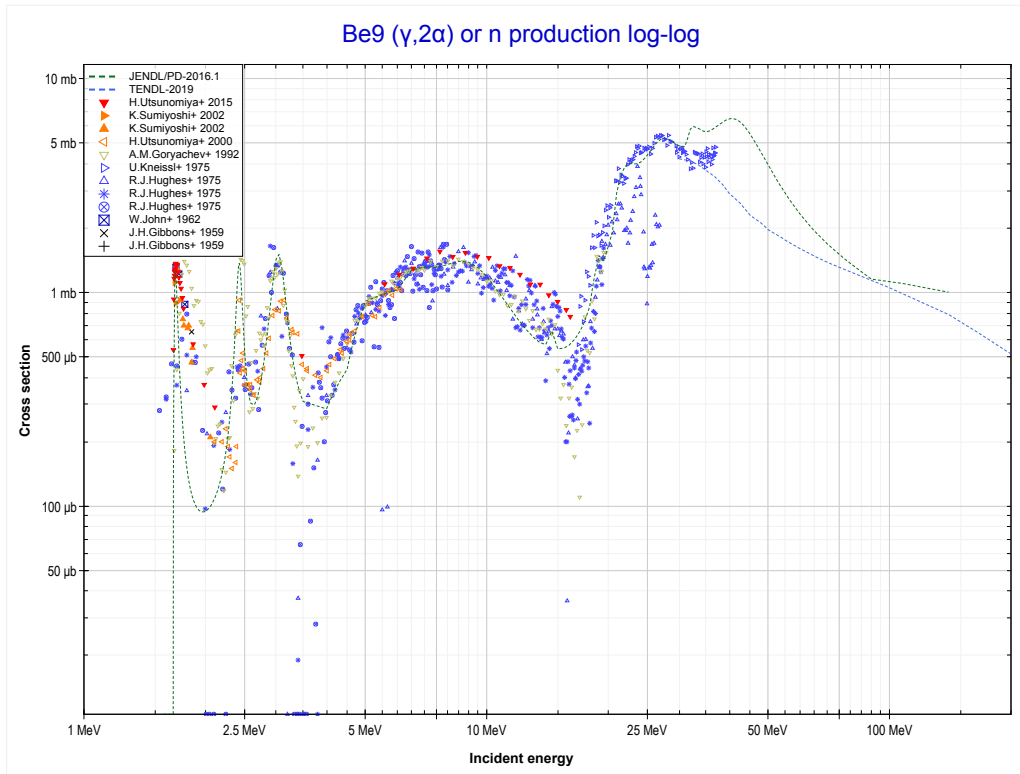
Reaction	Q-Value	Reaction	Q-Value
Be9(γ,2α)n	-1572.70 keV	Be9(γ,n+p+t+He3)n	-41964.18 keV
Be9(γ,p+t+α)n	-21386.56 keV	Be9(γ,2n+2He3)n	-42727.94 keV
Be9(γ,n+He3+α)n	-22150.32 keV	Be9(γ,p+2d+t)n	-45233.09 keV
Be9(γ,2d+α)n	-25419.23 keV	Be9(γ,n+2d+He3)n	-45996.85 keV
Be9(γ,n+p+d+α)n	-27643.79 keV	Be9(γ,n+2p+d+t)n	-47457.66 keV
Be9(γ,2n+2p+α)n	-29868.36 keV	Be9(γ,2n+p+d+He3)n	-48221.41 keV
Be9(γ,d+t+He3)n	-39739.62 keV	Be9(γ,4d)n	-49265.75 keV
Be9(γ,2p+2t)n	-41200.43 keV	Be9(γ,2n+3p+t)n	-49682.22 keV

	5-B-11	6-C-12 >>
<< 4-Be-9 MT108 (γ,2α)	**MT16 (γ,2n) or MT5 (B9 production)**	MT103 (γ,p) >>

B11 (γ,2n) or B9 production log-log

Legend:
- JENDL/PD-2016.1
- TENDL-2019 *
- × U.Kneissl+ 1976

B11 (γ,2n) or B9 production lin-log

Legend:
- JENDL/PD-2016.1
- TENDL-2019 *
- × U.Kneissl+ 1976
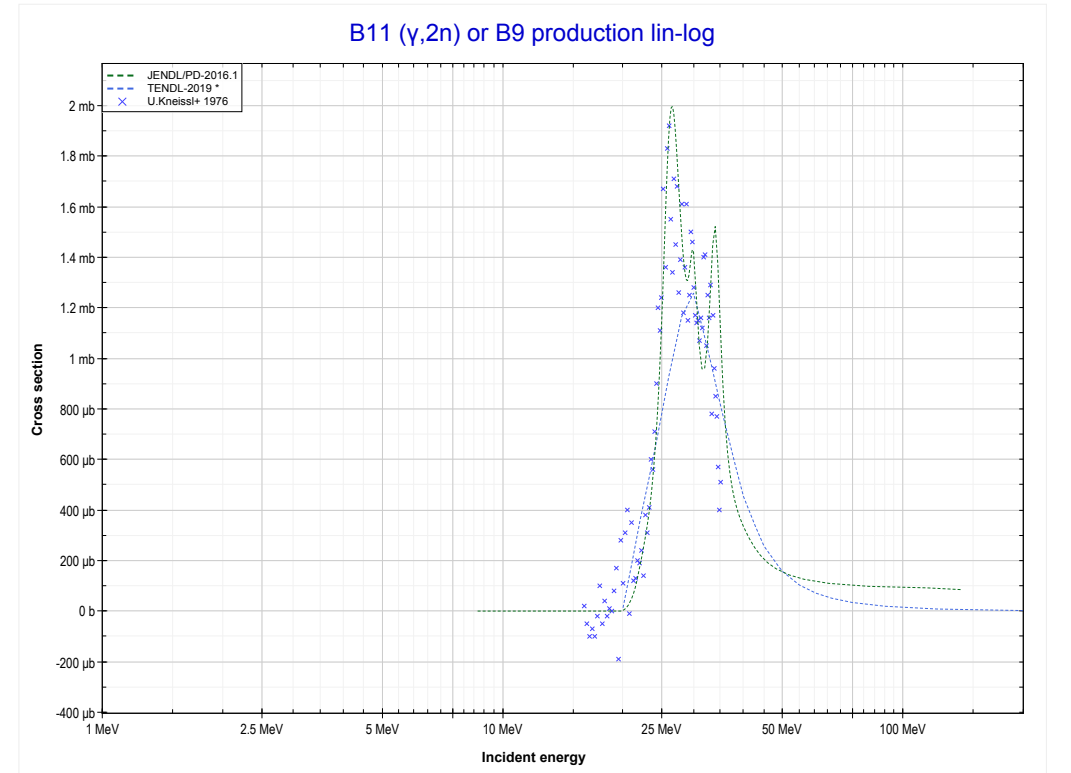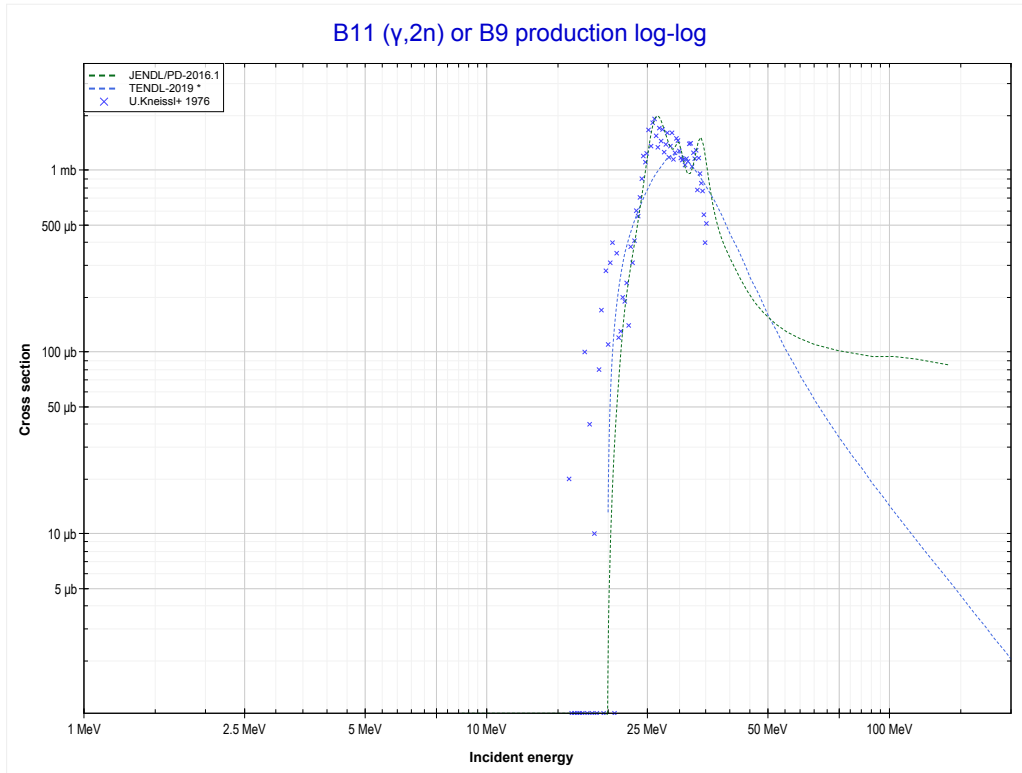
Reaction	Q-Value
B11(γ,2n)B9	-19891.43 keV

<< 4-Be-9	**5-B-11**	6-C-12 >>
<< MT16 (γ,2n)	**MT103 (γ,p) or MT5 (Be10 production)**	MT114 (γ,d+2α) >>

B11 (γ,p) or Be10 production log-log

B11 (γ,p) or Be10 production lin-log
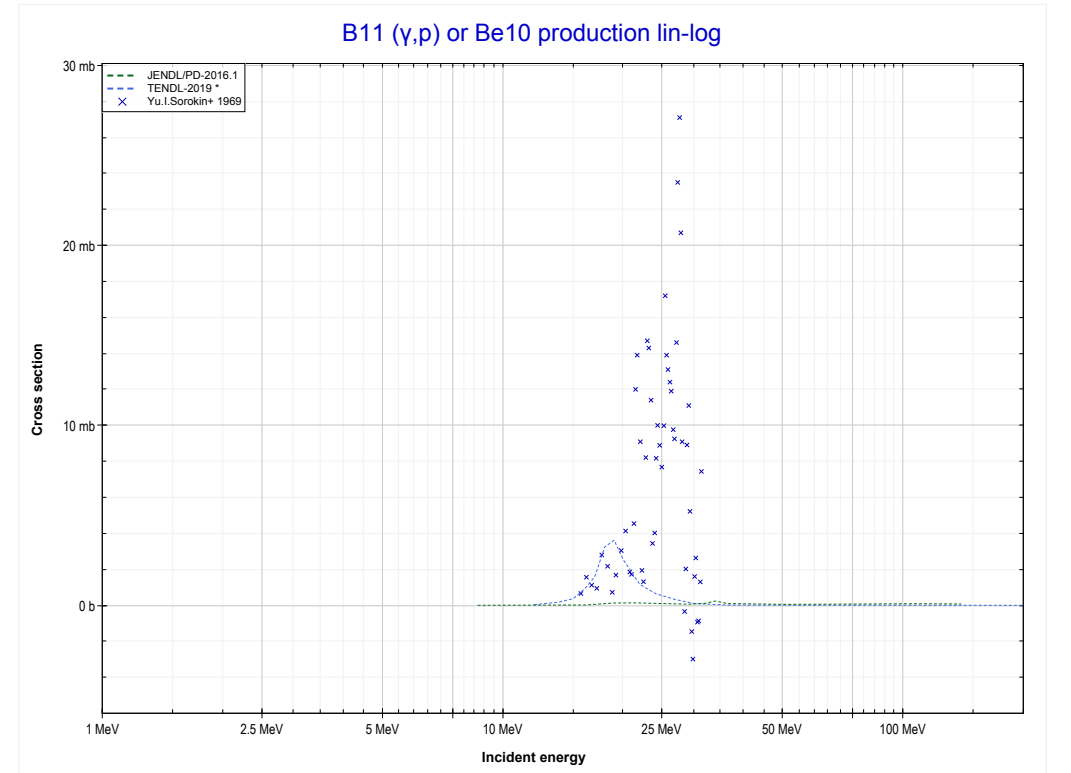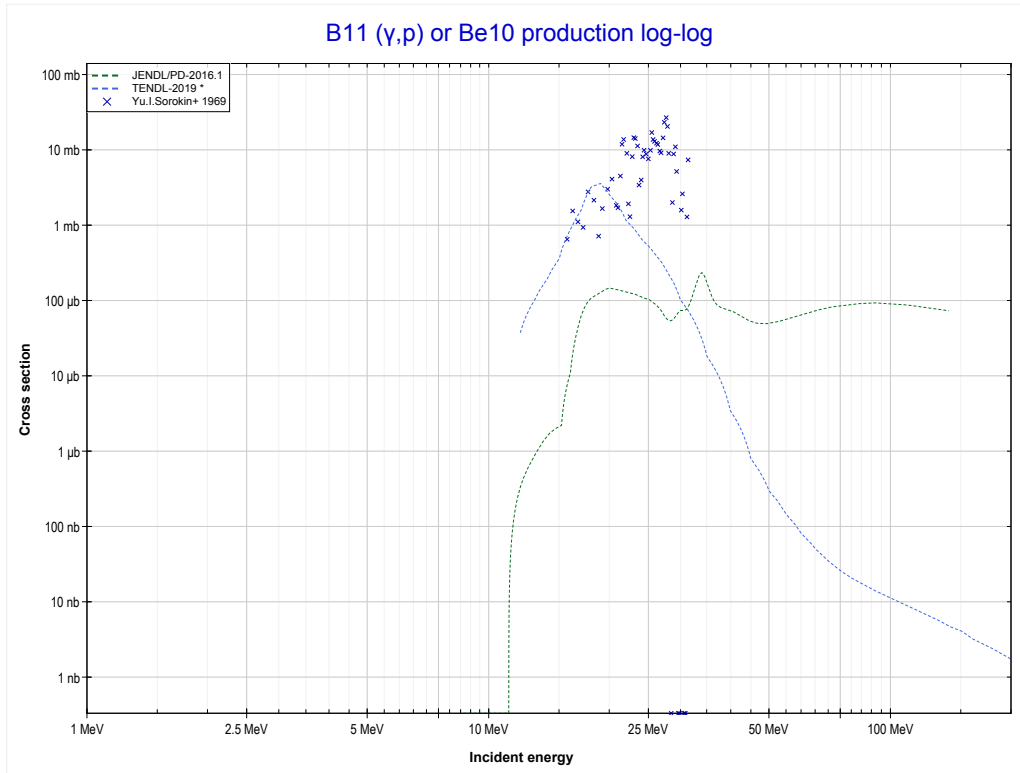
Reaction	Q-Value
B11(γ,p)Be10	-11228.75 keV

5-B-11		
<< MT103 (γ,p)	MT114 (γ,d+2α) or MT5 (n production)	6-C-12 MT4 (γ,n) >>

B11 (γ,d+2α) or n production log-log

B11 (γ,d+2α) or n production lin-log

Reaction	Q-Value	Reaction	Q-Value
B11(γ,d+2α)n	-17389.16 keV	B11(γ,n+p+2d+α)n	-43460.26 keV
B11(γ,n+p+2α)n	-19613.73 keV	B11(γ,2n+2p+d+α)n	-45684.82 keV
B11(γ,t+He3+α)n	-31709.55 keV	B11(γ,3n+3p+α)n	-47909.39 keV
B11(γ,p+d+t+α)n	-37203.03 keV	B11(γ,p+2t+He3)n	-51523.42 keV
B11(γ,n+d+He3+α)n	-37966.78 keV	B11(γ,n+t+2He3)n	-52287.17 keV
B11(γ,n+2p+t+α)n	-39427.59 keV	B11(γ,2d+t+He3)n	-55556.08 keV
B11(γ,2n+p+He3+α)n	-40191.35 keV	B11(γ,2p+d+2t)n	-57016.89 keV
B11(γ,3d+α)n	-41235.69 keV	B11(γ,n+p+d+t+He3)n	-57780.65 keV

<< 4-Be-9	**6-C-12**	6-C-13 >>
<< 5-B-11 MT114 (γ,d+2α)	**MT4 (γ,n) or MT5 (C11 production)**	MT16 (γ,2n) >>

C12 (γ,n) or C11 production log-log

C12 (γ,n) or C11 production lin-log
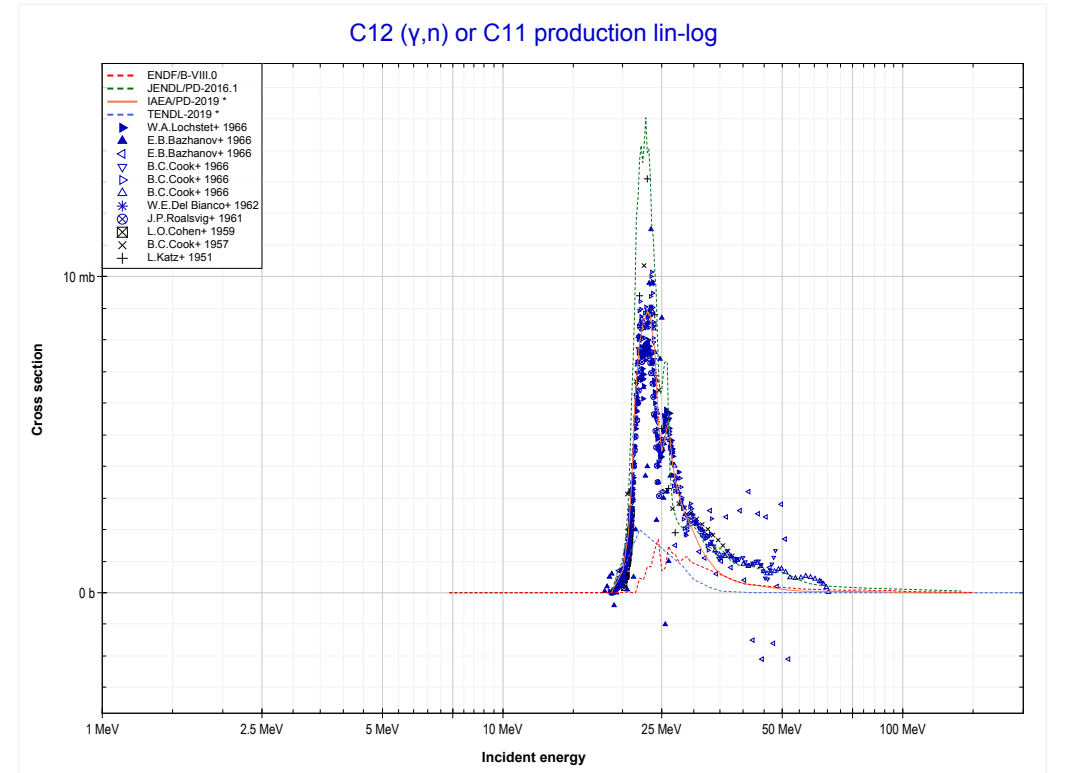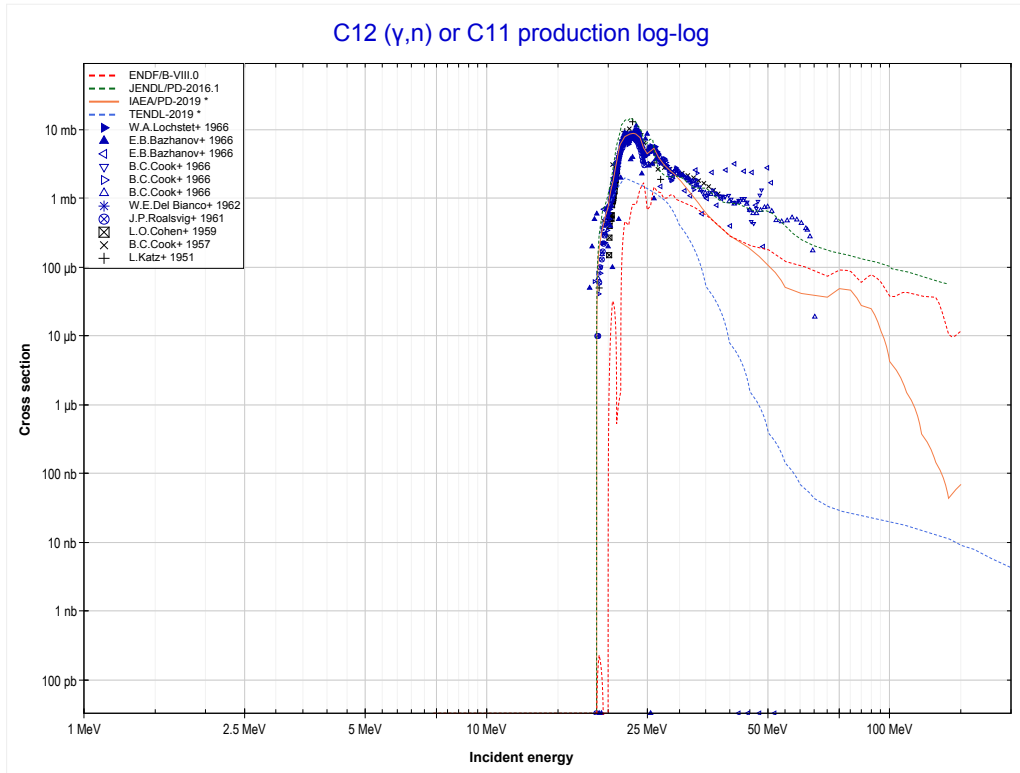
Reaction	Q-Value
C12(γ,n)C11	-18720.72 keV

<< 5-B-11	**6-C-12**	6-C-14 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (C10 production)**	MT22 (γ,n+α) >>

C12 (γ,2n) or C10 production log-log

C12 (γ,2n) or C10 production lin-log
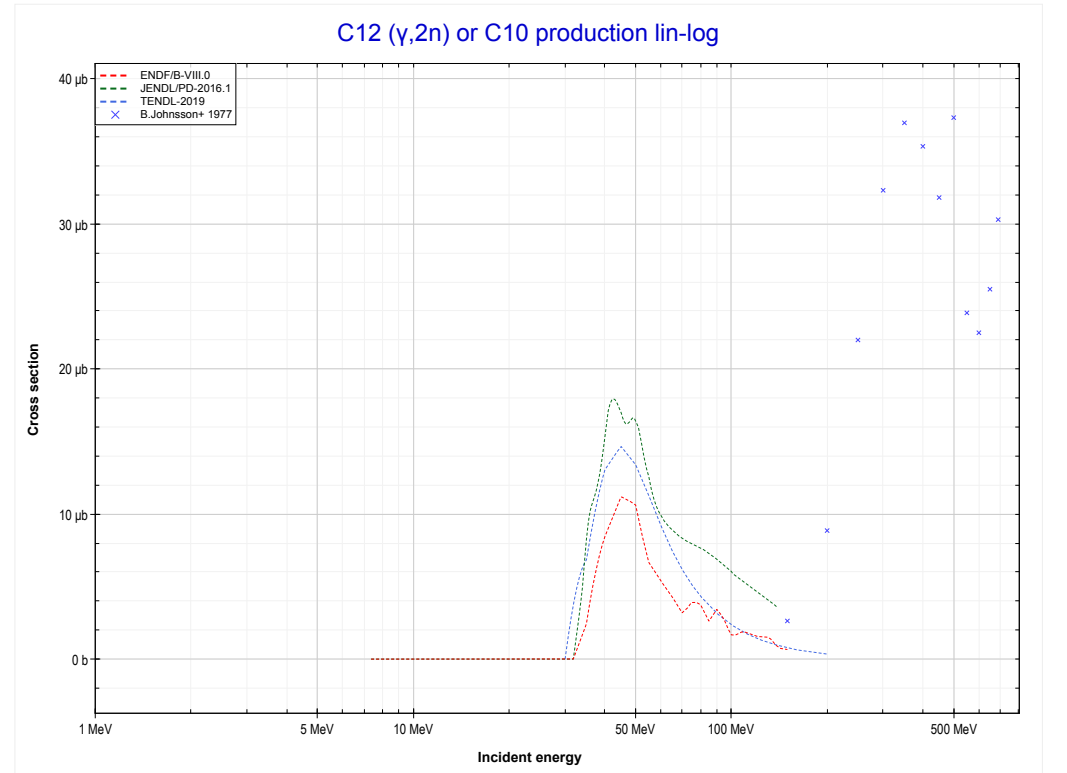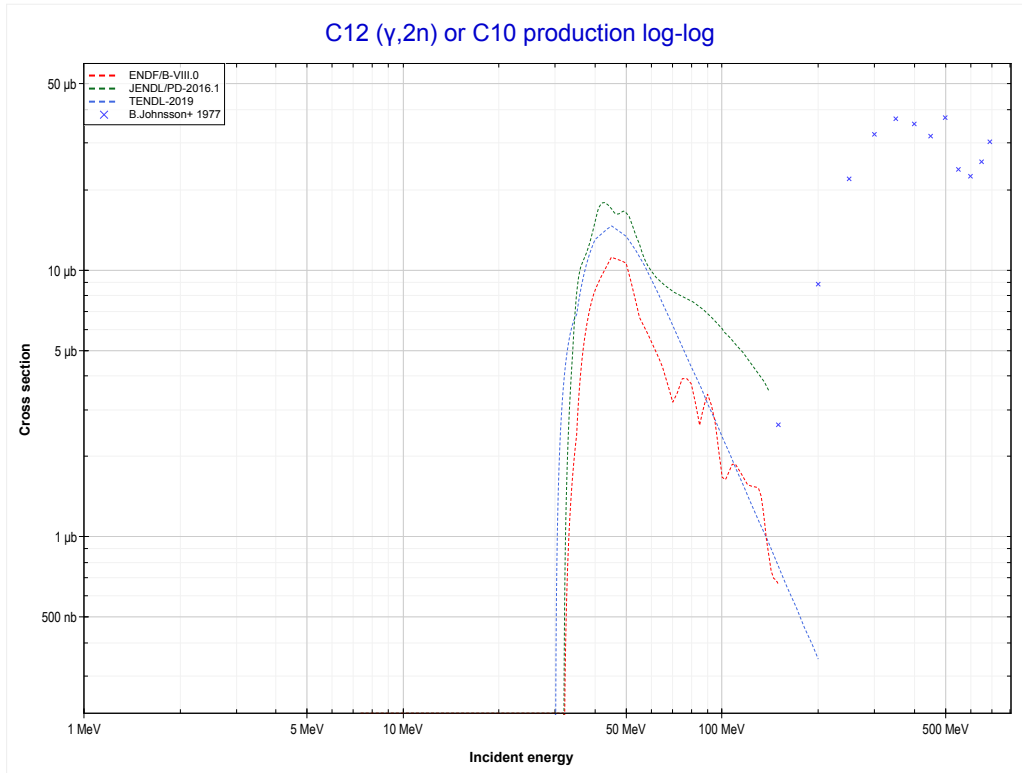
Reaction	Q-Value
C12(γ,2n)C10	-31841.30 keV

<< 4-Be-9	**6-C-12**	
<< MT16 (γ,2n)	**MT22 (γ,n+α) or MT5 (Be7 production)**	MT28 (γ,n+p) >>

C12 (γ,n+α) or Be7 production log-log

C12 (γ,n+α) or Be7 production lin-log

Reaction	Q-Value
C12(γ,n+α)Be7	-26265.23 keV
C12(γ,d+t)Be7	-43854.53 keV
C12(γ,n+p+t)Be7	-46079.10 keV
C12(γ,2n+He3)Be7	-46842.85 keV
C12(γ,n+2d)Be7	-50111.76 keV
C12(γ,2n+p+d)Be7	-52336.33 keV
C12(γ,3n+2p)Be7	-54560.89 keV

<< 3-Li-6	6-C-12	7-N-14 >>
<< MT22 (γ,n+α)	MT28 (γ,n+p) or MT5 (B10 production)	MT45 (γ,n+p+α) >>

C12 (γ,n+p) or B10 production log-log

C12 (γ,n+p) or B10 production lin-log
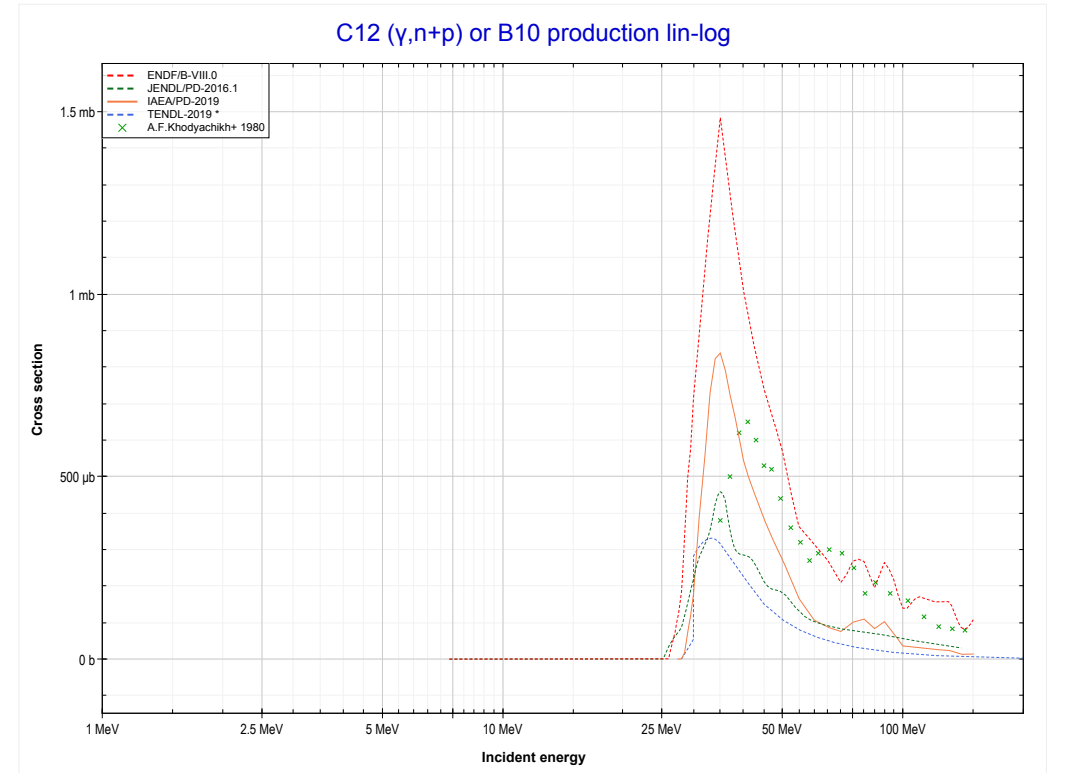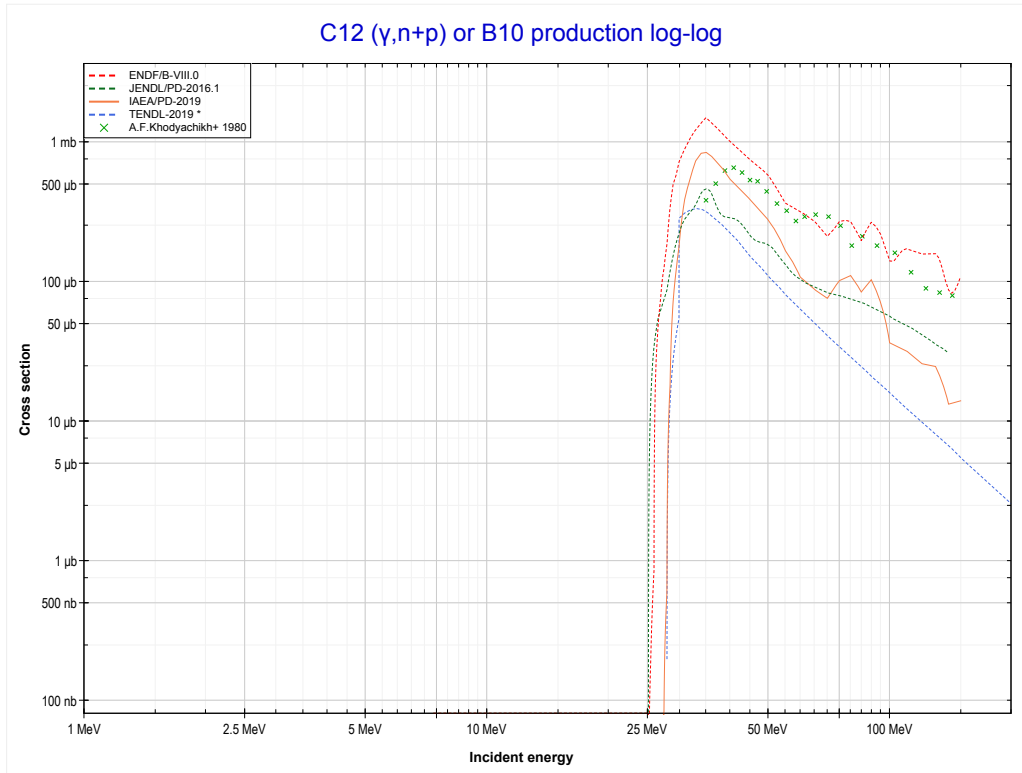
Reaction	Q-Value
C12(γ,d)B10	-25186.33 keV
C12(γ,n+p)B10	-27410.90 keV

<< 3-Li-7	6-C-12	12-Mg-24 >>
<< MT28 (γ,n+p)	**MT45 (γ,n+p+α) or MT5 (Li6 production)**	MT103 (γ,p) >>

C12 (γ,n+p+α) or Li6 production log-log

C12 (γ,n+p+α) or Li6 production lin-log
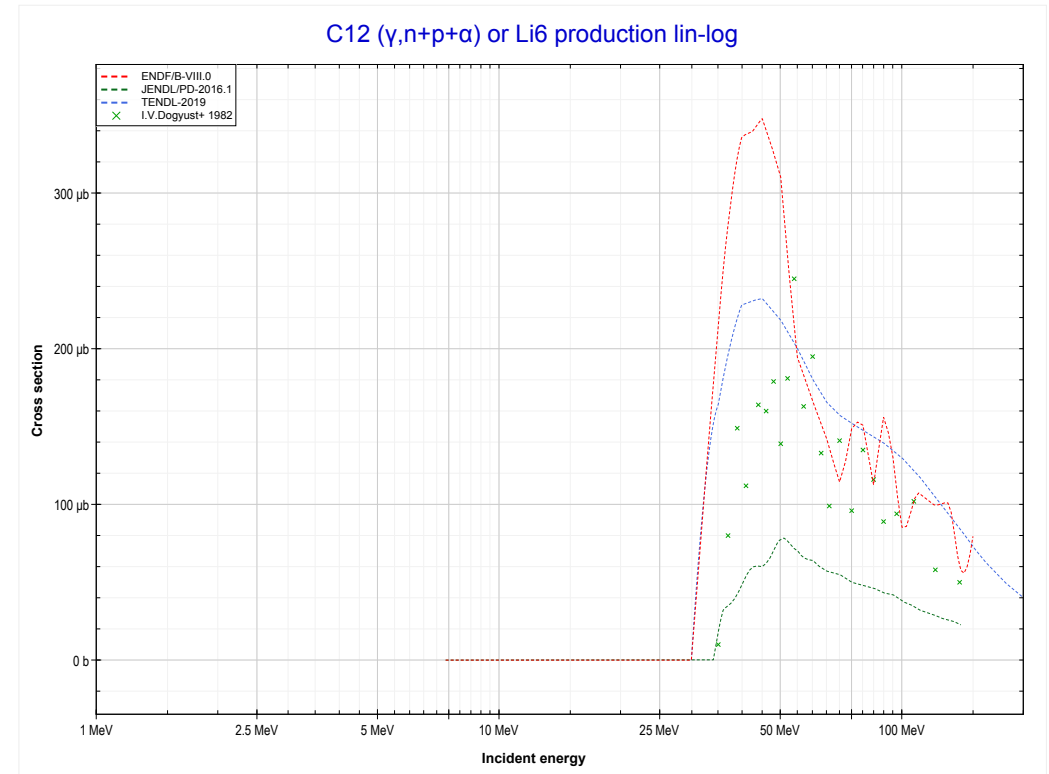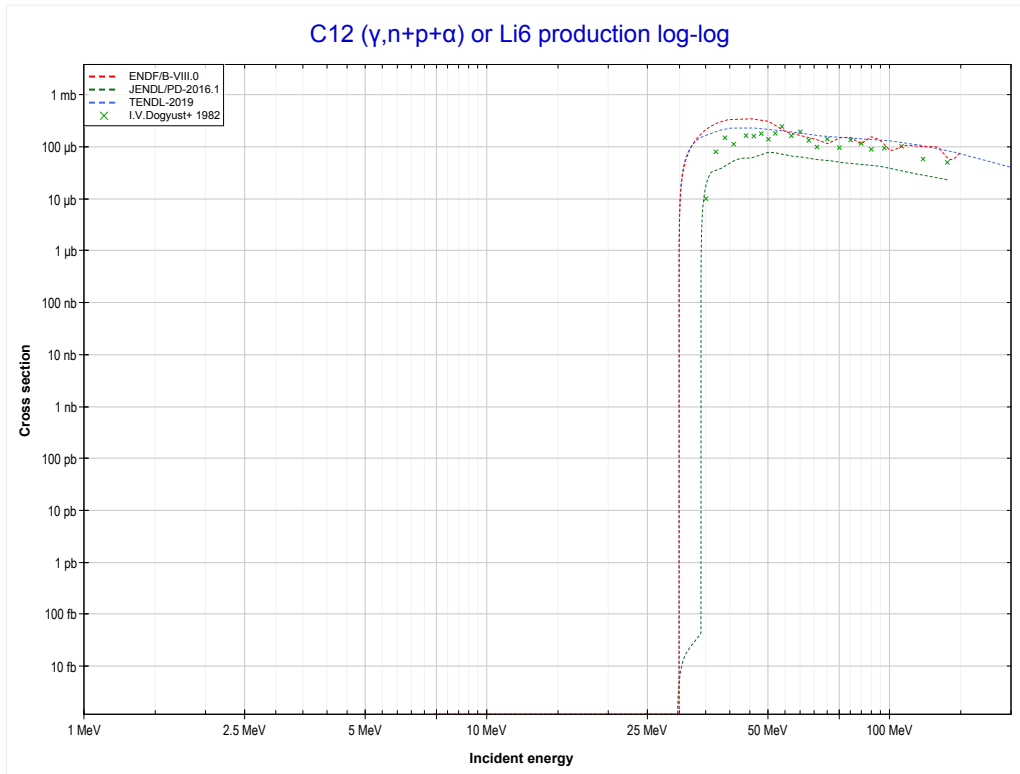
Reaction	Q-Value	Reaction	Q-Value
C12(γ,d+α)Li6	-29647.52 keV	C12(γ,n+p+2d)Li6	-55718.61 keV
C12(γ,n+p+α)Li6	-31872.08 keV	C12(γ,2n+2p+d)Li6	-57943.18 keV
C12(γ,t+He3)Li6	-43967.91 keV	C12(γ,3n+3p)Li6	-60167.74 keV
C12(γ,p+d+t)Li6	-49461.38 keV		
C12(γ,n+d+He3)Li6	-50225.14 keV		
C12(γ,n+2p+t)Li6	-51685.95 keV		
C12(γ,2n+p+He3)Li6	-52449.70 keV		
C12(γ,3d)Li6	-53494.04 keV		

<< 5-B-11	**6-C-12**	6-C-13 >>
<< MT45 (γ,n+p+α)	**MT103 (γ,p) or MT5 (B11 production)**	MT108 (γ,2α) >>

C12 (γ,p) or B11 production log-log

C12 (γ,p) or B11 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- TENDL-2019 *
- V.V.Kirichenko+ 1978
- V.V.Kirichenko+ 1977
- R.Carchon+ 1976
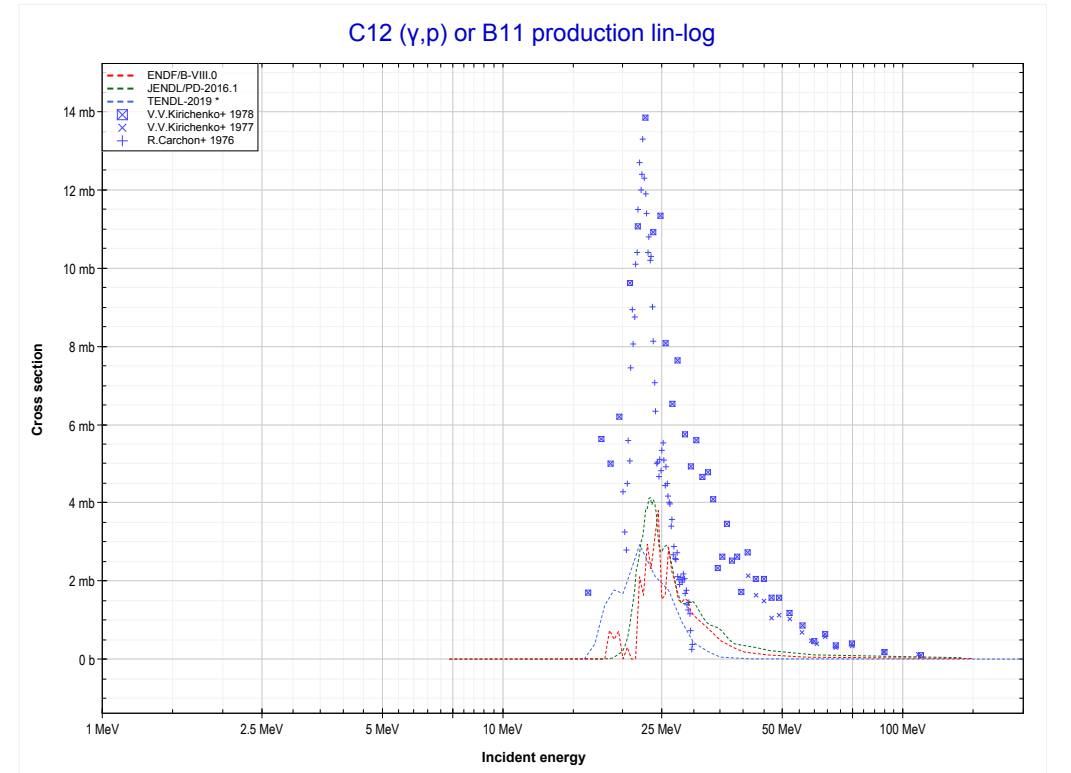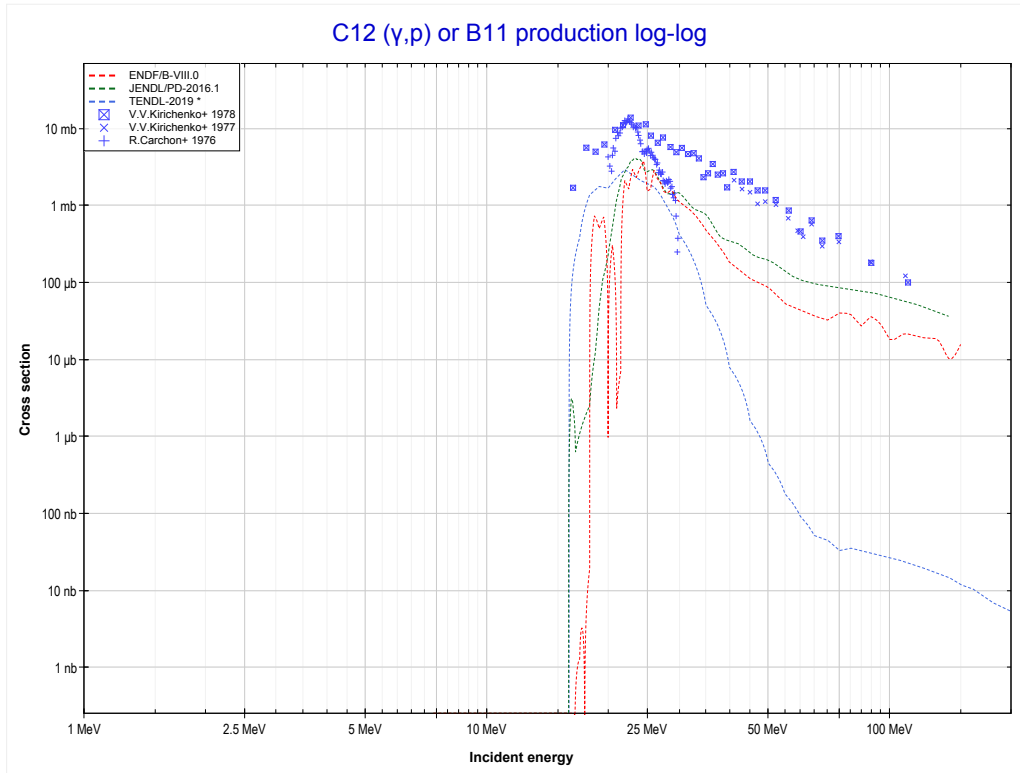
Reaction	Q-Value
C12(γ,p)B11	-15956.68 keV

<< 4-Be-9	**6-C-12**	
<< MT103 (γ,p)	**MT108 (γ,2α) or MT5 (He4 production)**	MT112 (γ,p+α) >>
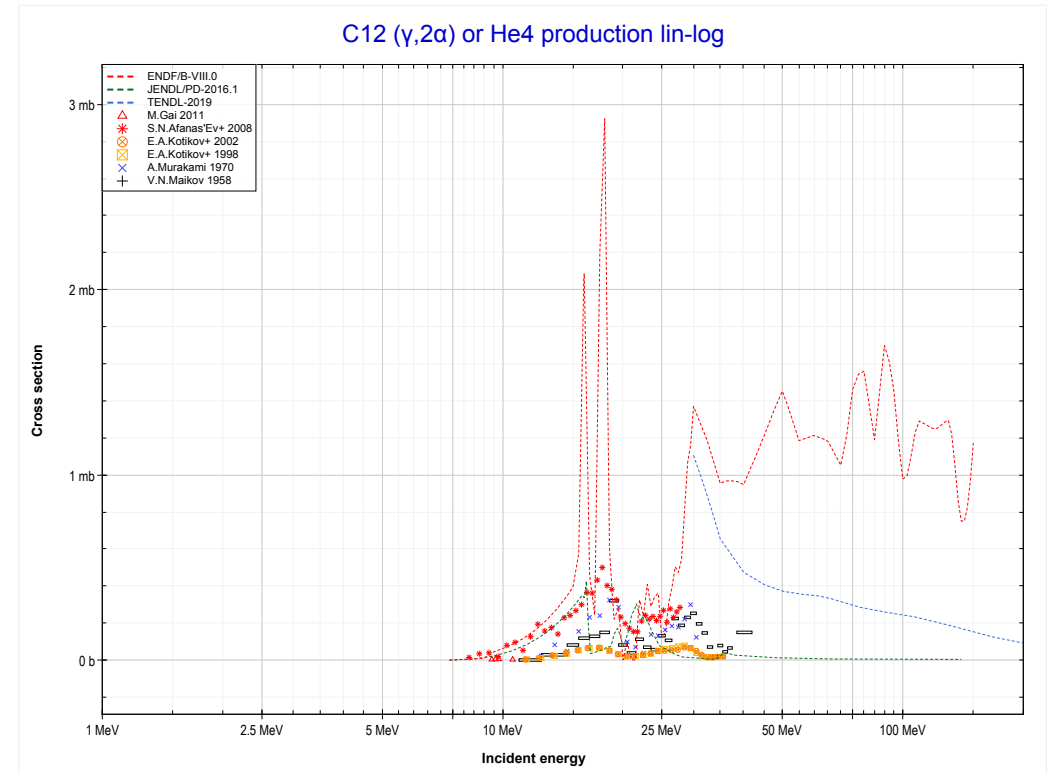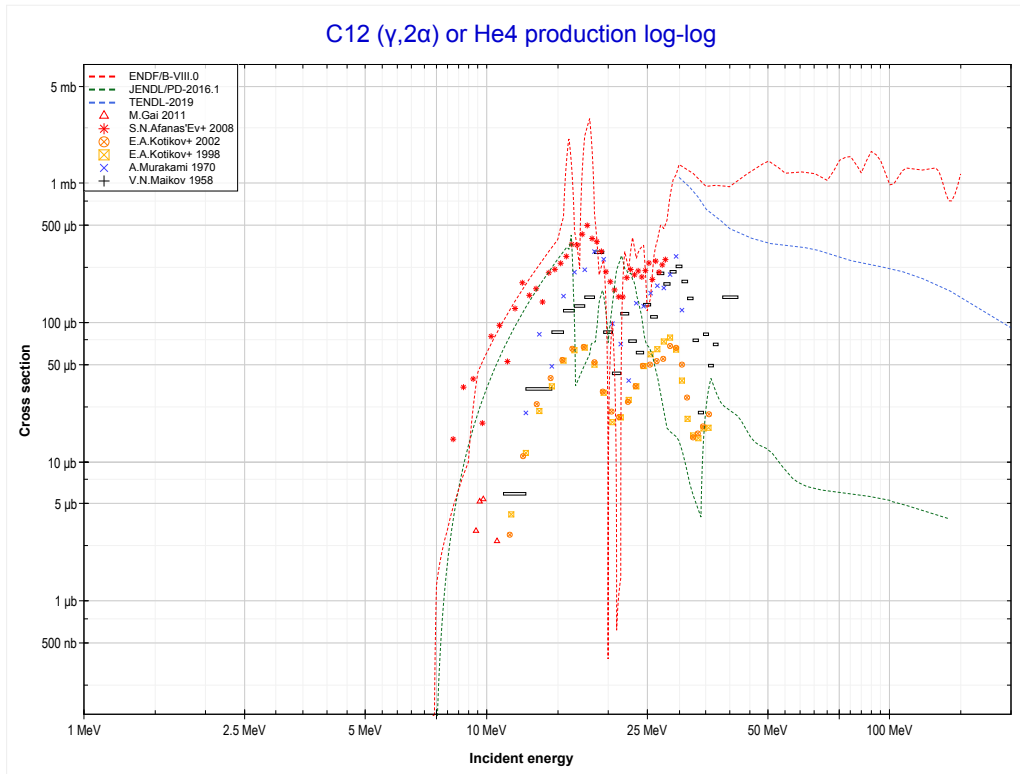
Reaction	Q-Value	Reaction	Q-Value
C12(γ,2α)He4	-7274.75 keV	C12(γ,n+p+t+He3)He4	-47666.23 keV
C12(γ,p+t+α)He4	-27088.61 keV	C12(γ,2n+2He3)He4	-48429.99 keV
C12(γ,n+He3+α)He4	-27852.37 keV	C12(γ,p+2d+t)He4	-50935.14 keV
C12(γ,2d+α)He4	-31121.27 keV	C12(γ,n+2d+He3)He4	-51698.89 keV
C12(γ,n+p+d+α)He4	-33345.84 keV	C12(γ,n+2p+d+t)He4	-53159.71 keV
C12(γ,2n+2p+α)He4	-35570.41 keV	C12(γ,2n+p+d+He3)He4	-53923.46 keV
C12(γ,d+t+He3)He4	-45441.67 keV	C12(γ,4d)He4	-54967.80 keV
C12(γ,2p+2t)He4	-46902.48 keV	C12(γ,2n+3p+t)He4	-55384.27 keV

<< 3-Li-6	**6-C-12**	8-O-16 >>
<< MT108 (γ,2α)	**MT112 (γ,p+α) or MT5 (Li7 production)**	MT176 (γ,2n+³He) >>

C12 (γ,p+α) or Li7 production log-log

C12 (γ,p+α) or Li7 production lin-log
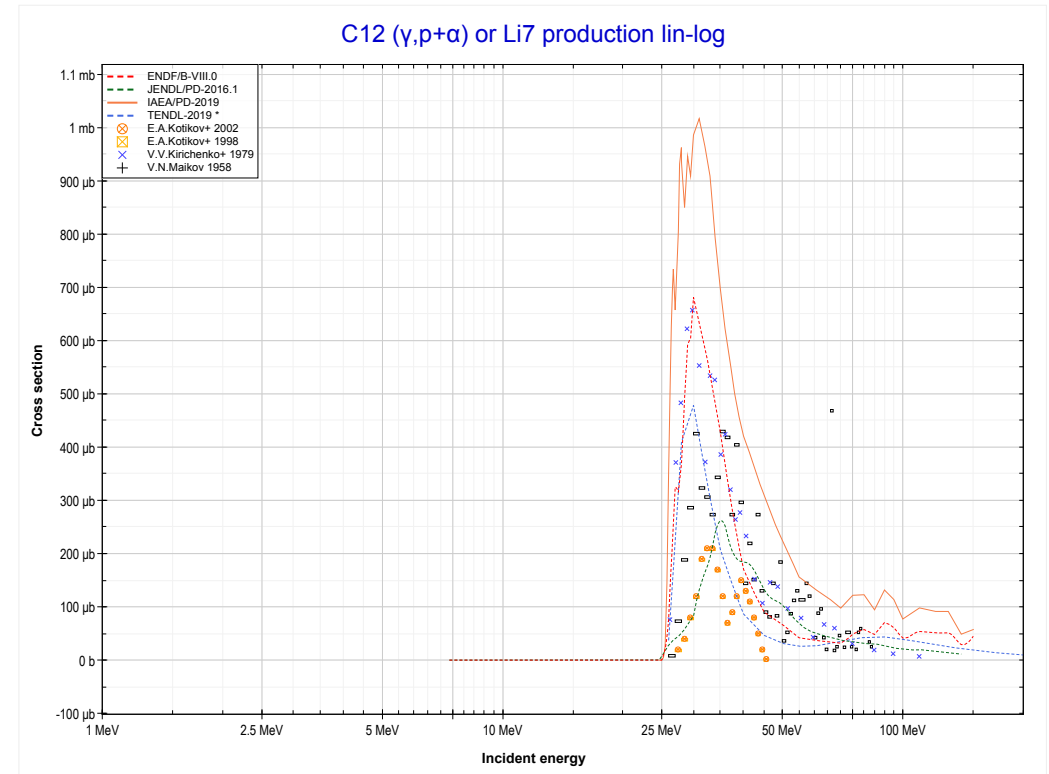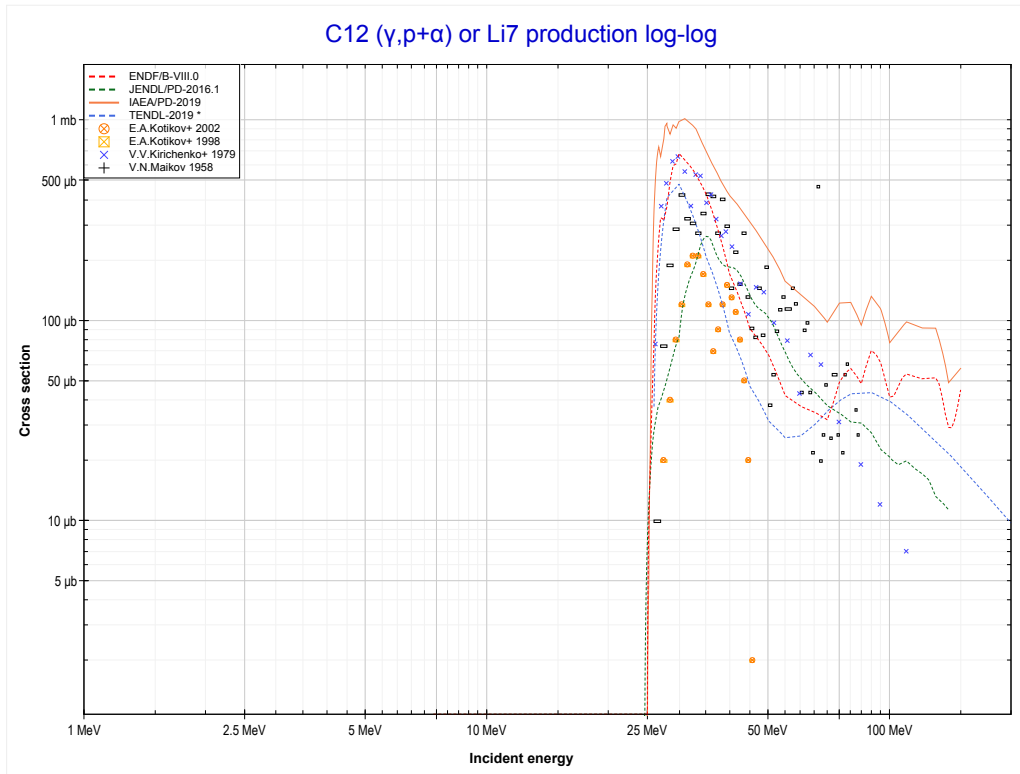
Reaction	Q-Value
C12(γ,p+α)Li7	-24620.99 keV
C12(γ,d+He3)Li7	-42974.04 keV
C12(γ,2p+t)Li7	-44434.86 keV
C12(γ,n+p+He3)Li7	-45198.61 keV
C12(γ,p+2d)Li7	-48467.52 keV
C12(γ,n+2p+d)Li7	-50692.09 keV
C12(γ,2n+3p)Li7	-52916.65 keV

6-C-12		
<< MT112 (γ,p+α)	**MT176 (γ,2n+³He) or MT5 (Be7 production)**	MT179 (γ,3n+2p) >>

C12 (γ,2n+³He) or Be7 production log-log

C12 (γ,2n+³He) or Be7 production lin-log

Reaction	Q-Value
C12(γ,n+α)Be7	-26265.23 keV
C12(γ,d+t)Be7	-43854.53 keV
C12(γ,n+p+t)Be7	-46079.10 keV
C12(γ,2n+He3)Be7	-46842.85 keV
C12(γ,n+2d)Be7	-50111.76 keV
C12(γ,2n+p+d)Be7	-52336.33 keV
C12(γ,3n+2p)Be7	-54560.89 keV

6-C-12		
<< MT176 (γ,2n+³He)	**MT179 (γ,3n+2p) or MT5 (Be7 production)**	MT182 (γ,d+t) >>

C12 (γ,3n+2p) or Be7 production log-log

C12 (γ,3n+2p) or Be7 production lin-log

Reaction	Q-Value
C12(γ,n+α)Be7	-26265.23 keV
C12(γ,d+t)Be7	-43854.53 keV
C12(γ,n+p+t)Be7	-46079.10 keV
C12(γ,2n+He3)Be7	-46842.85 keV
C12(γ,n+2d)Be7	-50111.76 keV
C12(γ,2n+p+d)Be7	-52336.33 keV
C12(γ,3n+2p)Be7	-54560.89 keV

	6-C-12	
<< MT179 (γ,3n+2p)	**MT182 (γ,d+t) or MT5 (Be7 production)**	MT184 (γ,n+p+t) >>

C12 (γ,d+t) or Be7 production log-log

C12 (γ,d+t) or Be7 production lin-log

Reaction	Q-Value
C12(γ,n+α)Be7	-26265.23 keV
C12(γ,d+t)Be7	-43854.53 keV
C12(γ,n+p+t)Be7	-46079.10 keV
C12(γ,2n+He3)Be7	-46842.85 keV
C12(γ,n+2d)Be7	-50111.76 keV
C12(γ,2n+p+d)Be7	-52336.33 keV
C12(γ,3n+2p)Be7	-54560.89 keV

	6-C-12	
<< MT182 (γ,d+t)	**MT184 (γ,n+p+t) or MT5 (Be7 production)**	6-C-13 MT4 (γ,n) >>

C12 (γ,n+p+t) or Be7 production log-log

C12 (γ,n+p+t) or Be7 production lin-log

Reaction	Q-Value
C12(γ,n+α)Be7	-26265.23 keV
C12(γ,d+t)Be7	-43854.53 keV
C12(γ,n+p+t)Be7	-46079.10 keV
C12(γ,2n+He3)Be7	-46842.85 keV
C12(γ,n+2d)Be7	-50111.76 keV
C12(γ,2n+p+d)Be7	-52336.33 keV
C12(γ,3n+2p)Be7	-54560.89 keV

<< 6-C-12	**6-C-13**	7-N-14 >>
<< 6-C-12 MT184 (γ,n+p+t)	**MT4 (γ,n) or MT5 (C12 production)**	MT103 (γ,p) >>

C13 (γ,n) or C12 production log-log

C13 (γ,n) or C12 production lin-log

Legend for both plots:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × B.C.Cook+ 1957
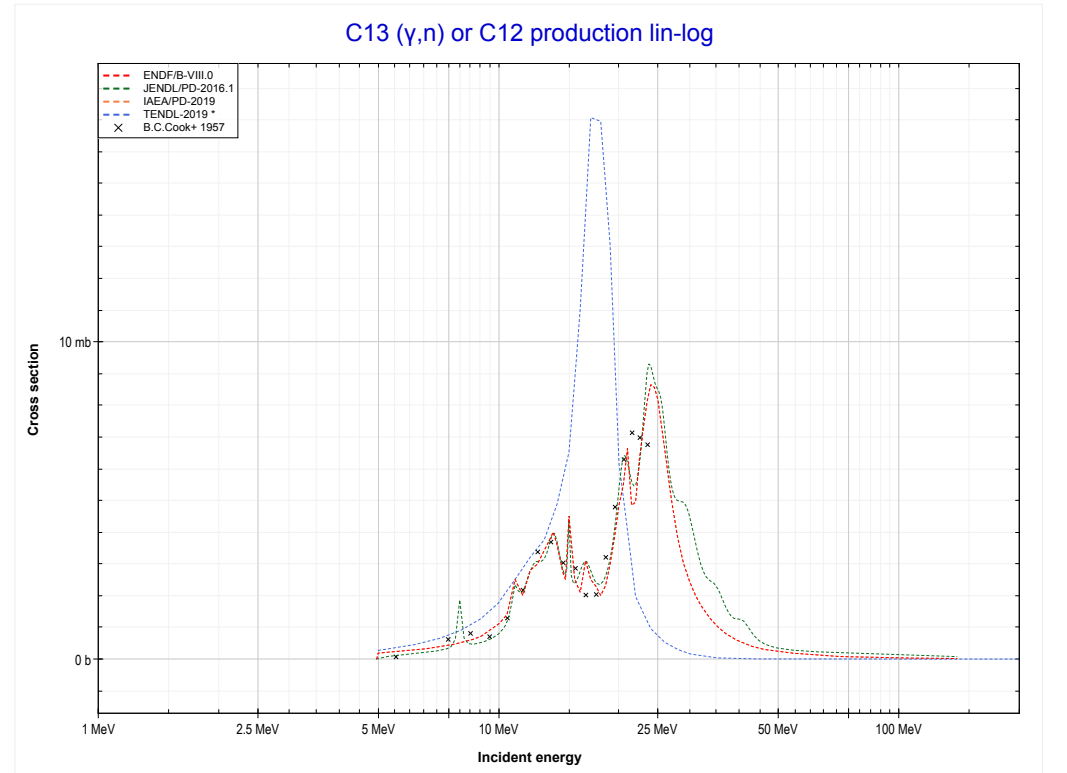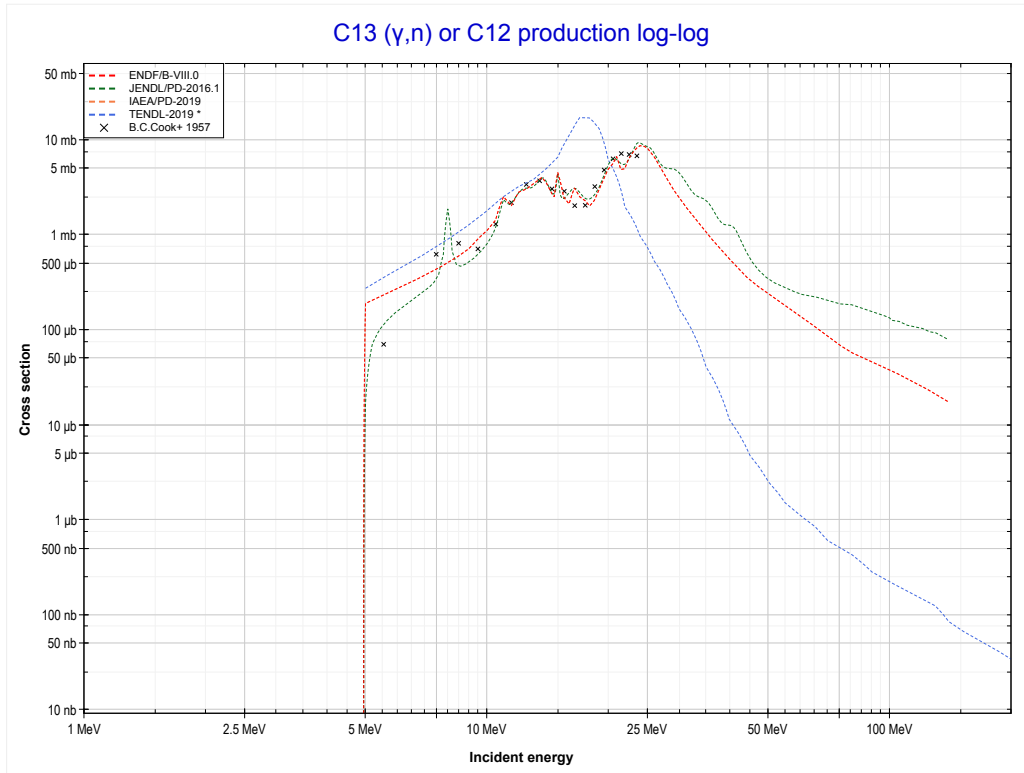
Reaction	Q-Value
C13(γ,n)C12	-4946.31 keV

<< 6-C-12	**6-C-13**	7-N-15 >>
<< MT4 (γ,n)	**MT103 (γ,p) or MT5 (B12 production)**	MT109 (γ,3α) >>

C13 (γ,p) or B12 production log-log

C13 (γ,p) or B12 production lin-log
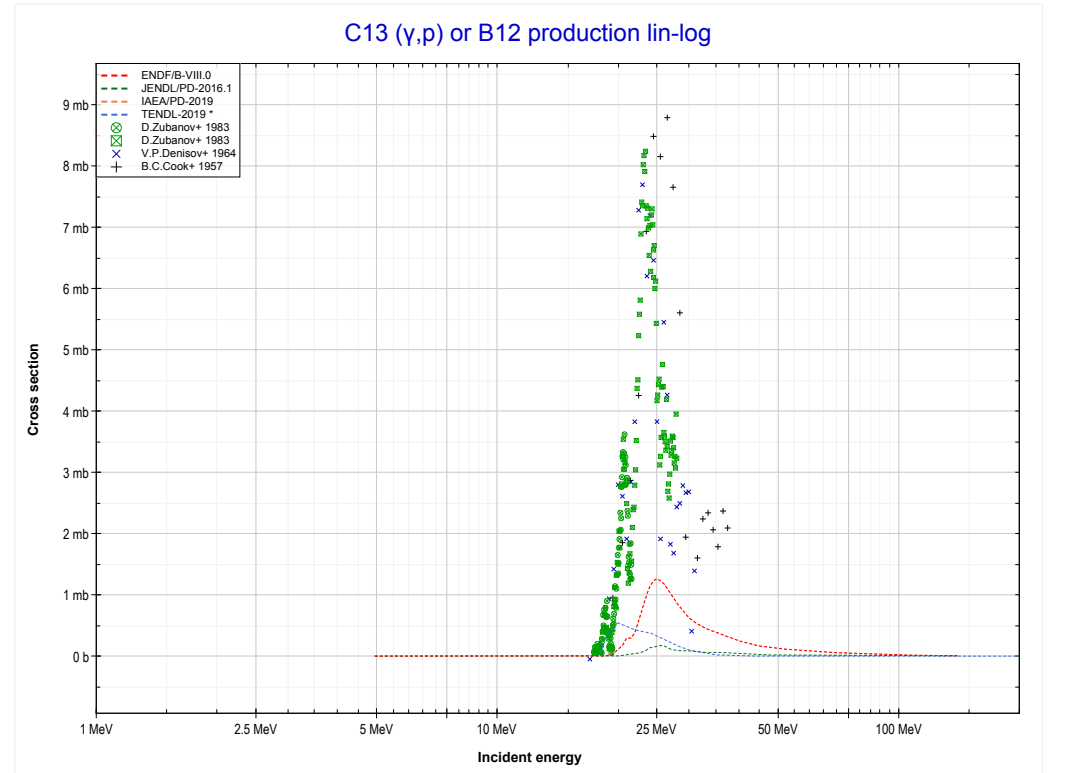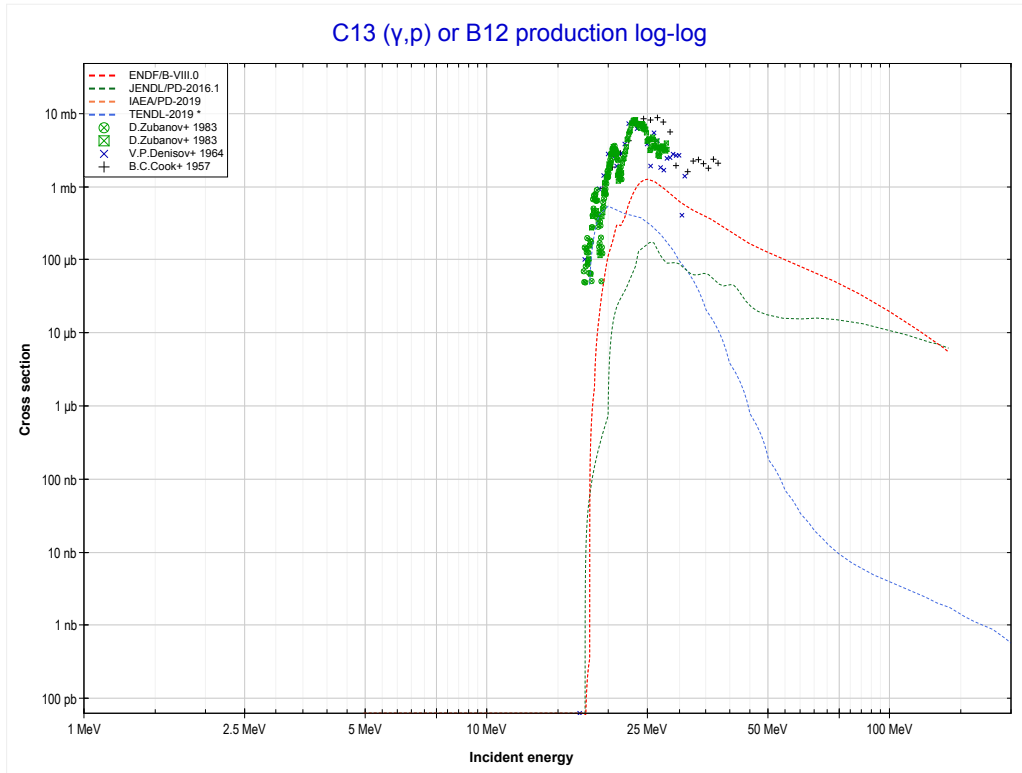
Reaction	Q-Value
C13(γ,p)B12	-17533.36 keV

	6-C-13	8-O-16 >>
<< MT103 (γ,p)	**MT109 (γ,3α) or MT5 (n production)**	6-C-14 MT16 (γ,2n) >>

C13 (γ,3α) or n production log-log

C13 (γ,3α) or n production lin-log

Reaction	Q-Value	Reaction	Q-Value
C13(γ,3α)n	-12221.06 keV	C13(γ,n+p+t+He3+α)n	-52612.54 keV
C13(γ,p+t+2α)n	-32034.92 keV	C13(γ,2n+2He3+α)n	-53376.29 keV
C13(γ,n+He3+2α)n	-32798.67 keV	C13(γ,p+2d+t+α)n	-55881.45 keV
C13(γ,2d+2α)n	-36067.58 keV	C13(γ,n+2d+He3+α)n	-56645.20 keV
C13(γ,n+p+d+2α)n	-38292.15 keV	C13(γ,n+2p+d+t+α)n	-58106.01 keV
C13(γ,2n+2p+2α)n	-40516.71 keV	C13(γ,2n+p+d+He3+α)n	-58869.77 keV
C13(γ,d+t+He3+α)n	-50387.97 keV	C13(γ,4d+α)n	-59914.11 keV
C13(γ,2p+2t+α)n	-51848.78 keV	C13(γ,2n+3p+t+α)n	-60330.58 keV

<< 6-C-12	**6-C-14**	8-O-16 >>
<< 6-C-13 MT109 (γ,3α)	**MT16 (γ,2n) or MT5 (C12 production)**	MT23 (γ,n+3α) >>
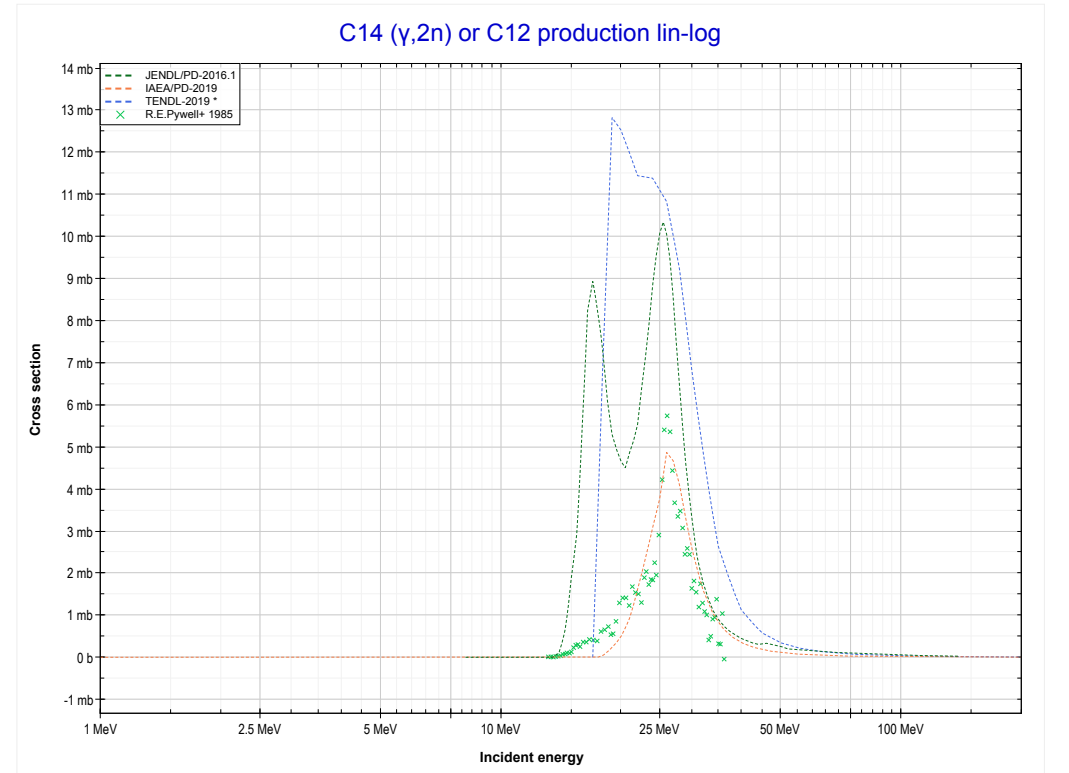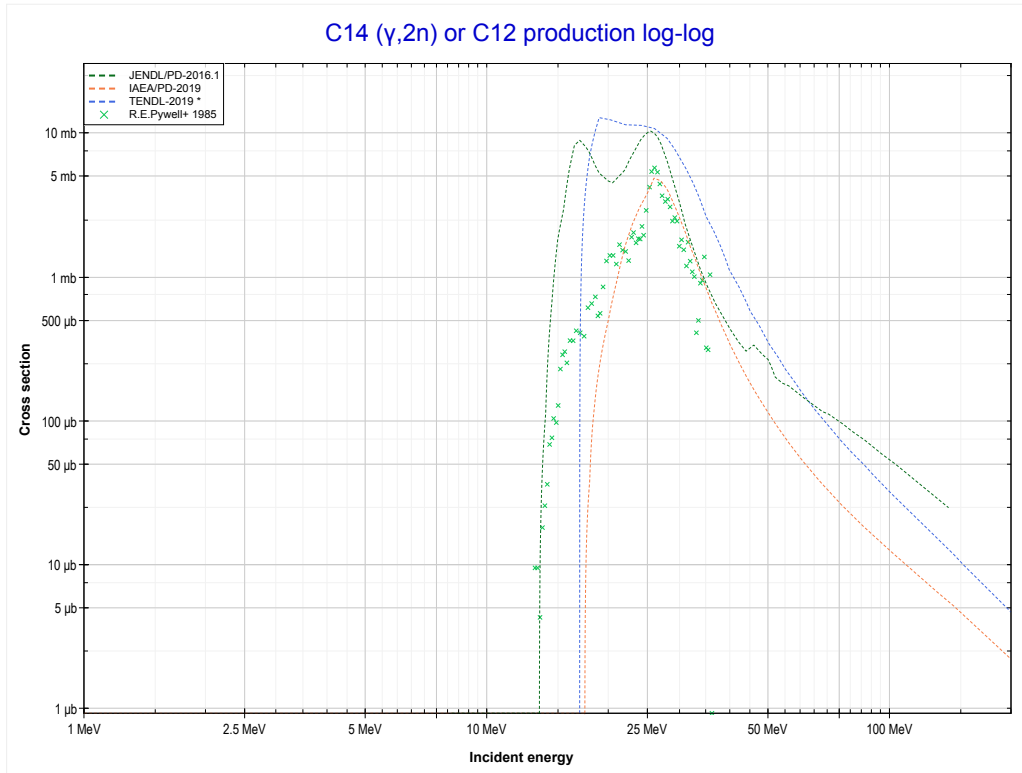
Reaction	Q-Value
C14(γ,2n)C12	-13122.74 keV

	6-C-14	
<< MT16 (γ,2n)	MT23 (γ,n+3α) or MT5 (n production)	7-N-14 MT4 (γ,n) >>

C14 (γ,n+3α) or n production log-log

C14 (γ,n+3α) or n production lin-log

Reaction	Q-Value	Reaction	Q-Value
C14(γ,n+3α)n	-20397.49 keV	C14(γ,p+d+2t+α)n	-57800.65 keV
C14(γ,d+t+2α)n	-37986.79 keV	C14(γ,n+d+t+He3+α)n	-58564.41 keV
C14(γ,n+p+t+2α)n	-40211.35 keV	C14(γ,n+2p+2t+α)n	-60025.22 keV
C14(γ,2n+He3+2α)n	-40975.11 keV	C14(γ,2n+p+t+He3+α)n	-60788.97 keV
C14(γ,n+2d+2α)n	-44244.02 keV	C14(γ,3n+2He3+α)n	-61552.73 keV
C14(γ,2n+p+d+2α)n	-46468.58 keV	C14(γ,3d+t+α)n	-61833.31 keV
C14(γ,3n+2p+2α)n	-48693.15 keV	C14(γ,n+p+2d+t+α)n	-64057.88 keV
C14(γ,2t+He3+α)n	-52307.18 keV	C14(γ,2n+2d+He3+α)n	-64821.64 keV

<< 6-C-13	**7-N-14**	8-O-16 >>
<< 6-C-14 MT23 (γ,n+3α)	**MT4 (γ,n) or MT5 (N13 production)**	MT28 (γ,n+p) >>

N14 (γ,n) or N13 production log-log

N14 (γ,n) or N13 production lin-log
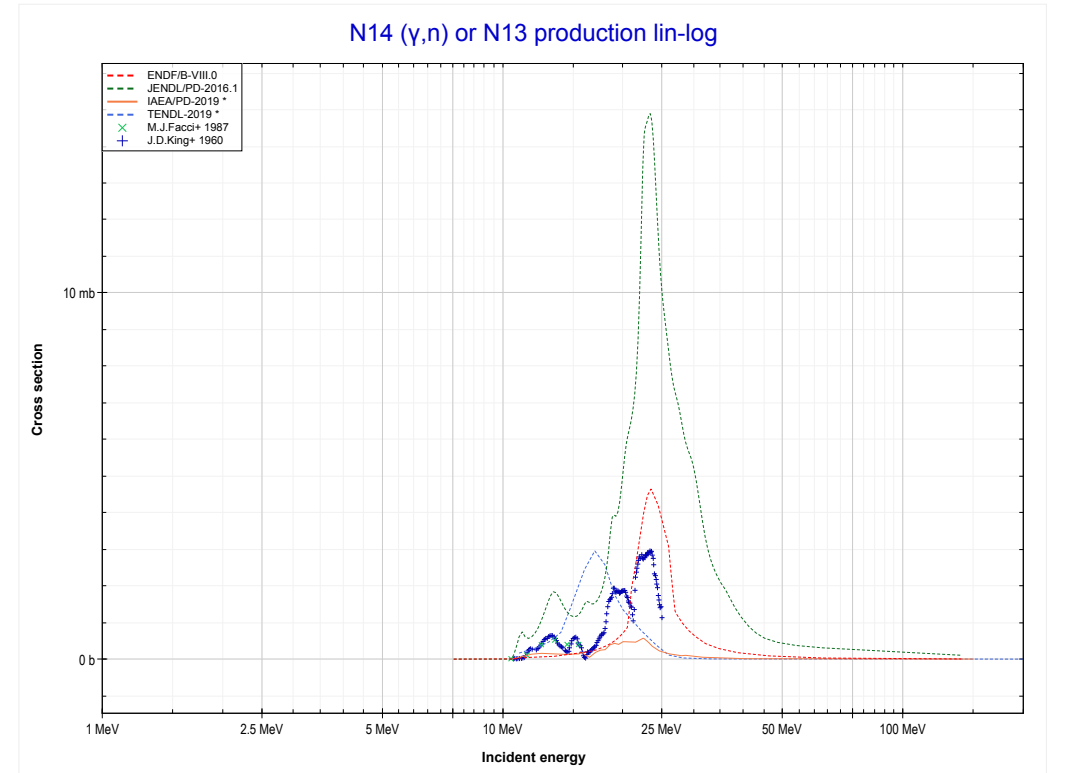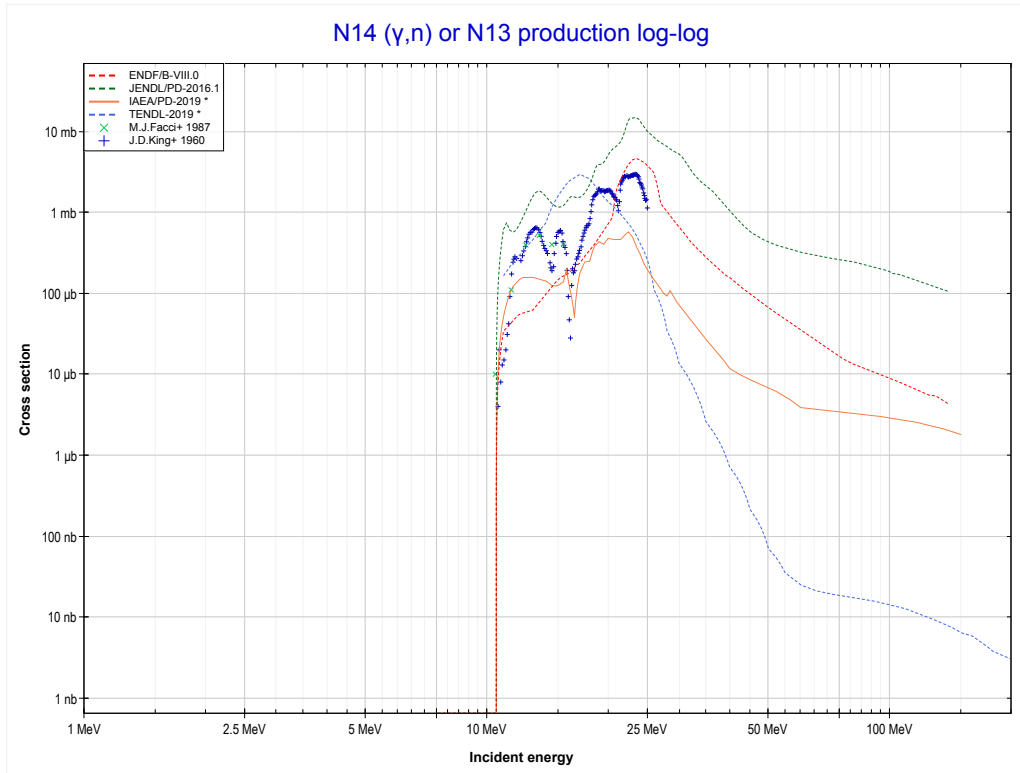
Reaction	Q-Value
N14(γ,n)N13	-10553.38 keV

<< 6-C-12	**7-N-14**	8-O-16 >>
<< MT4 (γ,n)	**MT28 (γ,n+p) or MT5 (C12 production)**	MT155 (γ,t+α) >>

N14 (γ,n+p) or C12 production log-log

N14 (γ,n+p) or C12 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- I.V.Dogyust+ 1995
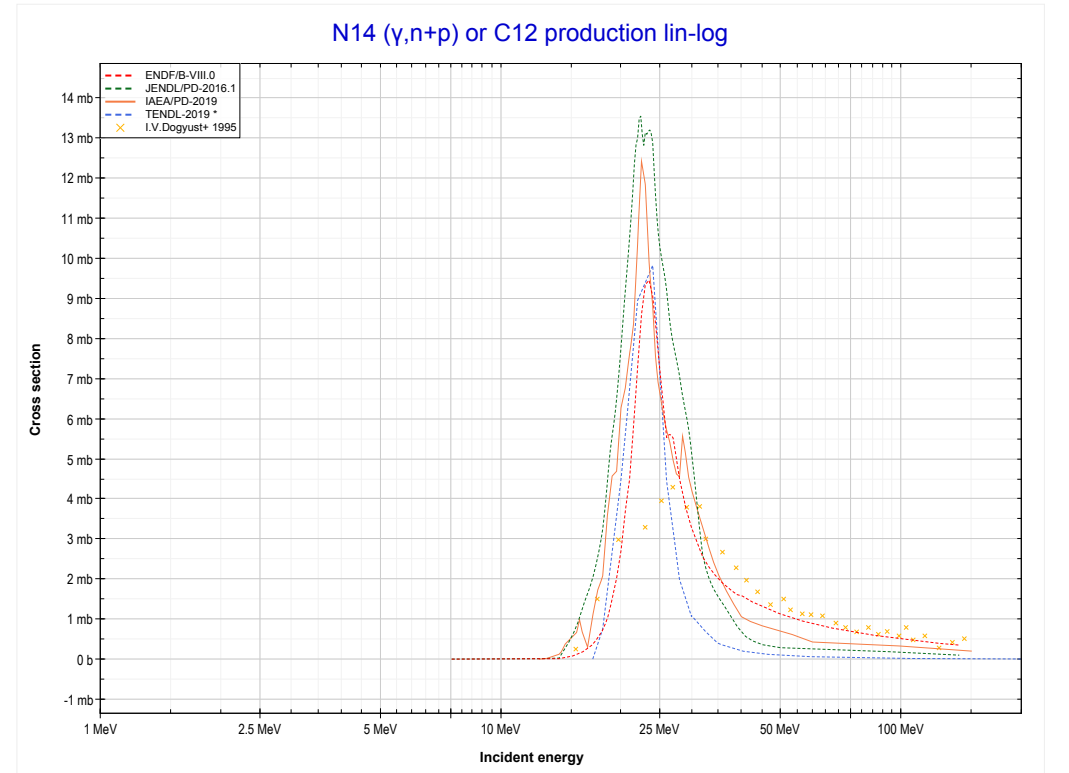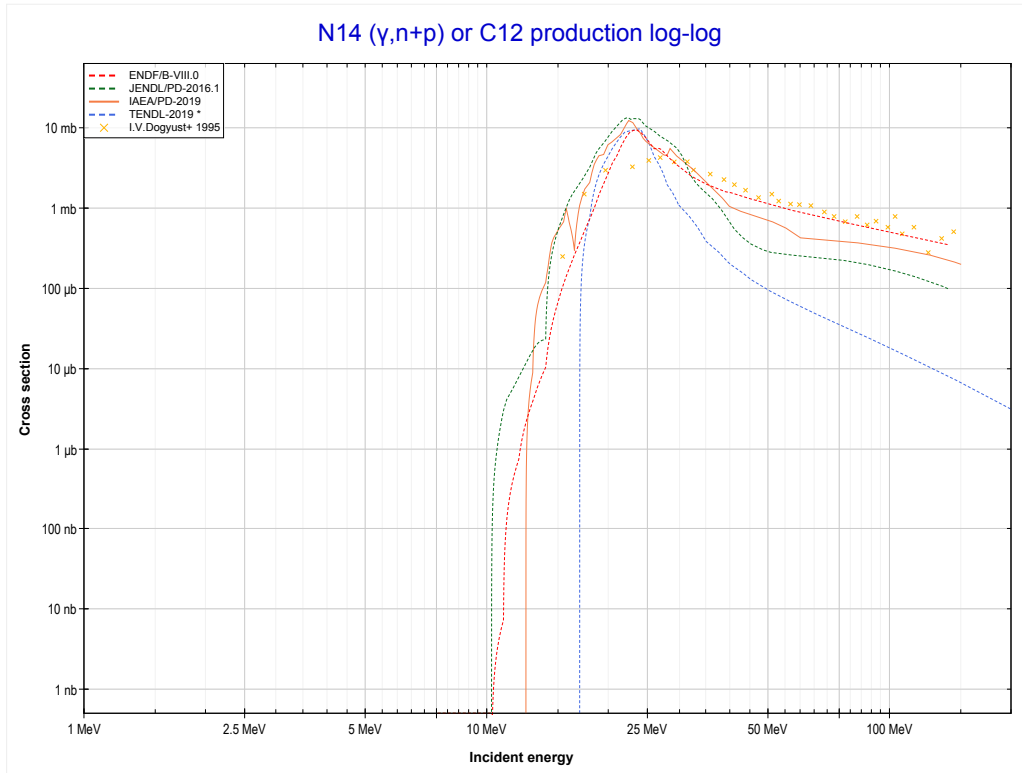
Reaction	Q-Value
N14(γ,d)C12	-10272.31 keV
N14(γ,n+p)C12	-12496.87 keV

	7-N-14	
<< MT28 (γ,n+p)	**MT155 (γ,t+α) or MT5 (Be7 production)**	MT158 (γ,n+d+α) >>

N14 (γ,t+α) or Be7 production log-log

N14 (γ,t+α) or Be7 production lin-log

Reaction	Q-Value	Reaction	Q-Value
N14(γ,t+α)Be7	-30280.31 keV	N14(γ,2n+2p+t)Be7	-58575.97 keV
N14(γ,n+d+α)Be7	-36537.54 keV	N14(γ,3n+p+He3)Be7	-59339.72 keV
N14(γ,2n+p+α)Be7	-38762.10 keV	N14(γ,n+3d)Be7	-60384.07 keV
N14(γ,p+2t)Be7	-50094.17 keV	N14(γ,2n+p+2d)Be7	-62608.63 keV
N14(γ,n+t+He3)Be7	-50857.93 keV	N14(γ,3n+2p+d)Be7	-64833.20 keV
N14(γ,2d+t)Be7	-54126.84 keV	N14(γ,4n+3p)Be7	-67057.76 keV
N14(γ,n+p+d+t)Be7	-56351.40 keV		
N14(γ,2n+d+He3)Be7	-57115.16 keV		

7-N-14		
<< MT155 (γ,t+α)	**MT158 (γ,n+d+α) or MT5 (Be7 production)**	MT159 (γ,2n+p+α) >>

N14 (γ,n+d+α) or Be7 production log-log

N14 (γ,n+d+α) or Be7 production lin-log

Reaction	Q-Value	Reaction	Q-Value
N14(γ,t+α)Be7	-30280.31 keV	N14(γ,2n+2p+t)Be7	-58575.97 keV
N14(γ,n+d+α)Be7	-36537.54 keV	N14(γ,3n+p+He3)Be7	-59339.72 keV
N14(γ,2n+p+α)Be7	-38762.10 keV	N14(γ,n+3d)Be7	-60384.07 keV
N14(γ,p+2t)Be7	-50094.17 keV	N14(γ,2n+p+2d)Be7	-62608.63 keV
N14(γ,n+t+He3)Be7	-50857.93 keV	N14(γ,3n+2p+d)Be7	-64833.20 keV
N14(γ,2d+t)Be7	-54126.84 keV	N14(γ,4n+3p)Be7	-67057.76 keV
N14(γ,n+p+d+t)Be7	-56351.40 keV		
N14(γ,2n+d+He3)Be7	-57115.16 keV		

	7-N-14	
<< MT158 (γ,n+d+α)	**MT159 (γ,2n+p+α) or MT5 (Be7 production)**	MT188 (γ,n+t+³He) >>

N14 (γ,2n+p+α) or Be7 production log-log

N14 (γ,2n+p+α) or Be7 production lin-log

Reaction	Q-Value	Reaction	Q-Value
N14(γ,t+α)Be7	-30280.31 keV	N14(γ,2n+2p+t)Be7	-58575.97 keV
N14(γ,n+d+α)Be7	-36537.54 keV	N14(γ,3n+p+He3)Be7	-59339.72 keV
N14(γ,2n+p+α)Be7	-38762.10 keV	N14(γ,n+3d)Be7	-60384.07 keV
N14(γ,p+2t)Be7	-50094.17 keV	N14(γ,2n+p+2d)Be7	-62608.63 keV
N14(γ,n+t+He3)Be7	-50857.93 keV	N14(γ,3n+2p+d)Be7	-64833.20 keV
N14(γ,2d+t)Be7	-54126.84 keV	N14(γ,4n+3p)Be7	-67057.76 keV
N14(γ,n+p+d+t)Be7	-56351.40 keV		
N14(γ,2n+d+He3)Be7	-57115.16 keV		

7-N-14		
<< MT159 (γ,2n+p+α)	**MT188 (γ,n+t+³He) or MT5 (Be7 production)**	7-N-15 MT103 (γ,p) >>

N14 (γ,n+t+³He) or Be7 production log-log

N14 (γ,n+t+³He) or Be7 production lin-log

Reaction	Q-Value	Reaction	Q-Value
N14(γ,t+α)Be7	-30280.31 keV	N14(γ,2n+2p+t)Be7	-58575.97 keV
N14(γ,n+d+α)Be7	-36537.54 keV	N14(γ,3n+p+He3)Be7	-59339.72 keV
N14(γ,2n+p+α)Be7	-38762.10 keV	N14(γ,n+3d)Be7	-60384.07 keV
N14(γ,p+2t)Be7	-50094.17 keV	N14(γ,2n+p+2d)Be7	-62608.63 keV
N14(γ,n+t+He3)Be7	-50857.93 keV	N14(γ,3n+2p+d)Be7	-64833.20 keV
N14(γ,2d+t)Be7	-54126.84 keV	N14(γ,4n+3p)Be7	-67057.76 keV
N14(γ,n+p+d+t)Be7	-56351.40 keV		
N14(γ,2n+d+He3)Be7	-57115.16 keV		

<< 6-C-13	7-N-15	8-O-16 >>
<< 7-N-14 MT188 (γ,n+t+³He)	MT103 (γ,p) or MT5 (C14 production)	8-O-16 MT4 (γ,n) >>

N15 (γ,p) or C14 production log-log

N15 (γ,p) or C14 production lin-log
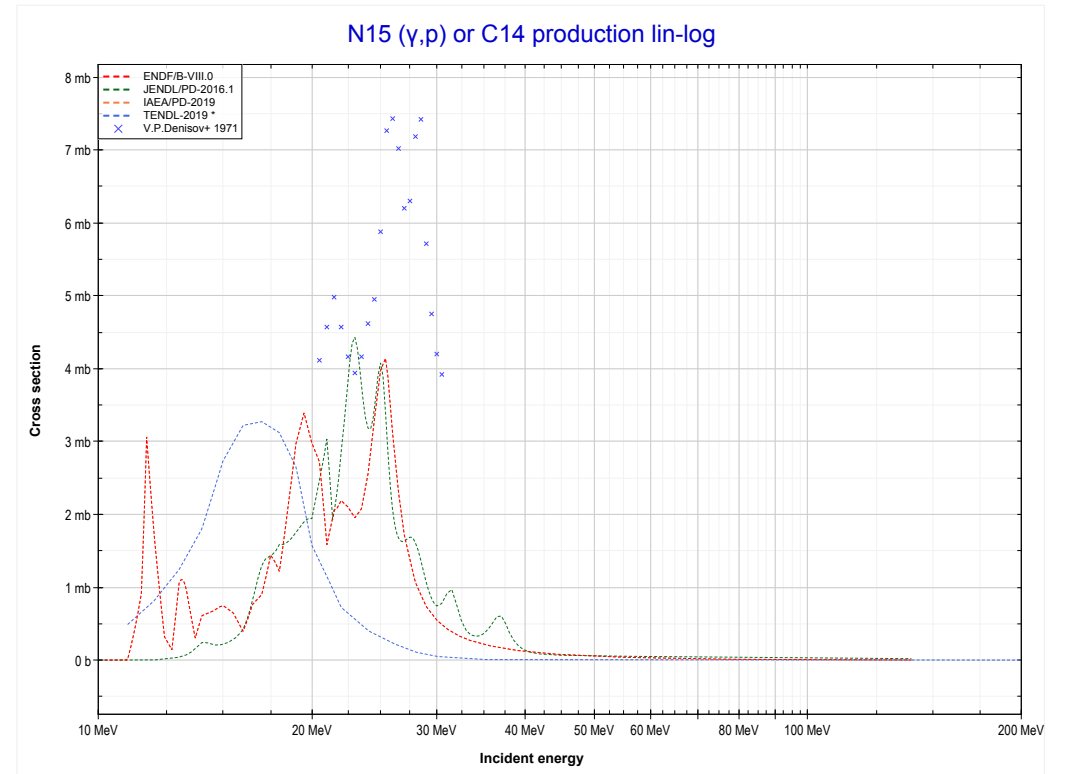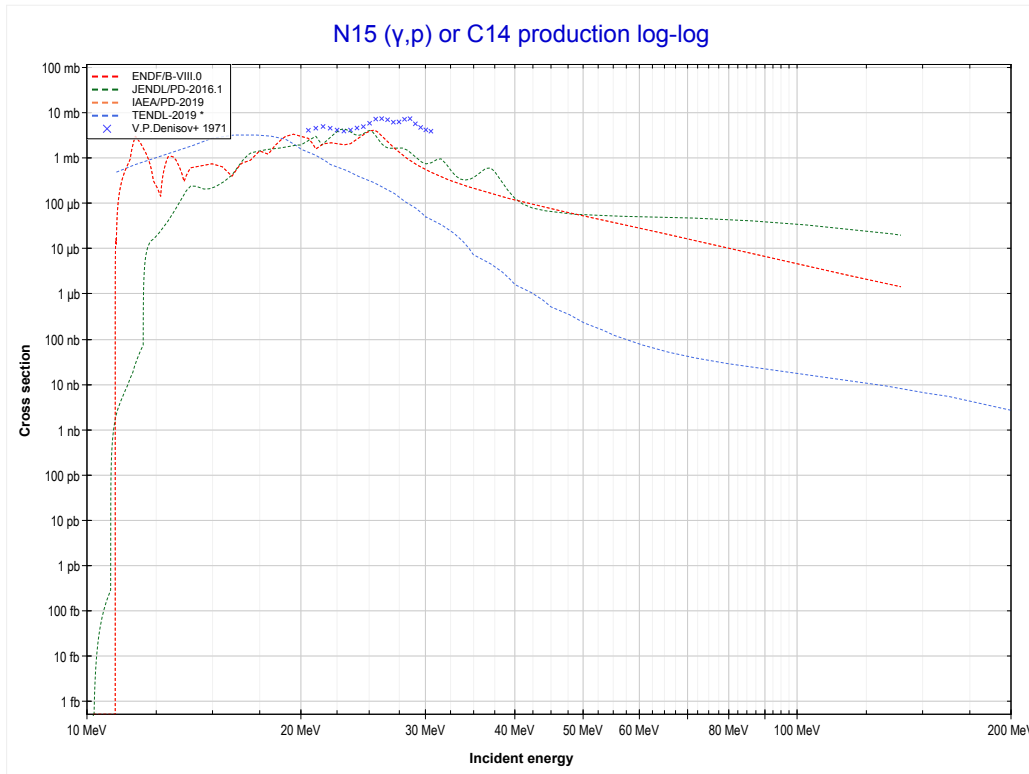
Reaction	Q-Value
N15(γ,p)C14	-10207.42 keV

<< 7-N-14	8-O-16	9-F-19 >>
<< 7-N-15 MT103 (γ,p)	MT4 (γ,n) or MT5 (O15 production)	MT16 (γ,2n) >>

O16 (γ,n) or O15 production log-log

O16 (γ,n) or O15 production lin-log
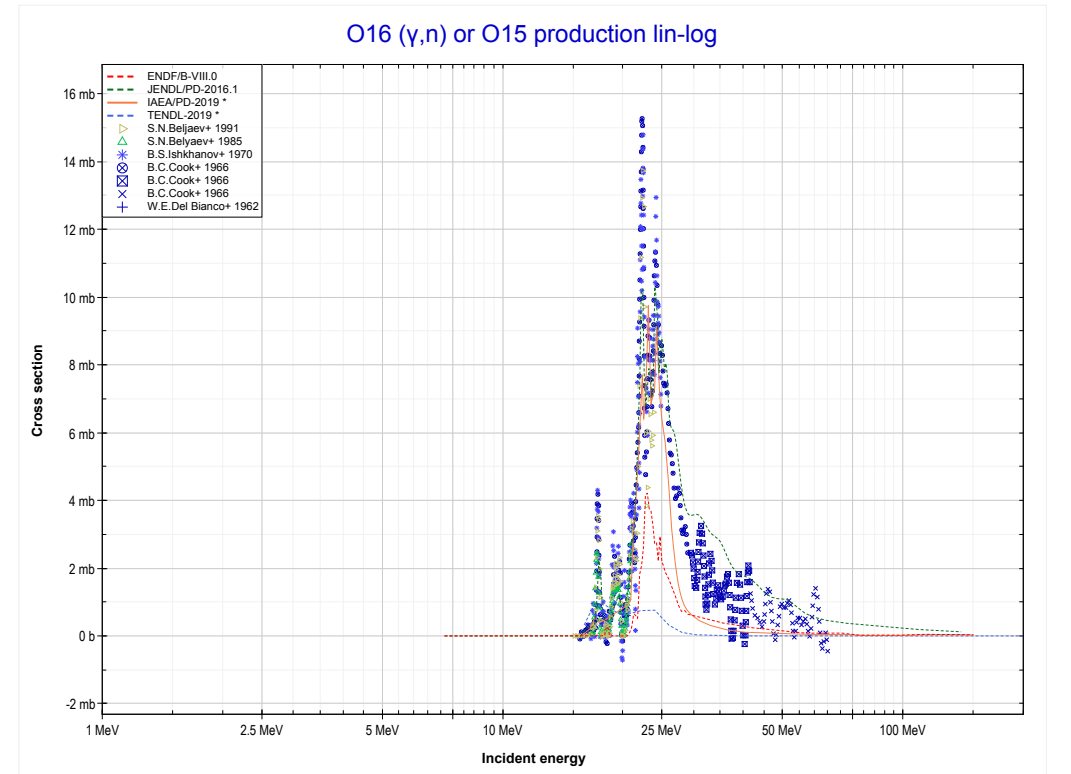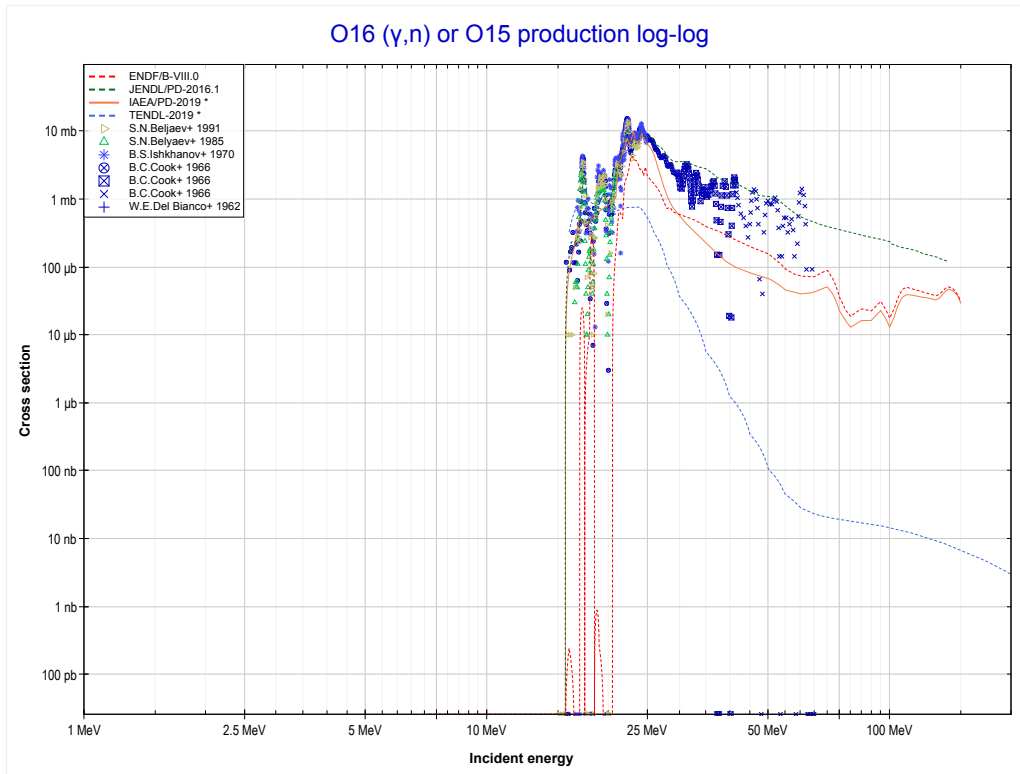
Reaction	Q-Value
O16(γ,n)O15	-15663.92 keV

<< 6-C-14	**8-O-16**	9-F-19 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (O14 production)**	MT28 (γ,n+p) >>

O16 (γ,2n) or O14 production log-log

O16 (γ,2n) or O14 production lin-log
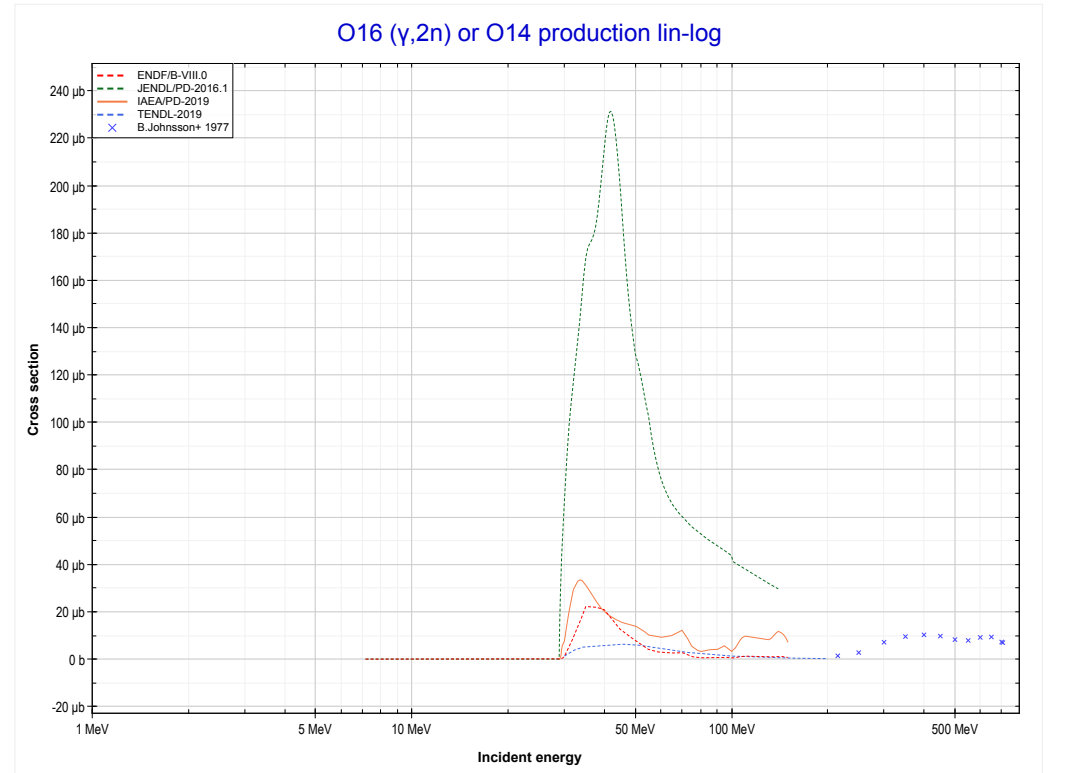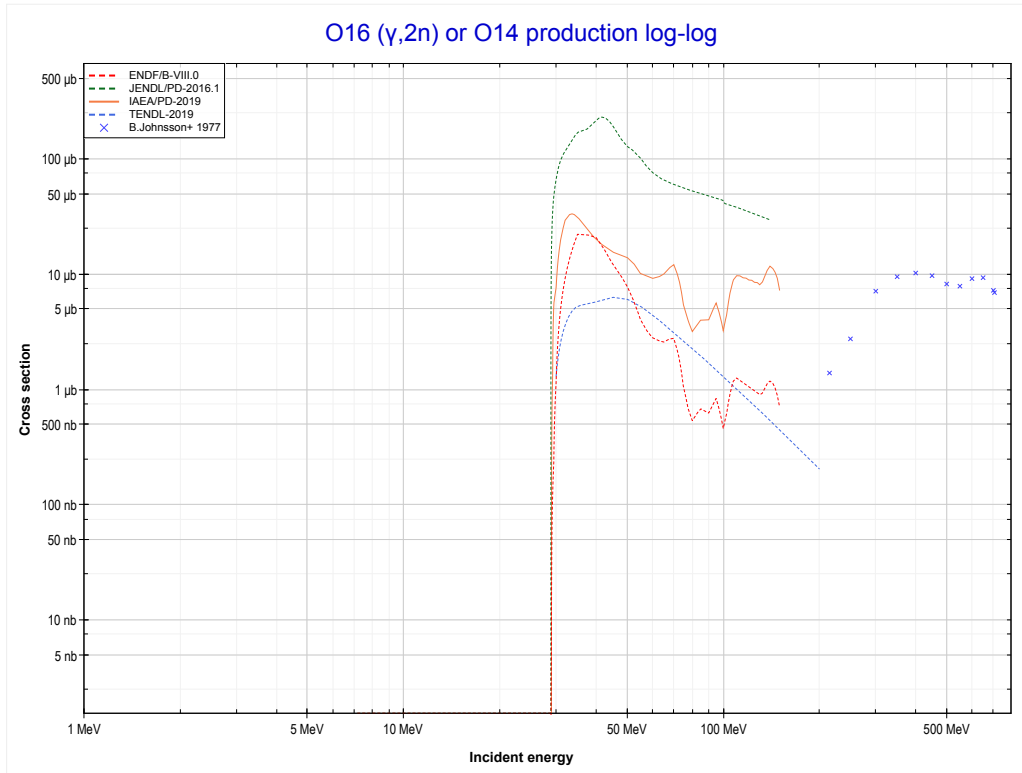
Reaction	Q-Value
O16(γ,2n)O14	-28887.42 keV

<< 7-N-14	**8-O-16**	8-O-18 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (N14 production)**	MT29 (γ,n+2α) >>

O16 (γ,n+p) or N14 production log-log

O16 (γ,n+p) or N14 production lin-log
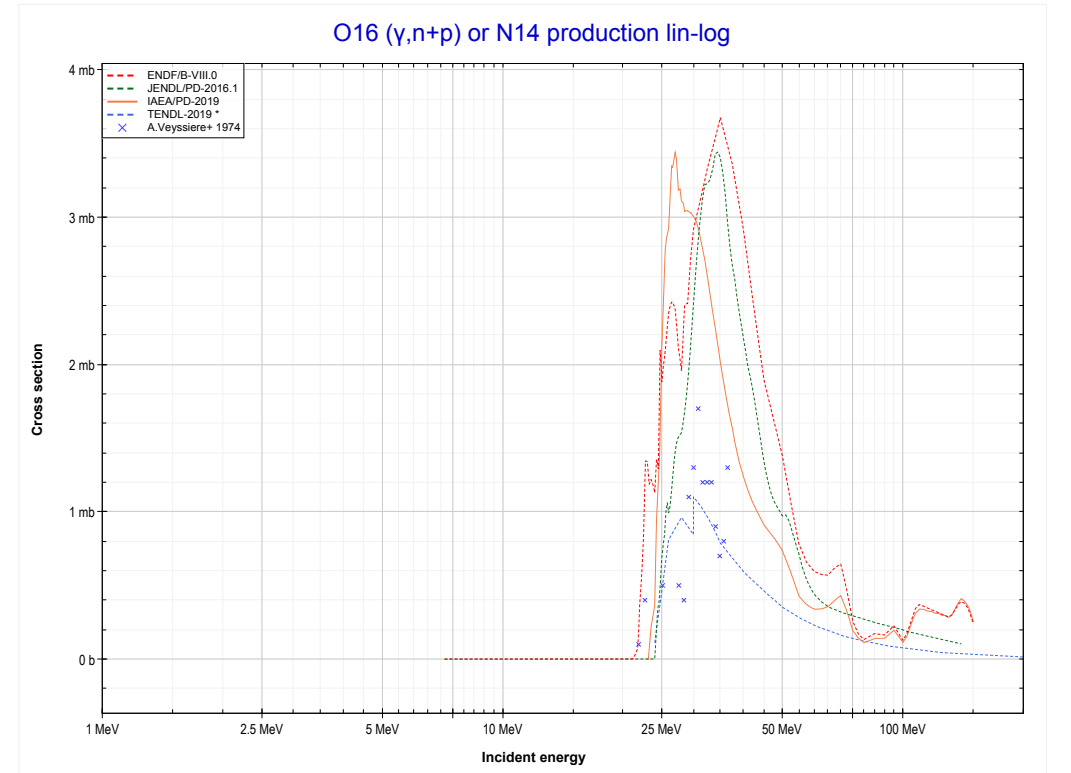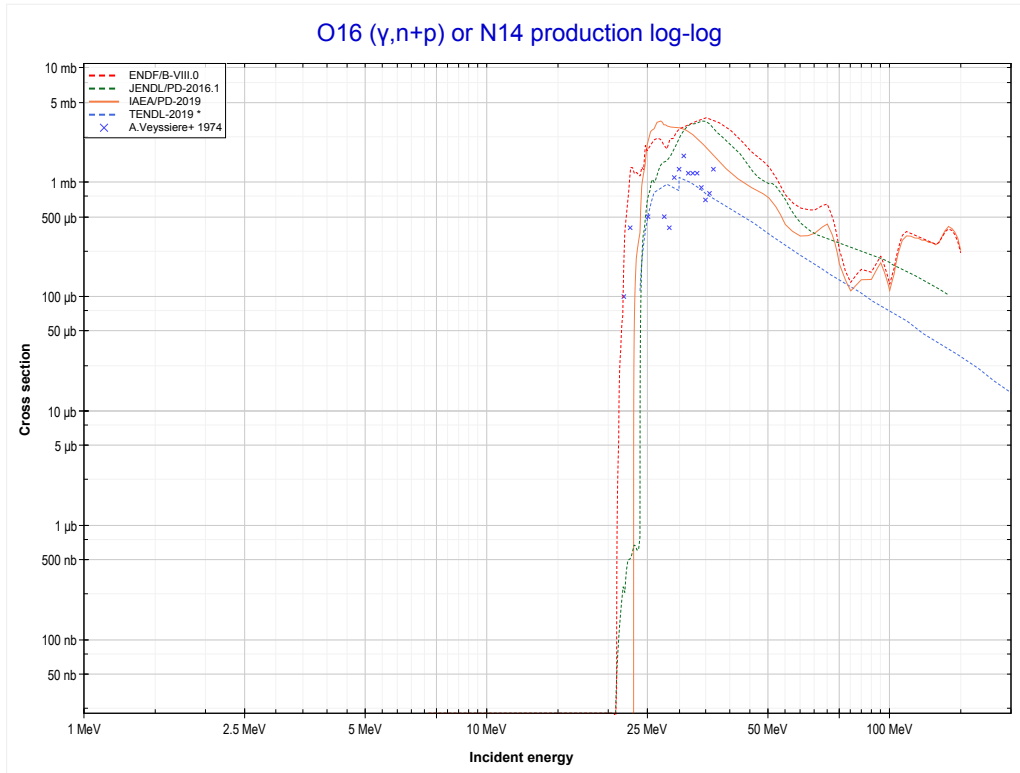
Reaction	Q-Value
O16(γ,d)N14	-20736.14 keV
O16(γ,n+p)N14	-22960.71 keV

	8-O-16	
<< MT28 (γ,n+p)	**MT29 (γ,n+2α) or MT5 (Be7 production)**	MT103 (γ,p) >>

O16 (γ,n+2α) or Be7 production log-log

O16 (γ,n+2α) or Be7 production lin-log

Reaction	Q-Value	Reaction	Q-Value
O16(γ,n+2α)Be7	-33427.15 keV	O16(γ,p+d+2t)Be7	-70830.31 keV
O16(γ,d+t+α)Be7	-51016.45 keV	O16(γ,n+d+t+He3)Be7	-71594.07 keV
O16(γ,n+p+t+α)Be7	-53241.01 keV	O16(γ,n+2p+2t)Be7	-73054.88 keV
O16(γ,2n+He3+α)Be7	-54004.77 keV	O16(γ,2n+p+t+He3)Be7	-73818.63 keV
O16(γ,n+2d+α)Be7	-57273.68 keV	O16(γ,3n+2He3)Be7	-74582.39 keV
O16(γ,2n+p+d+α)Be7	-59498.24 keV	O16(γ,3d+t)Be7	-74862.98 keV
O16(γ,3n+2p+α)Be7	-61722.81 keV	O16(γ,n+p+2d+t)Be7	-77087.54 keV
O16(γ,2t+He3)Be7	-65336.84 keV	O16(γ,2n+2d+He3)Be7	-77851.30 keV

<< 7-N-15	**8-O-16**	8-O-18 >>
<< MT29 (γ,n+2α)	**MT103 (γ,p) or MT5 (N15 production)**	MT109 (γ,3α) >>

O16 (γ,p) or N15 production log-log

O16 (γ,p) or N15 production lin-log
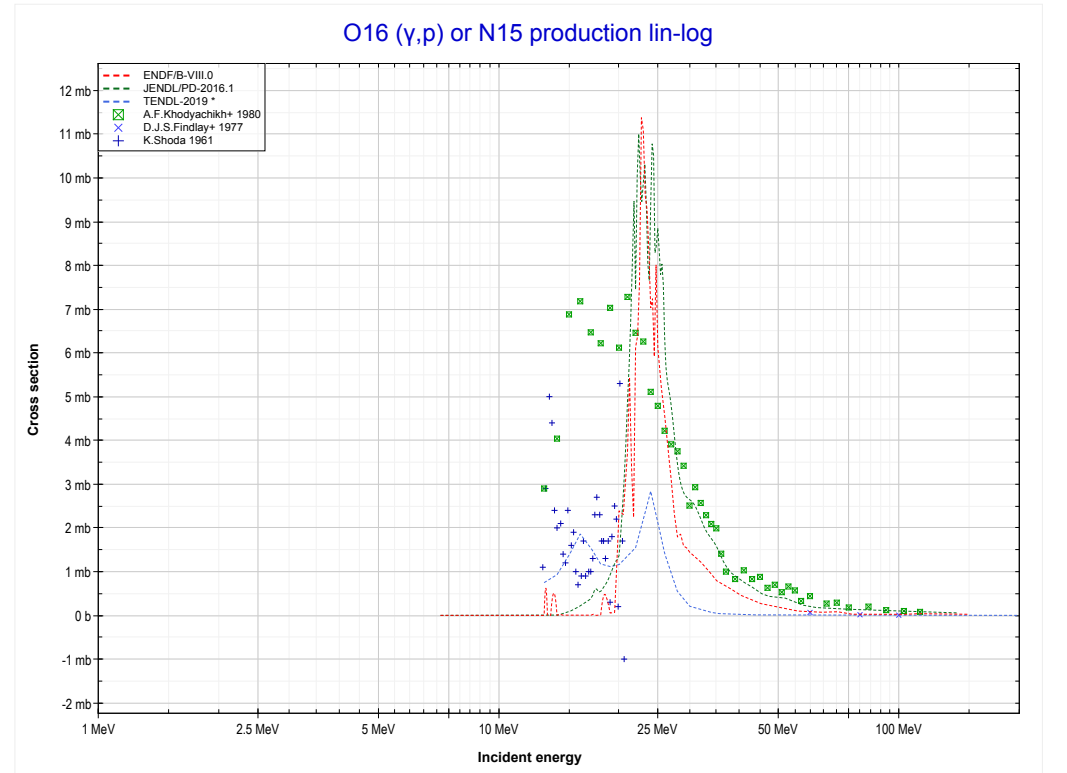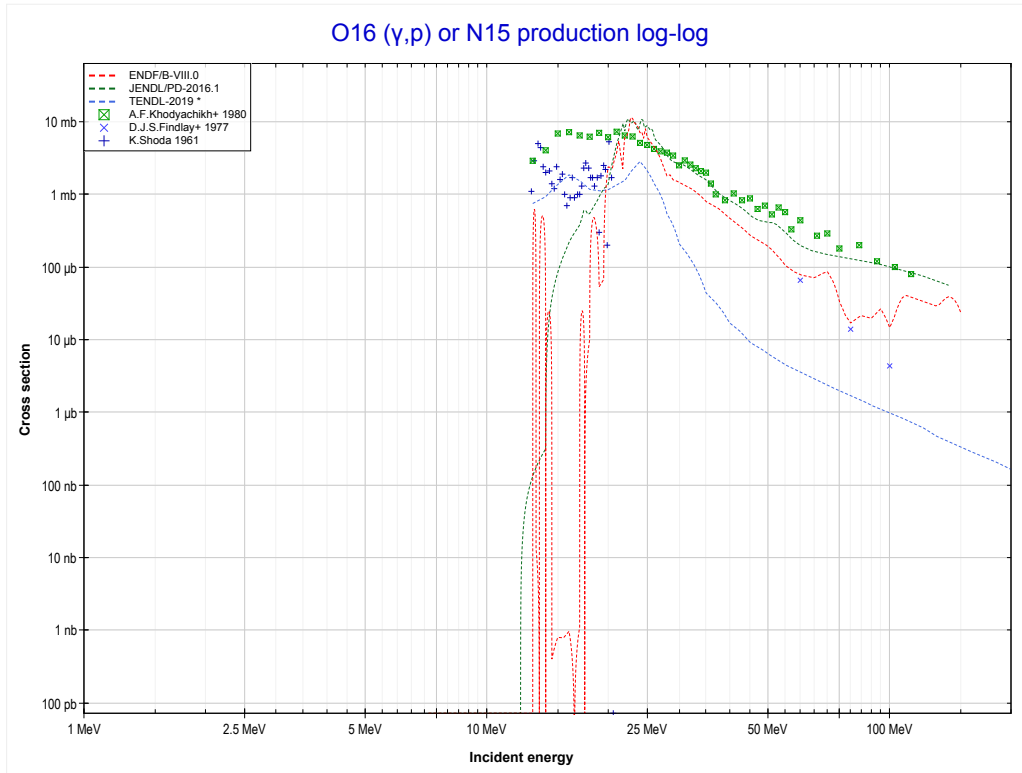
Reaction	Q-Value
O16(γ,p)N15	-12127.41 keV

<< 6-C-13	8-O-16	
<< MT103 (γ,p)	MT109 (γ,3α) or MT5 (He4 production)	MT112 (γ,p+α) >>

O16 (γ,3α) or He4 production log-log

O16 (γ,3α) or He4 production lin-log
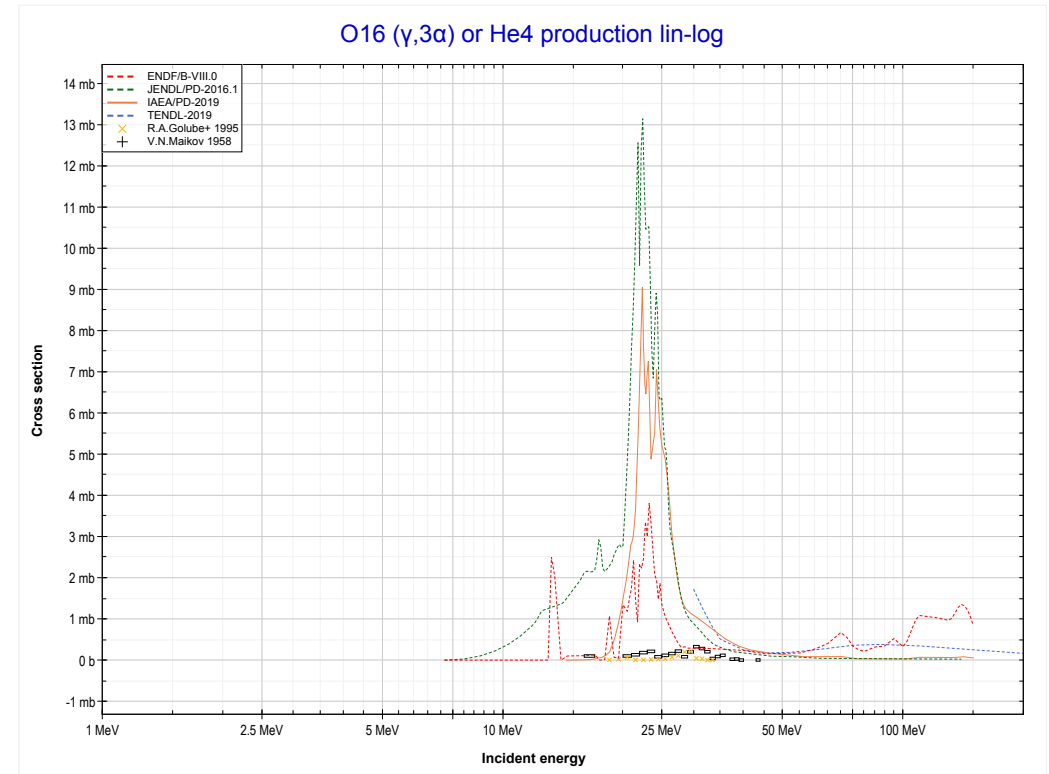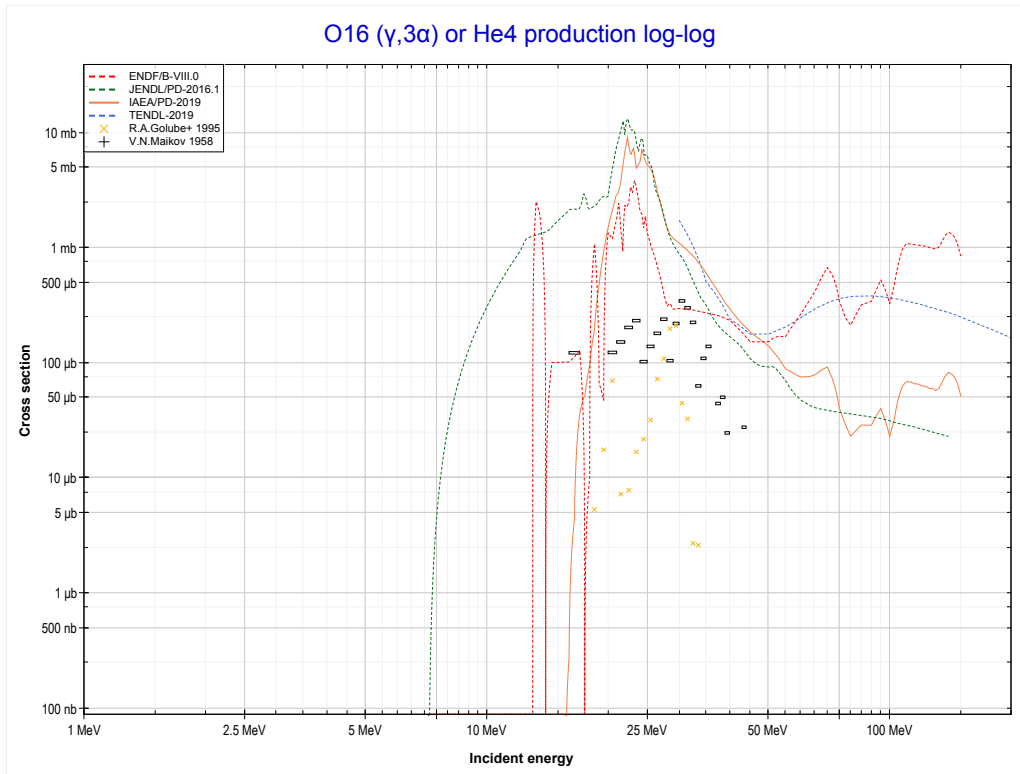
Reaction	Q-Value	Reaction	Q-Value
O16(γ,3α)He4	-14436.66 keV	O16(γ,n+p+t+He3+α)He4	-54828.15 keV
O16(γ,p+t+2α)He4	-34250.53 keV	O16(γ,2n+2He3+α)He4	-55591.90 keV
O16(γ,n+He3+2α)He4	-35014.28 keV	O16(γ,p+2d+t+α)He4	-58097.06 keV
O16(γ,2d+2α)He4	-38283.19 keV	O16(γ,n+2d+He3+α)He4	-58860.81 keV
O16(γ,n+p+d+2α)He4	-40507.76 keV	O16(γ,n+2p+d+t+α)He4	-60321.62 keV
O16(γ,2n+2p+2α)He4	-42732.32 keV	O16(γ,2n+p+d+He3+α)He4	-61085.38 keV
O16(γ,d+t+He3+α)He4	-52603.58 keV	O16(γ,4d+α)He4	-62129.72 keV
O16(γ,2p+2t+α)He4	-54064.39 keV	O16(γ,2n+3p+t+α)He4	-62546.19 keV

<< 6-C-12	8-O-16	
<< MT109 (γ,3α)	**MT112 (γ,p+α) or MT5 (B11 production)**	MT199 (γ,3n+2p+α) >>

O16 (γ,p+α) or B11 production log-log

O16 (γ,p+α) or B11 production lin-log
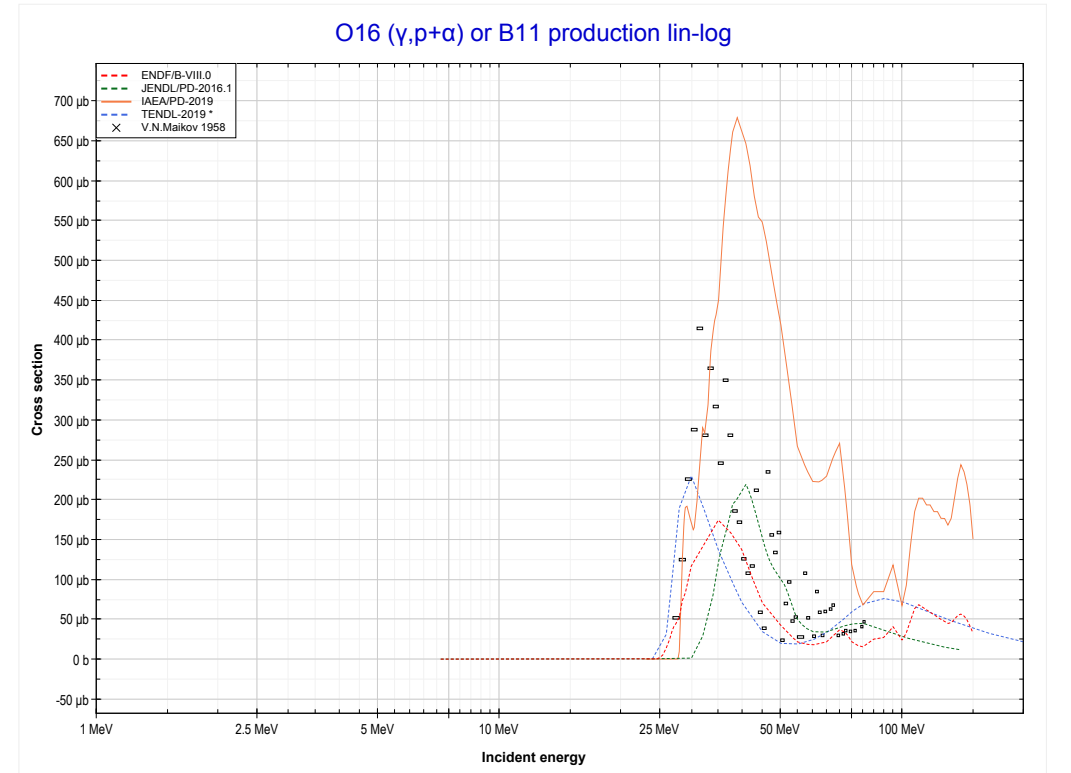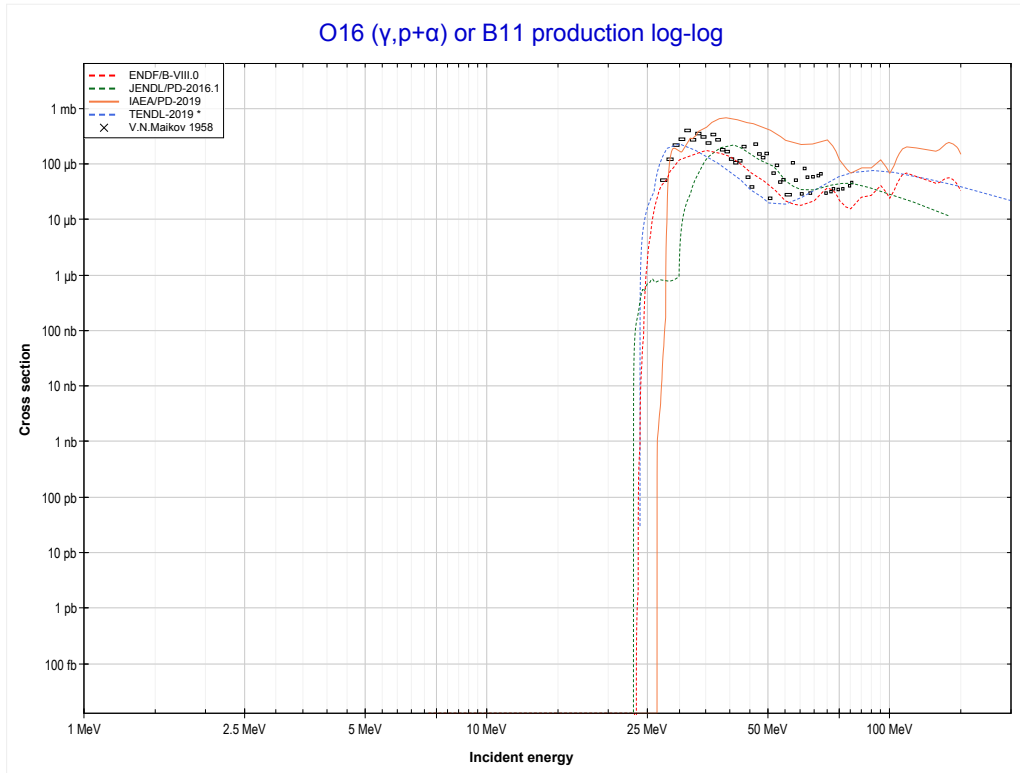
Reaction	Q-Value
O16(γ,p+α)B11	-23118.59 keV
O16(γ,d+He3)B11	-41471.65 keV
O16(γ,2p+t)B11	-42932.46 keV
O16(γ,n+p+He3)B11	-43696.21 keV
O16(γ,p+2d)B11	-46965.12 keV
O16(γ,n+2p+d)B11	-49189.69 keV
O16(γ,2n+3p)B11	-51414.25 keV

	8-O-16	
<< MT112 (γ,p+α)	**MT199 (γ,3n+2p+α) or MT5 (Be7 production)**	8-O-18 MT28 (γ,n+p) >>

O16 (γ,3n+2p+α) or Be7 production log-log

O16 (γ,3n+2p+α) or Be7 production lin-log

Reaction	Q-Value	Reaction	Q-Value
O16(γ,n+2α)Be7	-33427.15 keV	O16(γ,p+d+2t)Be7	-70830.31 keV
O16(γ,d+t+α)Be7	-51016.45 keV	O16(γ,n+d+t+He3)Be7	-71594.07 keV
O16(γ,n+p+t+α)Be7	-53241.01 keV	O16(γ,n+2p+2t)Be7	-73054.88 keV
O16(γ,2n+He3+α)Be7	-54004.77 keV	O16(γ,2n+p+t+He3)Be7	-73818.63 keV
O16(γ,n+2d+α)Be7	-57273.68 keV	O16(γ,3n+2He3)Be7	-74582.39 keV
O16(γ,2n+p+d+α)Be7	-59498.24 keV	O16(γ,3d+t)Be7	-74862.98 keV
O16(γ,3n+2p+α)Be7	-61722.81 keV	O16(γ,n+p+2d+t)Be7	-77087.54 keV
O16(γ,2t+He3)Be7	-65336.84 keV	O16(γ,2n+2d+He3)Be7	-77851.30 keV

<< 8-O-16	**8-O-18**	10-Ne-20 >>
<< 8-O-16 MT199 (γ,3n+2p+α)	**MT28 (γ,n+p) or MT5 (N16 production)**	MT103 (γ,p) >>

O18 (γ,n+p) or N16 production log-log

O18 (γ,n+p) or N16 production lin-log
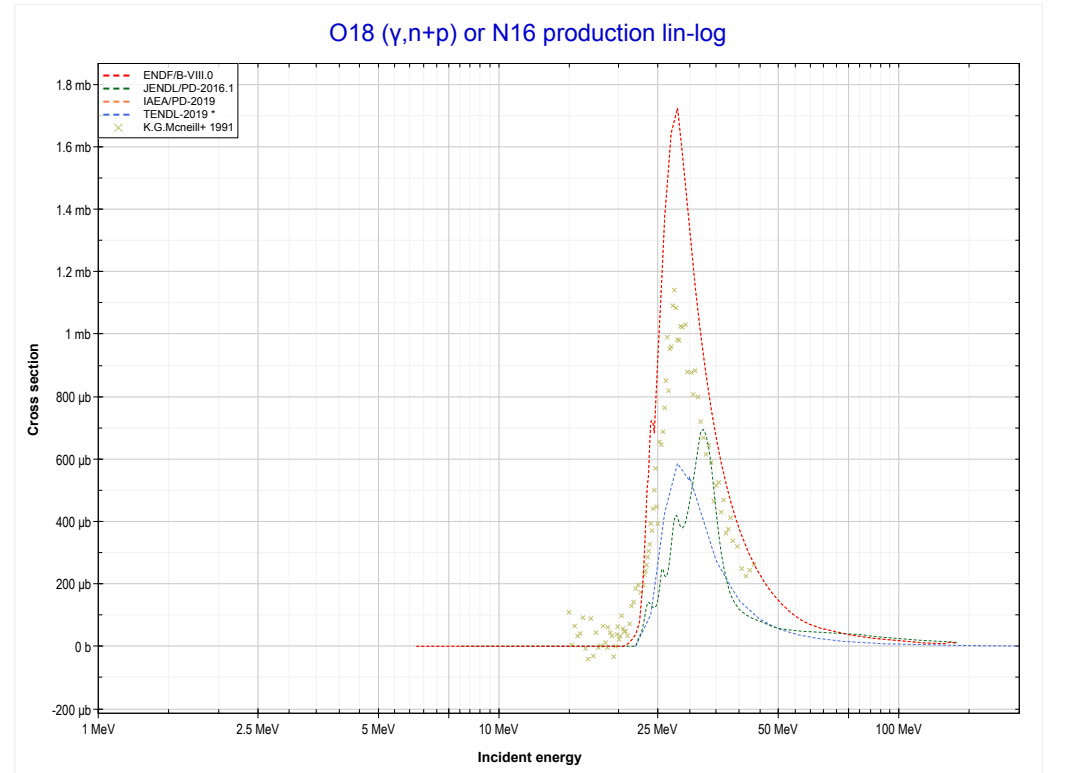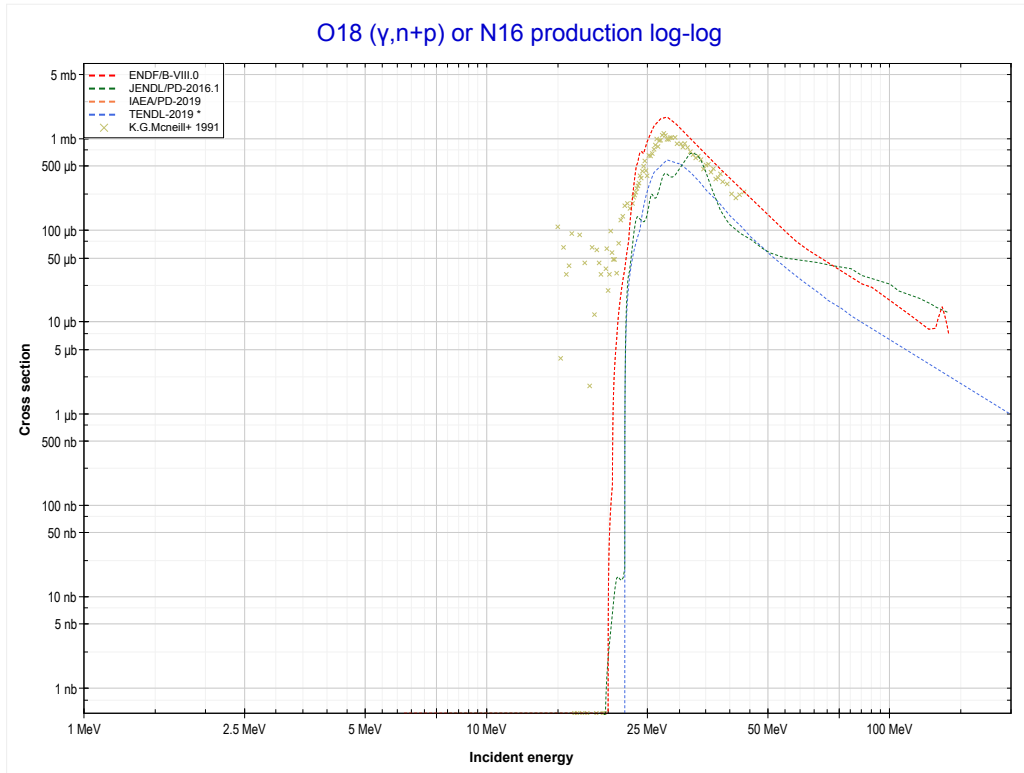
Reaction	Q-Value
O18(γ,d)N16	-19602.44 keV
O18(γ,n+p)N16	-21827.00 keV

<< 8-O-16	**8-O-18**	10-Ne-20 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (N17 production)**	MT104 (γ,d) >>

O18 (γ,p) or N17 production log-log

O18 (γ,p) or N17 production lin-log
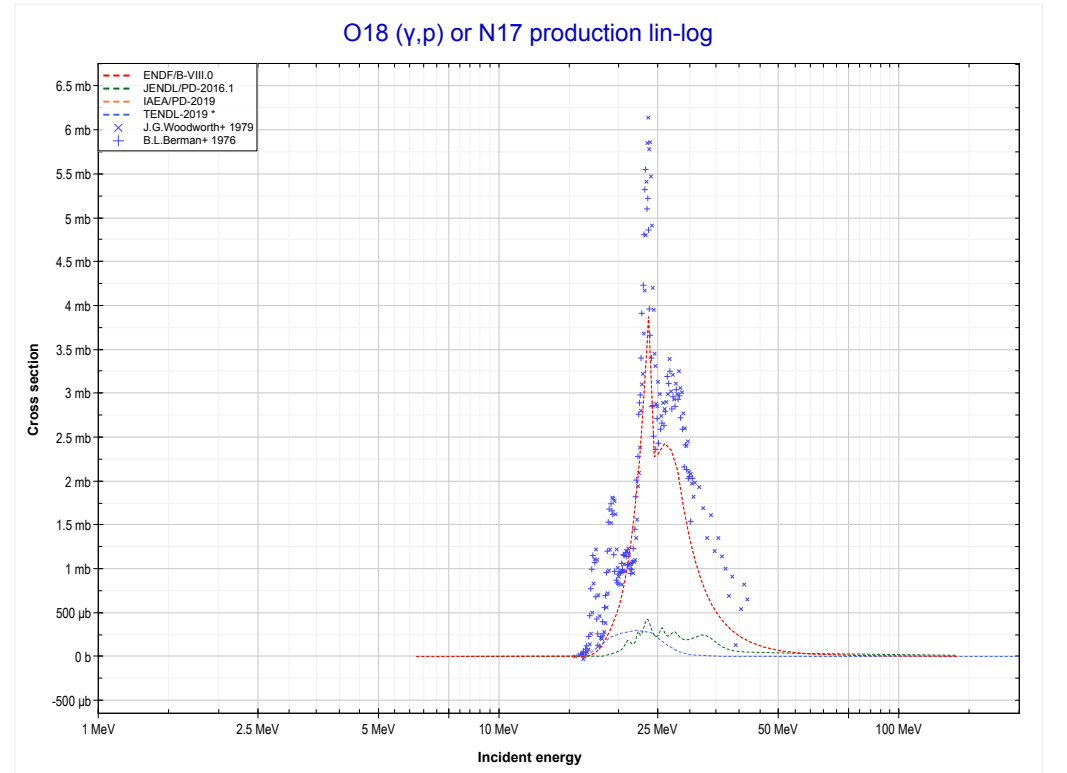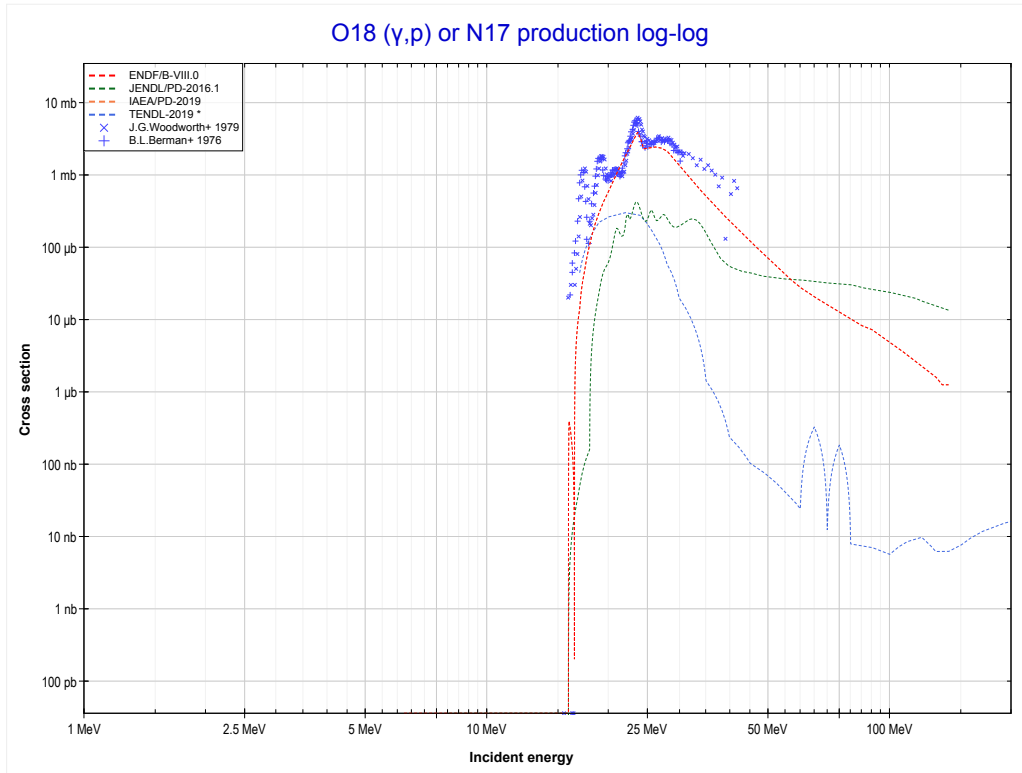
Reaction	Q-Value
O18(γ,p)N17	-15941.79 keV

8-O-18		22-Ti-46 >>
<< MT103 (γ,p)	**MT104 (γ,d) or MT5 (N16 production)**	9-F-19 MT4 (γ,n) >>

O18 (γ,d) or N16 production log-log

O18 (γ,d) or N16 production lin-log
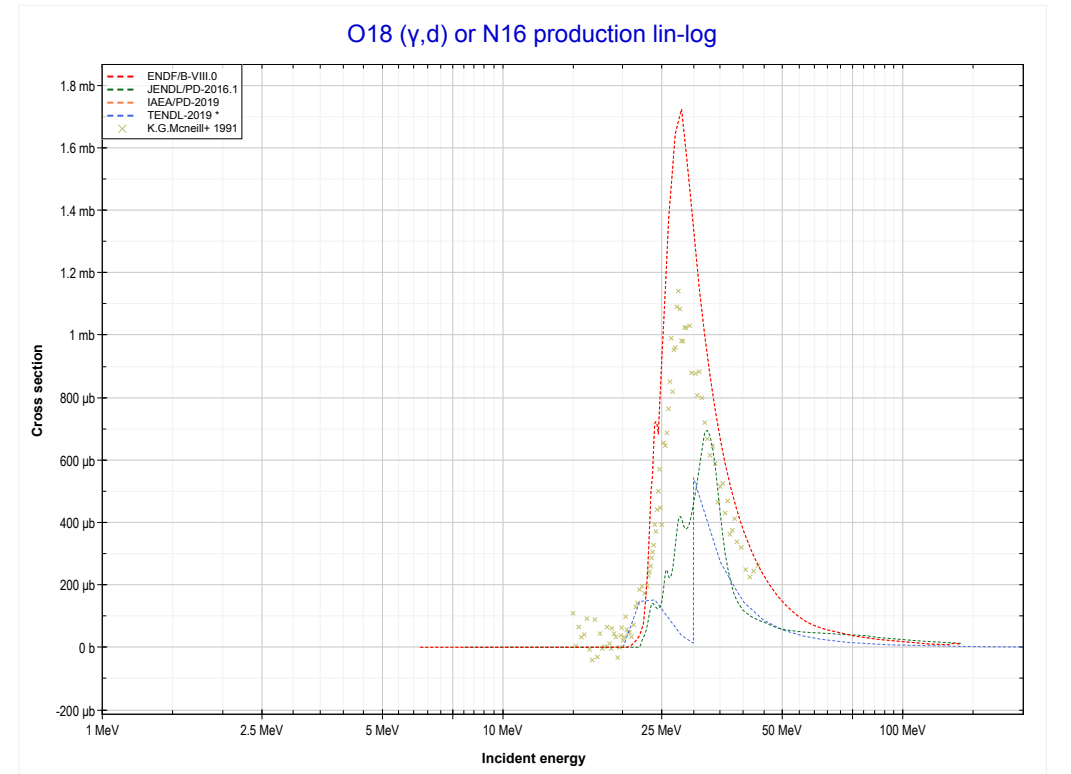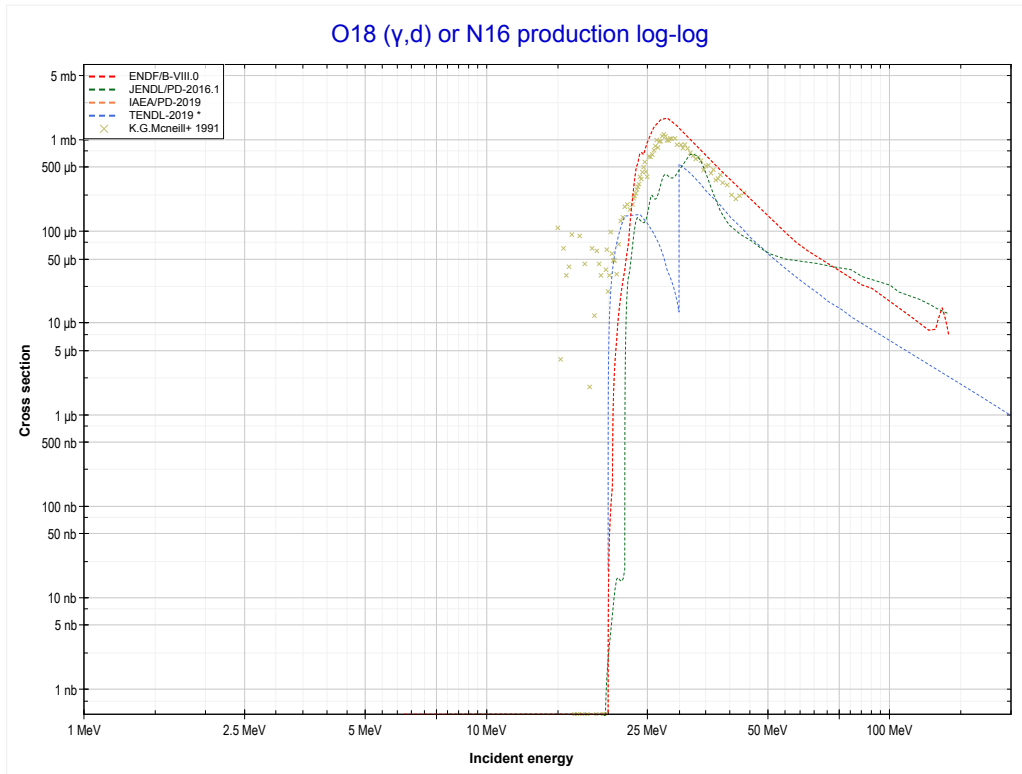
Reaction	Q-Value
O18(γ,d)N16	-19602.44 keV
O18(γ,n+p)N16	-21827.00 keV

<< 8-O-16	**9-F-19**	10-Ne-20 >>
<< 8-O-18 MT104 (γ,d)	**MT4 (γ,n) or MT5 (F18 production)**	MT16 (γ,2n) >>

F19 (γ,n) or F18 production log-log

F19 (γ,n) or F18 production lin-log
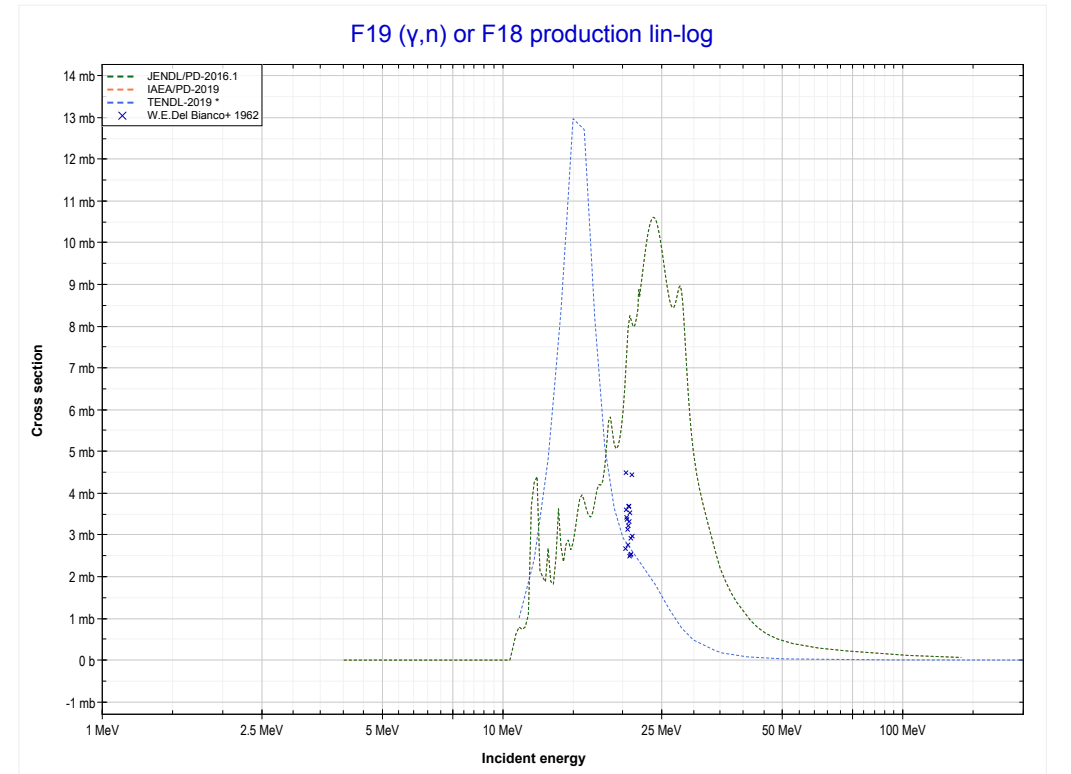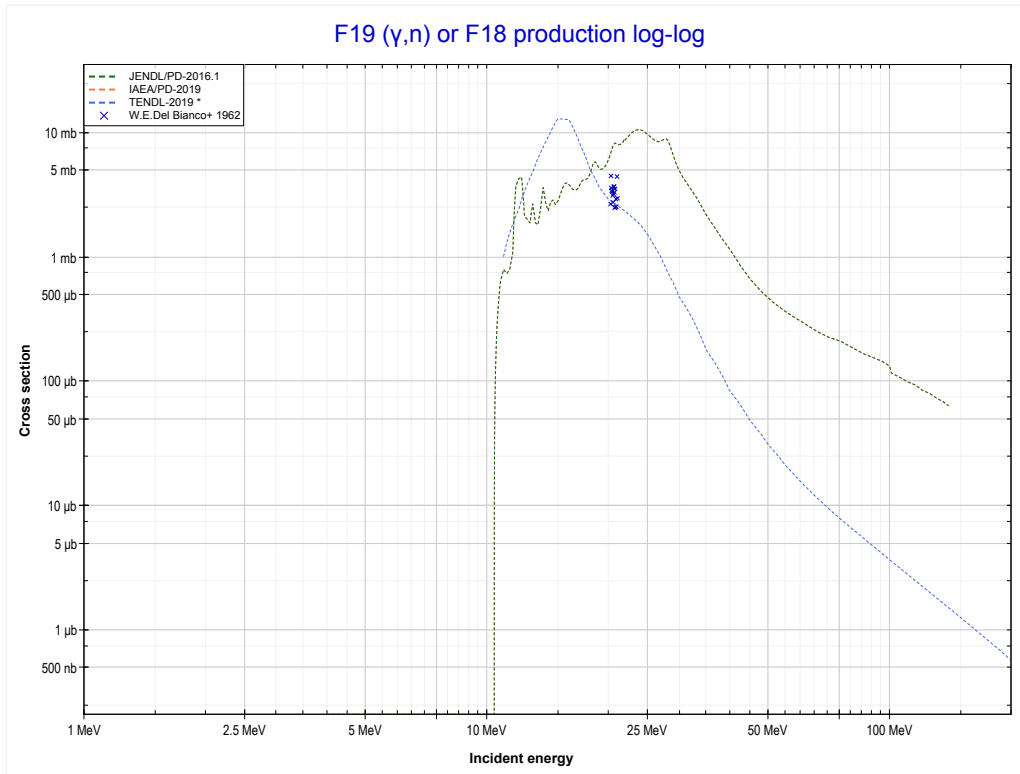
Reaction	Q-Value
F19(γ,n)F18	-10431.86 keV

<< 8-O-16	**9-F-19**	12-Mg-26 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (F17 production)**	10-Ne-20 MT4 (γ,n) >>

F19 (γ,2n) or F17 production log-log

F19 (γ,2n) or F17 production lin-log
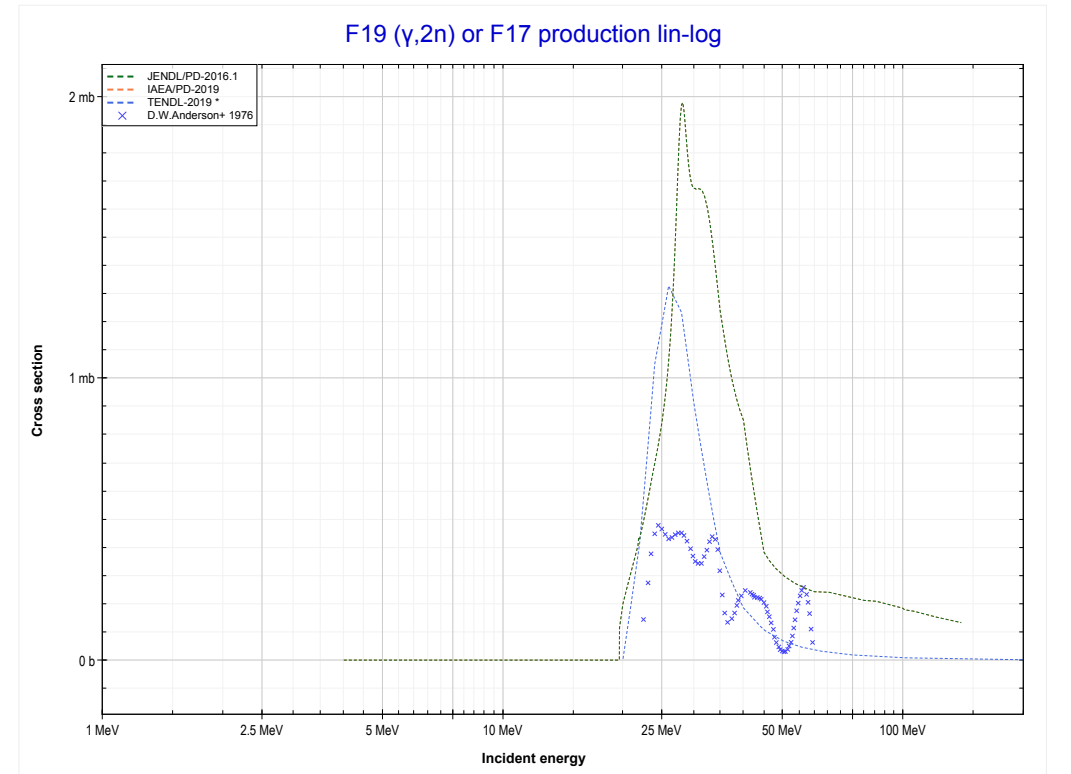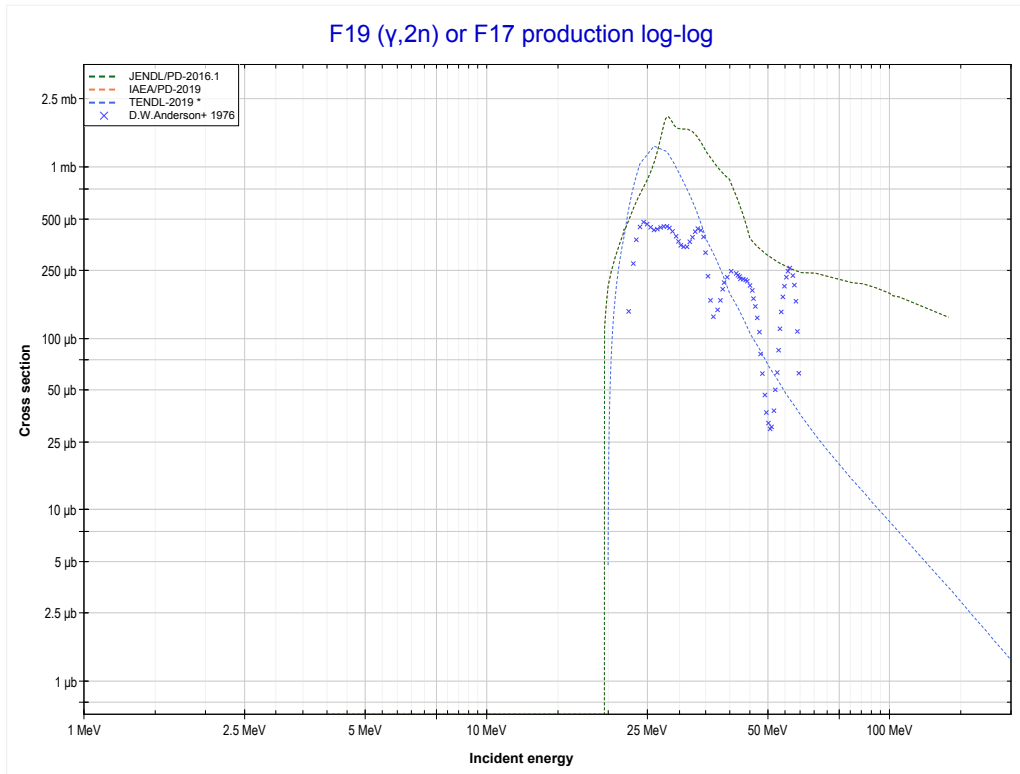
Reaction	Q-Value
F19(γ,2n)F17	-19581.78 keV

<< 9-F-19	**10-Ne-20**	10-Ne-22 >>
<< 9-F-19 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Ne19 production)**	MT28 (γ,n+p) >>

Ne20 (γ,n) or Ne19 production log-log

Ne20 (γ,n) or Ne19 production lin-log
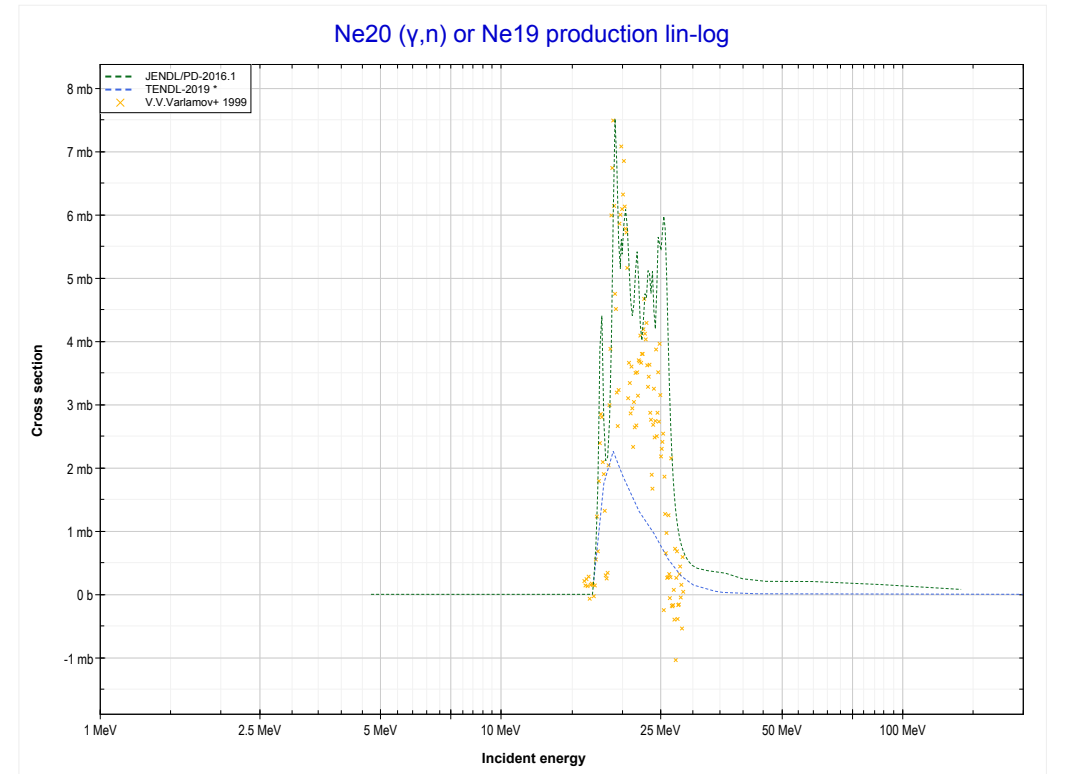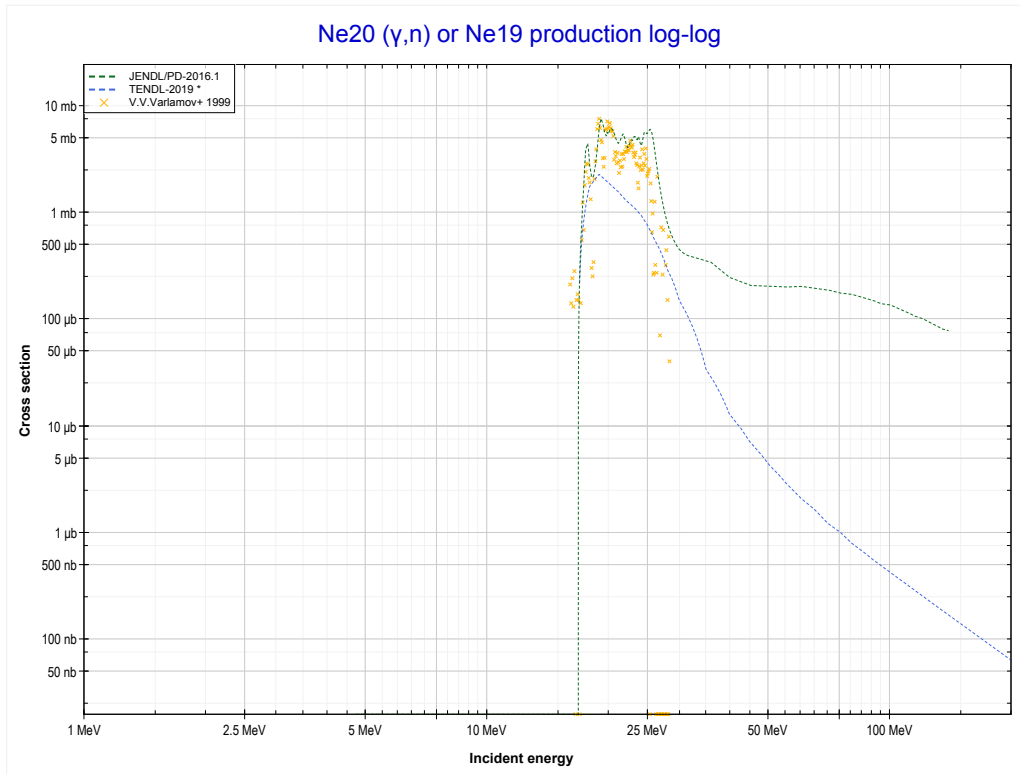
Reaction	Q-Value
Ne20(γ,n)Ne19	-16865.30 keV

<< 8-O-18	**10-Ne-20**	15-P-31 >>
<< MT4 (γ,n)	**MT28 (γ,n+p) or MT5 (F18 production)**	MT103 (γ,p) >>

Ne20 (γ,n+p) or F18 production log-log

Ne20 (γ,n+p) or F18 production lin-log
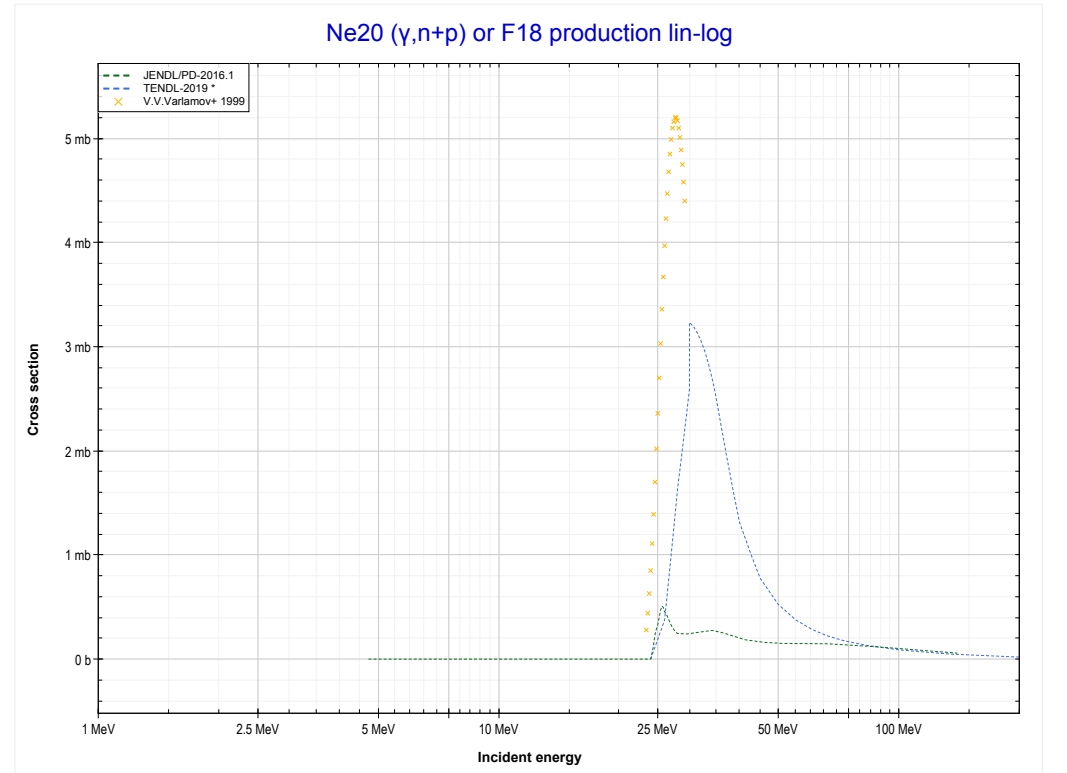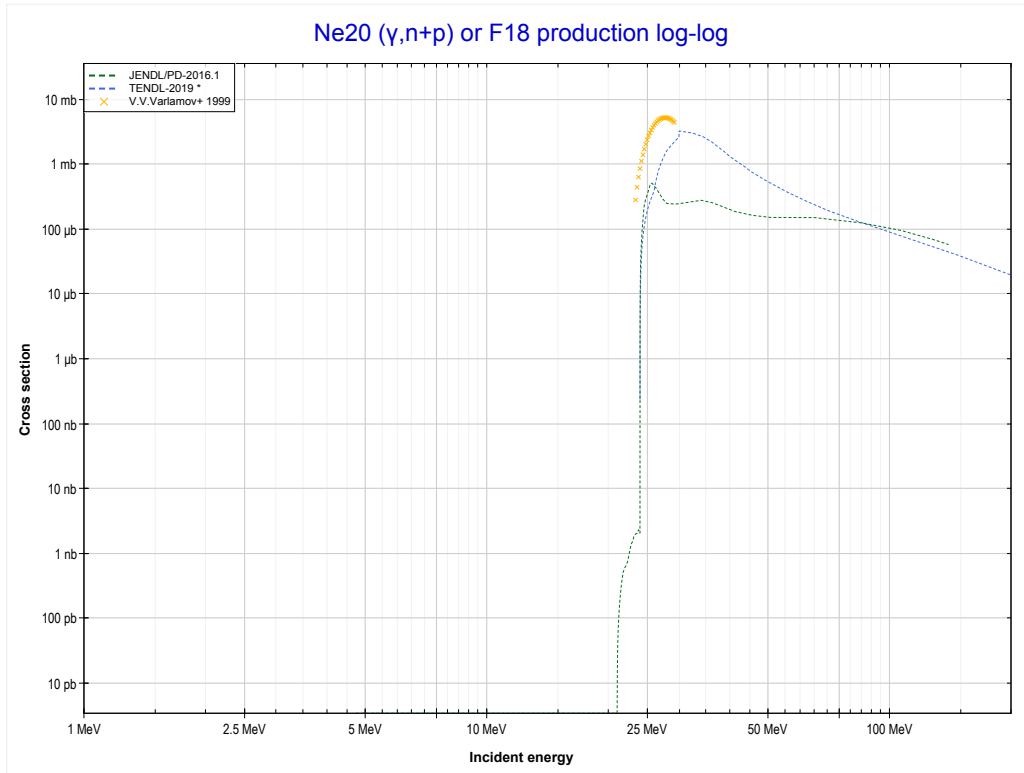
Reaction	Q-Value
Ne20(γ,d)F18	-21050.75 keV
Ne20(γ,n+p)F18	-23275.32 keV

<< 8-O-18	**10-Ne-20**	10-Ne-22 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (F19 production)**	10-Ne-22 MT4 (γ,n) >>

Ne20 (γ,p) or F19 production log-log

Ne20 (γ,p) or F19 production lin-log
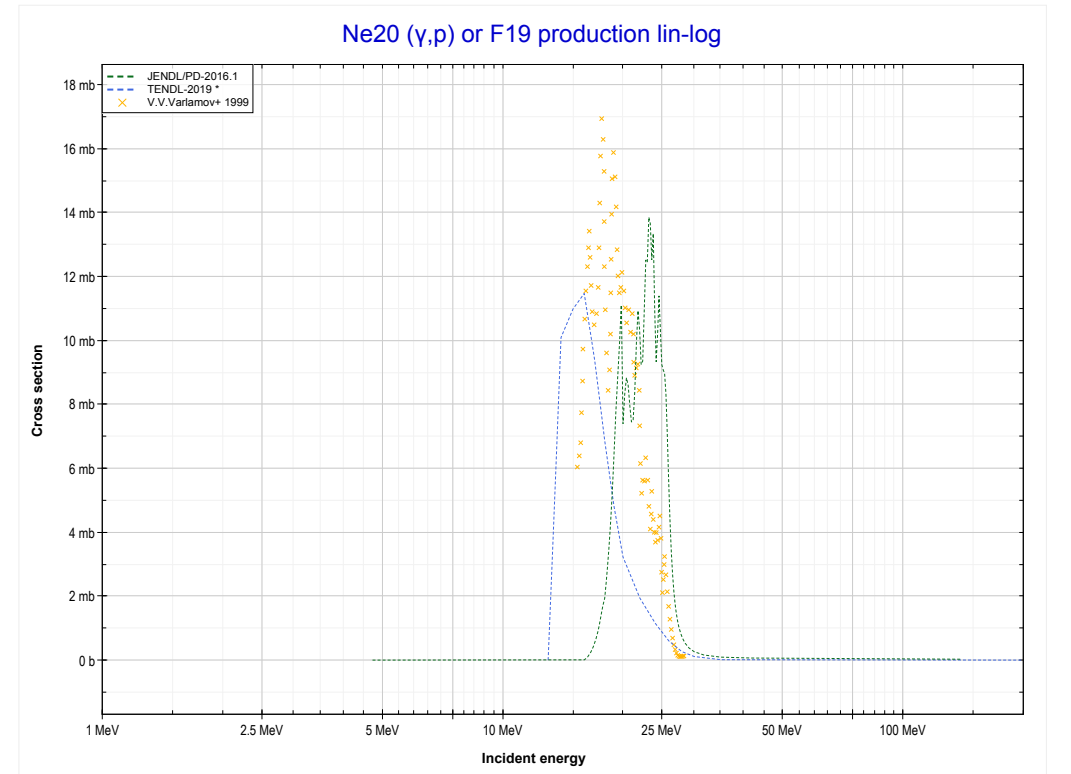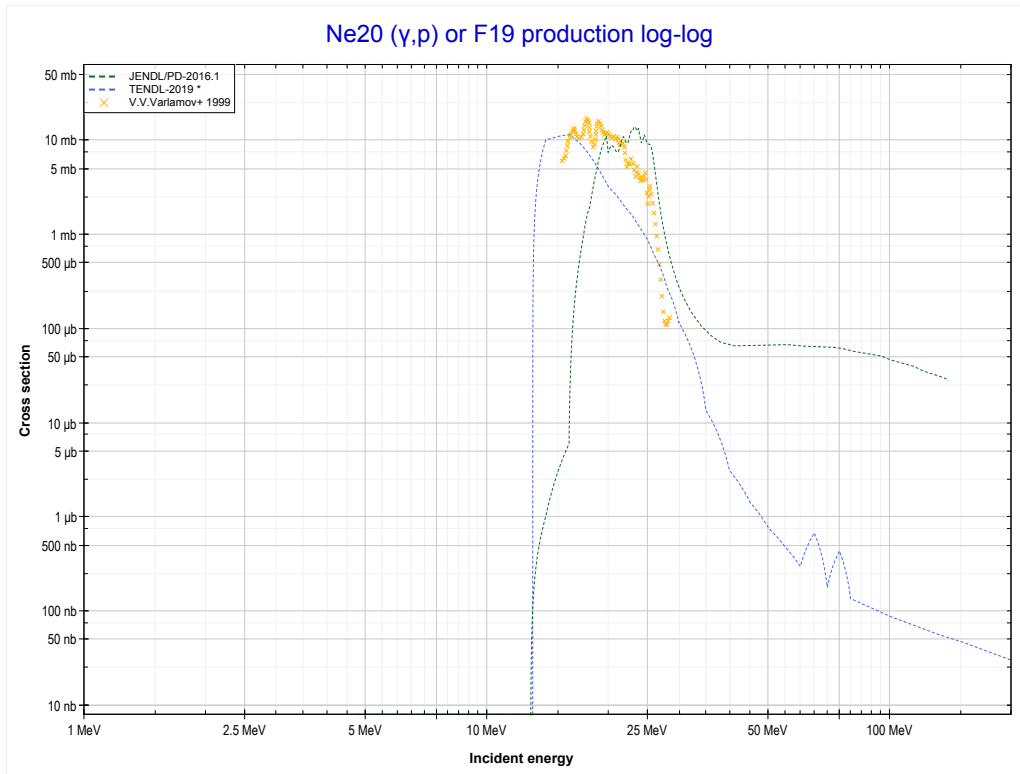
Reaction	Q-Value
Ne20(γ,p)F19	-12843.46 keV

<< 10-Ne-20	**10-Ne-22**	12-Mg-24 >>
<< 10-Ne-20 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Ne21 production)**	MT103 (γ,p) >>

Ne22 (γ,n) or Ne21 production log-log

Ne22 (γ,n) or Ne21 production lin-log
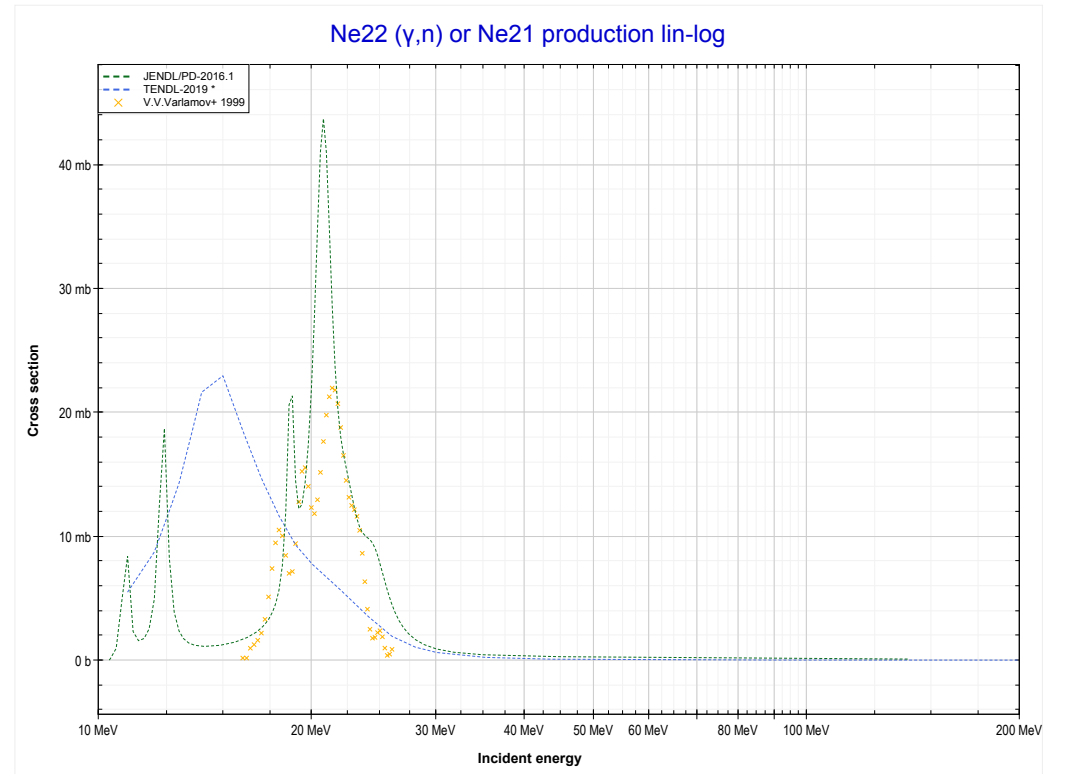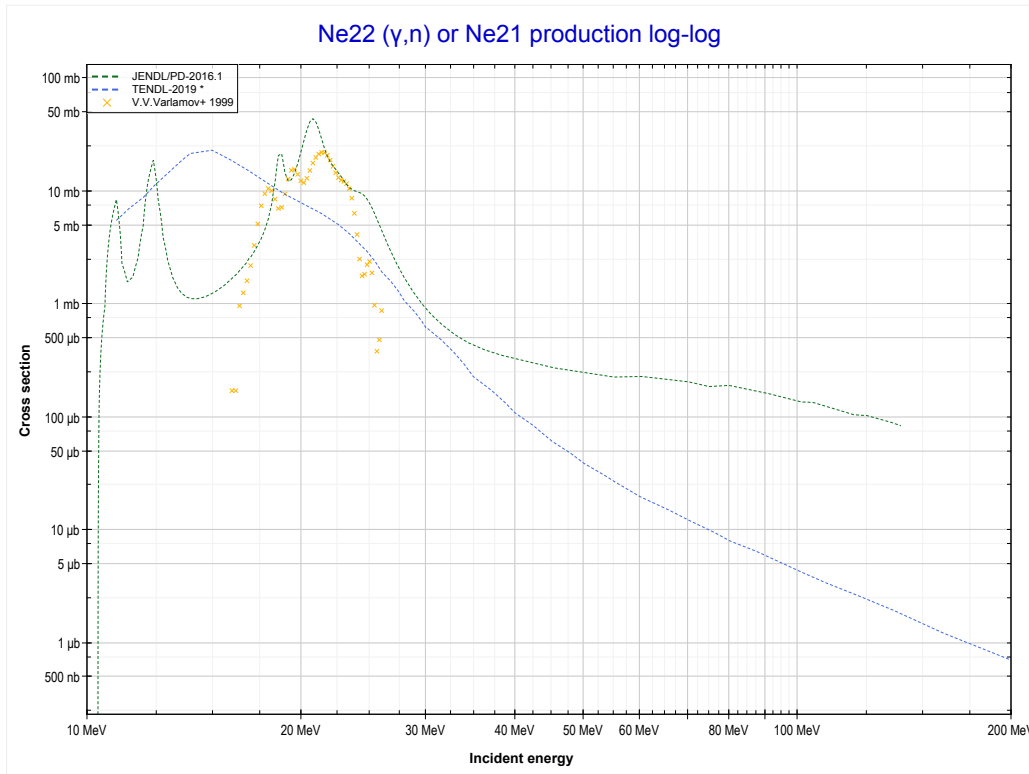
Reaction	Q-Value
Ne22(γ,n)Ne21	-10364.26 keV

<< 10-Ne-20	**10-Ne-22**	13-Al-27 >>
<< MT4 (γ,n)	**MT103 (γ,p) or MT5 (F21 production)**	12-Mg-24 MT4 (γ,n) >>
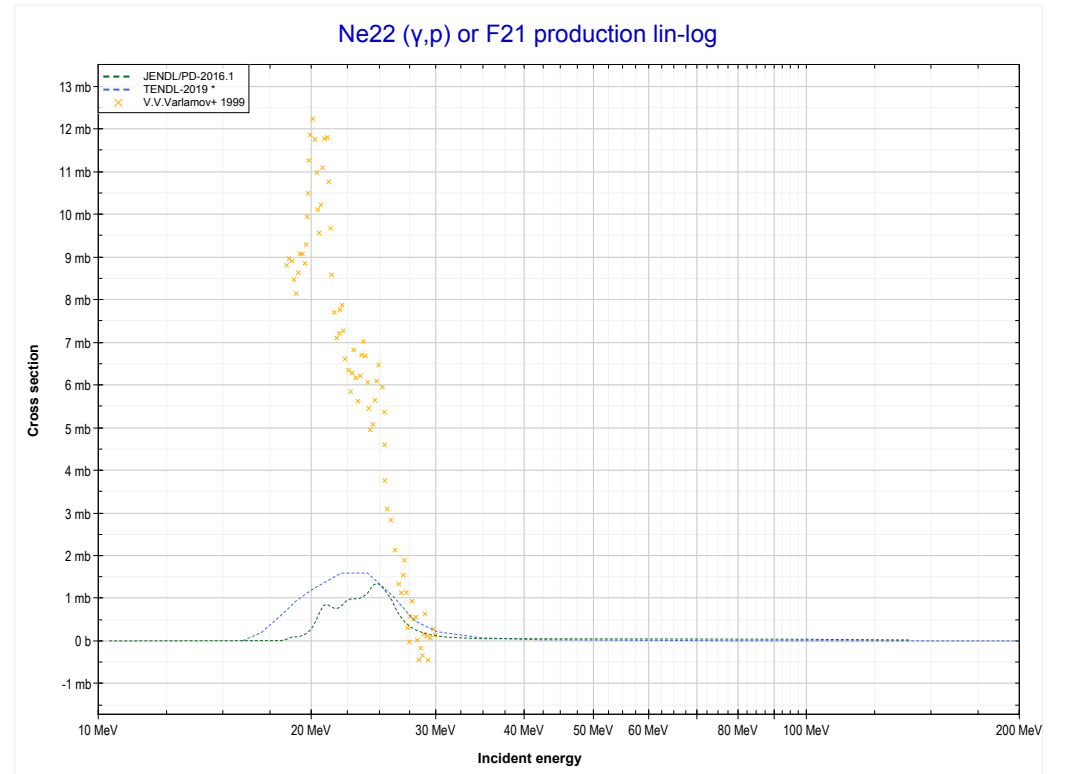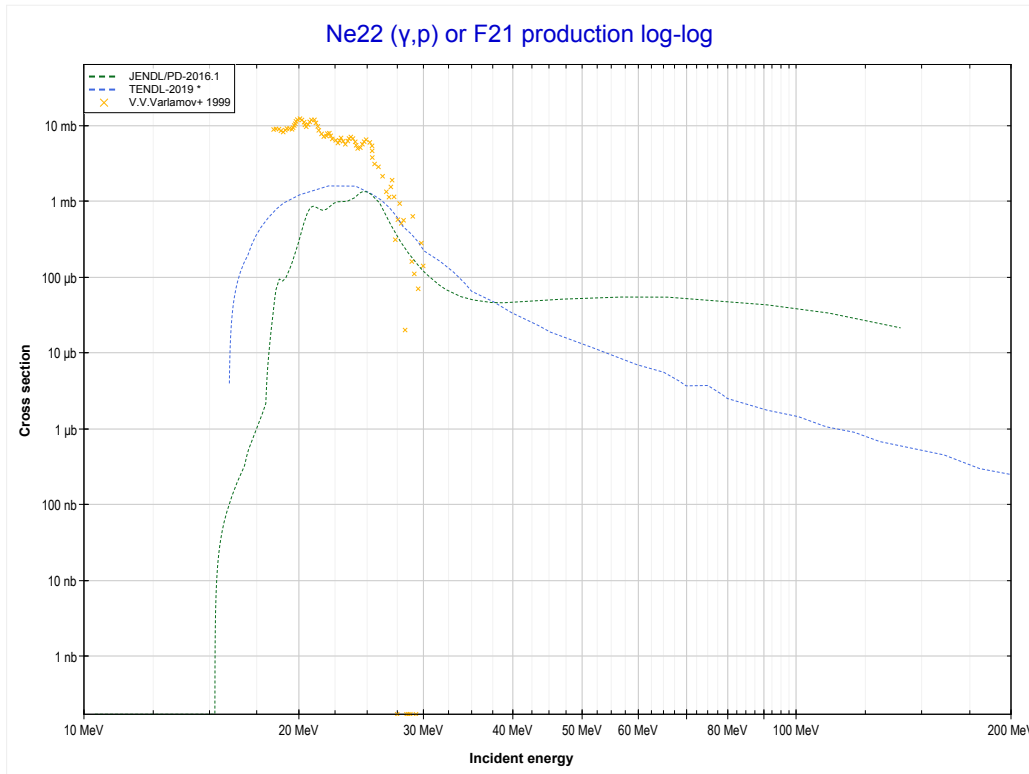
Reaction	Q-Value
Ne22(γ,p)F21	-15266.09 keV

<< 10-Ne-22	**12-Mg-24**	12-Mg-26 >>
<< 10-Ne-22 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Mg23 production)**	MT45 (γ,n+p+α) >>

Mg24 (γ,n) or Mg23 production log-log

Mg24 (γ,n) or Mg23 production lin-log
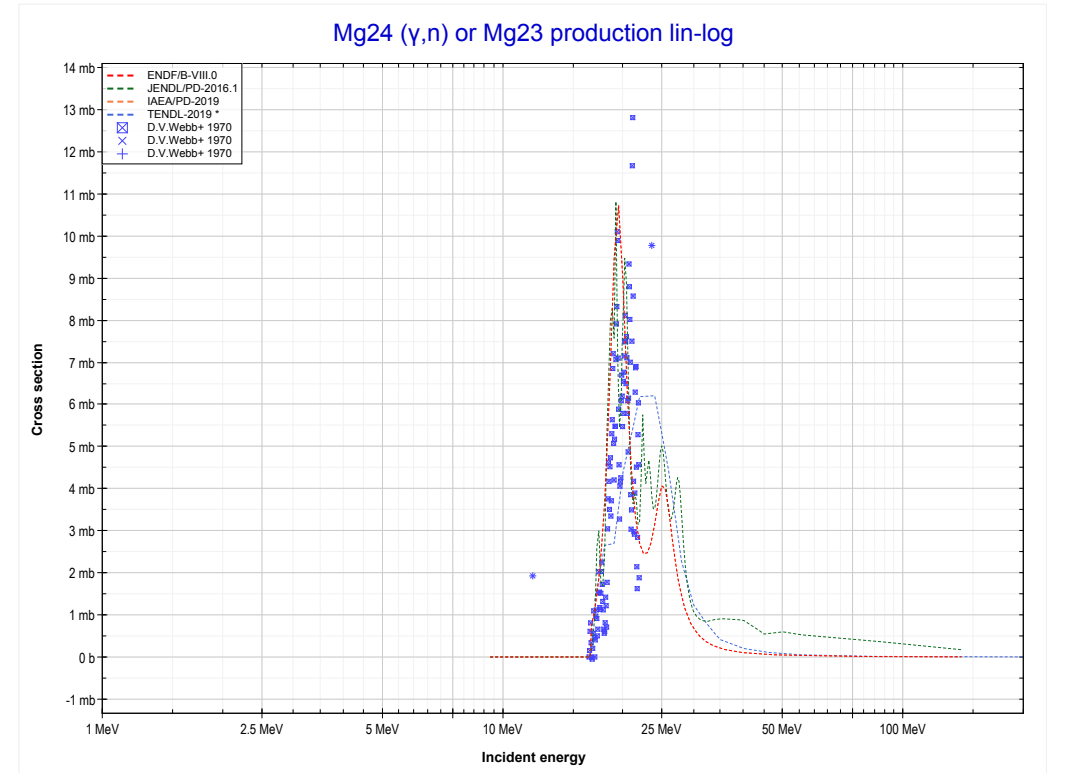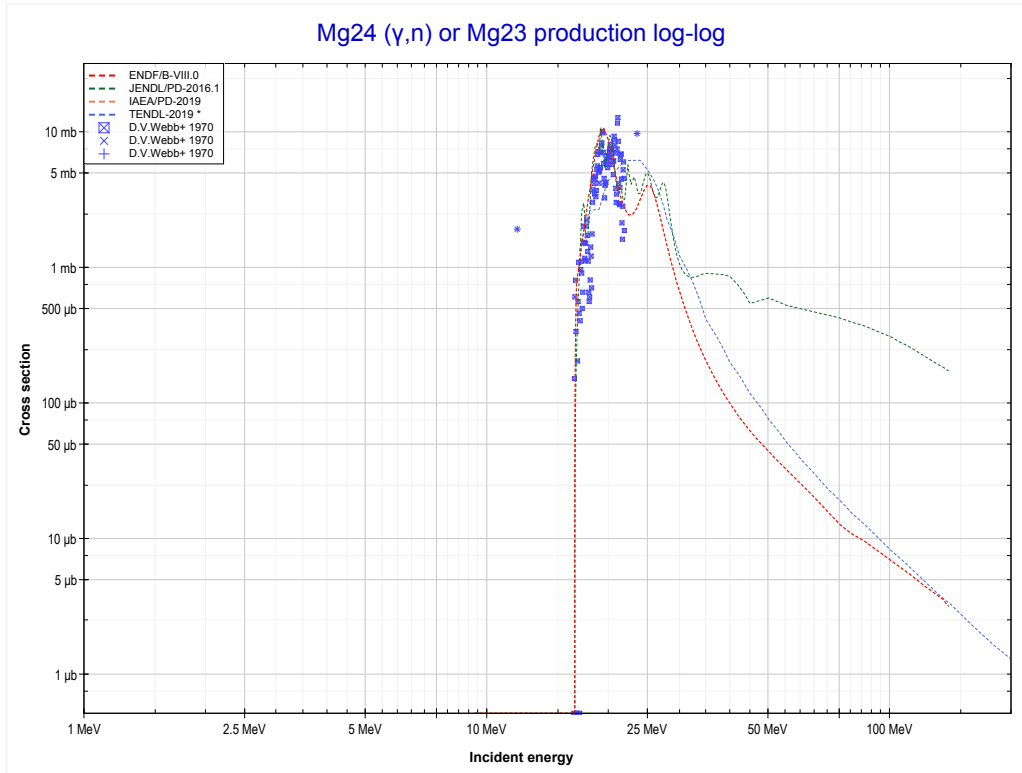
Reaction	Q-Value
Mg24(γ,n)Mg23	-16531.38 keV

<< 6-C-12	**12-Mg-24**	
<< MT4 (γ,n)	**MT45 (γ,n+p+α) or MT5 (F18 production)**	MT117 (γ,d+α) >>

Mg24 (γ,n+p+α) or F18 production log-log

Mg24 (γ,n+p+α) or F18 production lin-log

Reaction	Q-Value	Reaction	Q-Value
Mg24(γ,d+α)F18	-30367.31 keV	Mg24(γ,n+p+2d)F18	-56438.40 keV
Mg24(γ,n+p+α)F18	-32591.87 keV	Mg24(γ,2n+2p+d)F18	-58662.97 keV
Mg24(γ,t+He3)F18	-44687.70 keV	Mg24(γ,3n+3p)F18	-60887.53 keV
Mg24(γ,p+d+t)F18	-50181.17 keV		
Mg24(γ,n+d+He3)F18	-50944.93 keV		
Mg24(γ,n+2p+t)F18	-52405.74 keV		
Mg24(γ,2n+p+He3)F18	-53169.49 keV		
Mg24(γ,3d)F18	-54213.83 keV		

<< 3-Li-7	**12-Mg-24**	
<< MT45 (γ,n+p+α)	**MT117 (γ,d+α) or MT5 (F18 production)**	MT187 (γ,n+d+³He) >>

Mg24 (γ,d+α) or F18 production log-log

Mg24 (γ,d+α) or F18 production lin-log

Reaction	Q-Value	Reaction	Q-Value
Mg24(γ,d+α)F18	-30367.31 keV	Mg24(γ,n+p+2d)F18	-56438.40 keV
Mg24(γ,n+p+α)F18	-32591.87 keV	Mg24(γ,2n+2p+d)F18	-58662.97 keV
Mg24(γ,t+He3)F18	-44687.70 keV	Mg24(γ,3n+3p)F18	-60887.53 keV
Mg24(γ,p+d+t)F18	-50181.17 keV		
Mg24(γ,n+d+He3)F18	-50944.93 keV		
Mg24(γ,n+2p+t)F18	-52405.74 keV		
Mg24(γ,2n+p+He3)F18	-53169.49 keV		
Mg24(γ,3d)F18	-54213.83 keV		

<< 3-Li-7	**12-Mg-24**	
<< MT117 (γ,d+α)	**MT187 (γ,n+d+³He) or MT5 (F18 production)**	12-Mg-26 MT4 (γ,n) >>

Mg24 (γ,n+d+³He) or F18 production log-log

Mg24 (γ,n+d+³He) or F18 production lin-log

Reaction	Q-Value	Reaction	Q-Value
Mg24(γ,d+α)F18	-30367.31 keV	Mg24(γ,n+p+2d)F18	-56438.40 keV
Mg24(γ,n+p+α)F18	-32591.87 keV	Mg24(γ,2n+2p+d)F18	-58662.97 keV
Mg24(γ,t+He3)F18	-44687.70 keV	Mg24(γ,3n+3p)F18	-60887.53 keV
Mg24(γ,p+d+t)F18	-50181.17 keV		
Mg24(γ,n+d+He3)F18	-50944.93 keV		
Mg24(γ,n+2p+t)F18	-52405.74 keV		
Mg24(γ,2n+p+He3)F18	-53169.49 keV		
Mg24(γ,3d)F18	-54213.83 keV		

<< 12-Mg-24	**12-Mg-26**	13-Al-27 >>
<< 12-Mg-24 MT187 (γ,n+d+³He)	**MT4 (γ,n) or MT5 (Mg25 production)**	MT16 (γ,2n) >>

Mg26 (γ,n) or Mg25 production log-log

Mg26 (γ,n) or Mg25 production lin-log
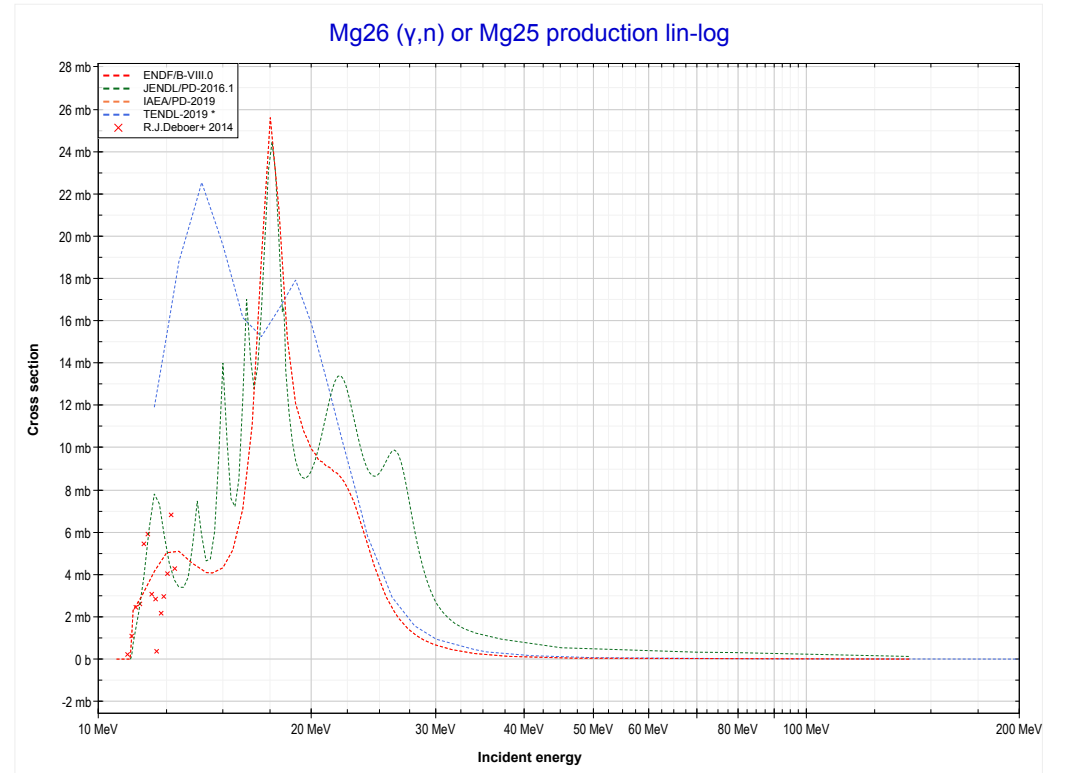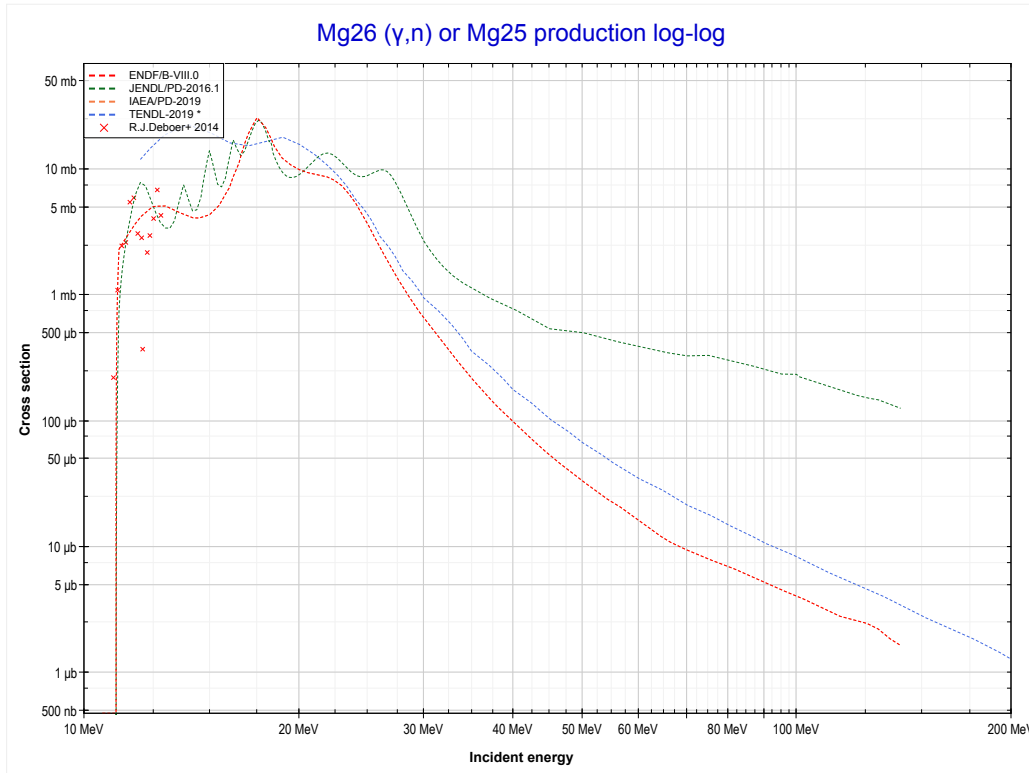
Reaction	Q-Value
Mg26(γ,n)Mg25	-11093.08 keV

<< 9-F-19	**12-Mg-26**	15-P-31 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Mg24 production)**	13-Al-27 MT4 (γ,n) >>

Mg26 (γ,2n) or Mg24 production log-log

Mg26 (γ,2n) or Mg24 production lin-log
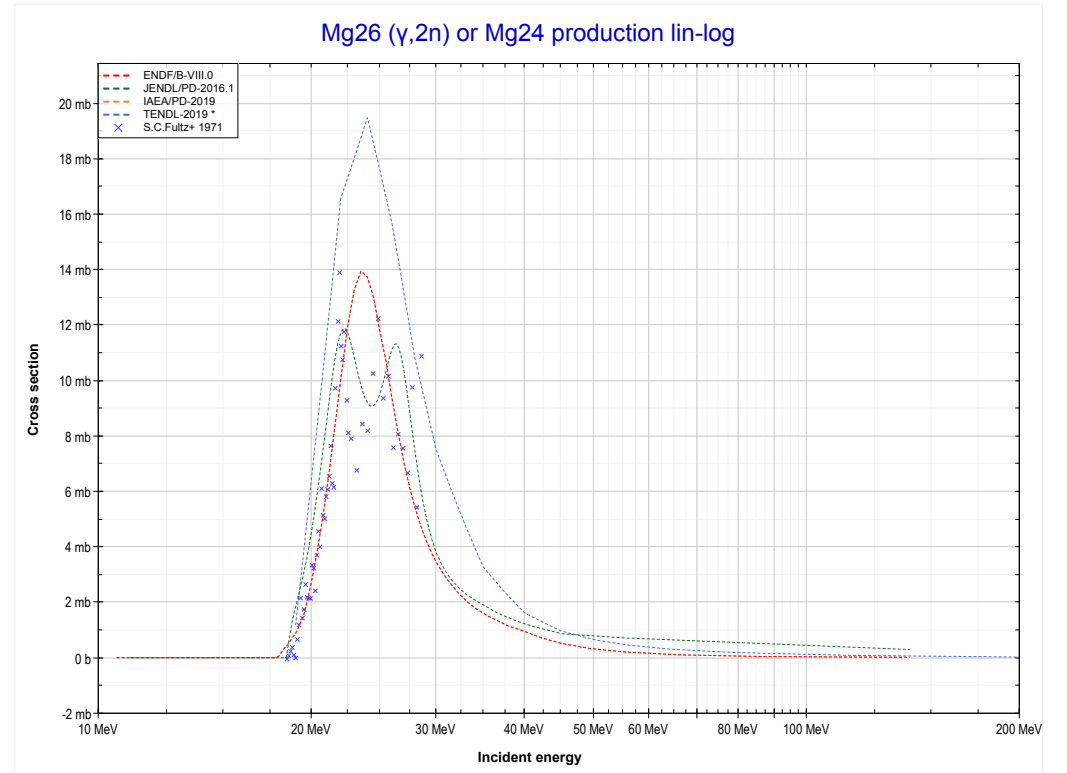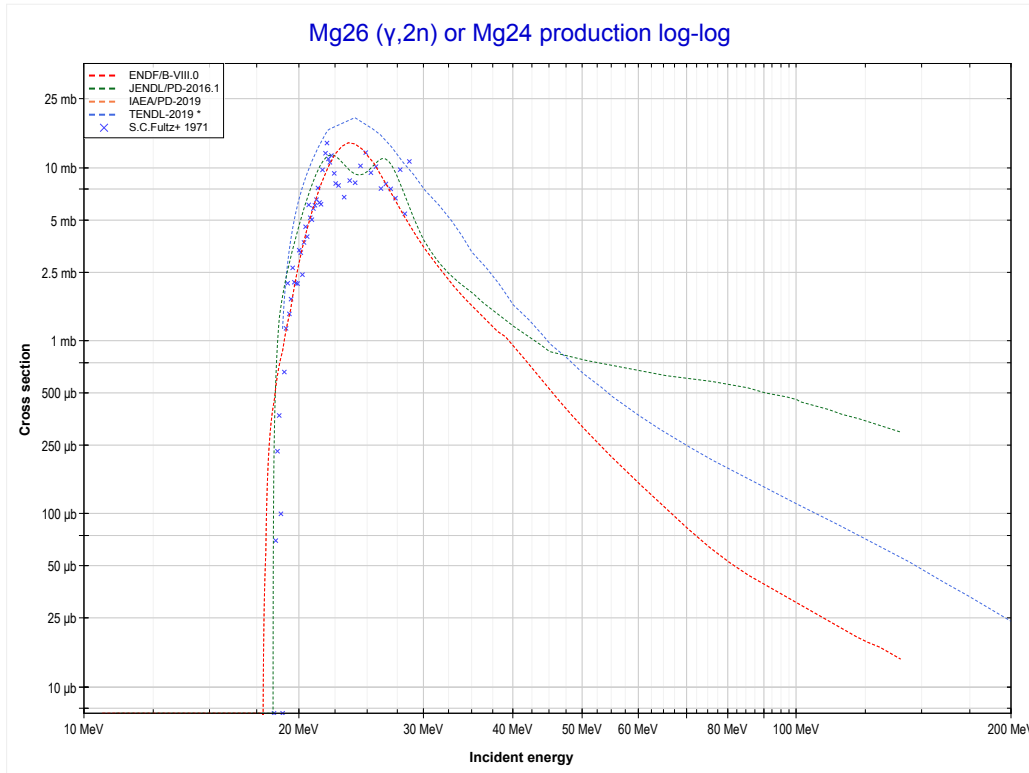
Reaction	Q-Value
Mg26(γ,2n)Mg24	-18423.61 keV

<< 12-Mg-26	**13-Al-27**	14-Si-28 >>
<< 12-Mg-26 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Al26 production)**	MT44 (γ,n+2p) >>

Al27 (γ,n) or Al26 production log-log

Al27 (γ,n) or Al26 production lin-log

Reaction	Q-Value
Al27(γ,n)Al26	-13058.03 keV

13-AI-27		27-Co-59 >>
<< MT4 (γ,n)	**MT44 (γ,n+2p) or MT5 (Na24 production)**	MT103 (γ,p) >>
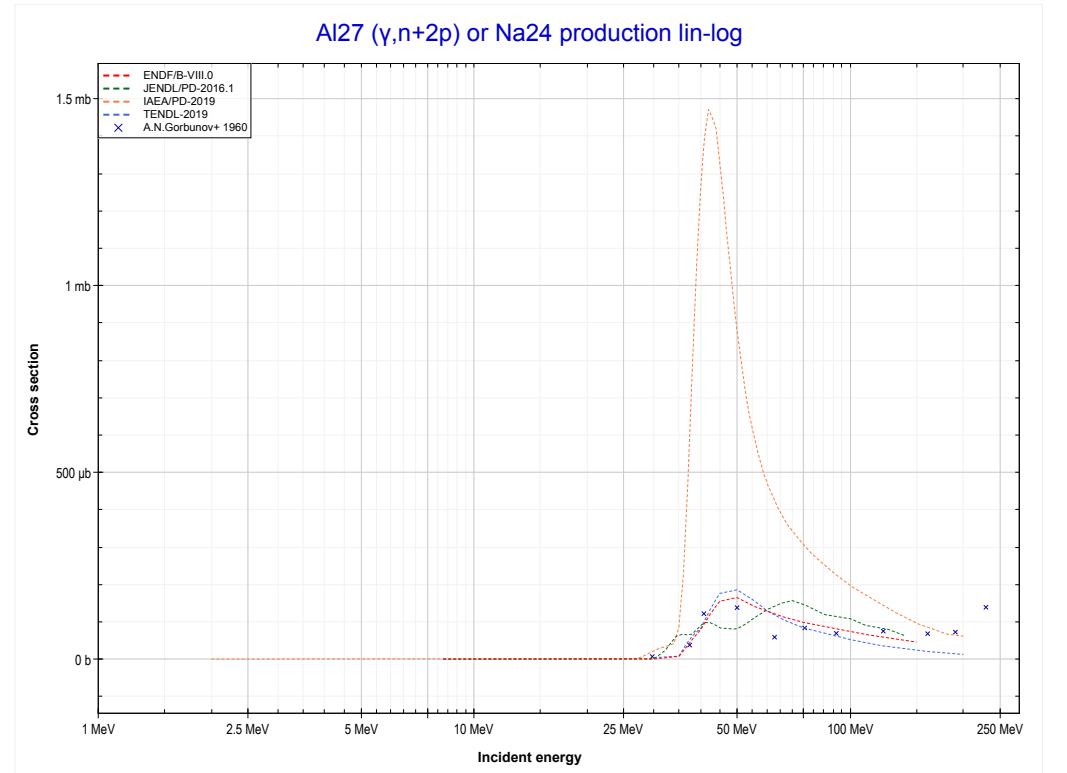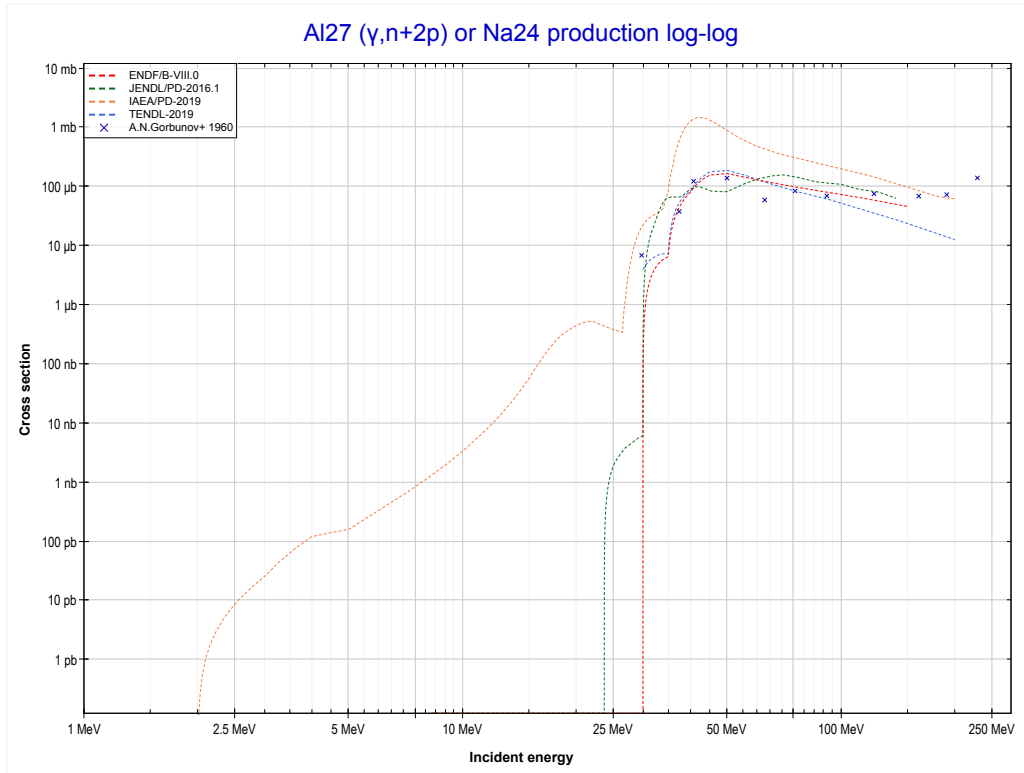
Al27 (γ,n+2p) or Na24 production log-log

Al27 (γ,n+2p) or Na24 production lin-log

Reaction	Q-Value
Al27(γ,He3)Na24	-23710.18 keV
Al27(γ,p+d)Na24	-29203.65 keV
Al27(γ,n+2p)Na24	-31428.22 keV

<< 10-Ne-22	**13-Al-27**	14-Si-28 >>
<< MT44 (γ,n+2p)	**MT103 (γ,p) or MT5 (Mg26 production)**	MT106 (γ,³He) >>

Al27 (γ,p) or Mg26 production log-log

- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × K.Shoda+ 1962

Al27 (γ,p) or Mg26 production lin-log

- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × K.Shoda+ 1962

Reaction	Q-Value
Al27(γ,p)Mg26	-8271.29 keV

27-Co-59 >>
13-AI-27
MT106 (γ,³He) or MT5 (Na24 production)

Al27 (γ,³He) or Na24 production log-log

Al27 (γ,³He) or Na24 production lin-log

Reaction	Q-Value
Al27(γ,He3)Na24	-23710.18 keV
Al27(γ,p+d)Na24	-29203.65 keV
Al27(γ,n+2p)Na24	-31428.22 keV

<< 3-Li-6	**13-Al-27**	27-Co-59 >>
<< MT106 (γ,³He)	**MT115 (γ,p+d) or MT5 (Na24 production)**	14-Si-28 MT4 (γ,n) >>
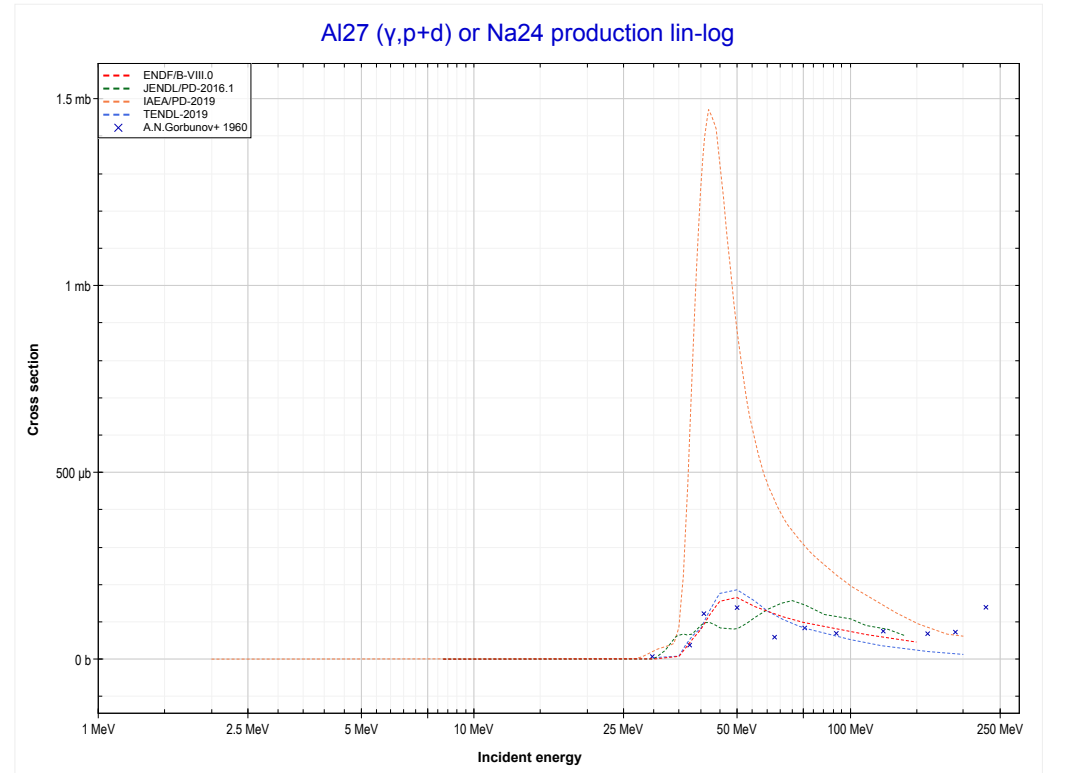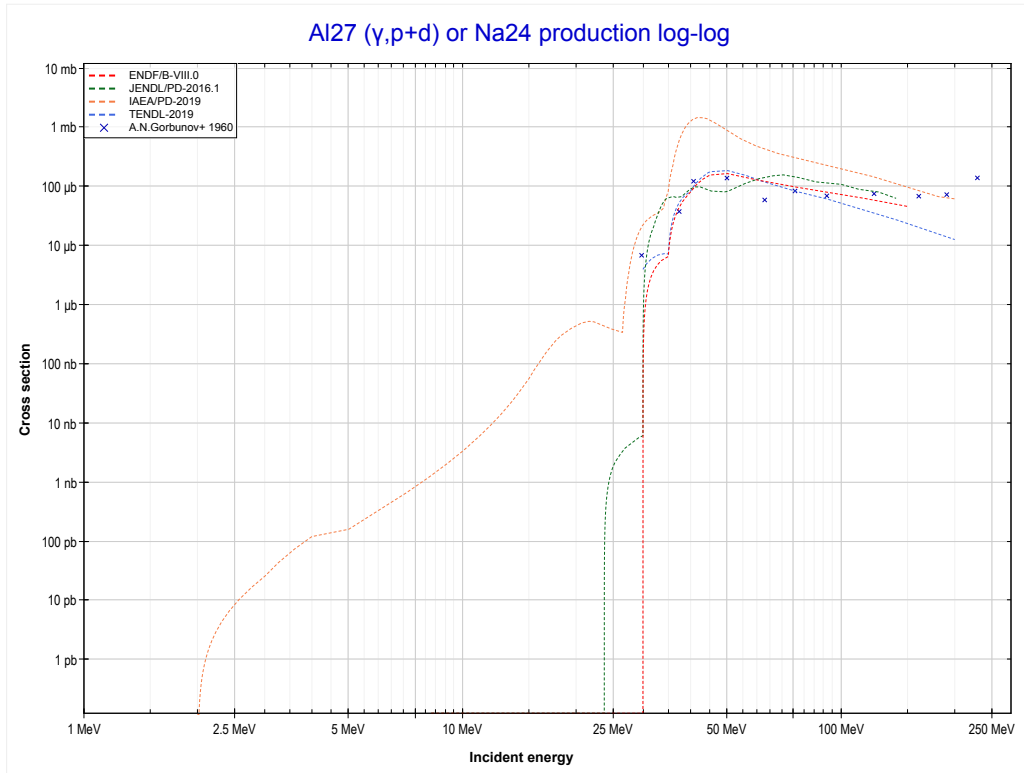
Al27 (γ,p+d) or Na24 production log-log

Al27 (γ,p+d) or Na24 production lin-log

Reaction	Q-Value
Al27(γ,He3)Na24	-23710.18 keV
Al27(γ,p+d)Na24	-29203.65 keV
Al27(γ,n+2p)Na24	-31428.22 keV

<< 13-Al-27	**14-Si-28**	14-Si-29 >>
<< 13-Al-27 MT115 (γ,p+d)	**MT4 (γ,n) or MT5 (Si27 production)**	MT103 (γ,p) >>

Si28 (γ,n) or Si27 production log-log

Si28 (γ,n) or Si27 production lin-log
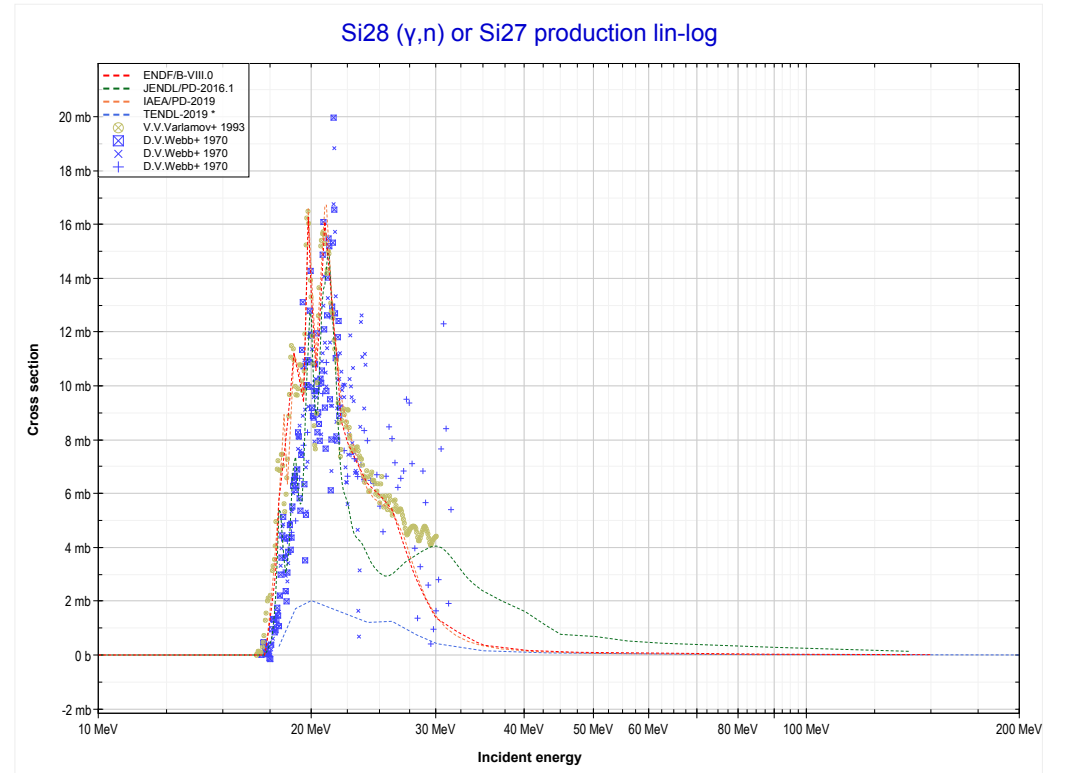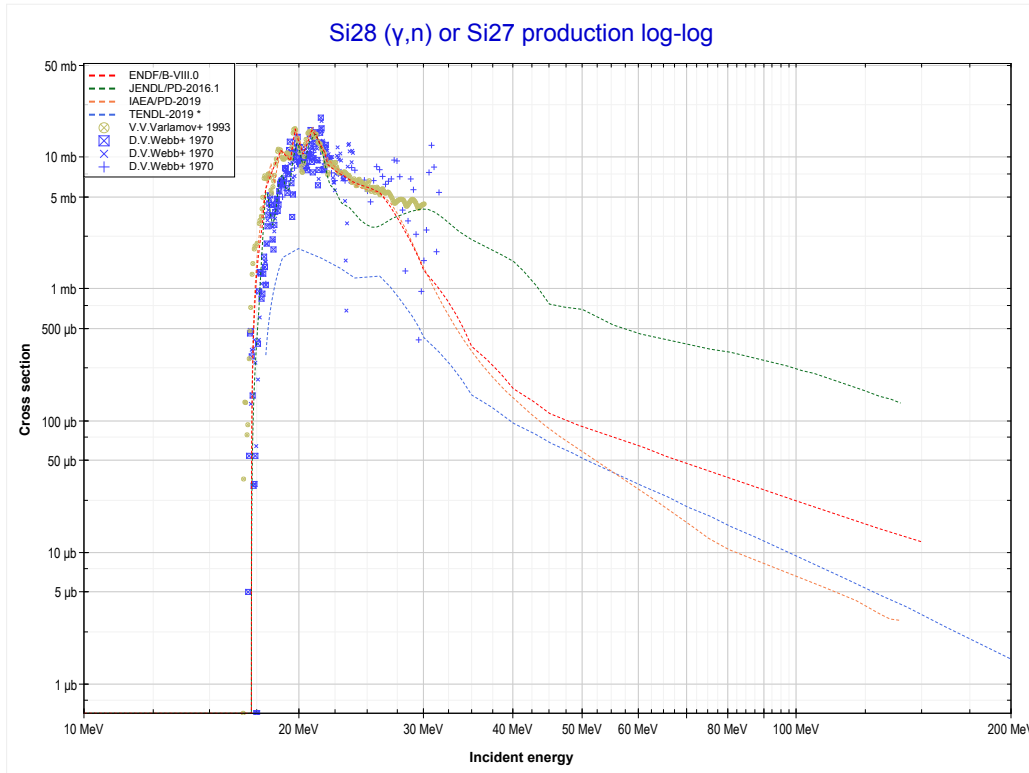
Reaction	Q-Value
Si28(γ,n)Si27	-17179.61 keV

<< 13-Al-27	**14-Si-28**	16-S-32 >>
<< MT4 (γ,n)	**MT103 (γ,p) or MT5 (Al27 production)**	14-Si-29 MT4 (γ,n) >>

Si28 (γ,p) or Al27 production log-log

Si28 (γ,p) or Al27 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × R.L.Gulbranson+ 1983
- + K.Shoda+ 1962
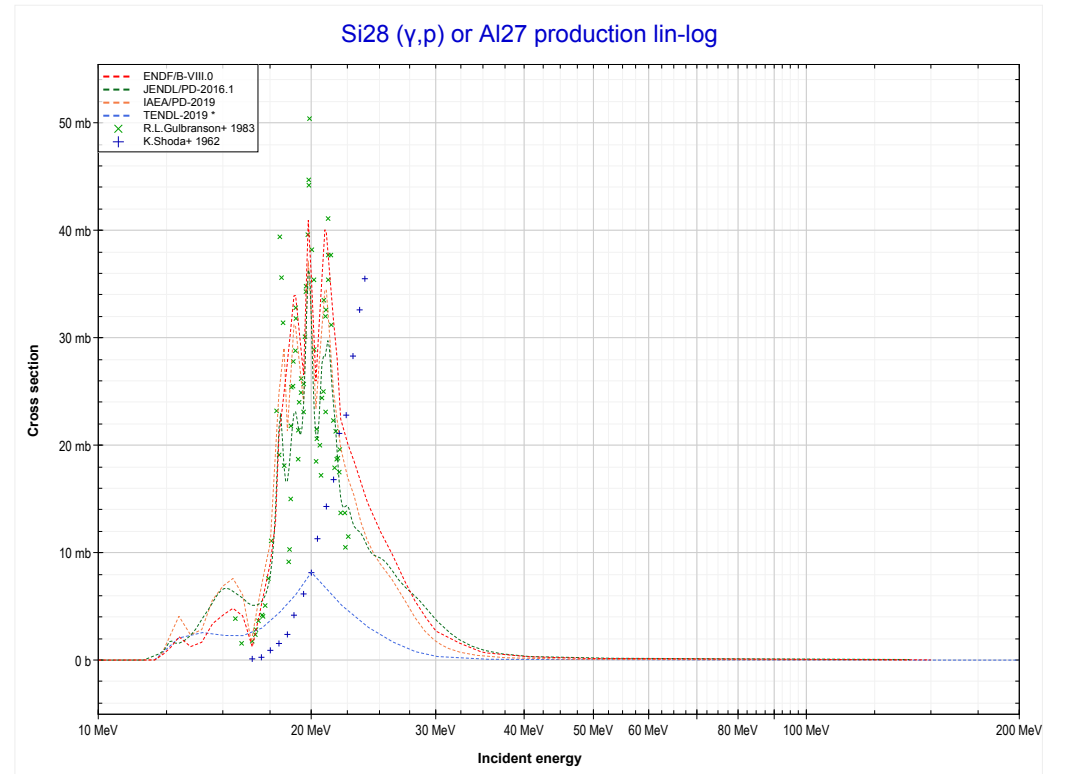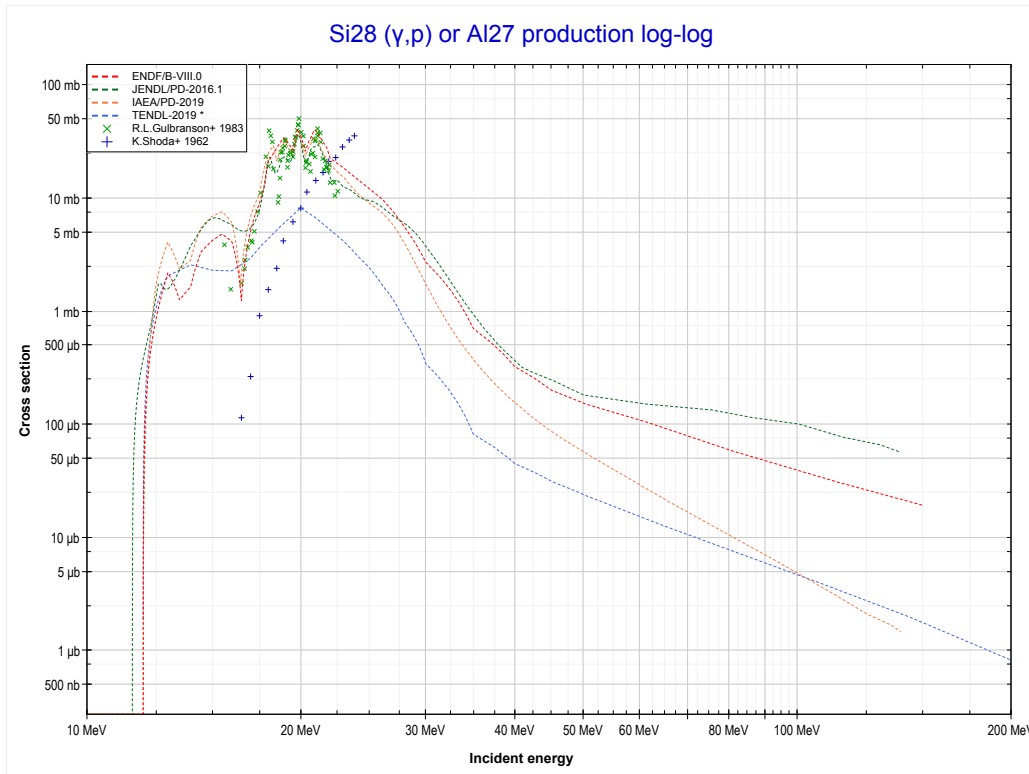
Reaction	Q-Value
Si28(γ,p)Al27	-11584.90 keV

<< 14-Si-28	**14-Si-29**	15-P-31 >>
<< 14-Si-28 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Si28 production)**	15-P-31 MT4 (γ,n) >>

Si29 (γ,n) or Si28 production log-log

Si29 (γ,n) or Si28 production lin-log
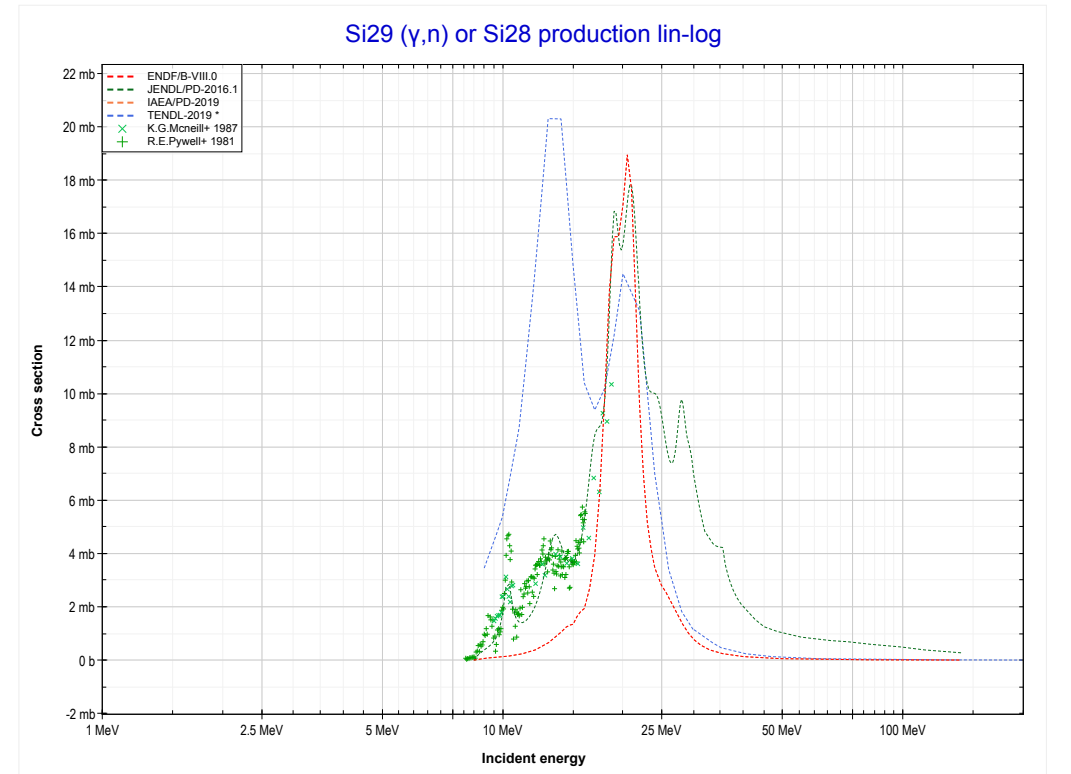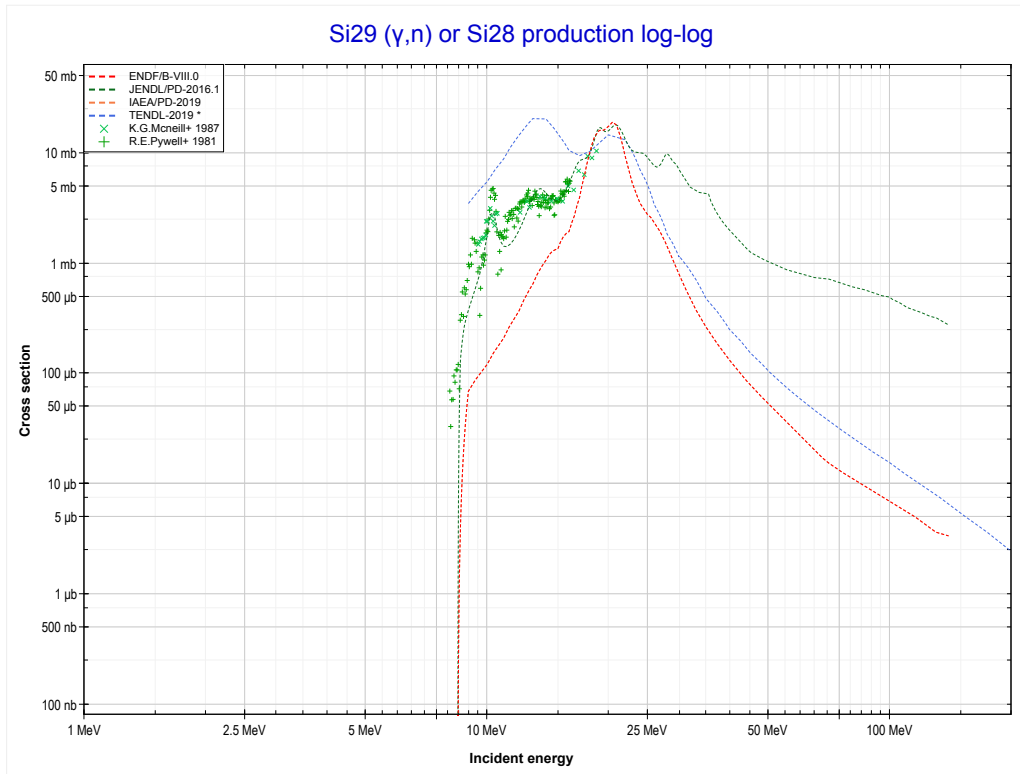
Reaction	Q-Value
Si29(γ,n)Si28	-8473.60 keV

<< 14-Si-29	**15-P-31**	16-S-32 >>
<< 14-Si-29 MT4 (γ,n)	**MT4 (γ,n) or MT5 (P30 production)**	MT16 (γ,2n) >>

P31 (γ,n) or P30 production log-log

P31 (γ,n) or P30 production lin-log
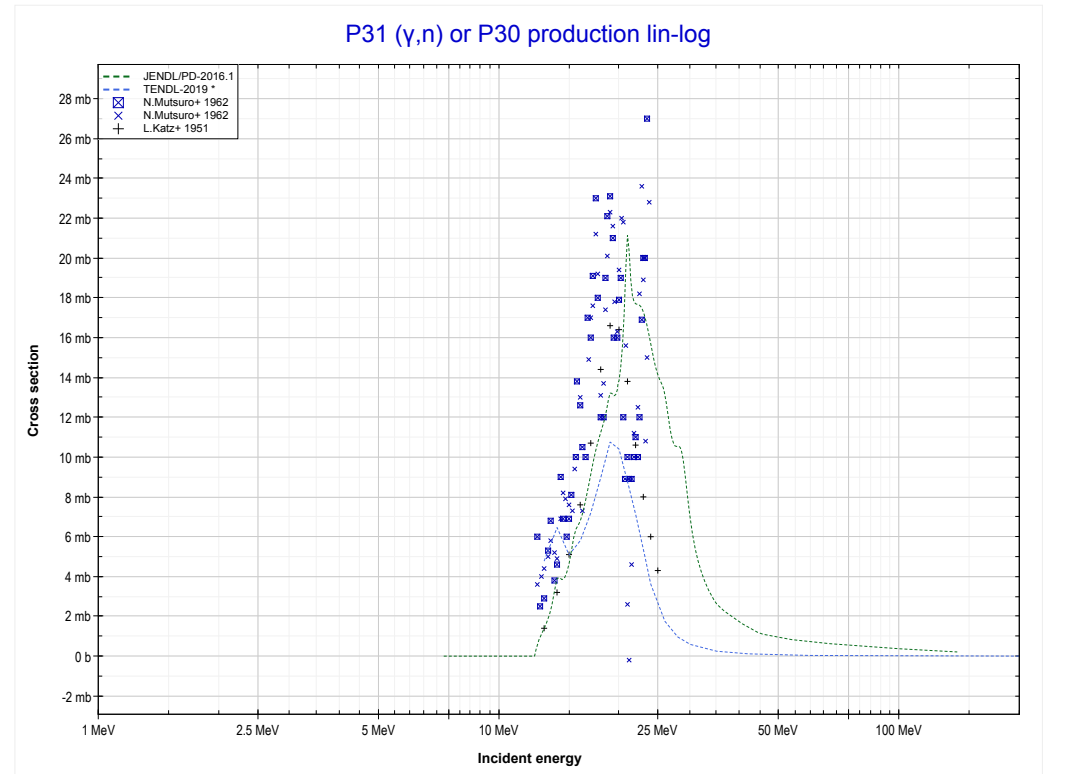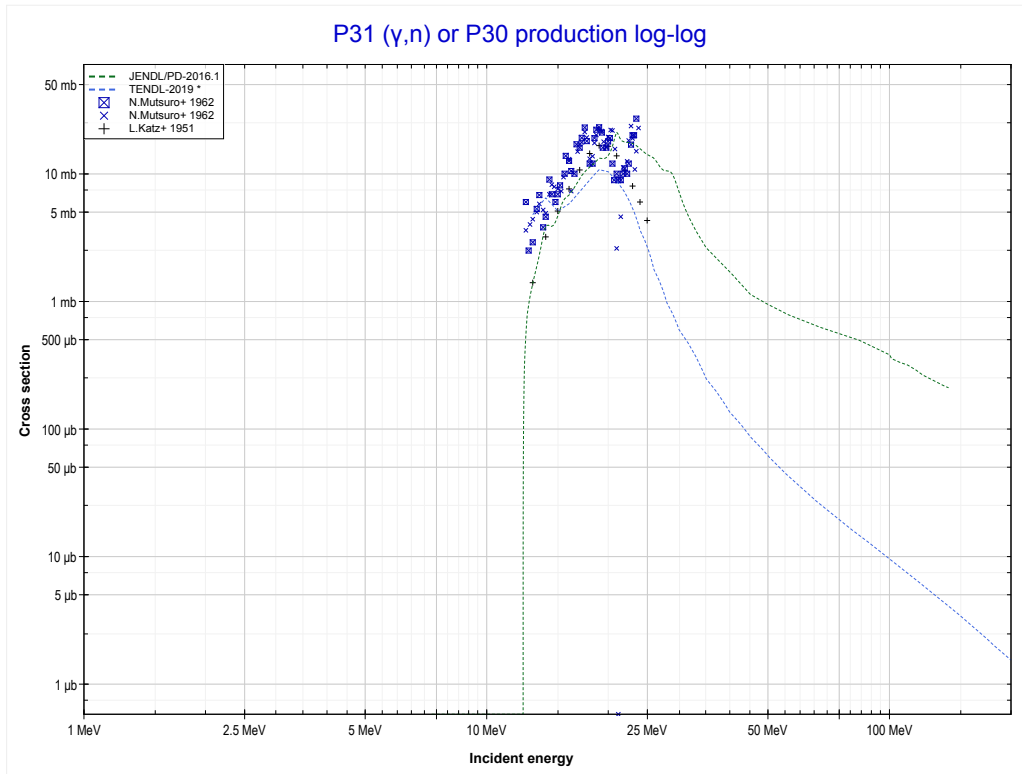
Reaction	Q-Value
P31(γ,n)P30	-12311.01 keV

<< 12-Mg-26	15-P-31	16-S-32 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (P29 production)**	MT28 (γ,n+p) >>

P31 (γ,2n) or P29 production log-log

P31 (γ,2n) or P29 production lin-log
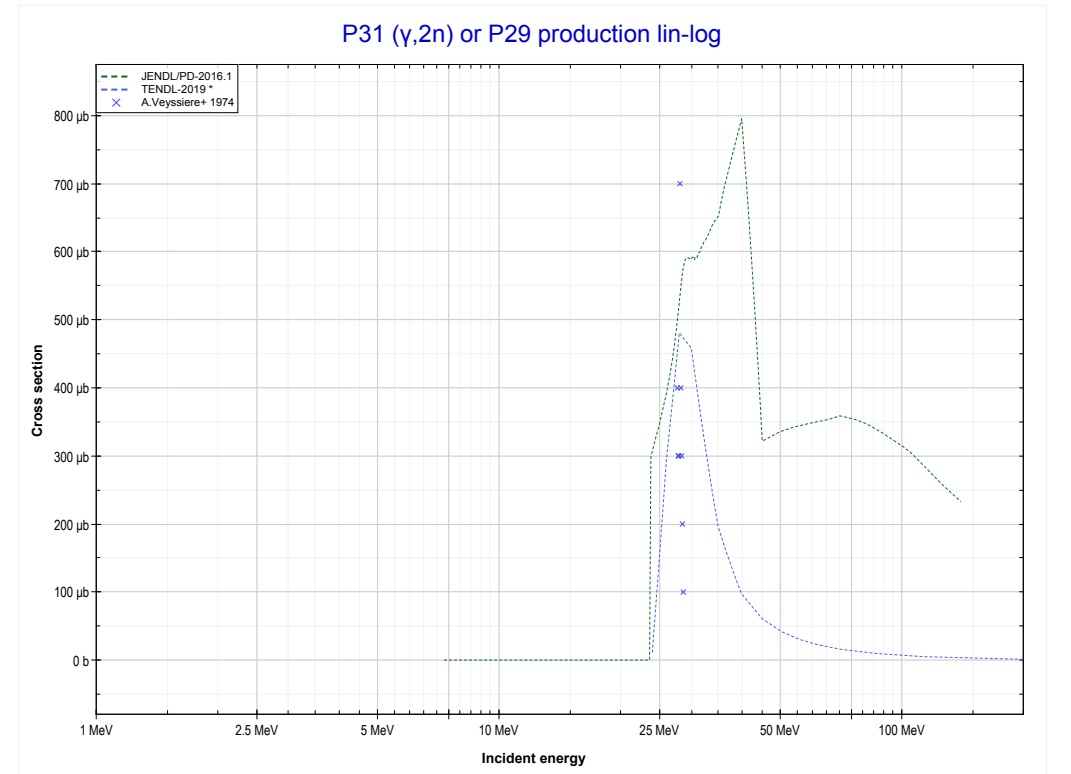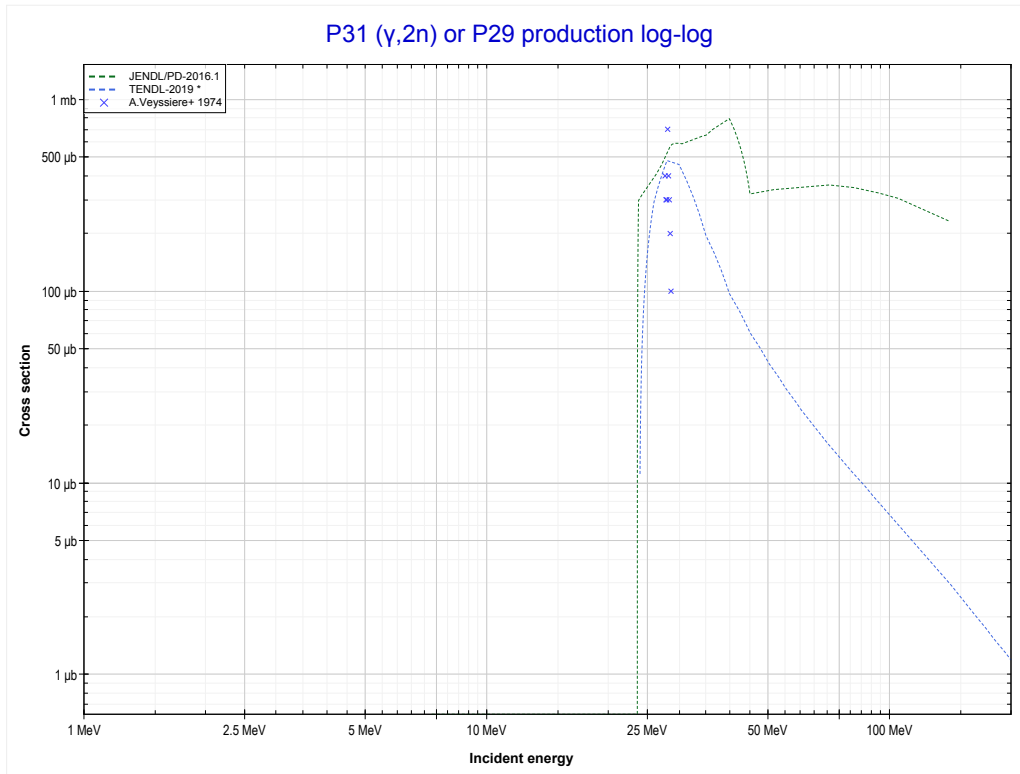
Reaction	Q-Value
P31(γ,2n)P29	-23630.38 keV

<< 10-Ne-20	**15-P-31**	16-S-32 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Si29 production)**	MT193 (γ,³He+α) >>

P31 (γ,n+p) or Si29 production log-log

P31 (γ,n+p) or Si29 production lin-log
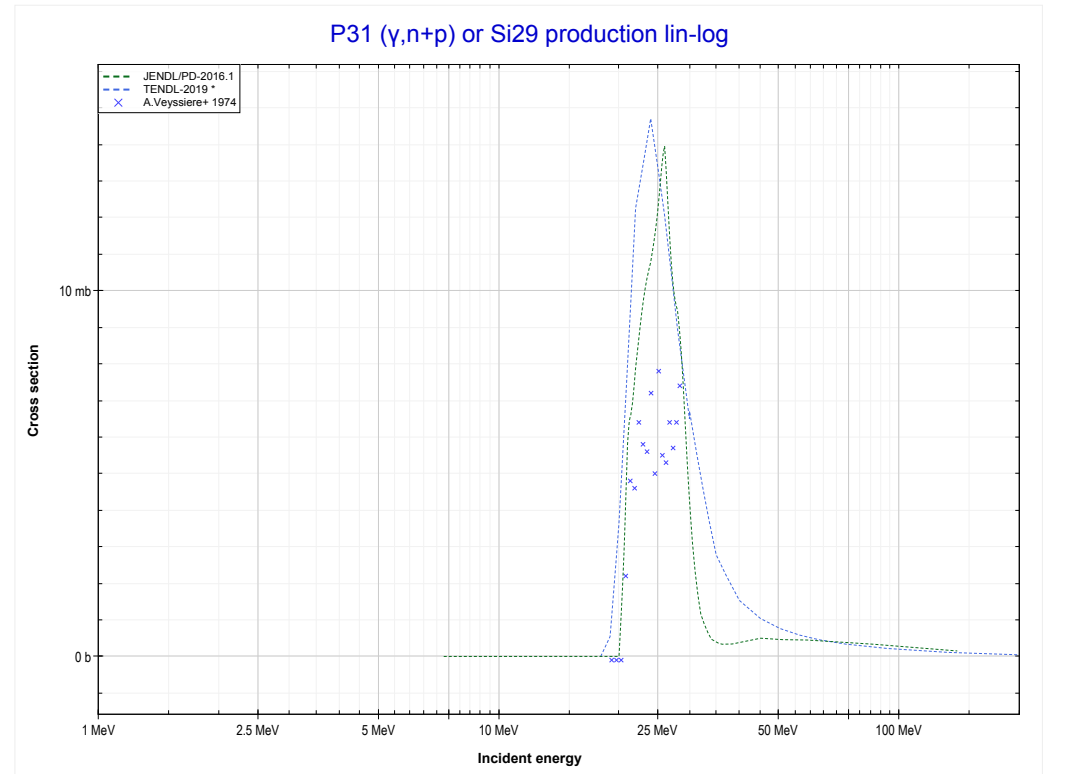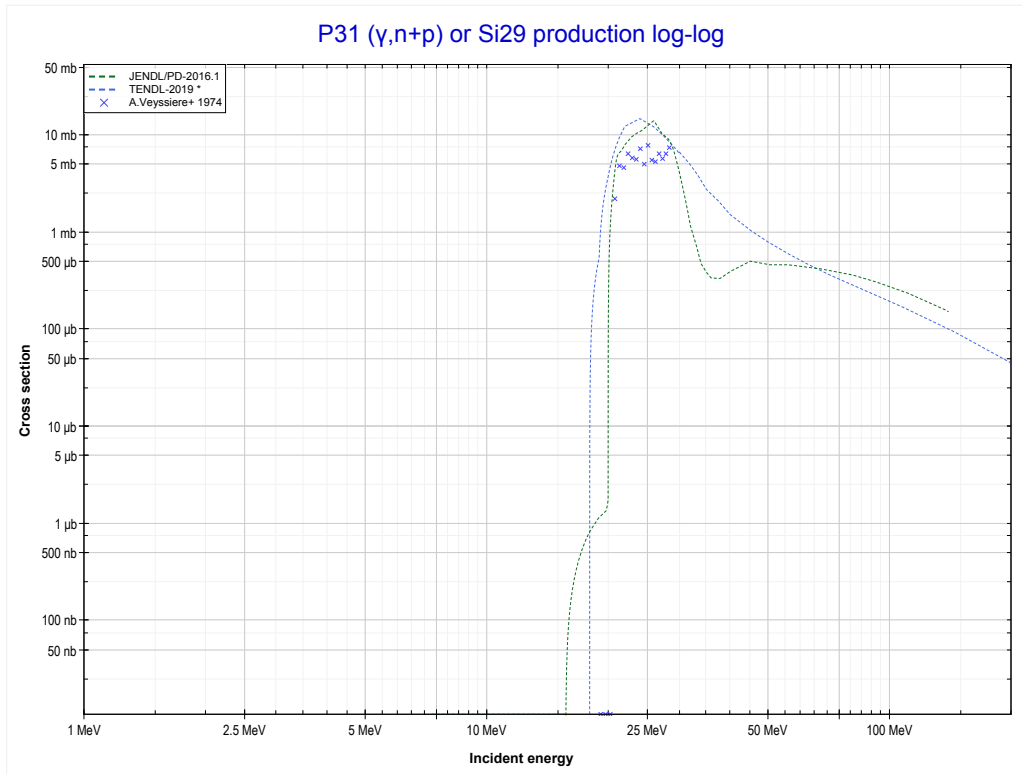
Reaction	Q-Value
P31(γ,d)Si29	-15681.18 keV
P31(γ,n+p)Si29	-17905.75 keV

	15-P-31	
<< MT28 (γ,n+p)	**MT193 (γ,³He+α) or MT5 (Na24 production)**	16-S-32 MT4 (γ,n) >>

P31 (γ,³He+α) or Na24 production log-log

P31 (γ,³He+α) or Na24 production lin-log
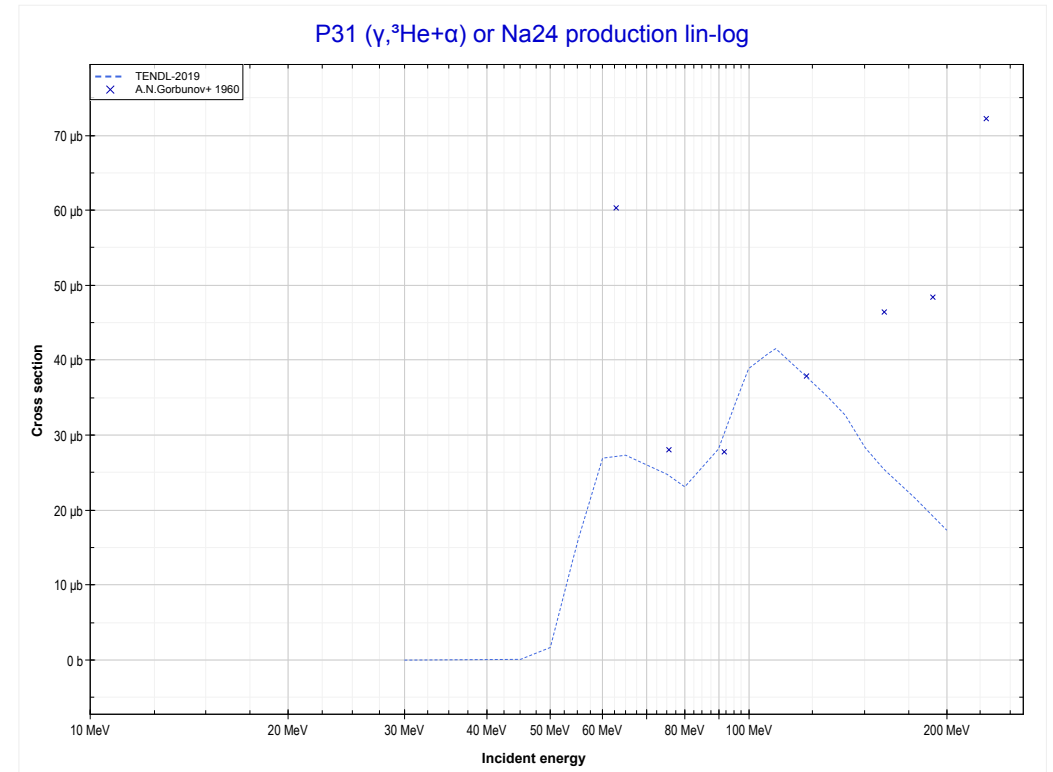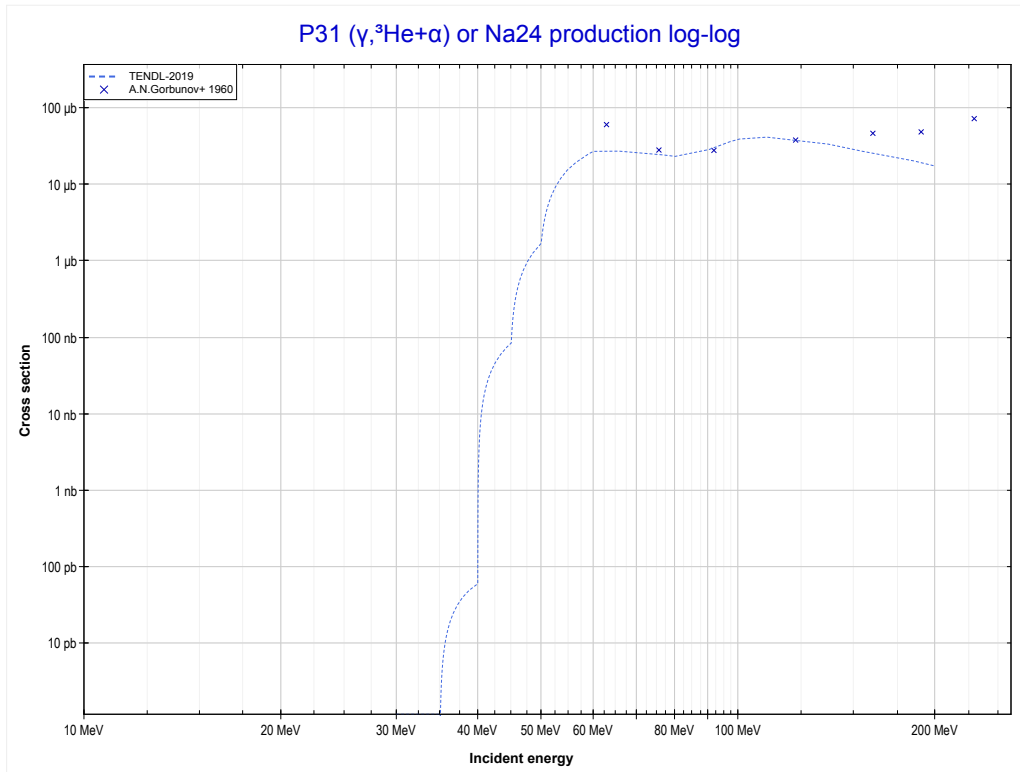
Reaction	Q-Value	Reaction	Q-Value
P31(γ,He3+α)Na24	-33378.77 keV	P31(γ,n+3p+t)Na24	-60910.68 keV
P31(γ,p+d+α)Na24	-38872.25 keV	P31(γ,2n+2p+He3)Na24	-61674.43 keV
P31(γ,n+2p+α)Na24	-41096.81 keV	P31(γ,p+3d)Na24	-62718.78 keV
P31(γ,p+t+He3)Na24	-53192.64 keV	P31(γ,n+2p+2d)Na24	-64943.34 keV
P31(γ,n+2He3)Na24	-53956.39 keV	P31(γ,2n+3p+d)Na24	-67167.91 keV
P31(γ,2d+He3)Na24	-57225.30 keV	P31(γ,3n+4p)Na24	-69392.47 keV
P31(γ,2p+d+t)Na24	-58686.11 keV		
P31(γ,n+p+d+He3)Na24	-59449.87 keV		

<< 15-P-31	**16-S-32**	17-Cl-35 >>
<< 15-P-31 MT193 (γ,³He+α)	**MT4 (γ,n) or MT5 (S31 production)**	MT16 (γ,2n) >>

S32 (γ,n) or S31 production log-log

S32 (γ,n) or S31 production lin-log
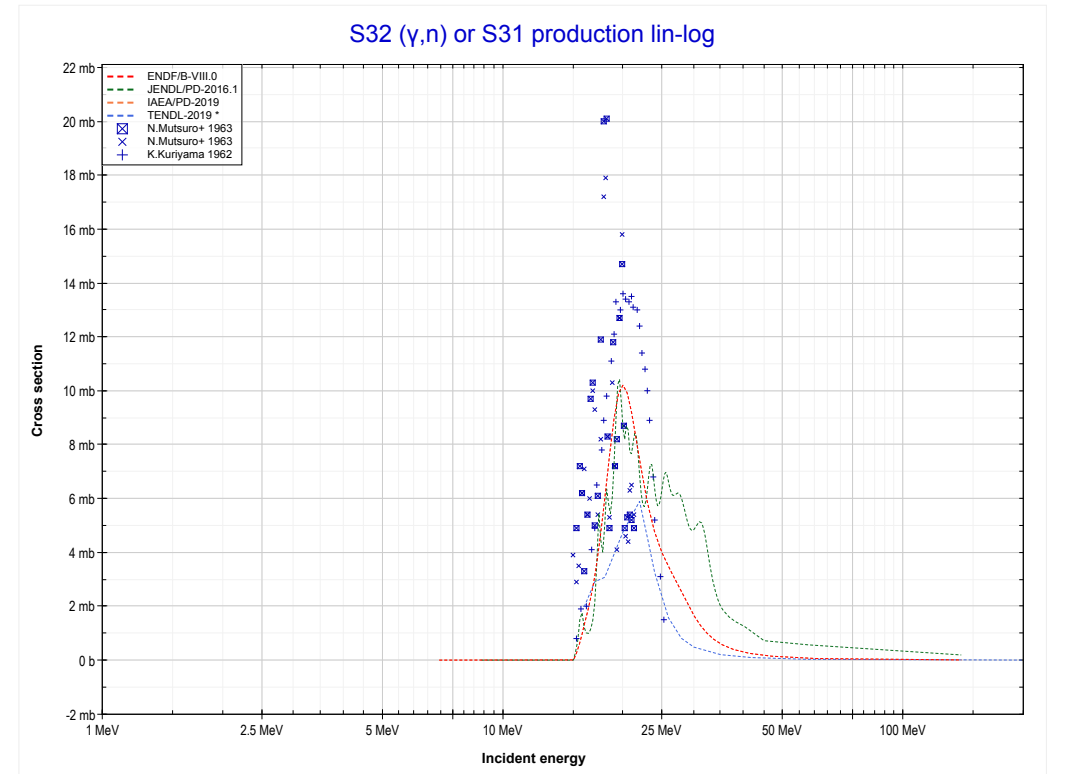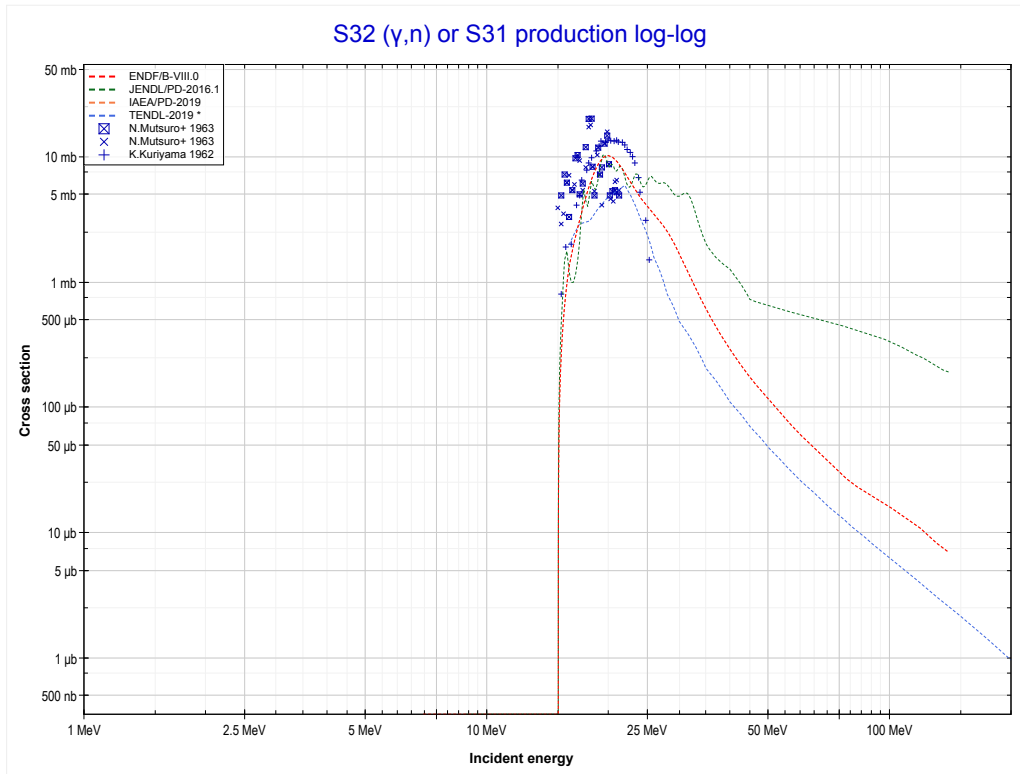
Reaction	Q-Value
S32(γ,n)S31	-15044.33 keV

<< 15-P-31	**16-S-32**	16-S-34 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (S30 production)**	MT28 (γ,n+p) >>

S32 (γ,2n) or S30 production log-log

S32 (γ,2n) or S30 production lin-log
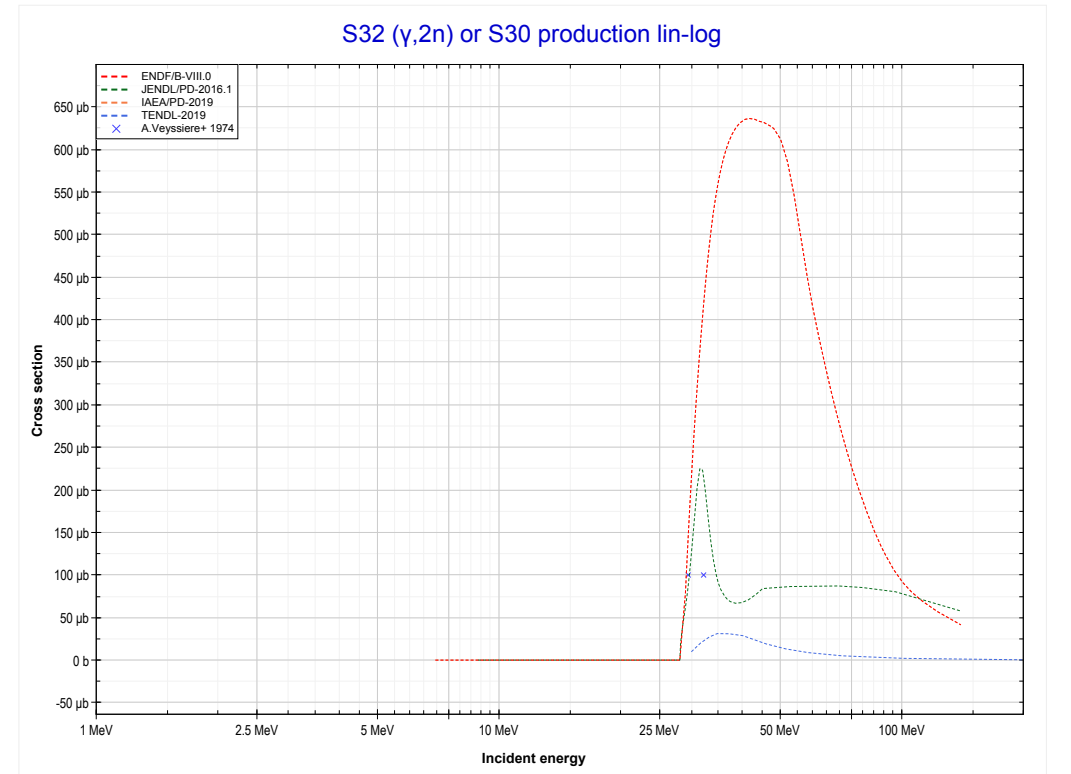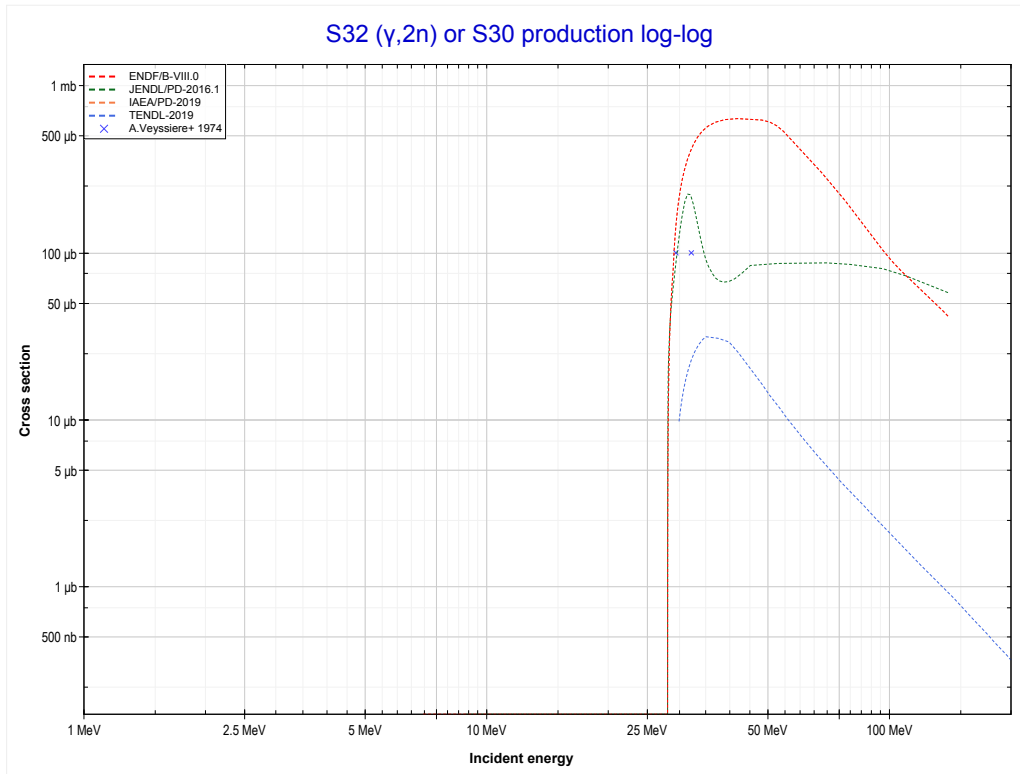
Reaction	Q-Value
S32(γ,2n)S30	-28098.92 keV

<< 15-P-31	**16-S-32**	16-S-34 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (P30 production)**	MT103 (γ,p) >>

S32 (γ,n+p) or P30 production log-log

S32 (γ,n+p) or P30 production lin-log
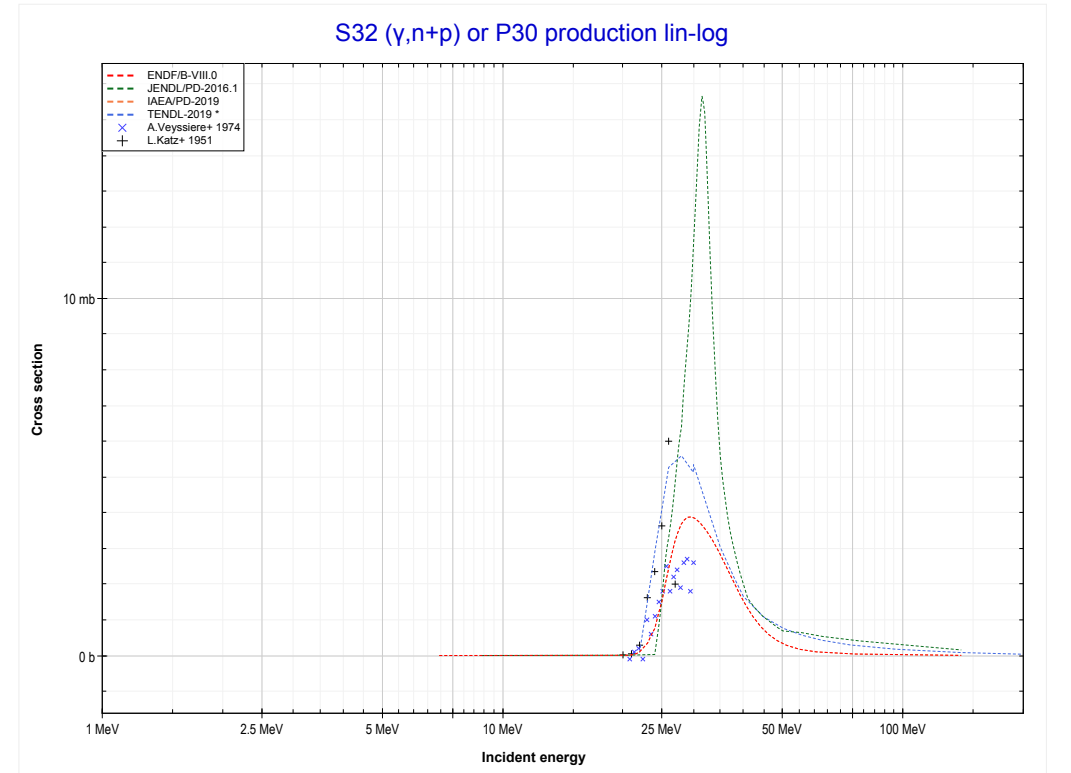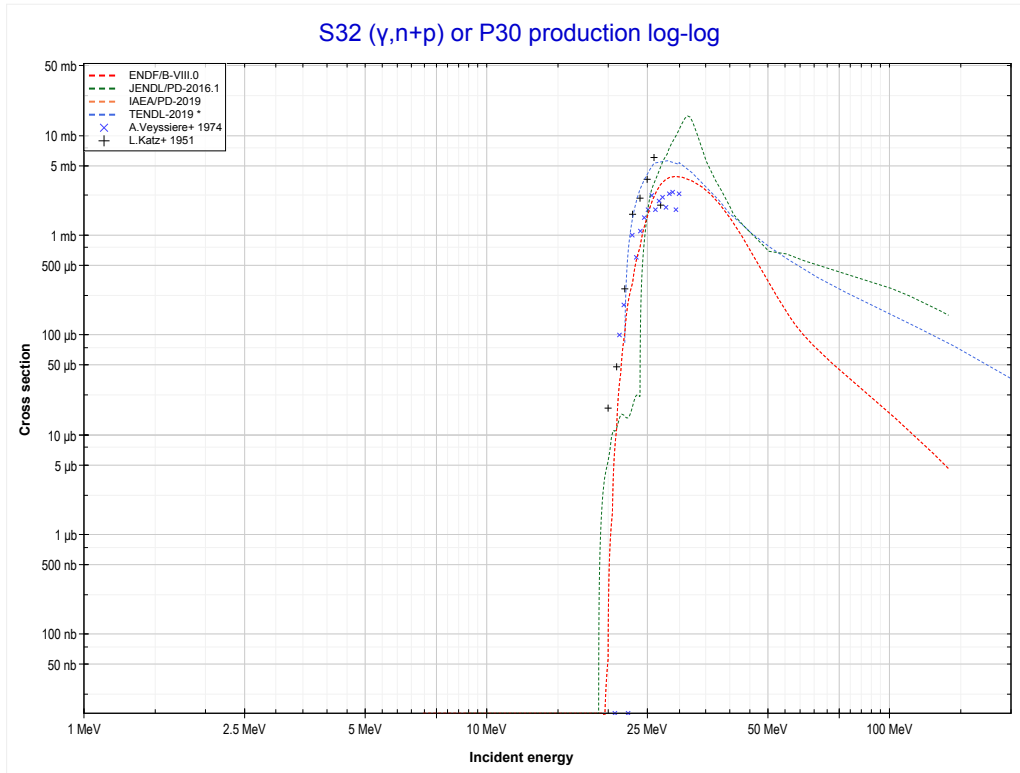
Reaction	Q-Value
S32(γ,d)P30	-18950.41 keV
S32(γ,n+p)P30	-21174.97 keV

<< 14-Si-28	**16-S-32**	16-S-34 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (P31 production)**	16-S-34 MT16 (γ,2n) >>

S32 (γ,p) or P31 production log-log

Legend: ENDF/B-VIII.0, JENDL/PD-2016.1, IAEA/PD-2019, TENDL-2019 *, K.Shoda+ 1962

S32 (γ,p) or P31 production lin-log

Legend: ENDF/B-VIII.0, JENDL/PD-2016.1, IAEA/PD-2019, TENDL-2019 *, K.Shoda+ 1962
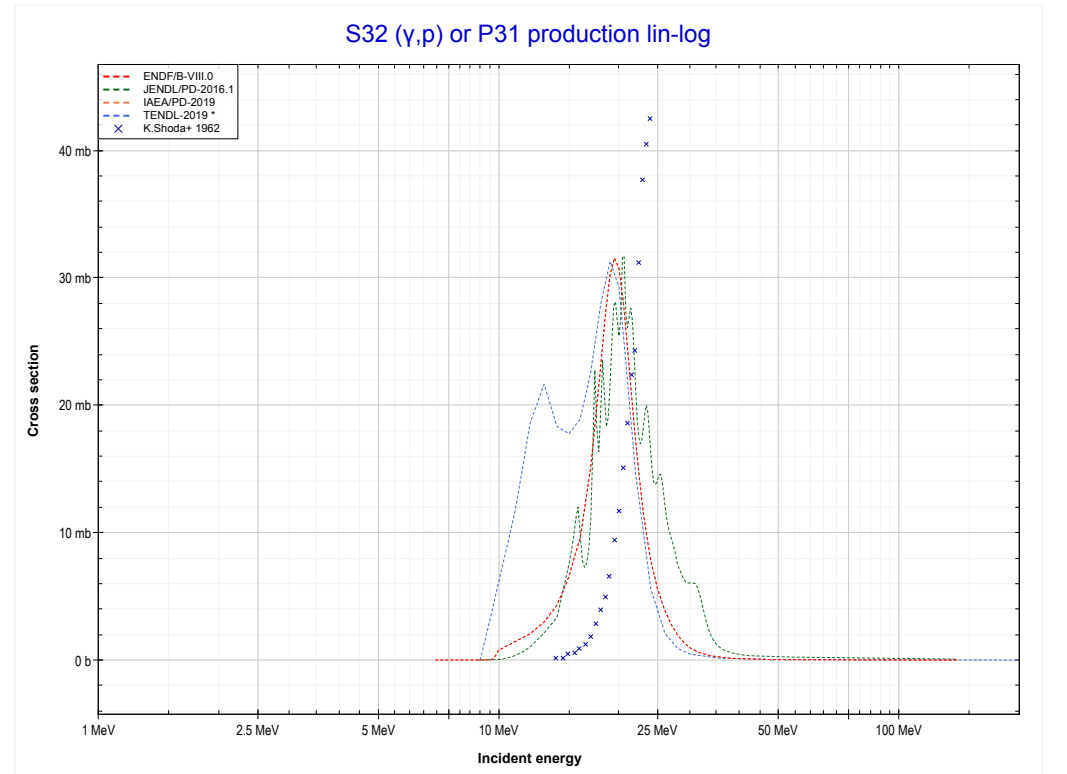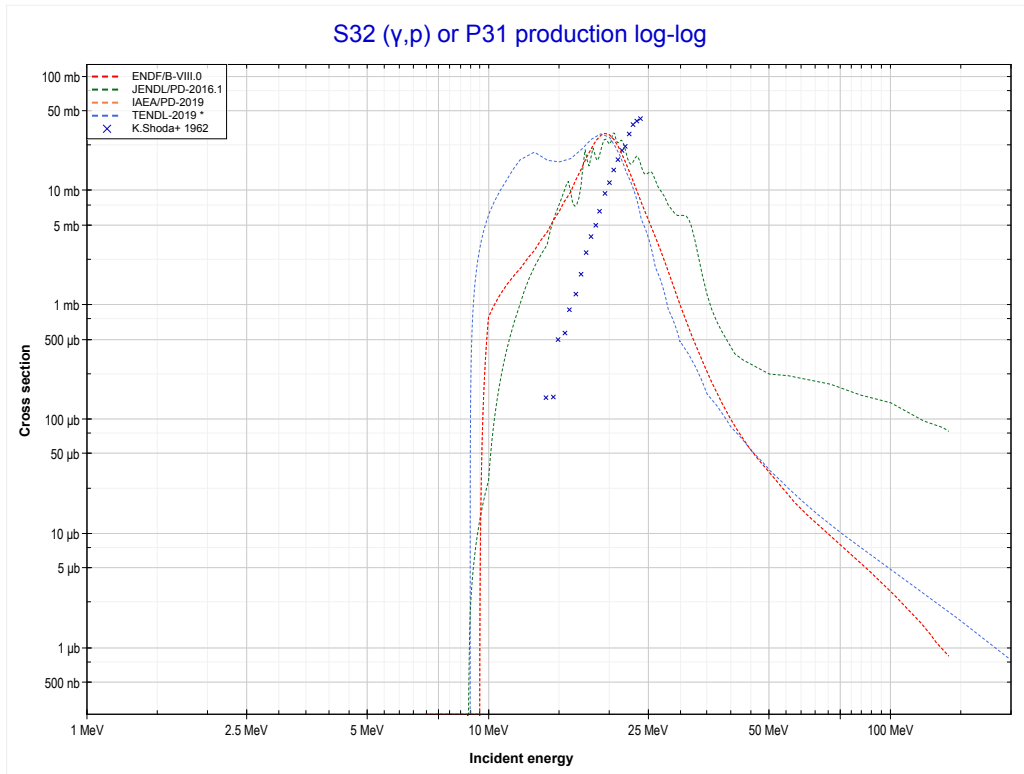
Reaction	Q-Value
S32(γ,p)P31	-8863.96 keV

<< 16-S-32	**16-S-34**	20-Ca-48 >>
<< 16-S-32 MT103 (γ,p)	**MT16 (γ,2n) or MT5 (S32 production)**	MT28 (γ,n+p) >>

S34 (γ,2n) or S32 production log-log

S34 (γ,2n) or S32 production lin-log
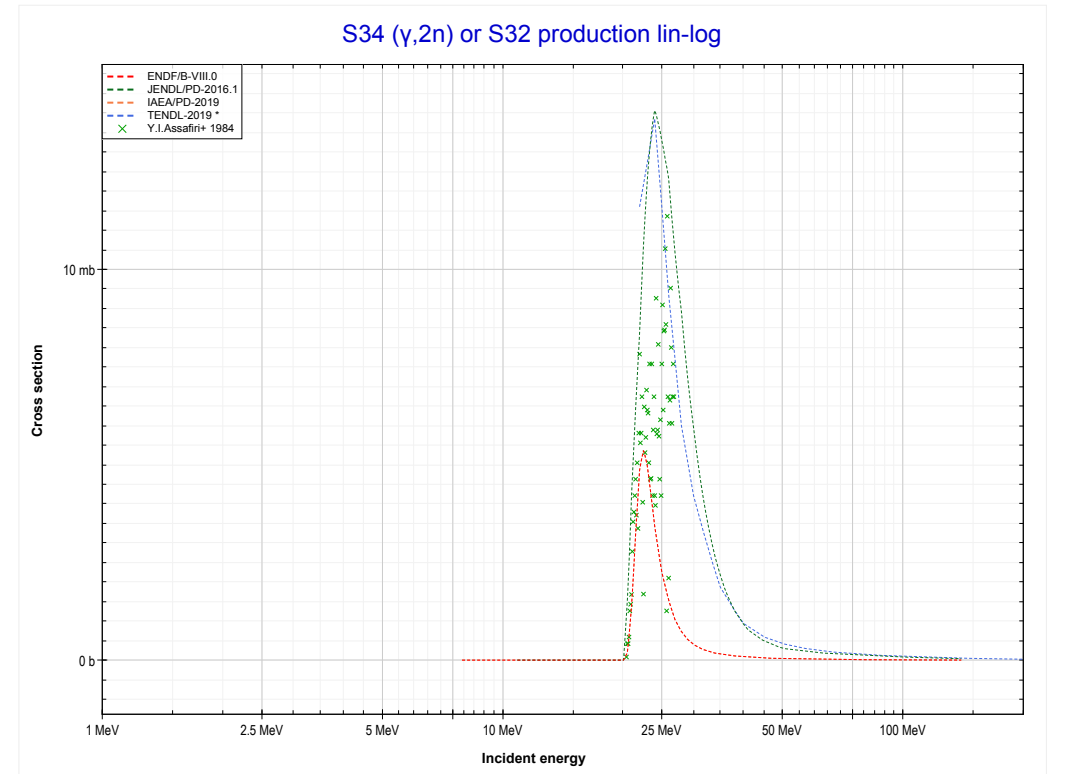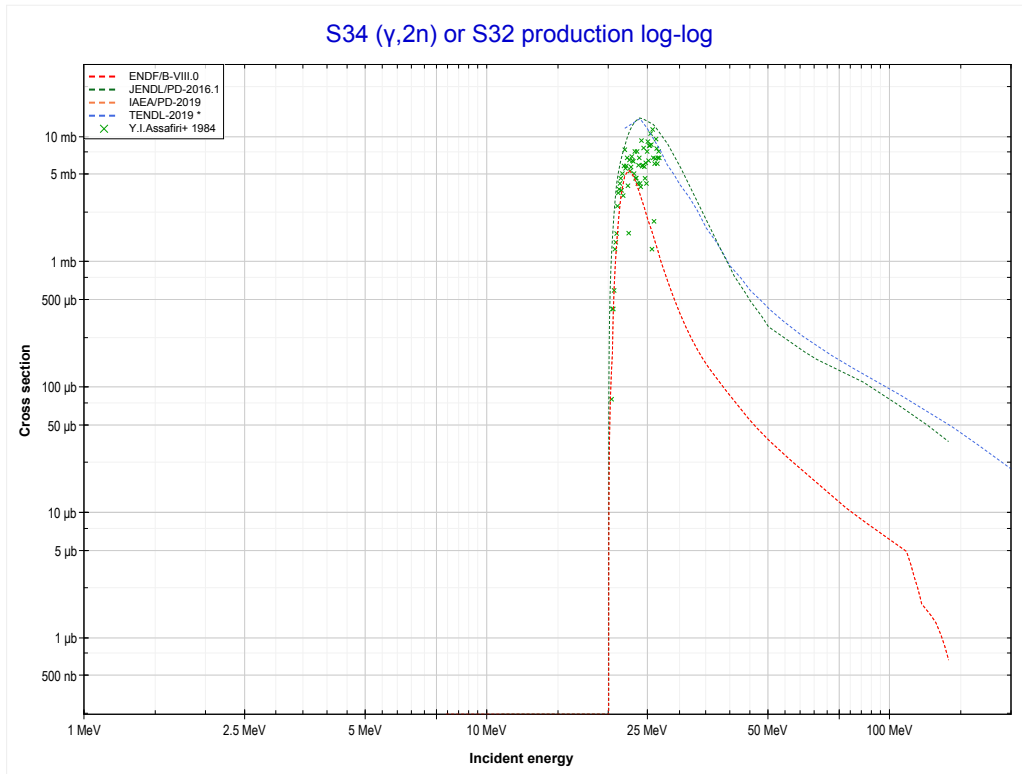
Reaction	Q-Value
S34(γ,2n)S32	-20058.79 keV

<< 16-S-32	**16-S-34**	22-Ti-46 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (P32 production)**	MT103 (γ,p) >>

S34 (γ,n+p) or P32 production log-log

S34 (γ,n+p) or P32 production lin-log
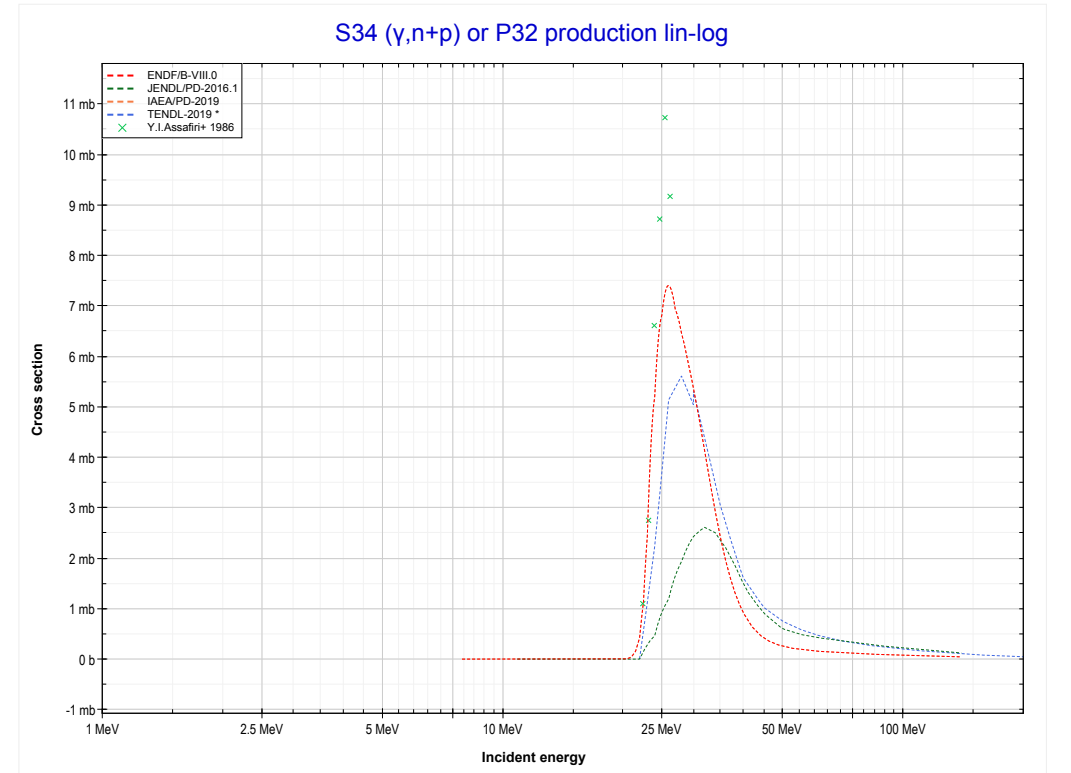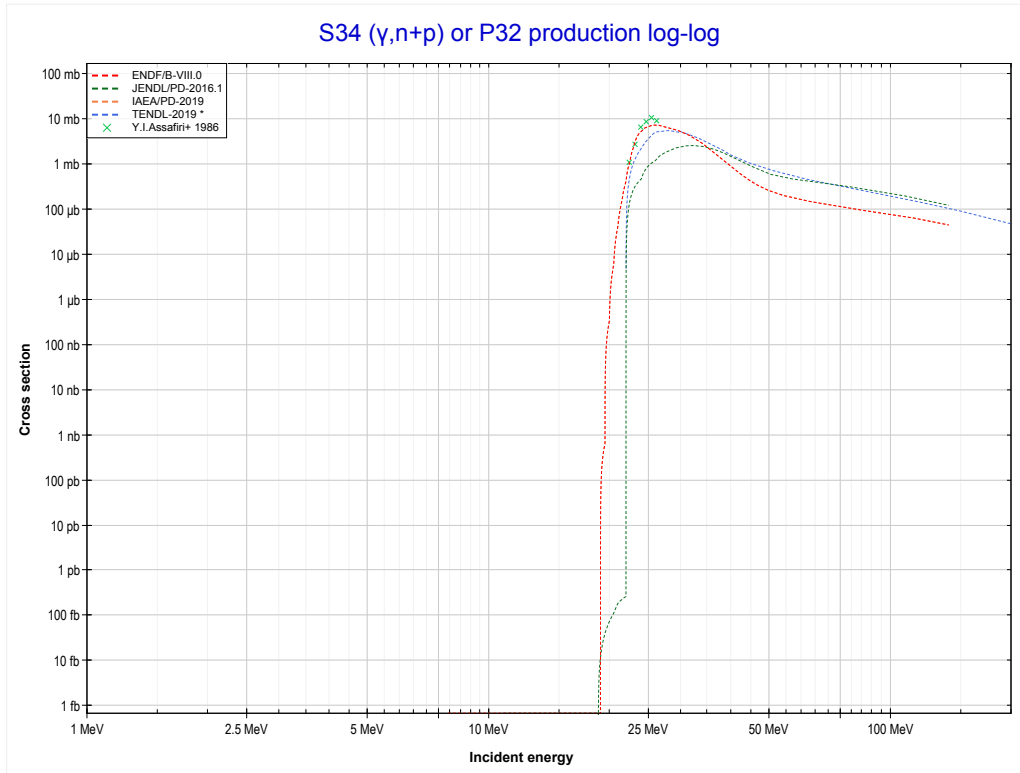
Reaction	Q-Value
S34(γ,d)P32	-18762.54 keV
S34(γ,n+p)P32	-20987.11 keV

<< 16-S-32	**16-S-34**	22-Ti-50 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (P33 production)**	17-Cl-35 MT4 (γ,n) >>

S34 (γ,p) or P33 production log-log

S34 (γ,p) or P33 production lin-log
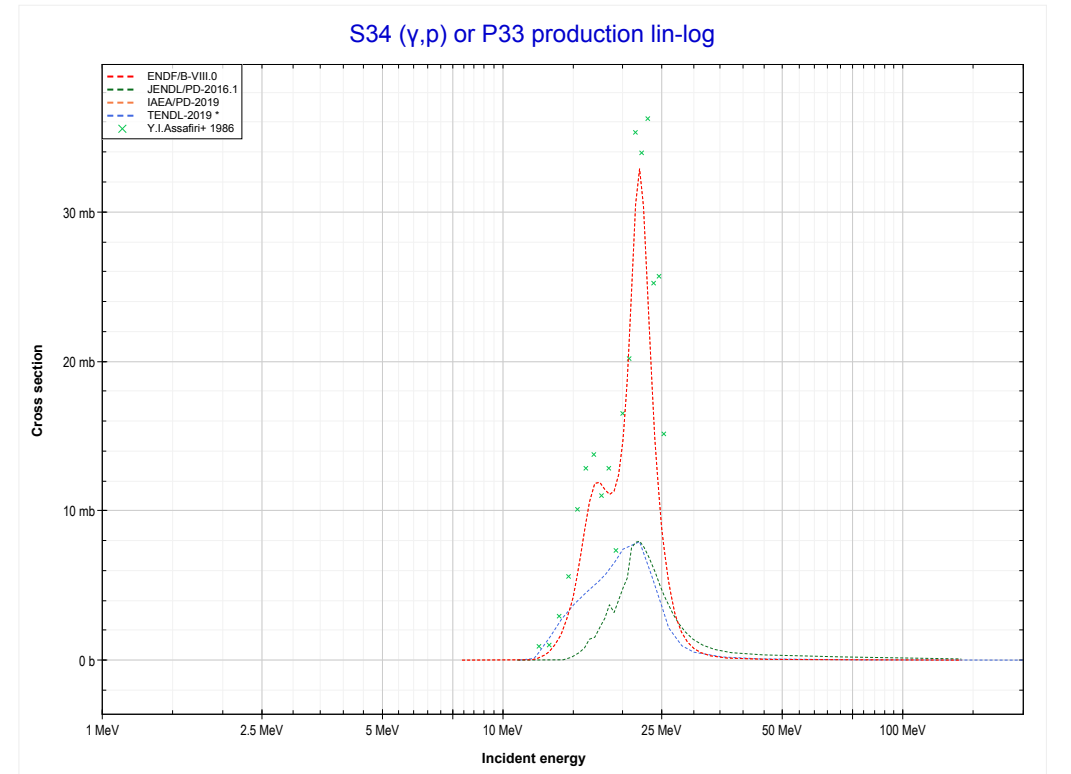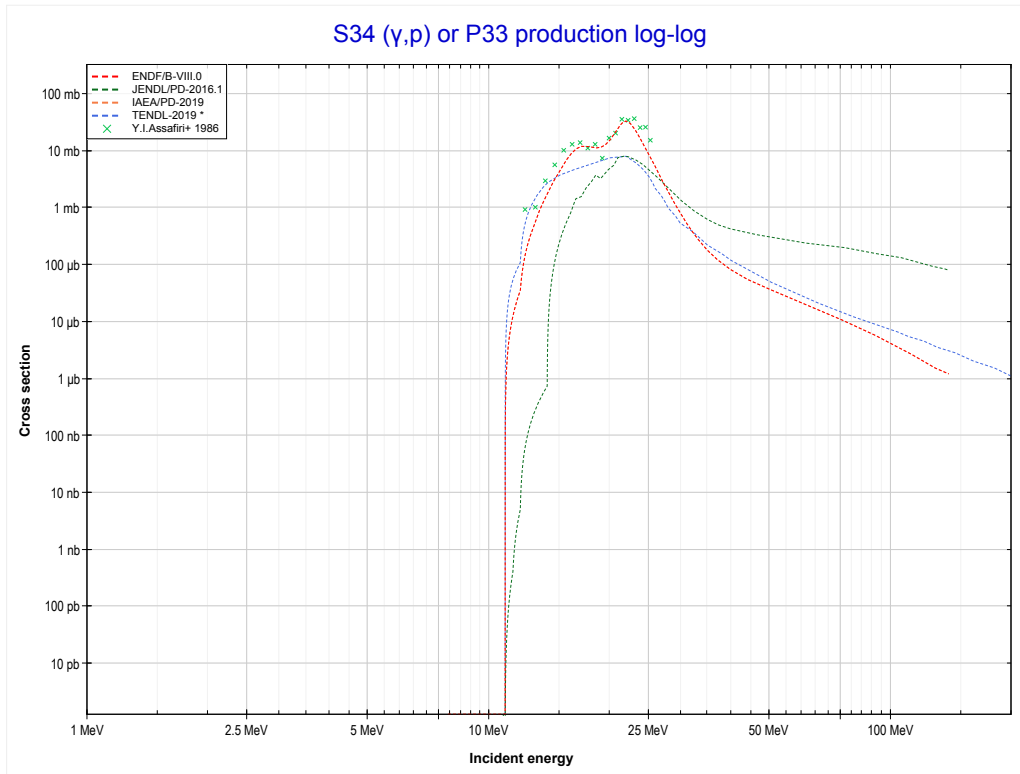
Reaction	Q-Value
S34(γ,p)P33	-10883.36 keV

<< 16-S-32	**17-Cl-35**	19-K-39 >>
<< 16-S-34 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Cl34 production)**	19-K-39 MT4 (γ,n) >>

Cl35 (γ,n) or Cl34 production log-log

Cl35 (γ,n) or Cl34 production lin-log
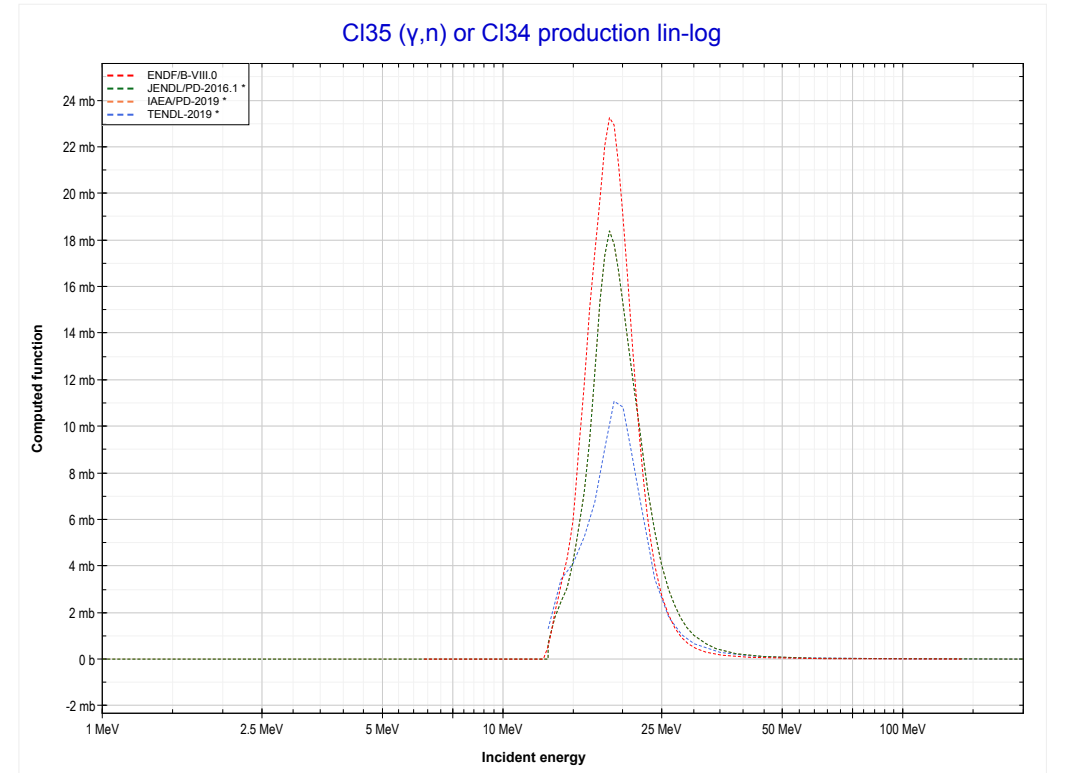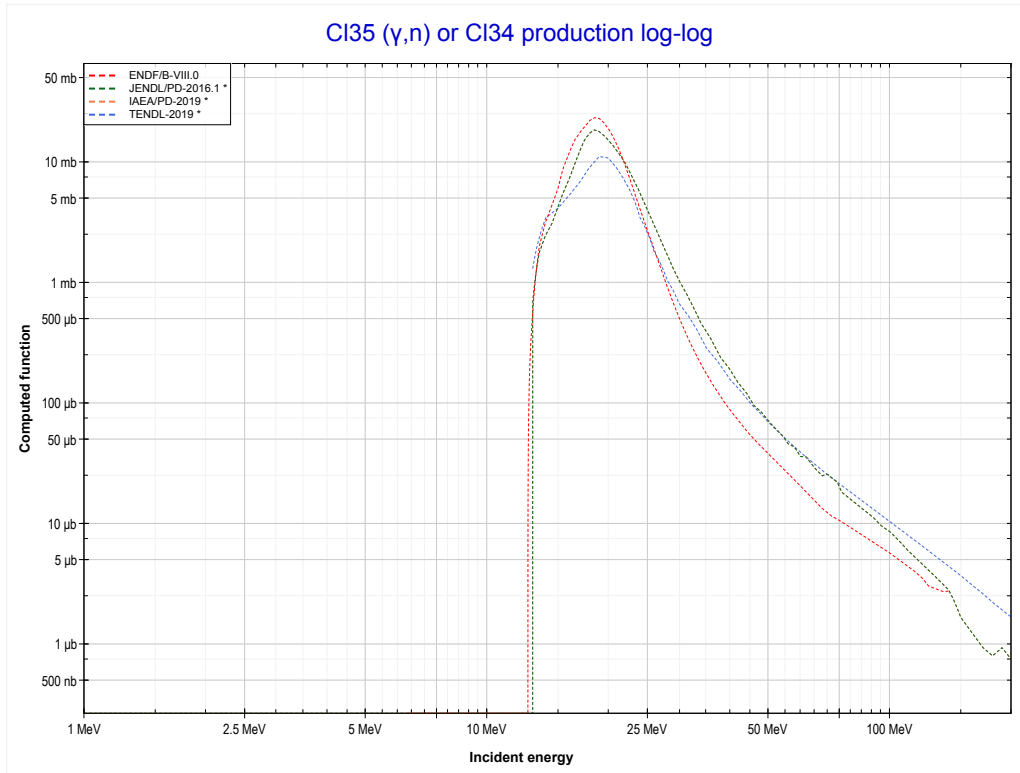
Reaction	Q-Value
Cl35(γ,n)Cl34	-12644.77 keV

<< 17-Cl-35	**19-K-39**	20-Ca-48 >>
<< 17-Cl-35 MT4 (γ,n)	**MT4 (γ,n) or MT5 (K38 production)**	20-Ca-48 MT4 (γ,n) >>

K39 (γ,n) or K38 production log-log

K39 (γ,n) or K38 production lin-log
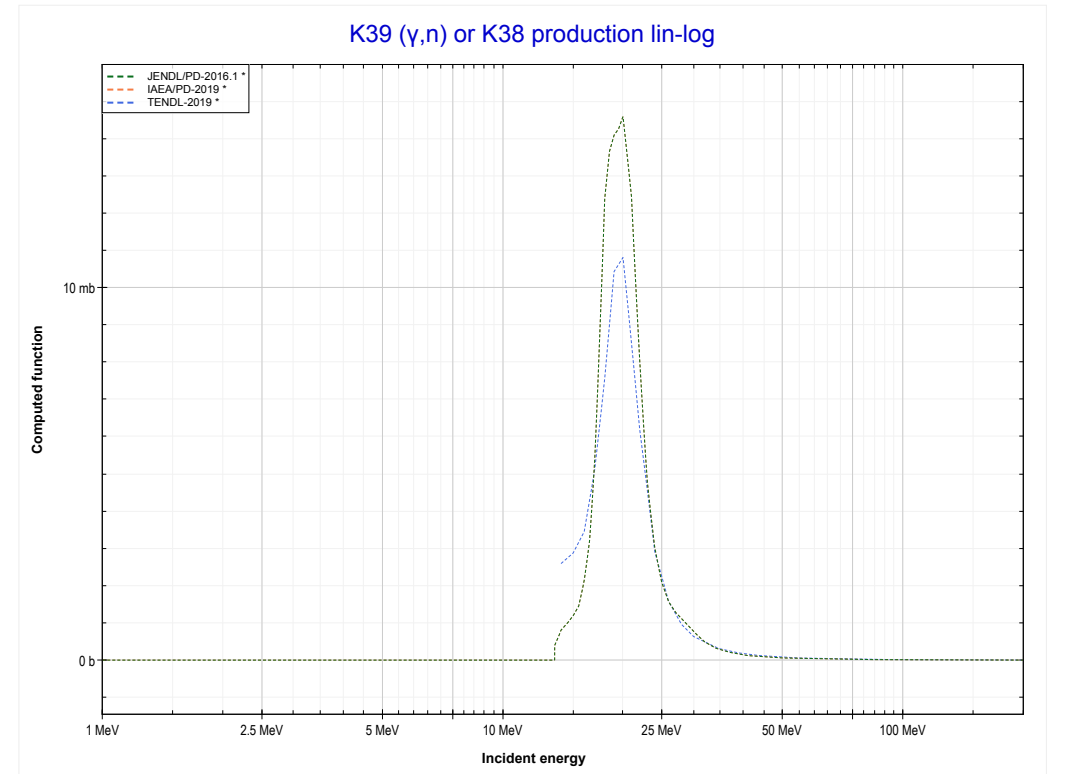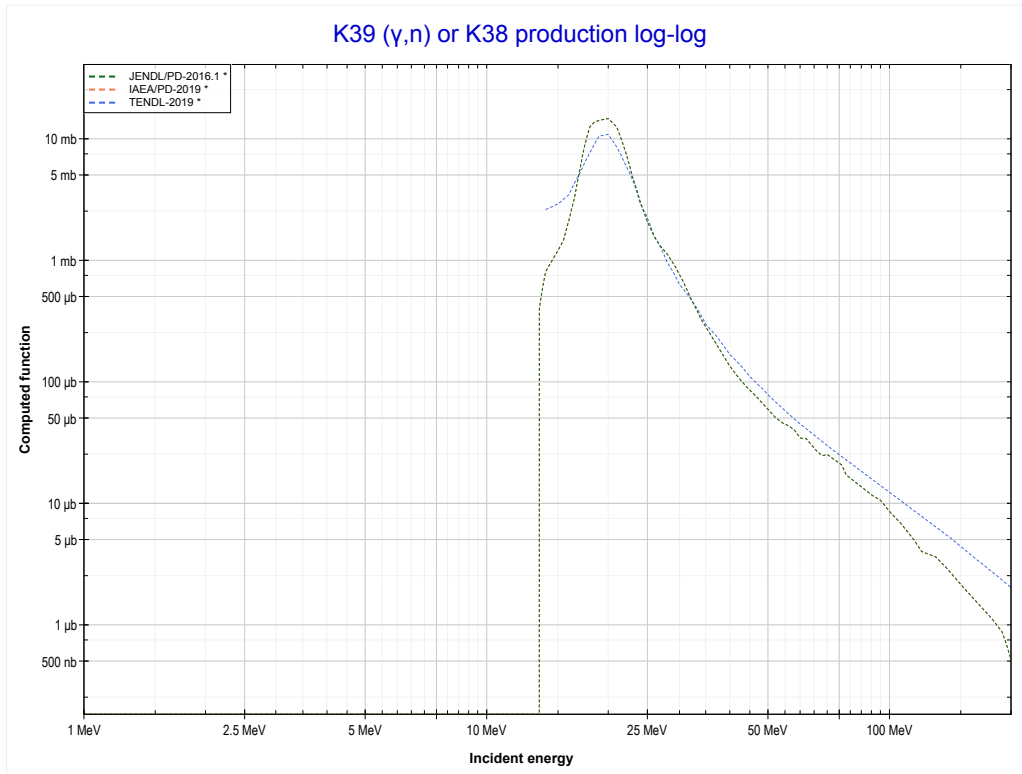
Reaction	Q-Value
K39(γ,n)K38	-13077.76 keV

<< 19-K-39	20-Ca-48	21-Sc-45 >>
<< 19-K-39 MT4 (γ,n)	MT4 (γ,n) or MT5 (Ca47 production)	MT16 (γ,2n) >>

Ca48 (γ,n) or Ca47 production log-log

Ca48 (γ,n) or Ca47 production lin-log
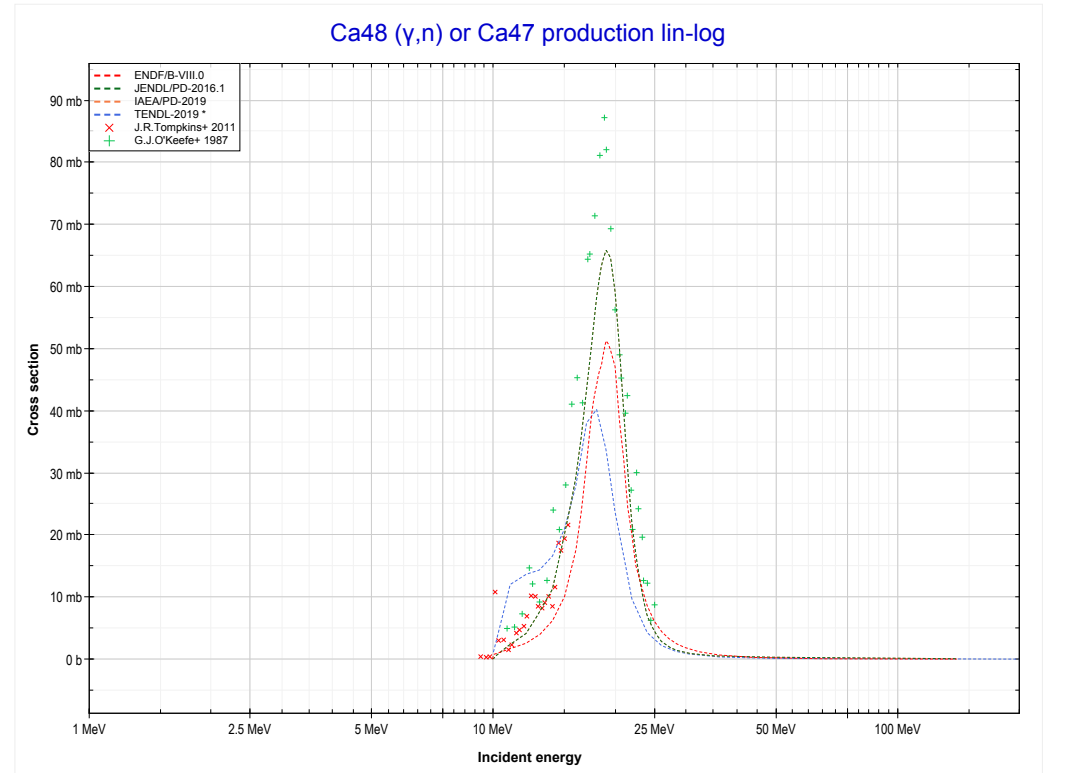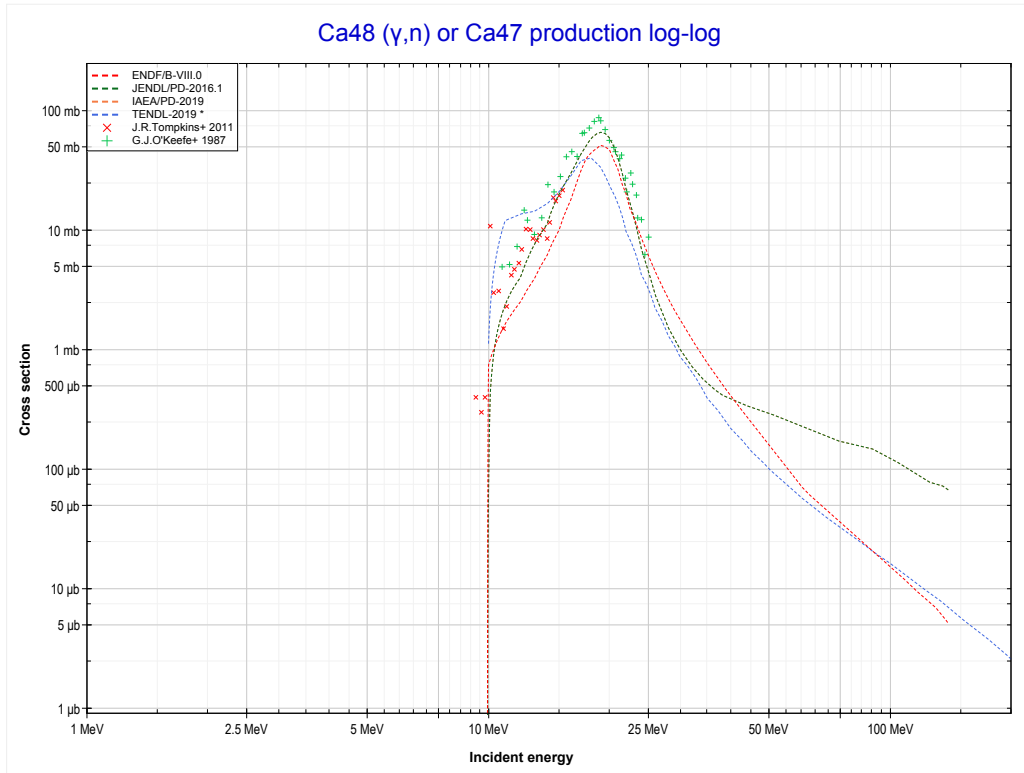
Reaction	Q-Value
Ca48(γ,n)Ca47	-9951.55 keV

<< 16-S-34	**20-Ca-48**	23-V-51 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ca46 production)**	21-Sc-45 MT4 (γ,n) >>

Ca48 (γ,2n) or Ca46 production log-log

Ca48 (γ,2n) or Ca46 production lin-log
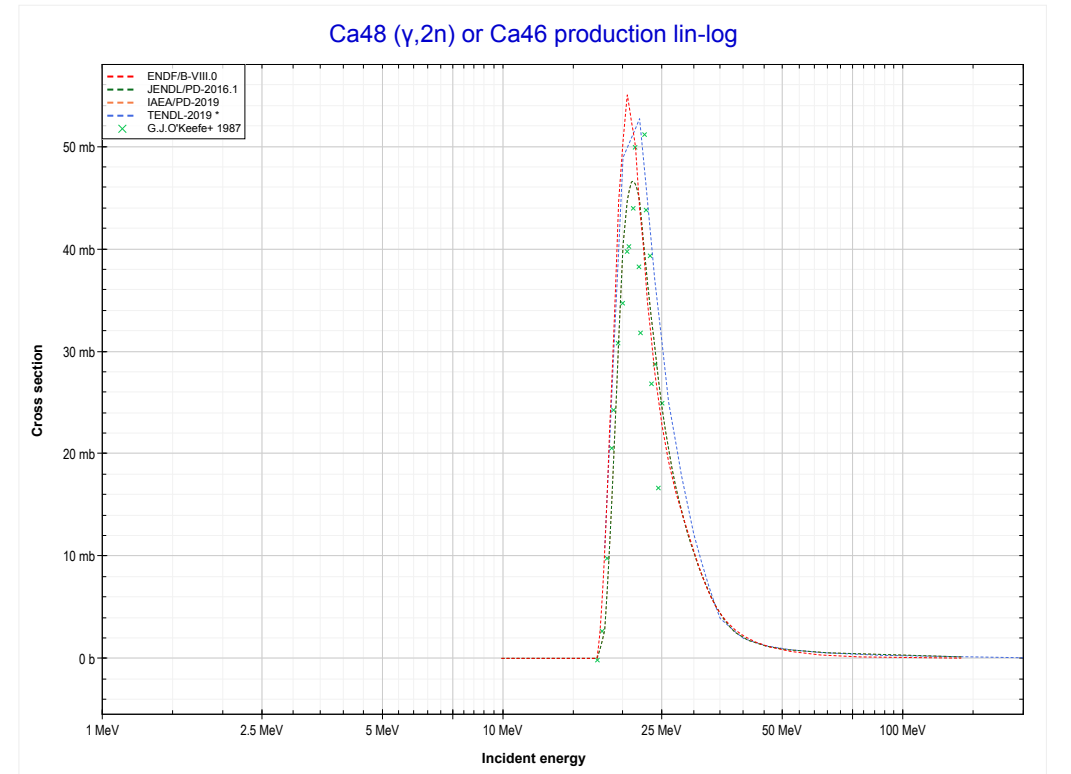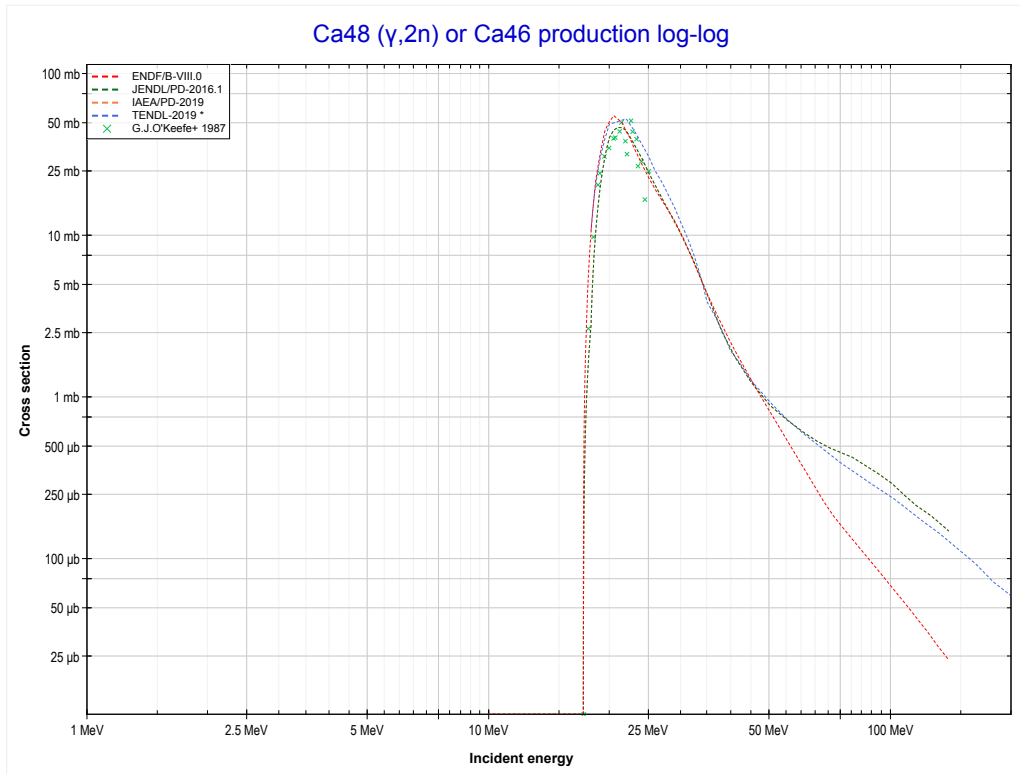
Reaction	Q-Value
Ca48(γ,2n)Ca46	-17227.86 keV

<< 20-Ca-48	**21-Sc-45**	22-Ti-46 >>
<< 20-Ca-48 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sc44 production)**	22-Ti-46 MT4 (γ,n) >>

Sc45 (γ,n) or Sc44 production log-log

Sc45 (γ,n) or Sc44 production lin-log
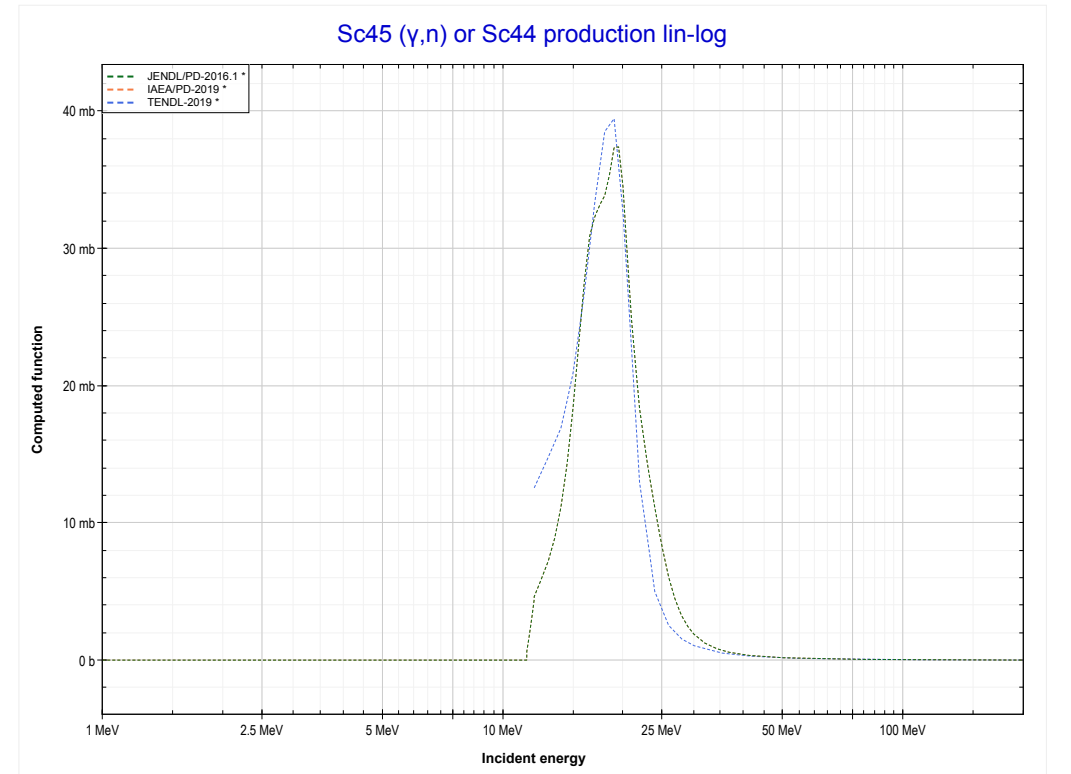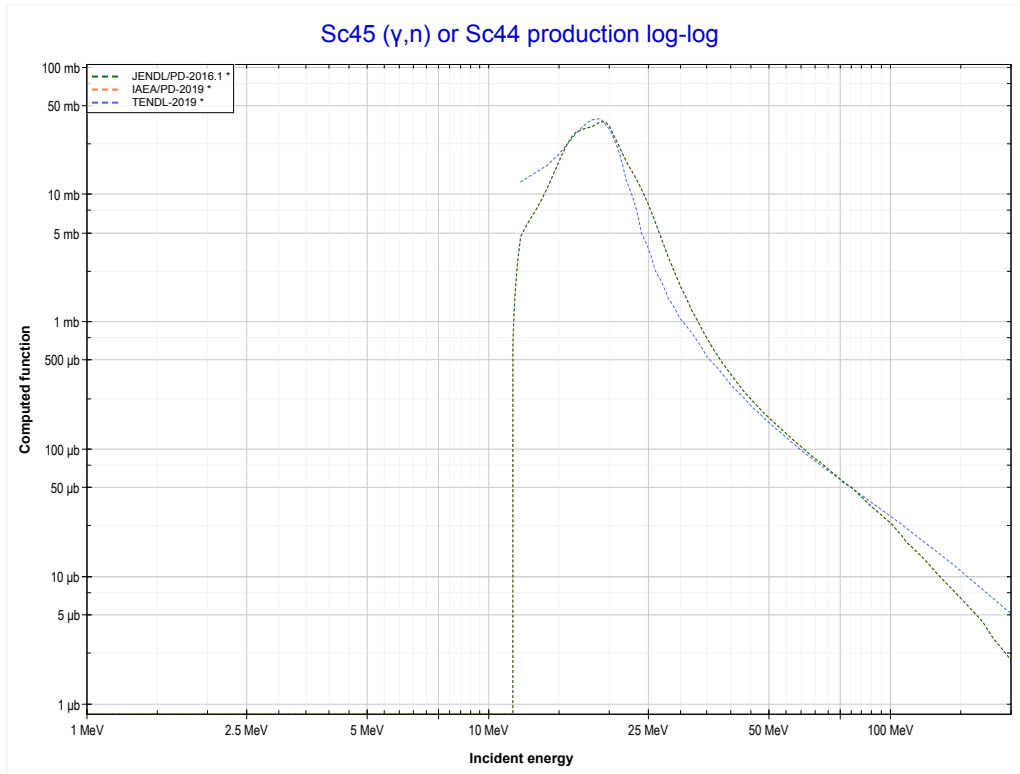
Reaction	Q-Value
Sc45(γ,n)Sc44	-11327.22 keV

<< 21-Sc-45	**22-Ti-46**	24-Cr-50 >>
<< 21-Sc-45 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ti45 production)**	MT28 (γ,n+p) >>

Ti46 (γ,n) or Ti45 production log-log

Ti46 (γ,n) or Ti45 production lin-log
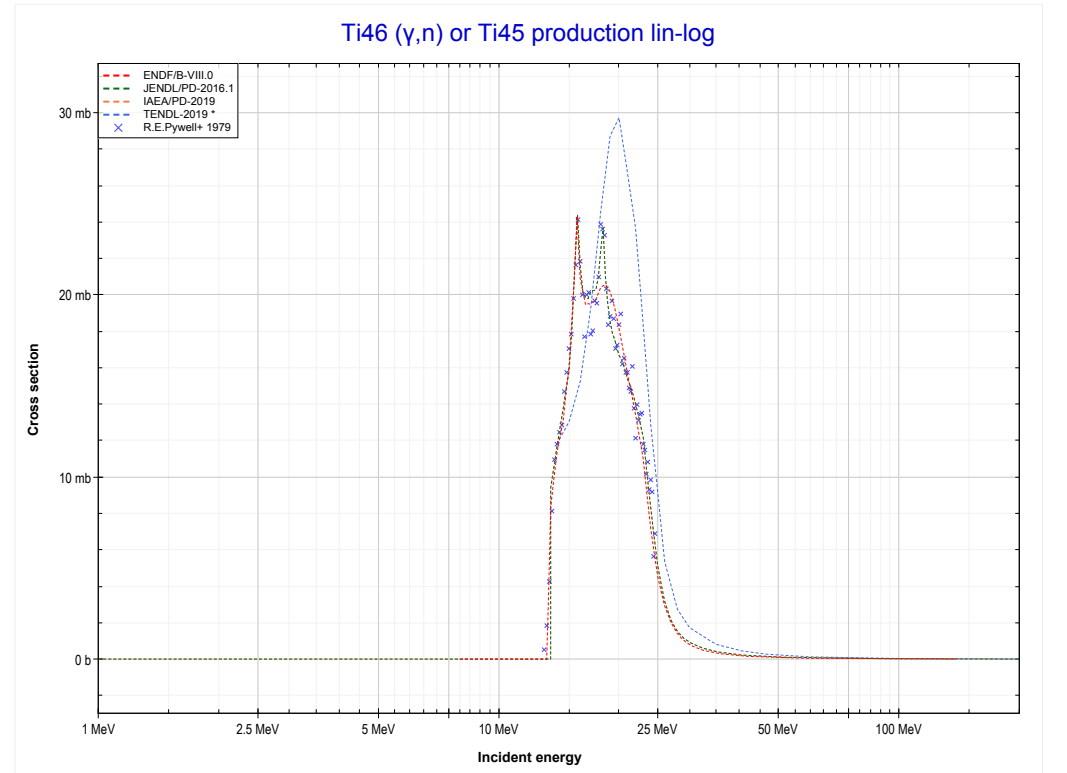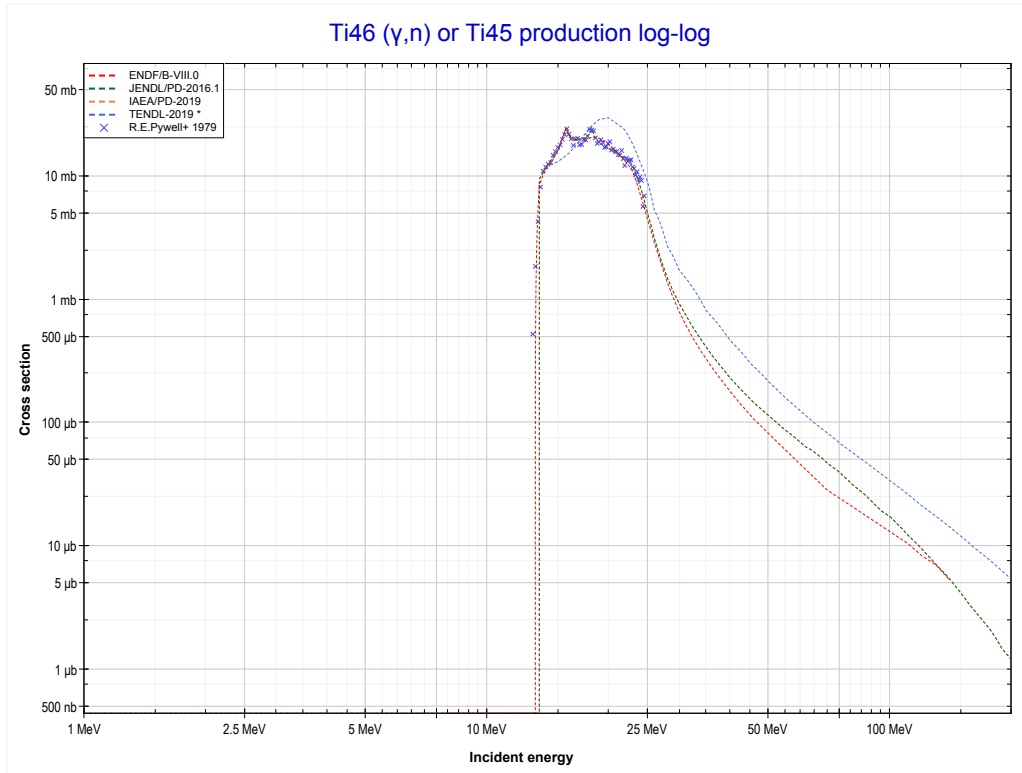
Reaction	Q-Value
Ti46(γ,n)Ti45	-13189.32 keV

<< 16-S-34	22-Ti-46	26-Fe-54 >>
<< MT4 (γ,n)	MT28 (γ,n+p) or MT5 (Sc44 production)	MT104 (γ,d) >>

Ti46 (γ,n+p) or Sc44 production log-log

Ti46 (γ,n+p) or Sc44 production lin-log
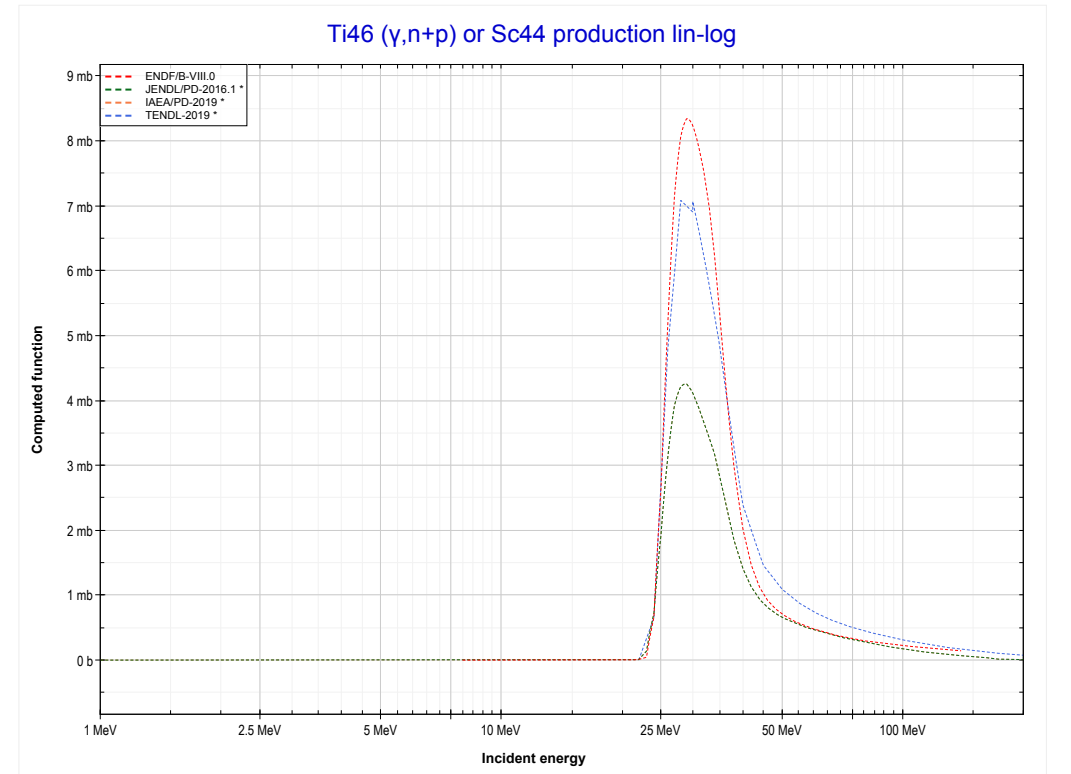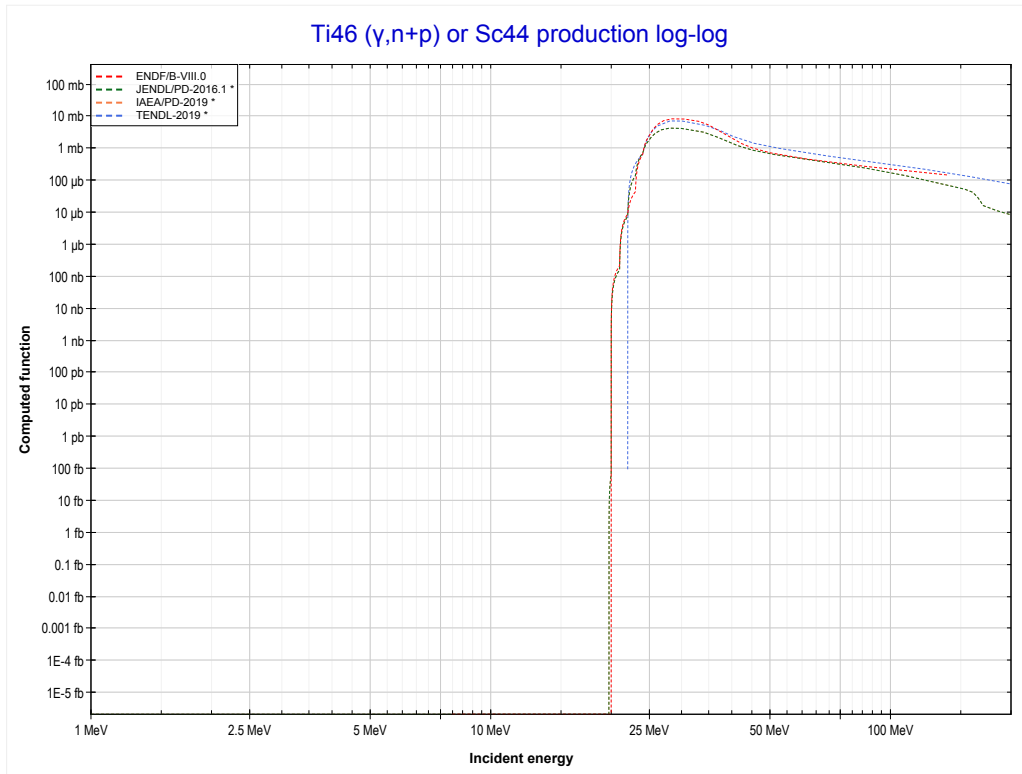
Reaction	Q-Value
Ti46(γ,d)Sc44	-19447.52 keV
Ti46(γ,n+p)Sc44	-21672.09 keV

<< 8-O-18	**22-Ti-46**	30-Zn-64 >>
<< MT28 (γ,n+p)	**MT104 (γ,d) or MT5 (Sc44 production)**	22-Ti-50 MT103 (γ,p) >>

Ti46 (γ,d) or Sc44 production log-log

Ti46 (γ,d) or Sc44 production lin-log
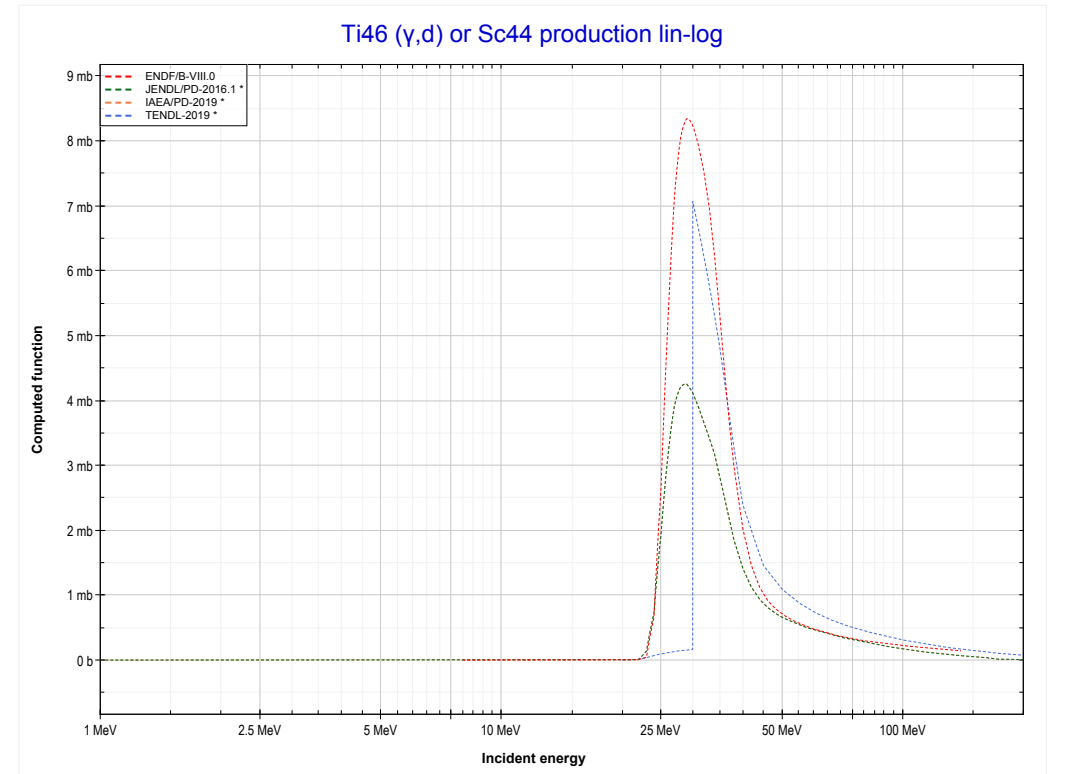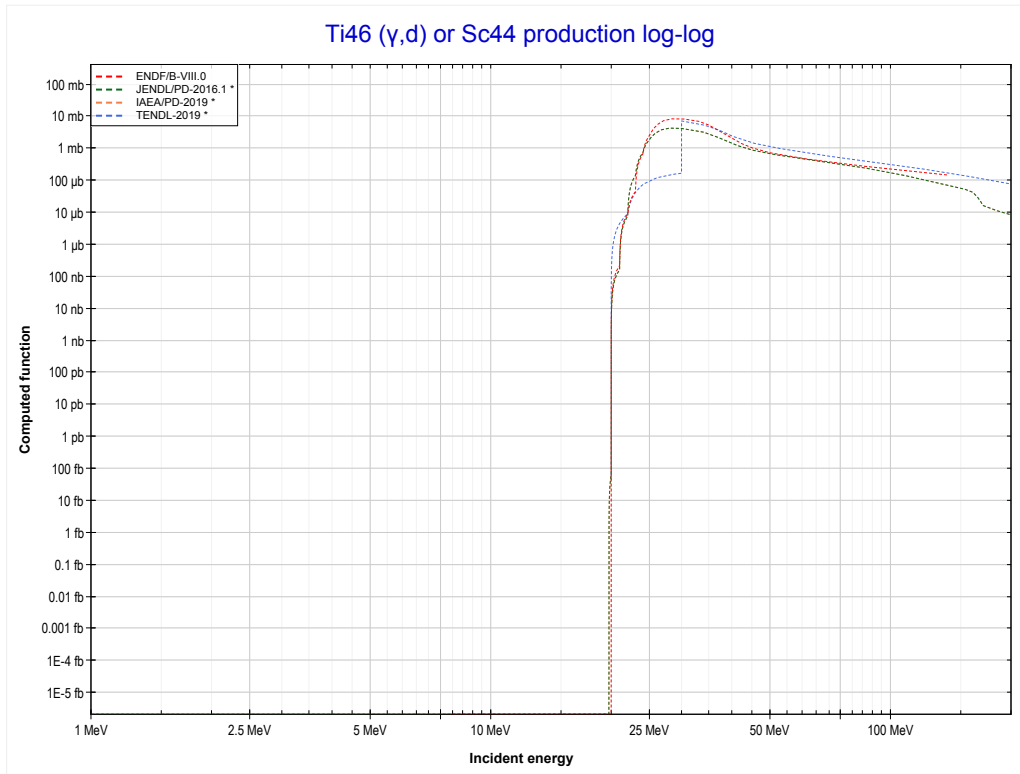
Reaction	Q-Value
Ti46(γ,d)Sc44	-19447.52 keV
Ti46(γ,n+p)Sc44	-21672.09 keV

<< 16-S-34	**22-Ti-50**	26-Fe-54 >>
<< 22-Ti-46 MT104 (γ,d)	**MT103 (γ,p) or MT5 (Sc49 production)**	23-V-51 MT16 (γ,2n) >>

Ti50 (γ,p) or Sc49 production log-log

Ti50 (γ,p) or Sc49 production lin-log
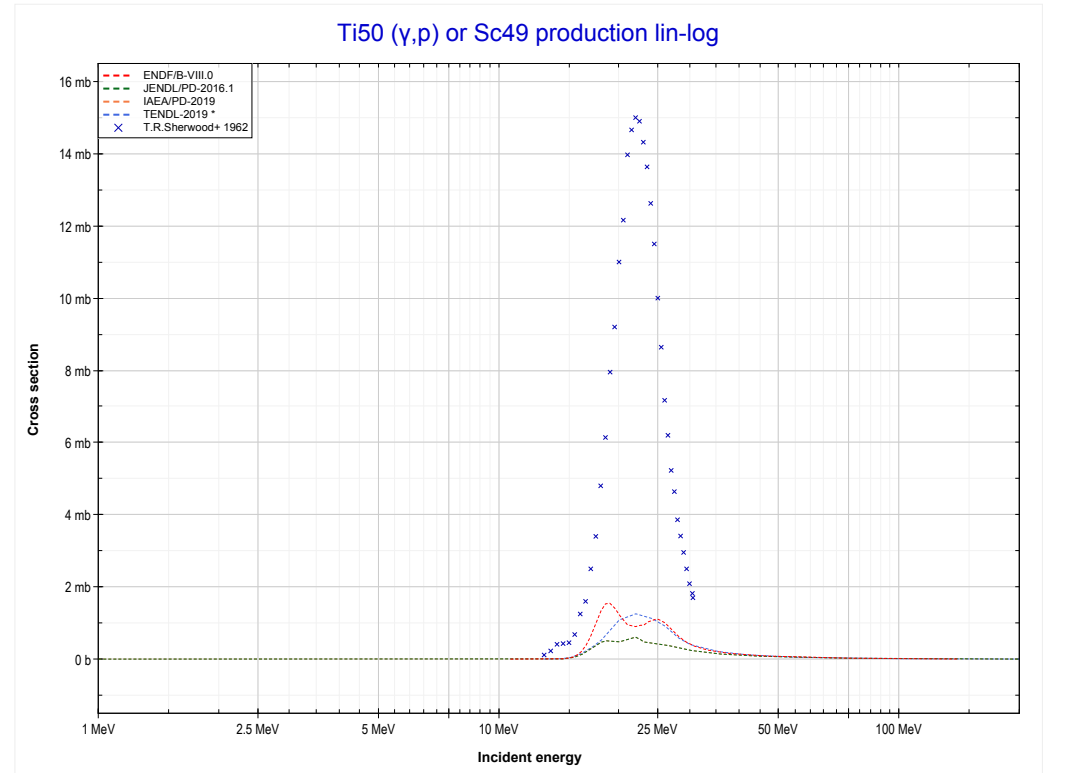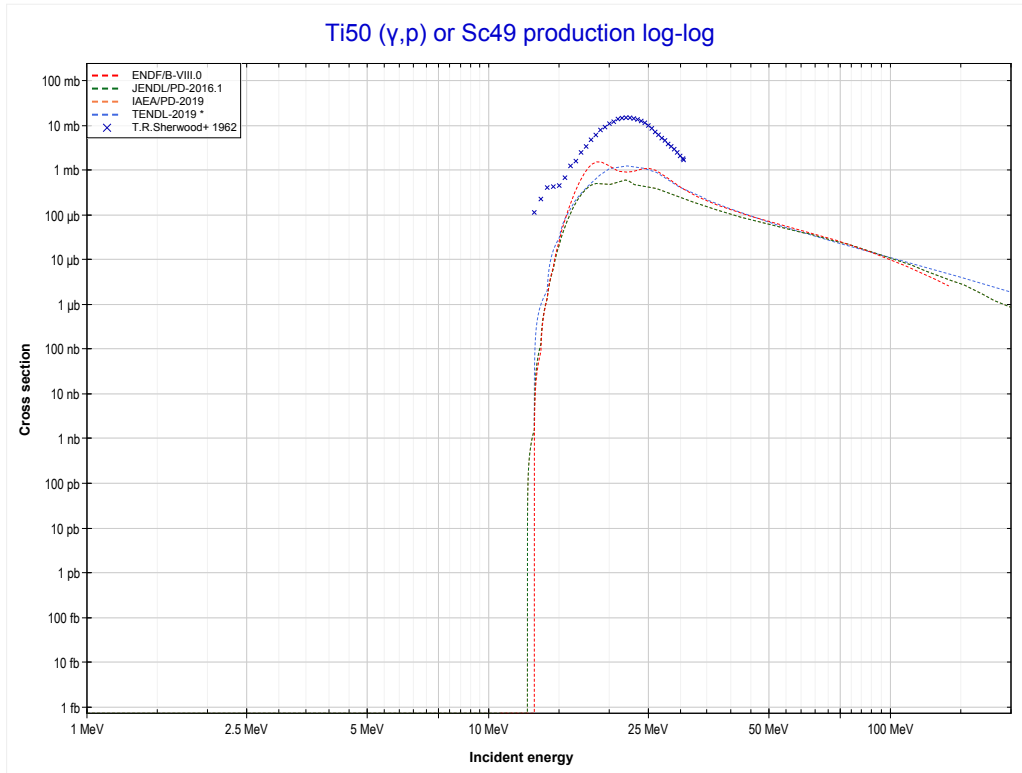
Reaction	Q-Value
Ti50(γ,p)Sc49	-12159.33 keV

<< 20-Ca-48	**23-V-51**	26-Fe-54 >>
<< 22-Ti-50 MT103 (γ,p)	**MT16 (γ,2n) or MT5 (V49 production)**	MT107 (γ,α) >>

V51 (γ,2n) or V49 production log-log

V51 (γ,2n) or V49 production lin-log
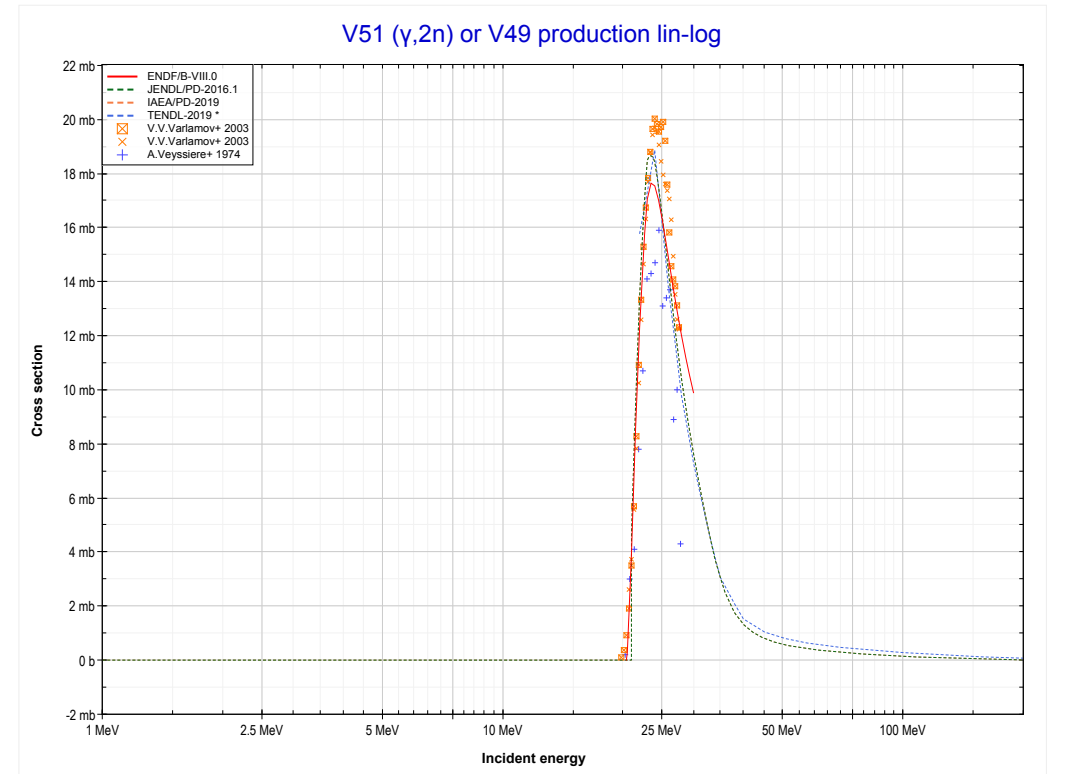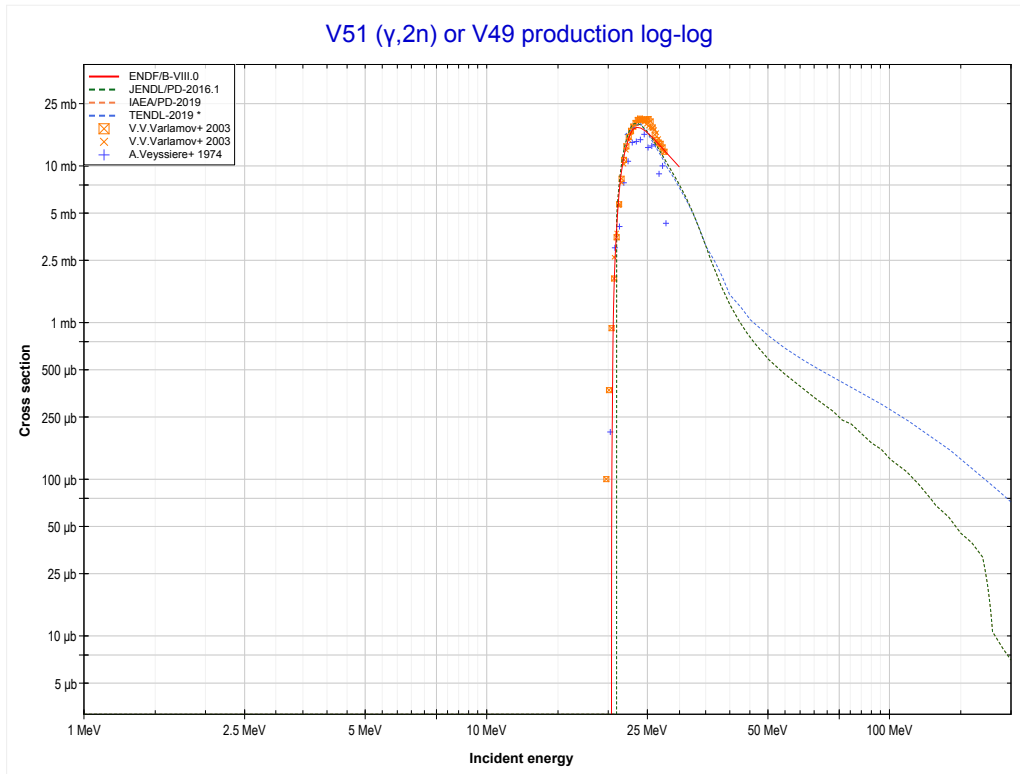
Reaction	Q-Value
V51(γ,2n)V49	-20384.53 keV

23-V-51		29-Cu-65 >>
<< MT16 (γ,2n)	**MT107 (γ,α) or MT5 (Sc47 production)**	24-Cr-50 MT4 (γ,n) >>

V51 (γ,α) or Sc47 production log-log

V51 (γ,α) or Sc47 production lin-log
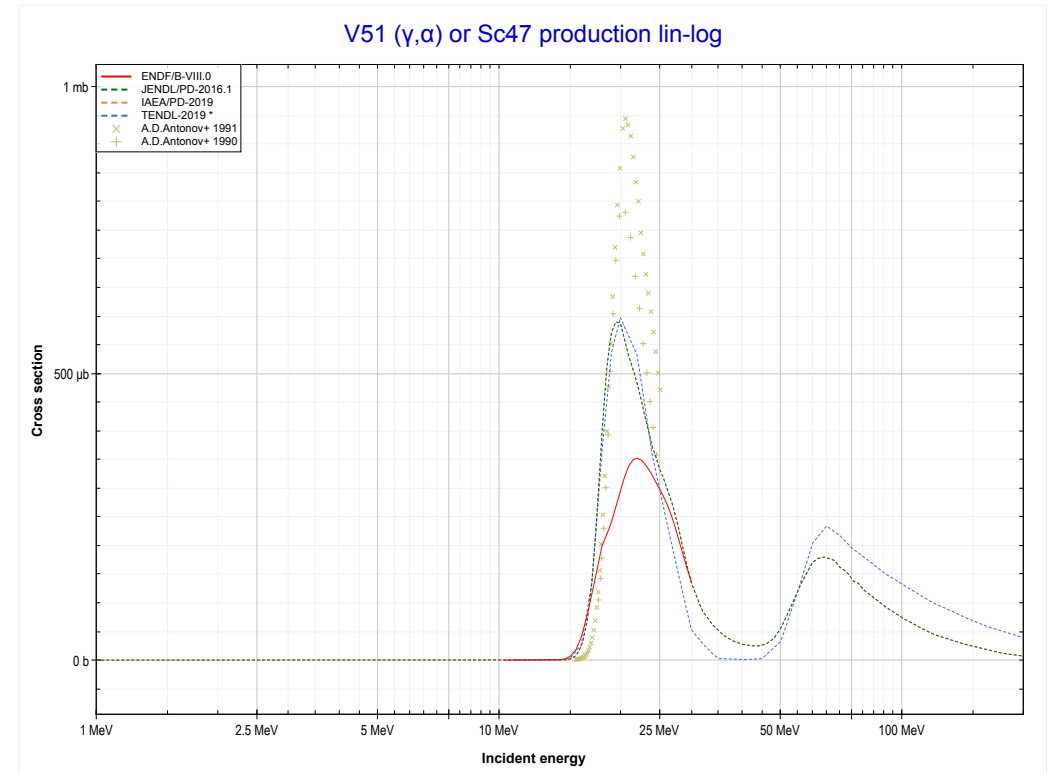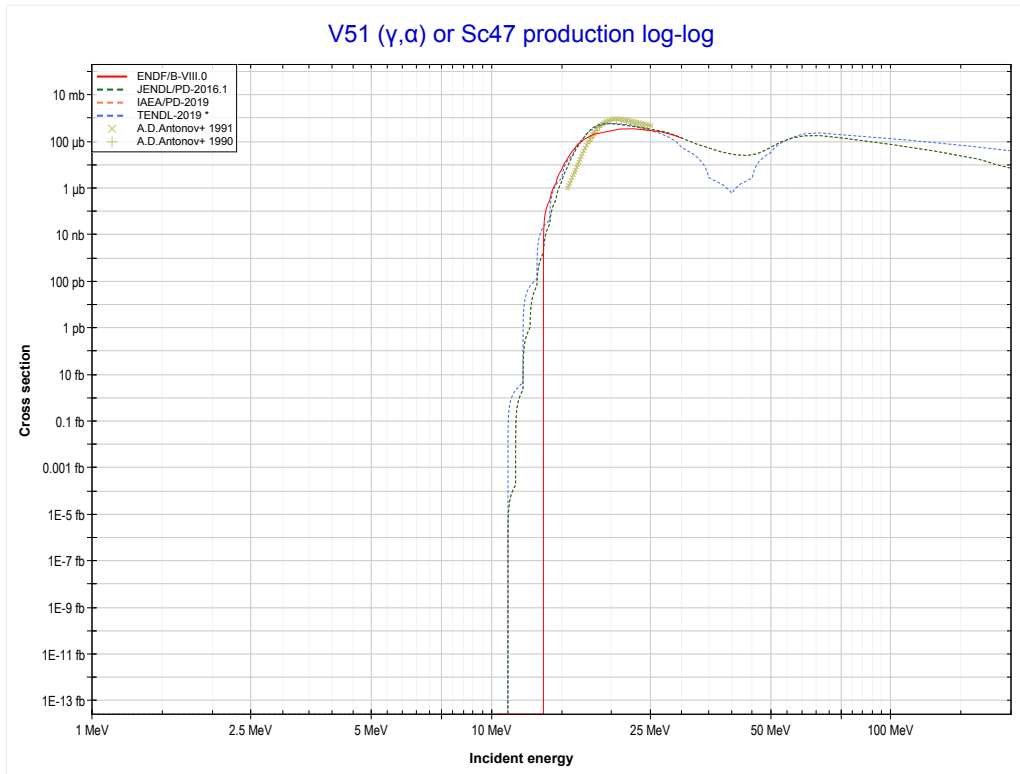
Reaction	Q-Value
V51(γ,α)Sc47	-10292.12 keV
V51(γ,p+t)Sc47	-30105.98 keV
V51(γ,n+He3)Sc47	-30869.73 keV
V51(γ,2d)Sc47	-34138.64 keV
V51(γ,n+p+d)Sc47	-36363.21 keV
V51(γ,2n+2p)Sc47	-38587.78 keV

<< 22-Ti-46 >>	**24-Cr-50**	26-Fe-54 >>
<< 23-V-51 MT107 (γ,α)	**MT4 (γ,n) or MT5 (Cr49 production)**	25-Mn-55 MT17 (γ,3n) >>

Cr50 (γ,n) or Cr49 production log-log

Cr50 (γ,n) or Cr49 production lin-log
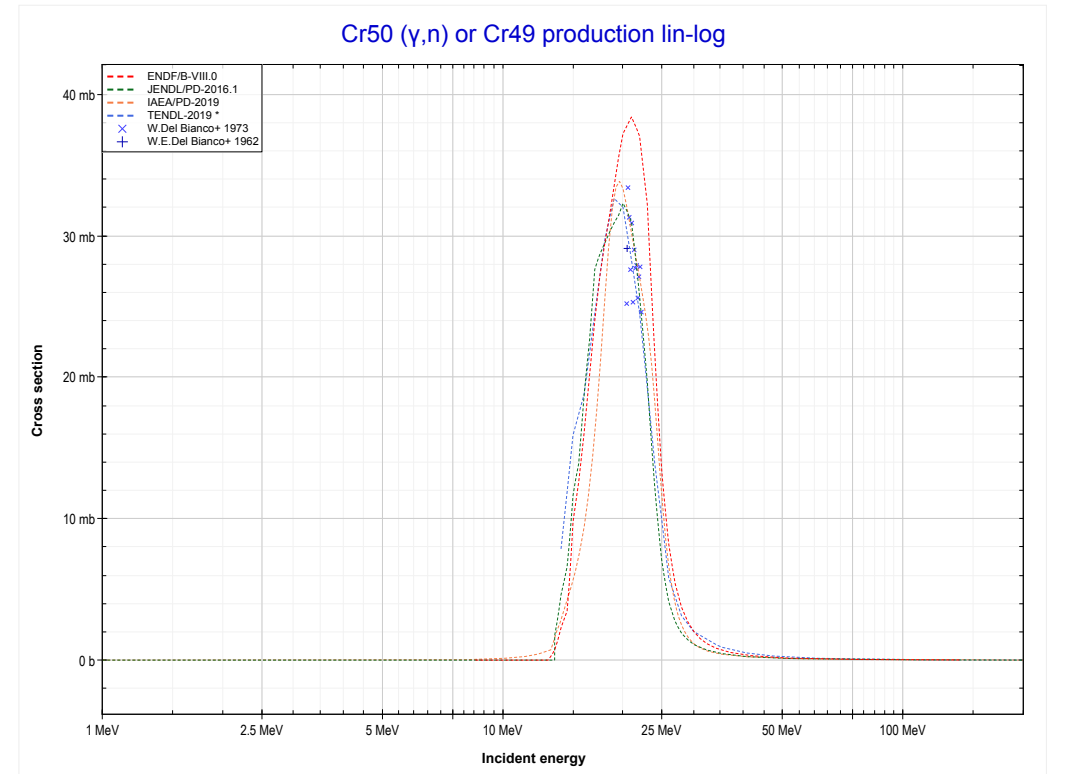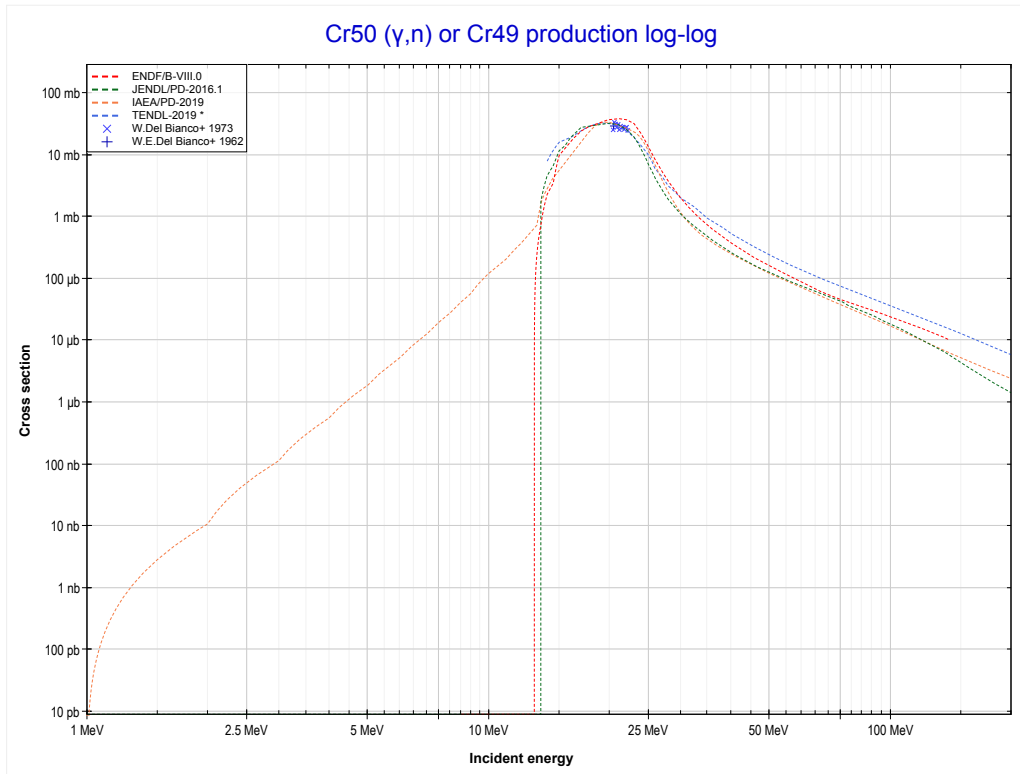
Reaction	Q-Value
Cr50(γ,n)Cr49	-13000.32 keV

27-Co-59 >>	**25-Mn-55**	27-Co-59 >>
<< 24-Cr-50 MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Mn52 production)**	26-Fe-54 MT4 (γ,n) >>

Mn55 (γ,3n) or Mn52 production log-log

Mn55 (γ,3n) or Mn52 production lin-log
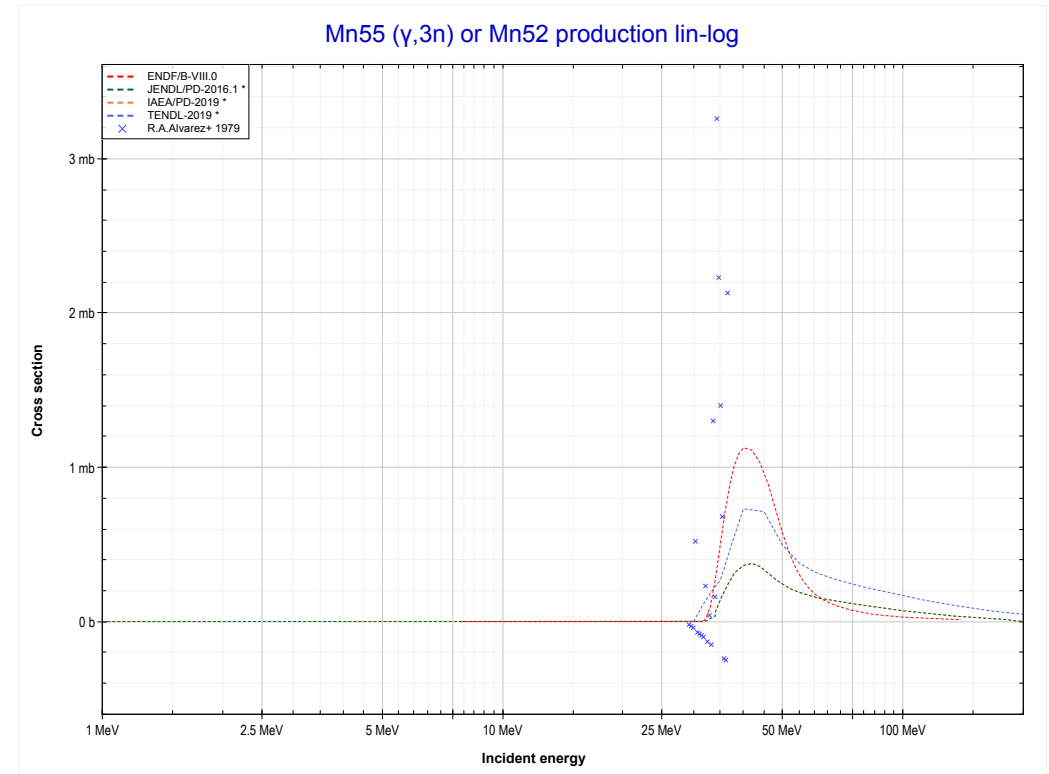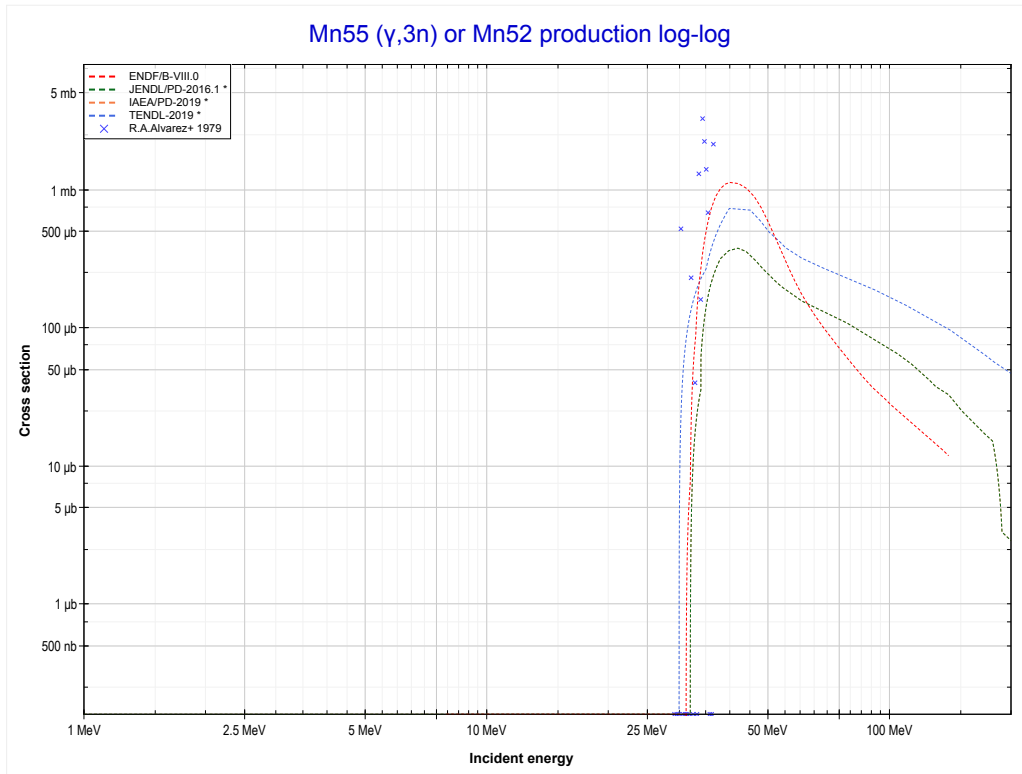
Reaction	Q-Value
Mn55(γ,3n)Mn52	-31219.05 keV

<< 24-Cr-50	**26-Fe-54**	26-Fe-56 >>
<< 25-Mn-55 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Fe53 production)**	MT16 (γ,2n) >>

Fe54 (γ,n) or Fe53 production log-log

Fe54 (γ,n) or Fe53 production lin-log
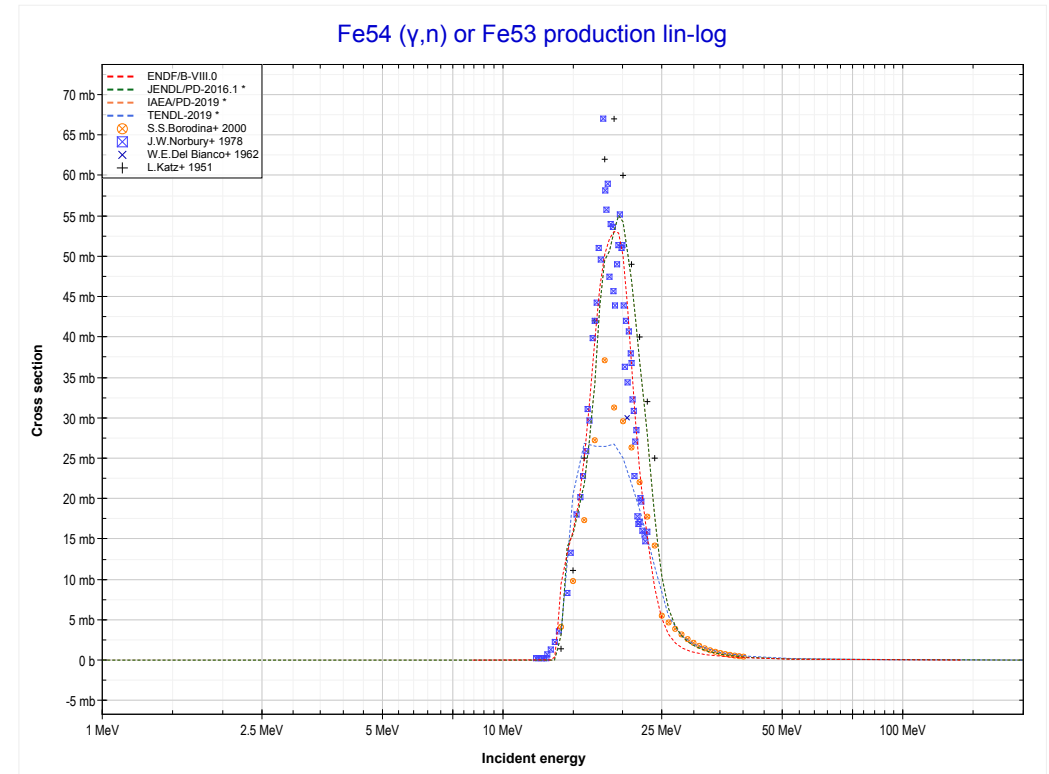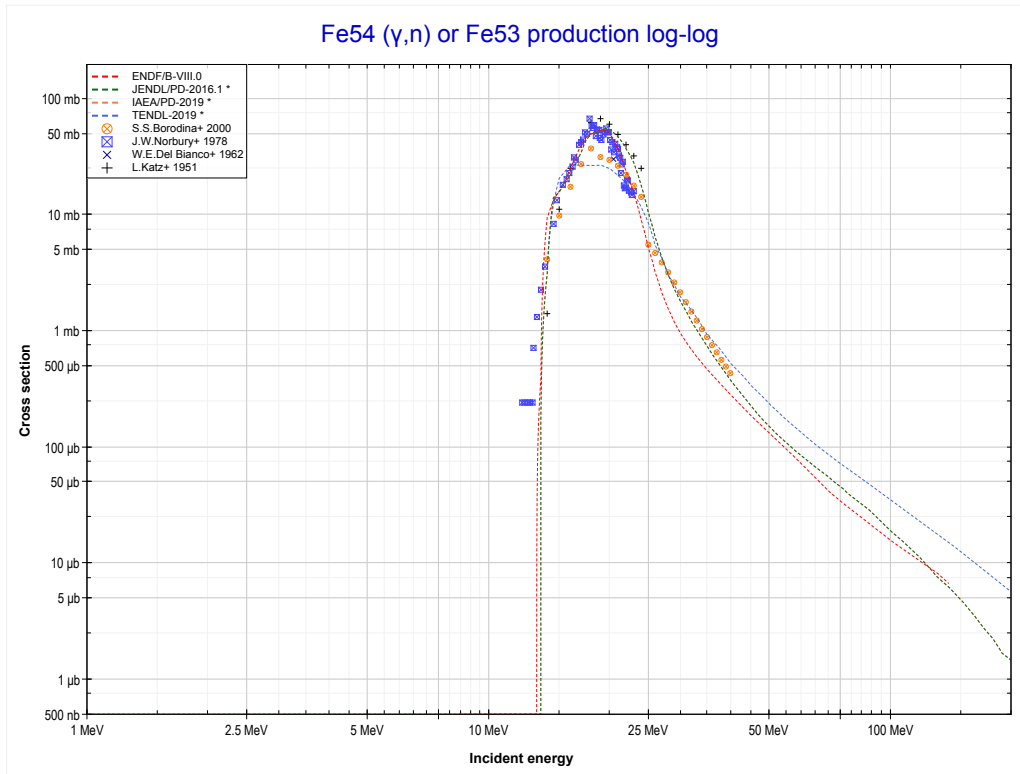
Reaction	Q-Value
Fe54(γ,n)Fe53	-13378.32 keV

<< 23-V-51	**26-Fe-54**	26-Fe-56 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Fe52 production)**	MT28 (γ,n+p) >>

Fe54 (γ,2n) or Fe52 production log-log

Fe54 (γ,2n) or Fe52 production lin-log
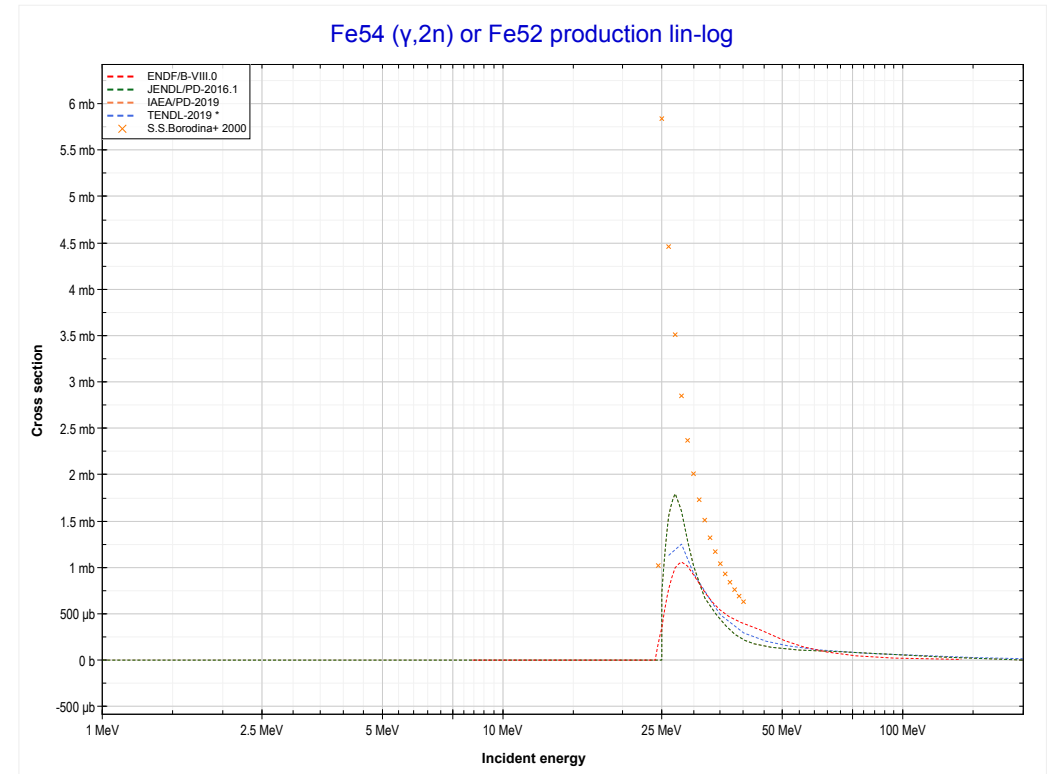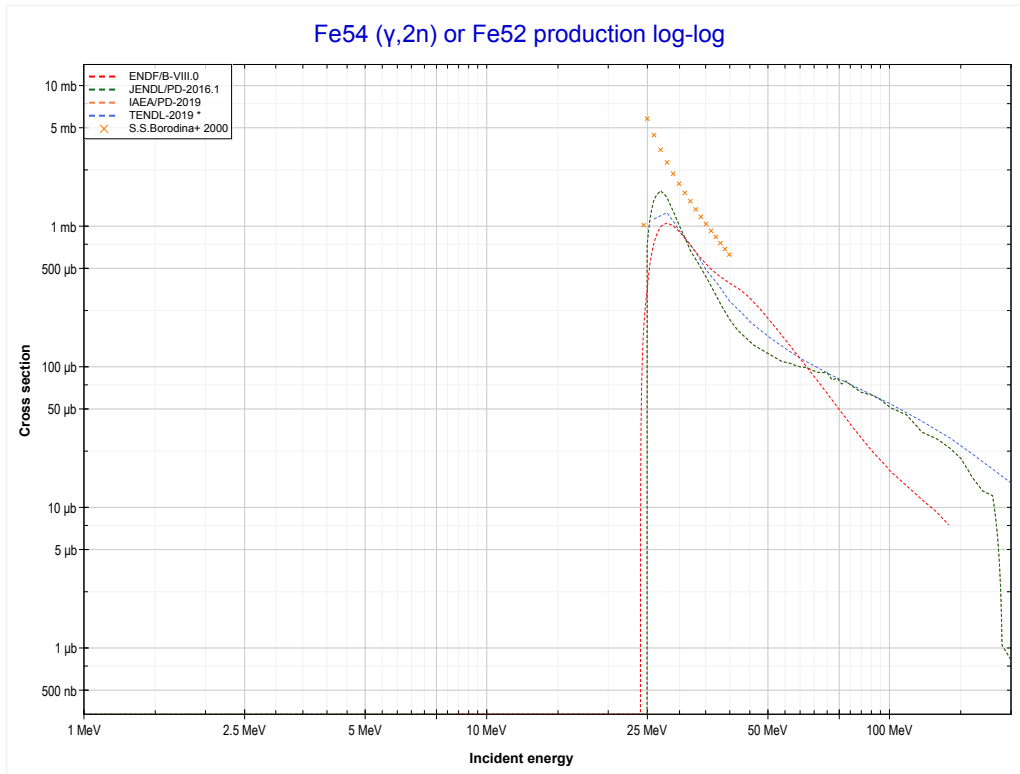
Reaction	Q-Value
Fe54(γ,2n)Fe52	-24067.13 keV

<< 22-Ti-46	**26-Fe-54**	26-Fe-56 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Mn52 production)**	MT103 (γ,p) >>

Fe54 (γ,n+p) or Mn52 production log-log

Fe54 (γ,n+p) or Mn52 production lin-log
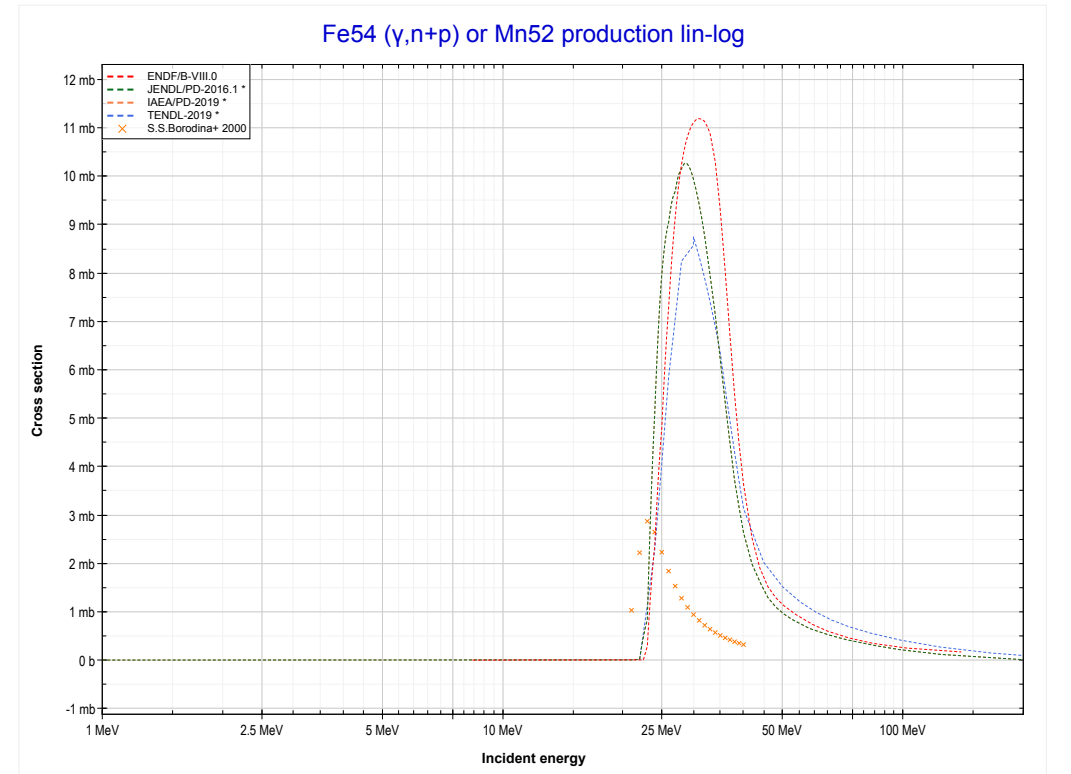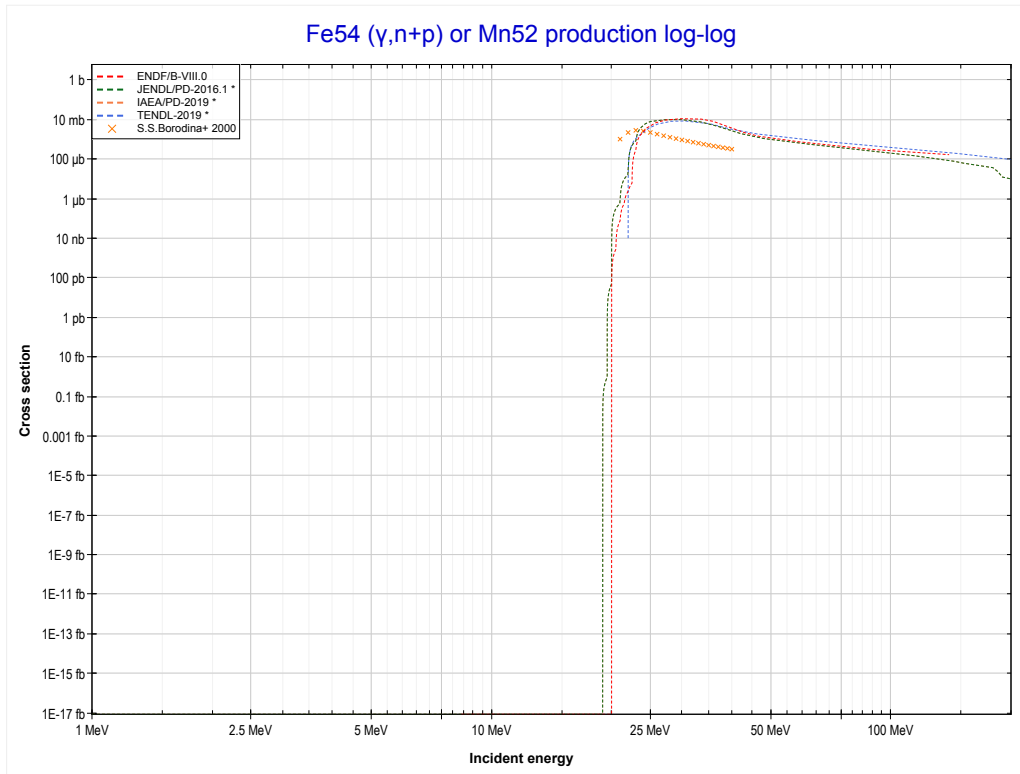
Reaction	Q-Value
Fe54(γ,d)Mn52	-18682.92 keV
Fe54(γ,n+p)Mn52	-20907.49 keV

<< 22-Ti-50	**26-Fe-54**	26-Fe-56 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (Mn53 production)**	26-Fe-56 MT4 (γ,n) >>

Fe54 (γ,p) or Mn53 production log-log

Fe54 (γ,p) or Mn53 production lin-log
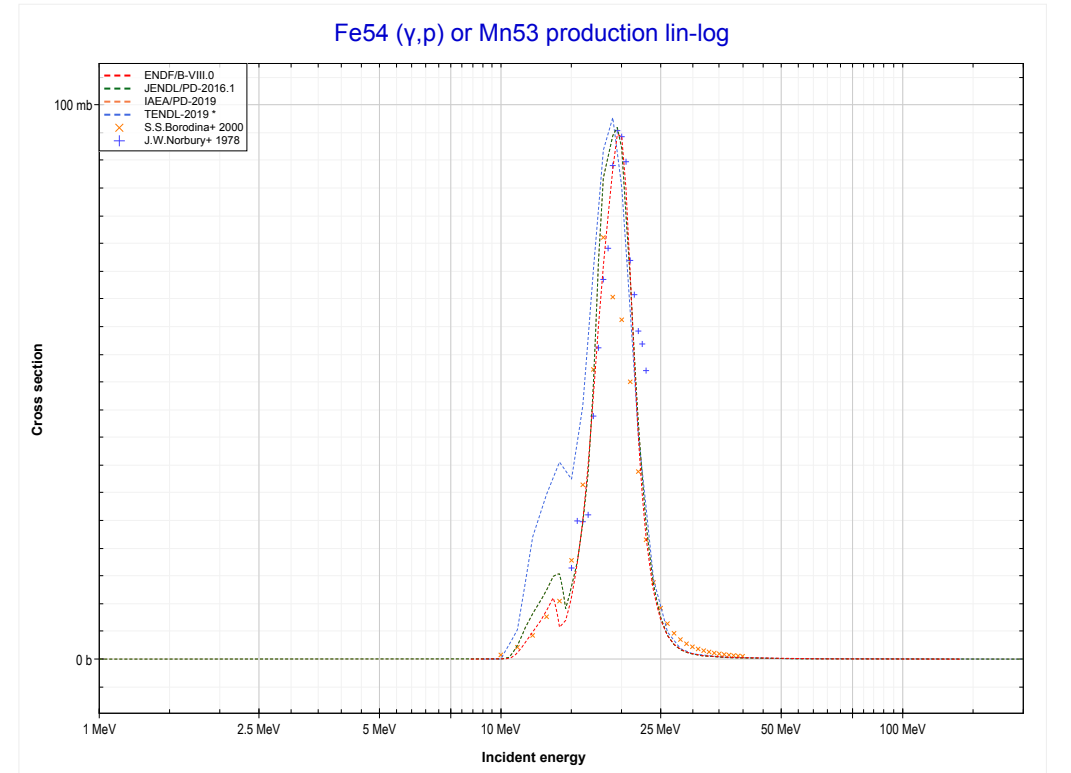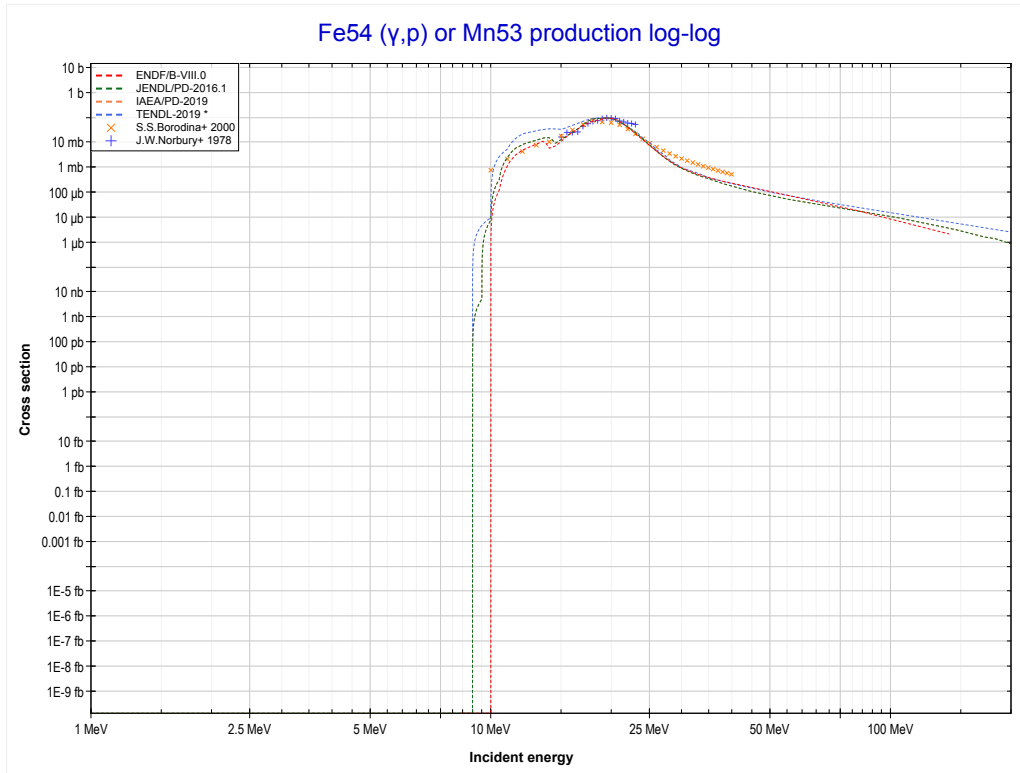
Reaction	Q-Value
Fe54(γ,p)Mn53	-8853.37 keV

<< 26-Fe-54	**26-Fe-56**	27-Co-59 >>
<< 26-Fe-54 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Fe55 production)**	MT16 (γ,2n) >>

Fe56 (γ,n) or Fe55 production log-log

Fe56 (γ,n) or Fe55 production lin-log
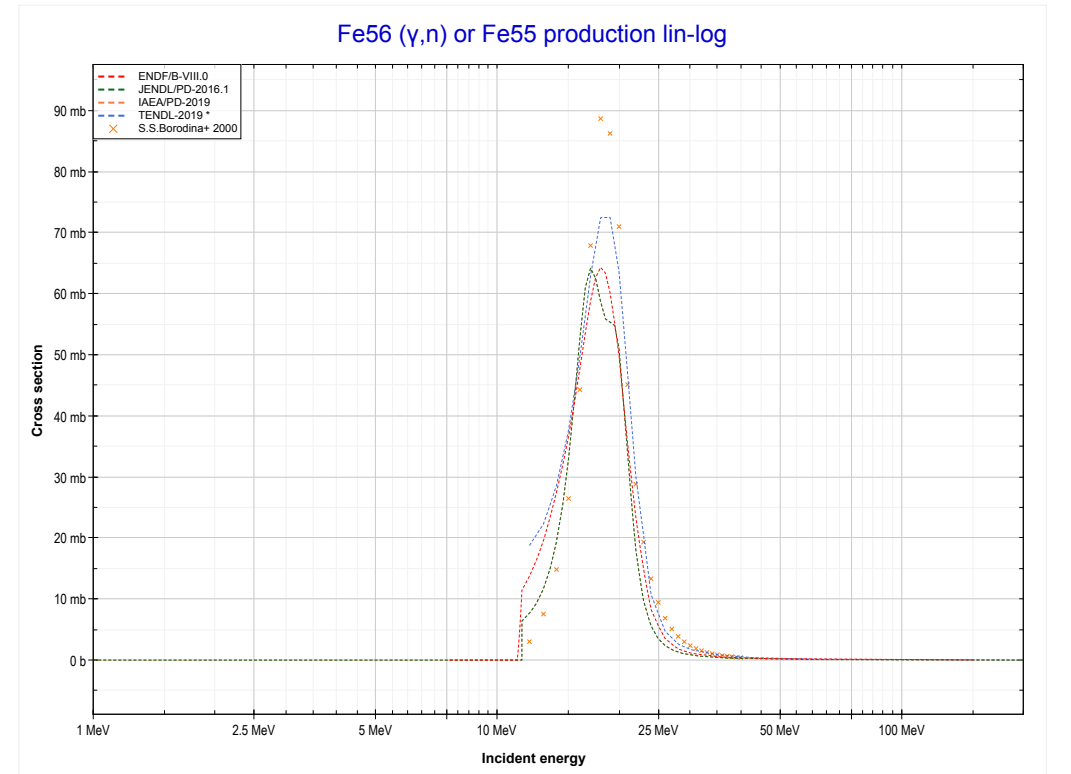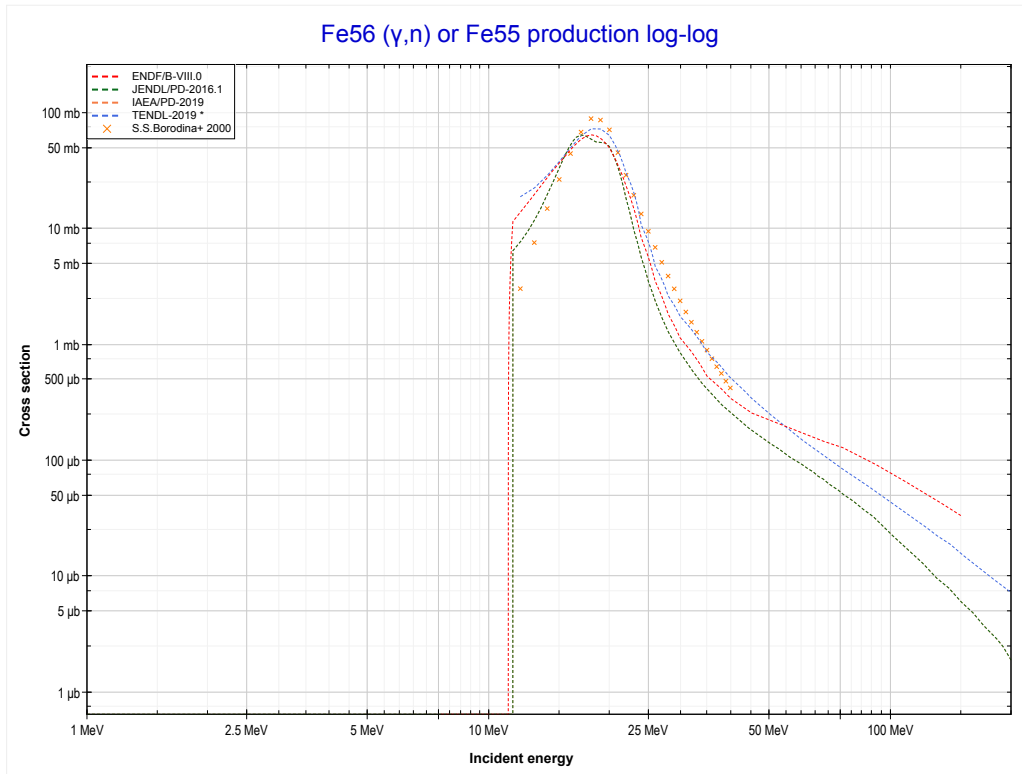
Reaction	Q-Value
Fe56(γ,n)Fe55	-11197.12 keV

<< 26-Fe-54	**26-Fe-56**	27-Co-59 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Fe54 production)**	MT28 (γ,n+p) >>

Fe56 (γ,2n) or Fe54 production log-log

Fe56 (γ,2n) or Fe54 production lin-log
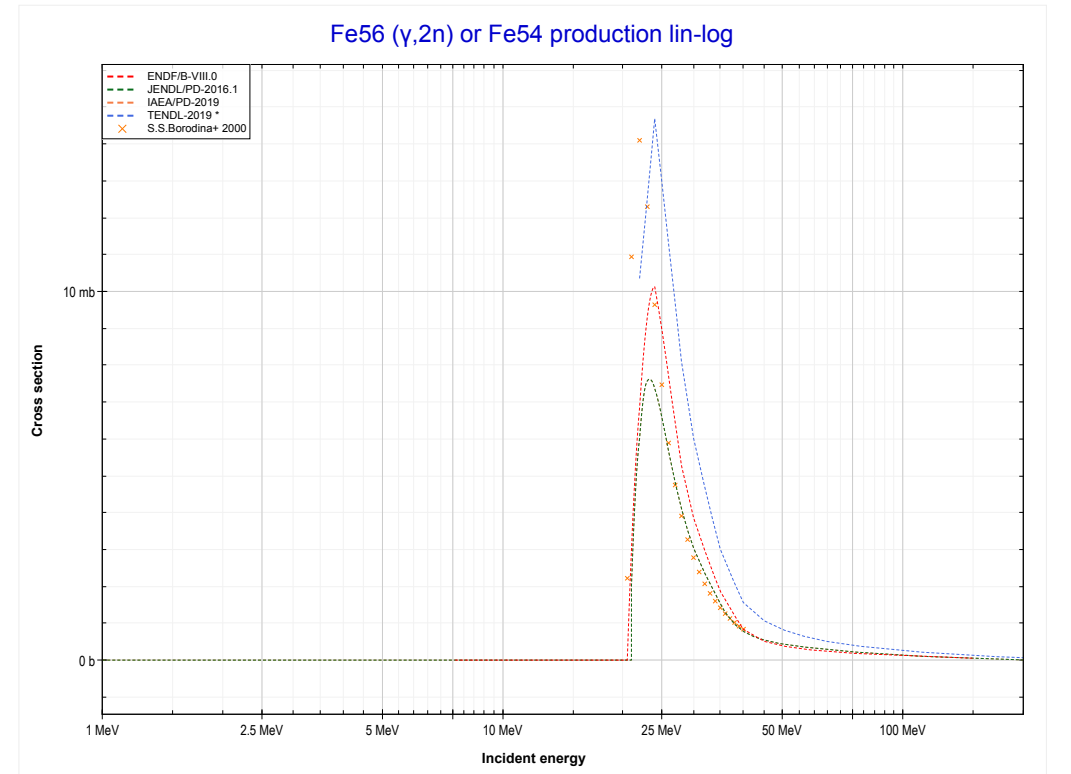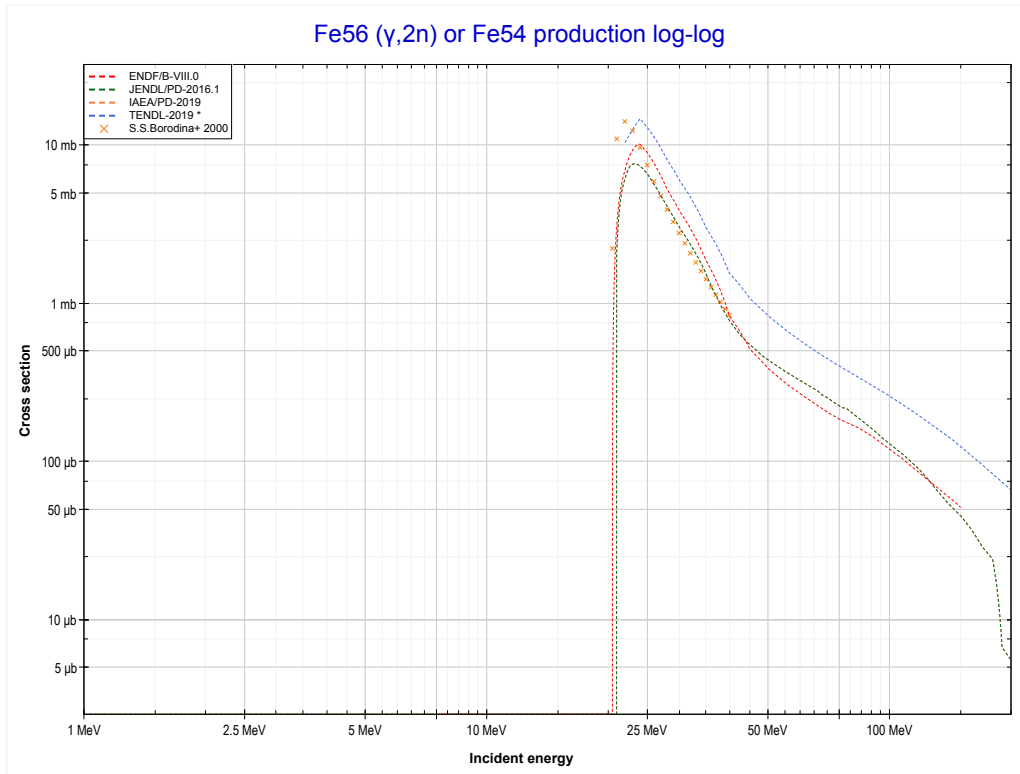
Reaction	Q-Value
Fe56(γ,2n)Fe54	-20495.23 keV

<< 26-Fe-54	**26-Fe-56**	28-Ni-58 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Mn54 production)**	MT103 (γ,p) >>

Fe56 (γ,n+p) or Mn54 production log-log

Fe56 (γ,n+p) or Mn54 production lin-log
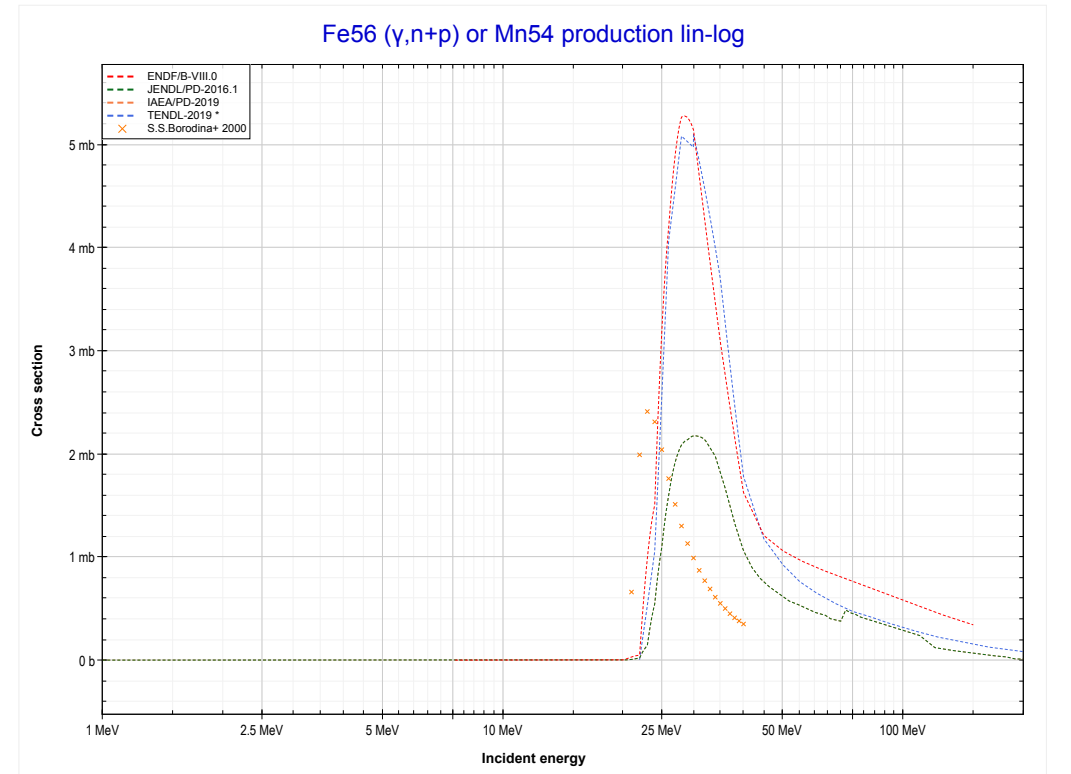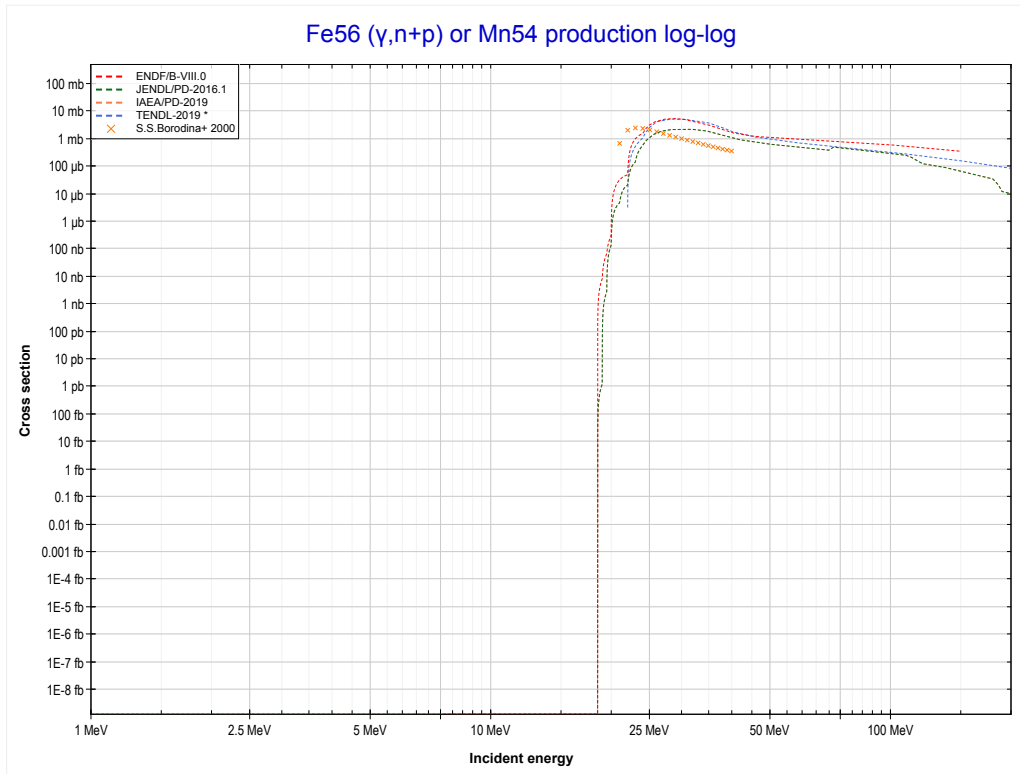
Reaction	Q-Value
Fe56(γ,d)Mn54	-18185.22 keV
Fe56(γ,n+p)Mn54	-20409.79 keV

<< 26-Fe-54	**26-Fe-56**	28-Ni-58 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (Mn55 production)**	27-Co-59 MT4 (γ,n) >>

Fe56 (γ,p) or Mn55 production log-log

Fe56 (γ,p) or Mn55 production lin-log
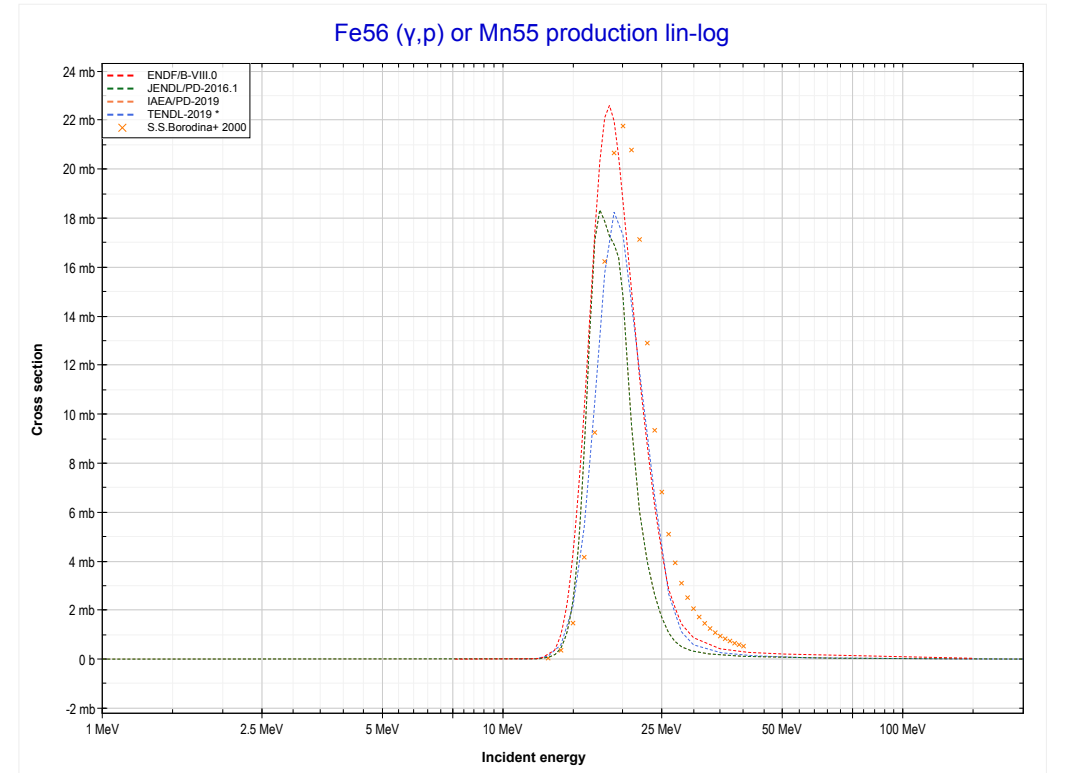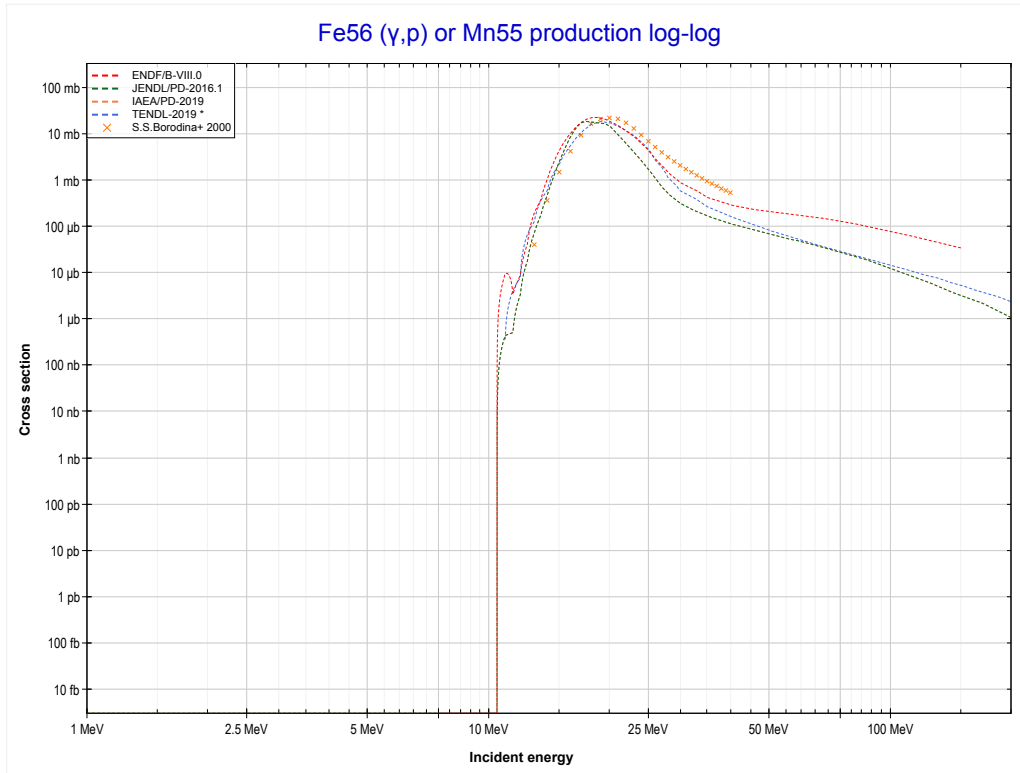
Reaction	Q-Value
Fe56(γ,p)Mn55	-10183.67 keV

<< 26-Fe-56	27-Co-59	28-Ni-58 >>
<< 26-Fe-56 MT103 (γ,p)	MT4 (γ,n) or MT5 (Co58 production)	MT16 (γ,2n) >>

Co59 (γ,n) or Co58 production log-log

Co59 (γ,n) or Co58 production lin-log
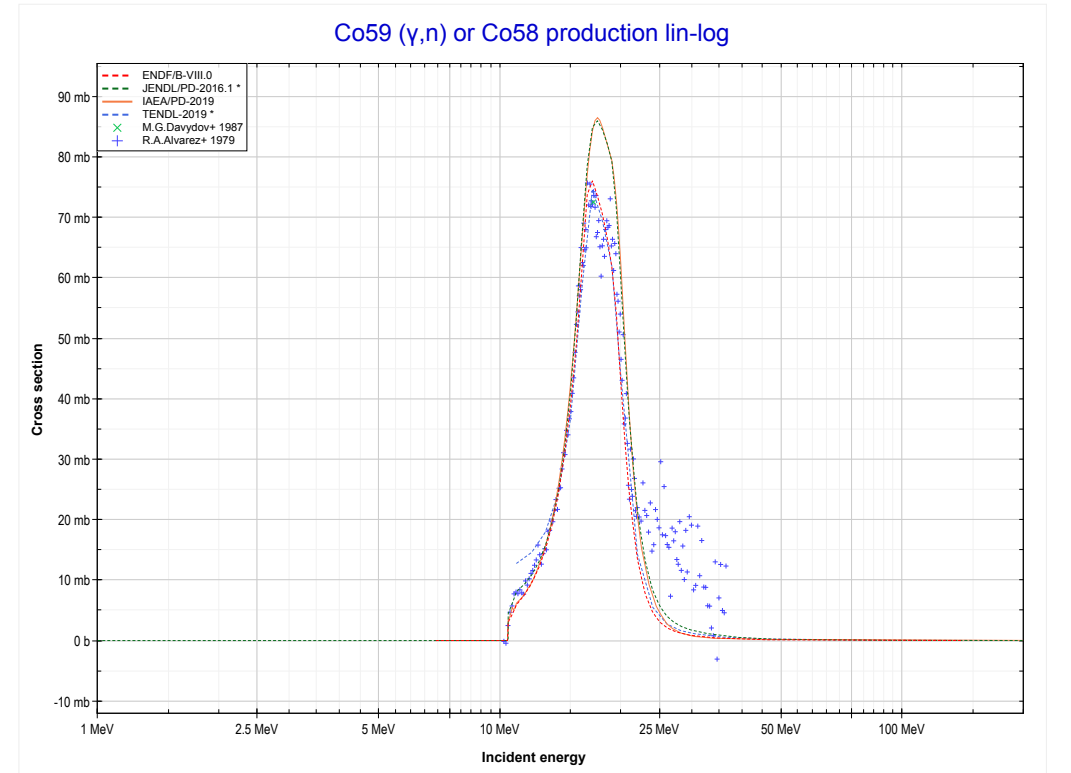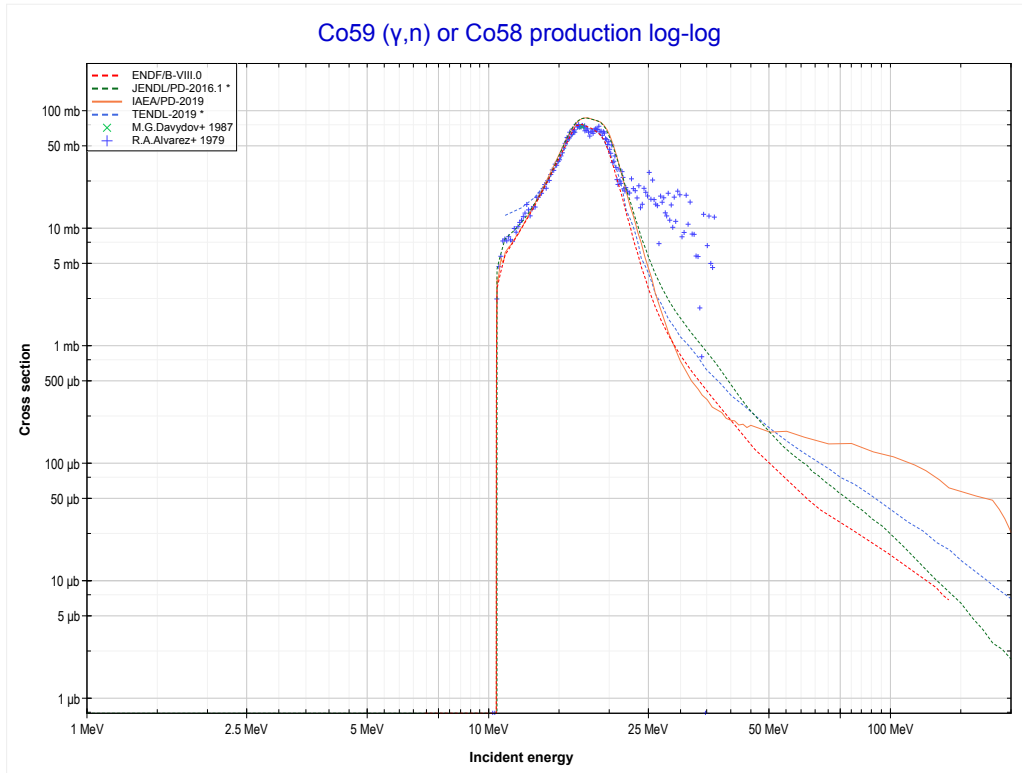
Reaction	Q-Value
Co59(γ,n)Co58	-10453.82 keV

<< 26-Fe-56	27-Co-59	28-Ni-58 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Co57 production)	MT17 (γ,3n) >>

Co59 (γ,2n) or Co57 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- R.A.Alvarez+ 1979
- G.Baciu+ 1965

Co59 (γ,2n) or Co57 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- R.A.Alvarez+ 1979
- G.Baciu+ 1965
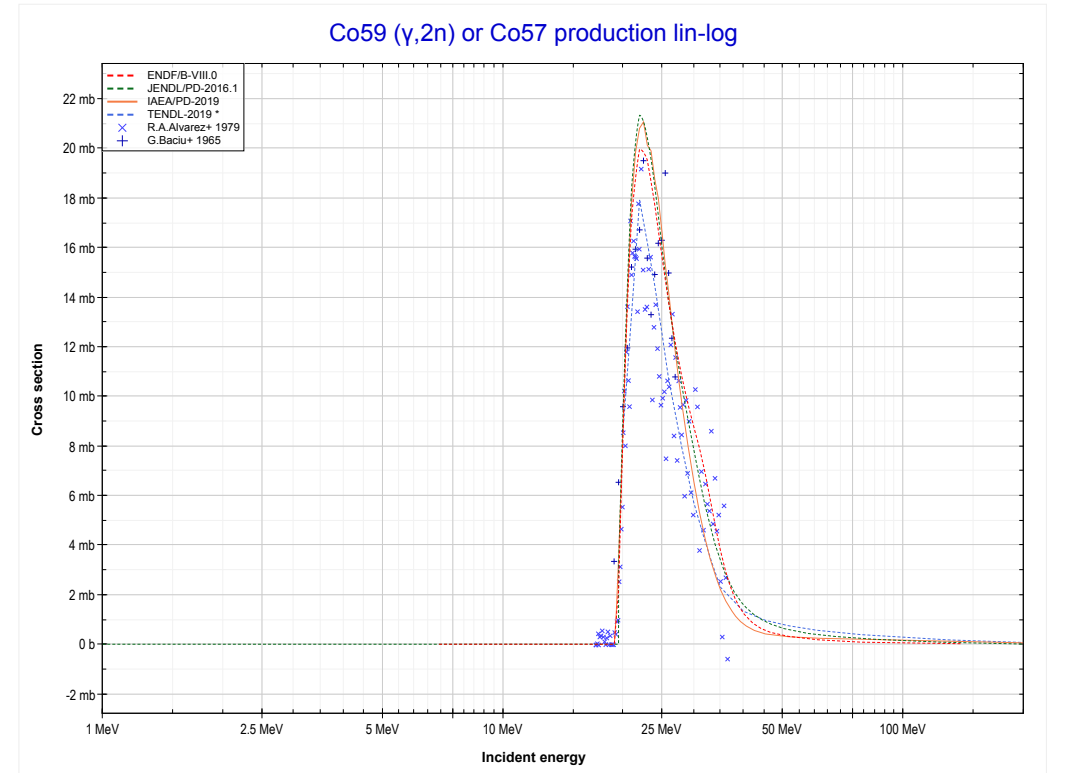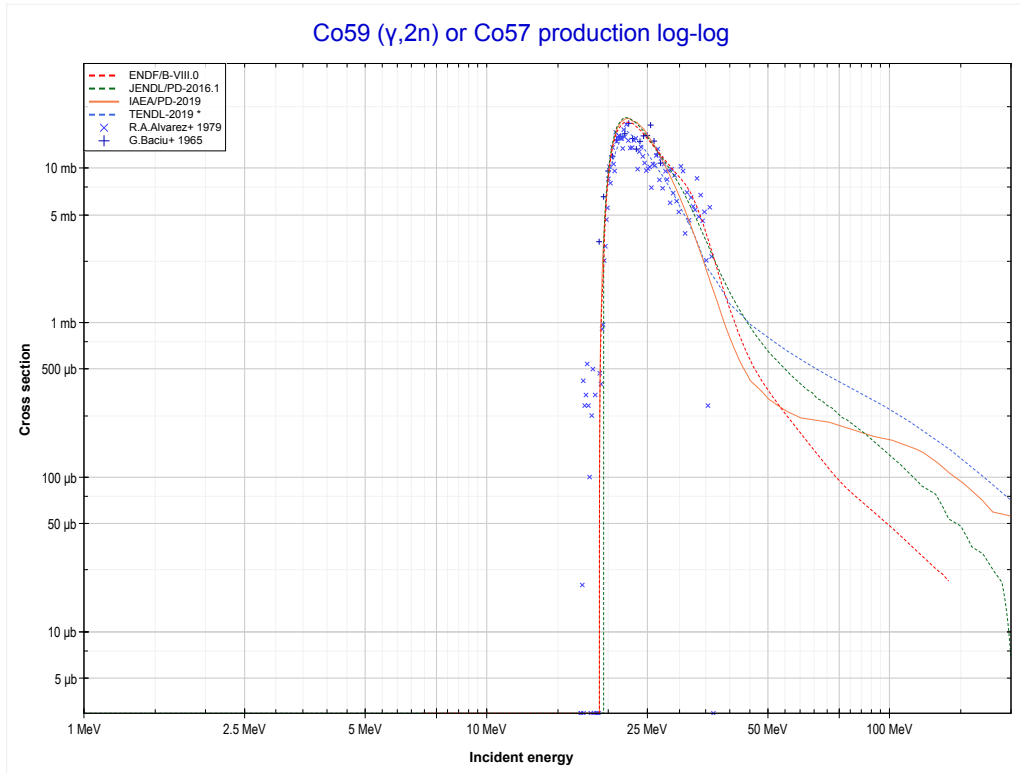
Reaction	Q-Value
Co59(γ,2n)Co57	-19026.73 keV

<< 25-Mn-55	27-Co-59	40-Zr-94 >>
<< MT16 (γ,2n)	MT17 (γ,3n) or MT5 (Co56 production)	MT44 (γ,n+2p) >>

Co59 (γ,3n) or Co56 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019
- × V.V.Varlamov+ 2017
- + R.A.Alvarez+ 1979

Co59 (γ,3n) or Co56 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019
- × V.V.Varlamov+ 2017
- + R.A.Alvarez+ 1979
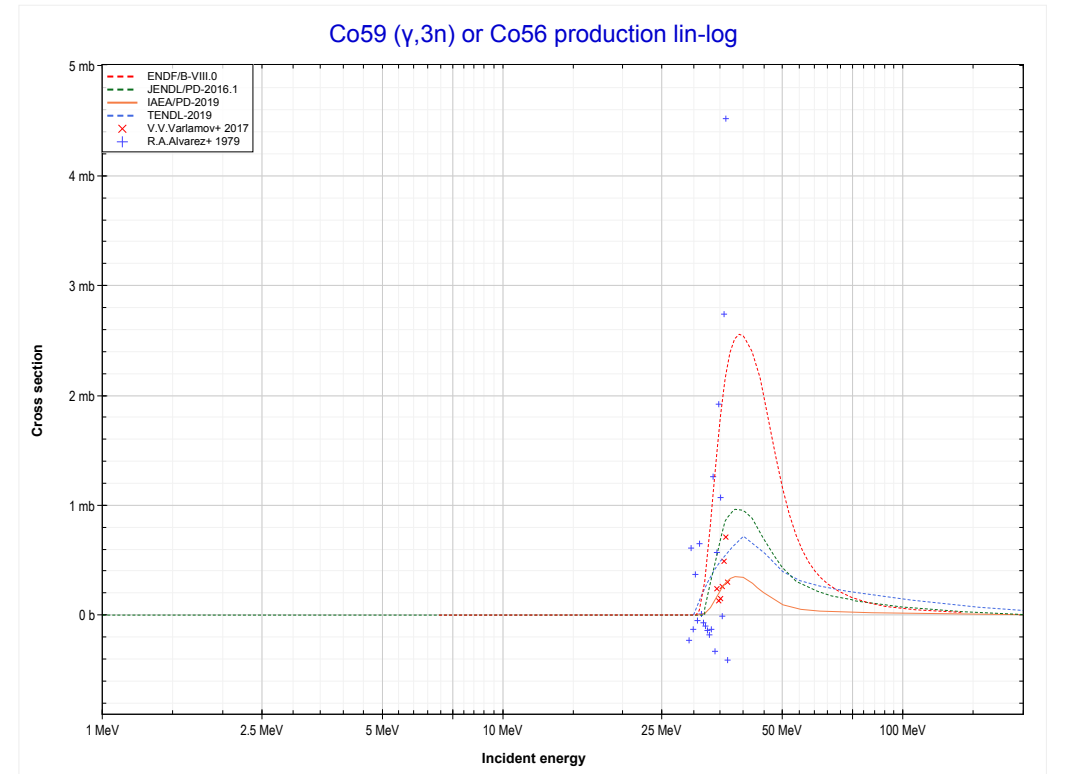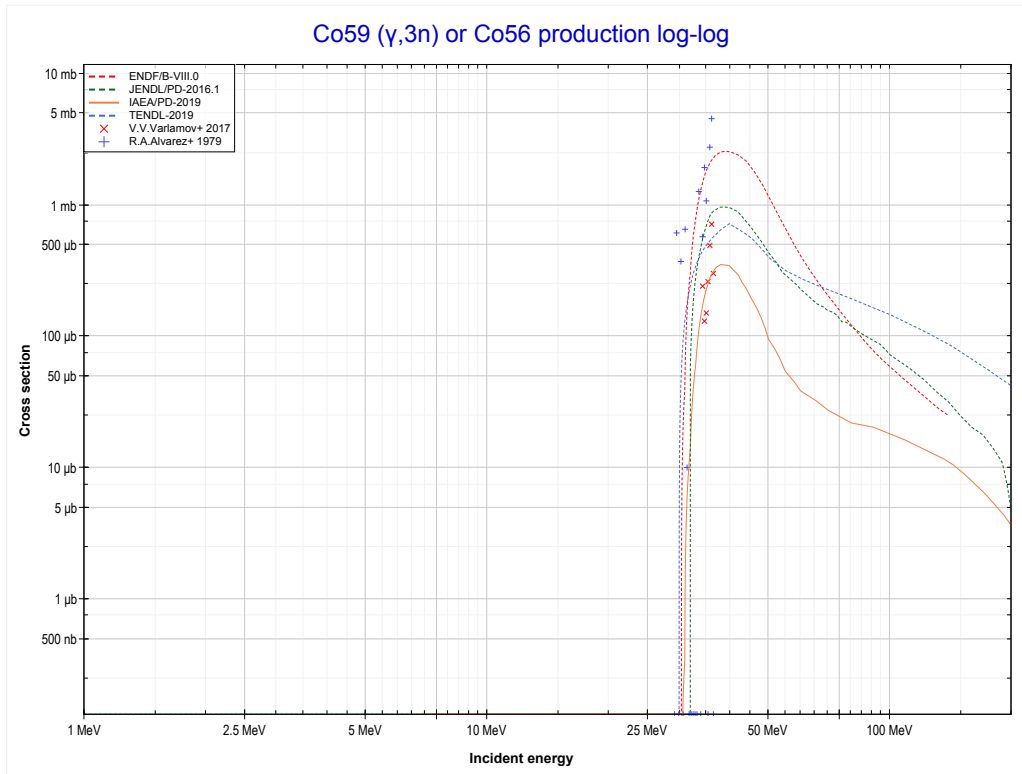
Reaction	Q-Value
Co59(γ,3n)Co56	-30403.25 keV

<< 13-Al-27	**27-Co-59**	
<< MT17 (γ,3n)	**MT44 (γ,n+2p) or MT5 (Mn56 production)**	MT106 (γ,³He) >>

Co59 (γ,n+2p) or Mn56 production log-log

Co59 (γ,n+2p) or Mn56 production lin-log

Reaction	Q-Value
Co59(γ,He3)Mn56	-20249.42 keV
Co59(γ,p+d)Mn56	-25742.89 keV
Co59(γ,n+2p)Mn56	-27967.46 keV

<< 13-Al-27	27-Co-59	
<< MT44 (γ,n+2p)	MT106 (γ,³He) or MT5 (Mn56 production)	MT115 (γ,p+d) >>

Co59 (γ,³He) or Mn56 production log-log

Co59 (γ,³He) or Mn56 production lin-log

Reaction	Q-Value
Co59(γ,He3)Mn56	-20249.42 keV
Co59(γ,p+d)Mn56	-25742.89 keV
Co59(γ,n+2p)Mn56	-27967.46 keV

<< 13-Al-27	27-Co-59	
<< MT106 (γ,³He)	MT115 (γ,p+d) or MT5 (Mn56 production)	28-Ni-58 MT4 (γ,n) >>
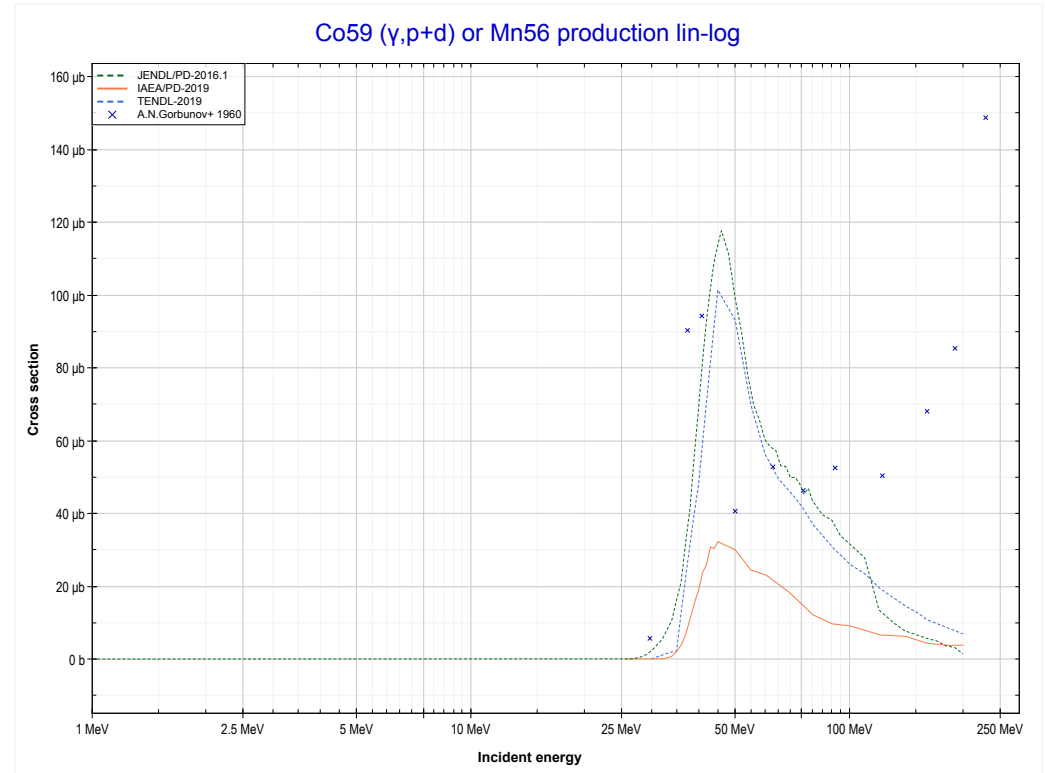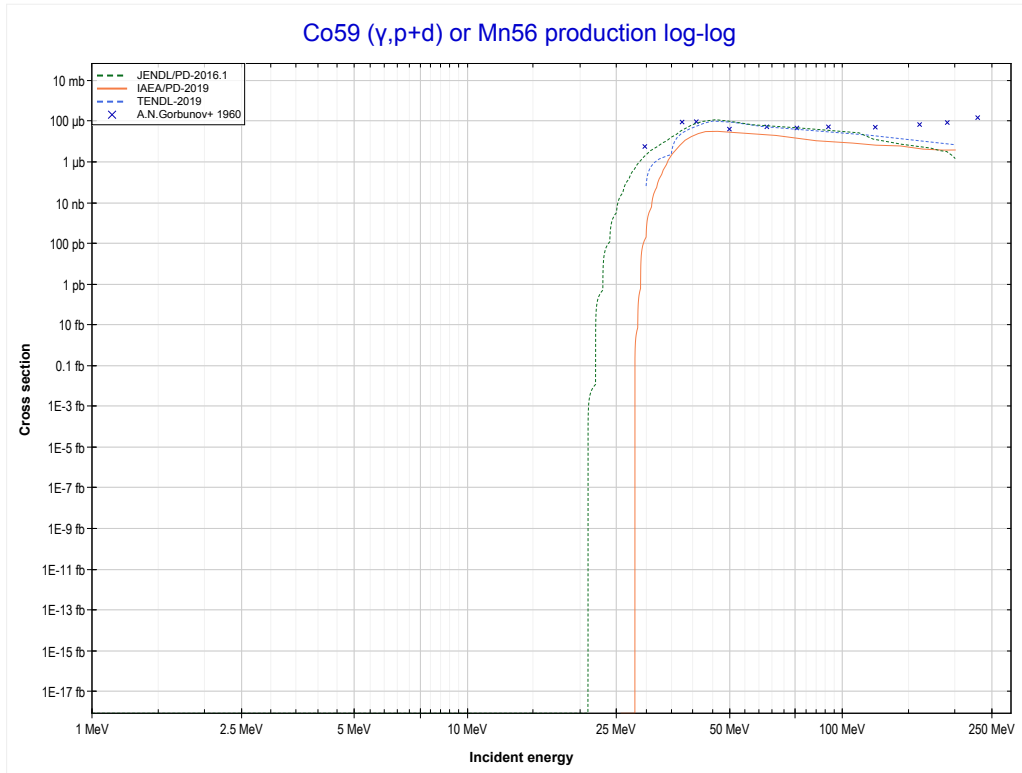
Co59 (γ,p+d) or Mn56 production log-log

Co59 (γ,p+d) or Mn56 production lin-log

Reaction	Q-Value
Co59(γ,He3)Mn56	-20249.42 keV
Co59(γ,p+d)Mn56	-25742.89 keV
Co59(γ,n+2p)Mn56	-27967.46 keV

<< 27-Co-59	**28-Ni-58**	28-Ni-60 >>
<< 27-Co-59 MT115 (γ,p+d)	**MT4 (γ,n) or MT5 (Ni57 production)**	MT16 (γ,2n) >>

Ni58 (γ,n) or Ni57 production log-log

Ni58 (γ,n) or Ni57 production lin-log
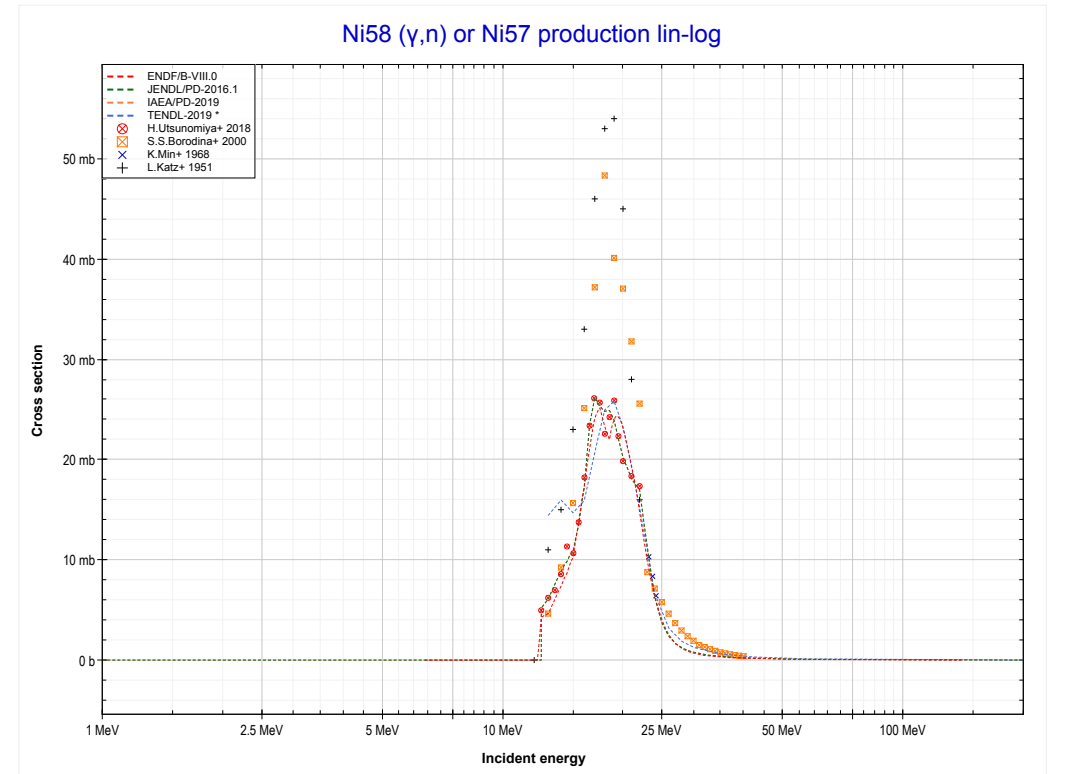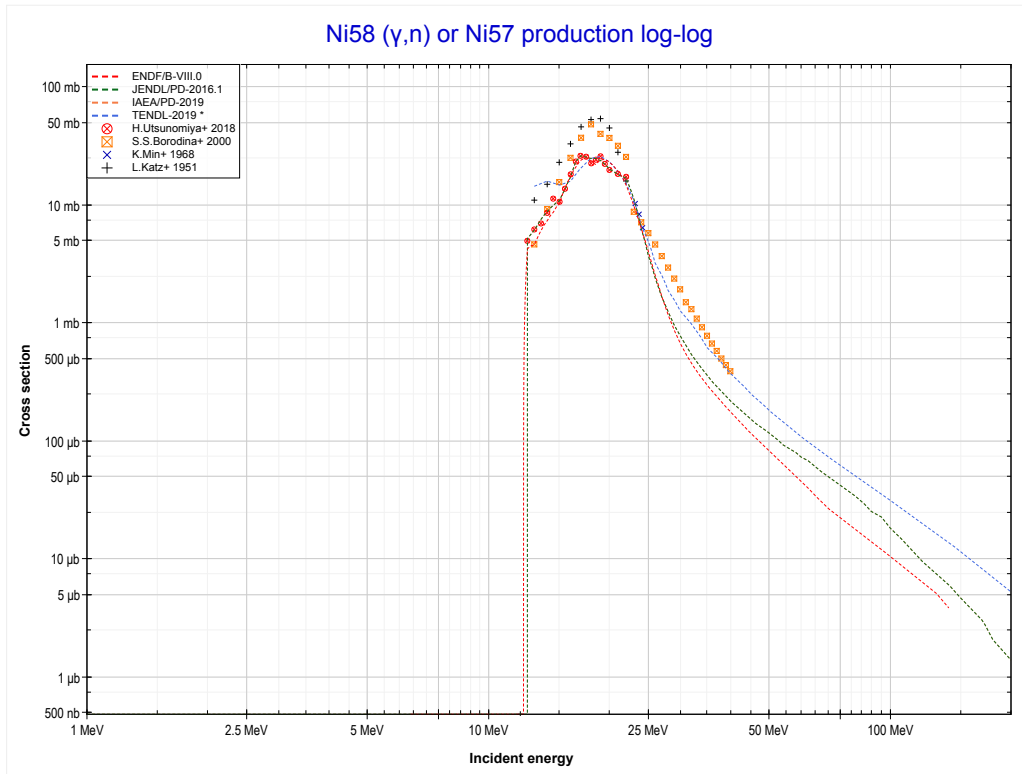
Reaction	Q-Value
Ni58(γ,n)Ni57	-12216.22 keV

<< 27-Co-59	**28-Ni-58**	28-Ni-60 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ni56 production)**	MT28 (γ,n+p) >>

Ni58 (γ,2n) or Ni56 production log-log

Ni58 (γ,2n) or Ni56 production lin-log
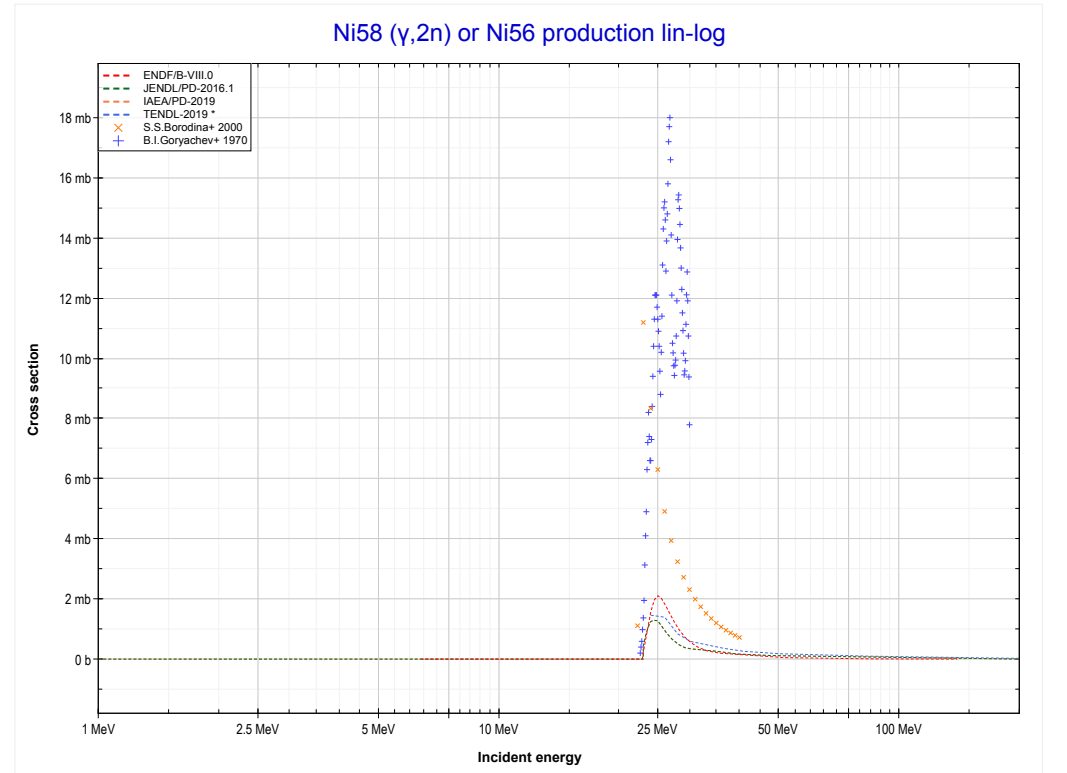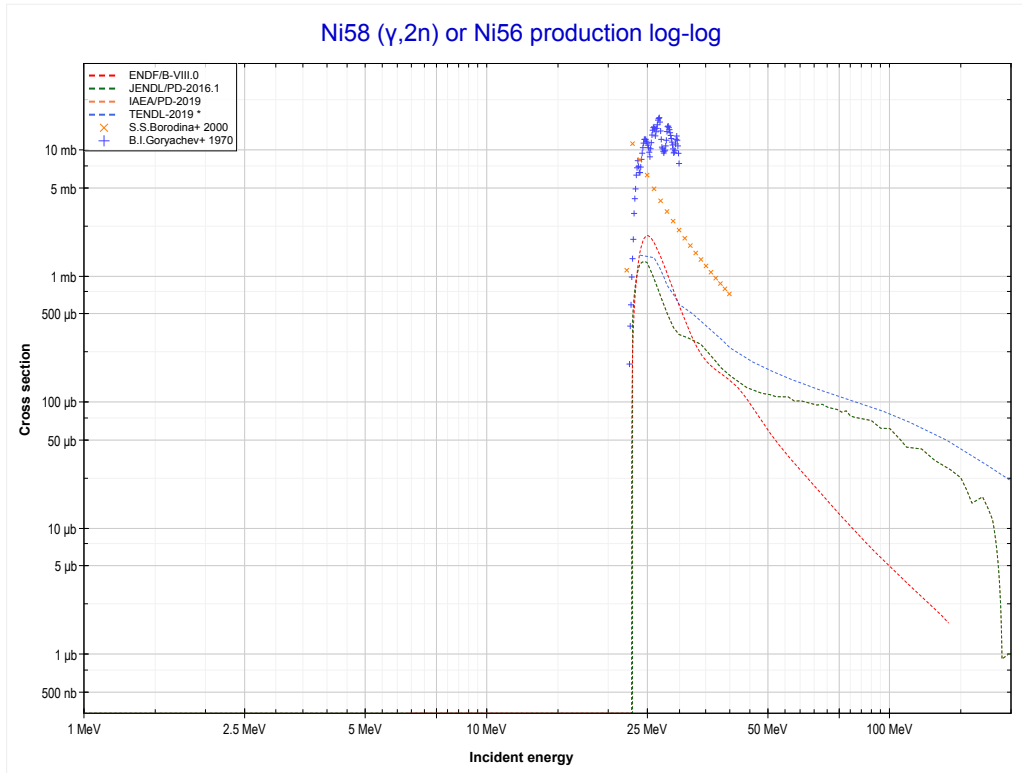
Reaction	Q-Value
Ni58(γ,2n)Ni56	-22463.83 keV

<< 26-Fe-56	28-Ni-58	28-Ni-60 >>
<< MT16 (γ,2n)	MT28 (γ,n+p) or MT5 (Co56 production)	MT103 (γ,p) >>

Ni58 (γ,n+p) or Co56 production log-log

Ni58 (γ,n+p) or Co56 production lin-log
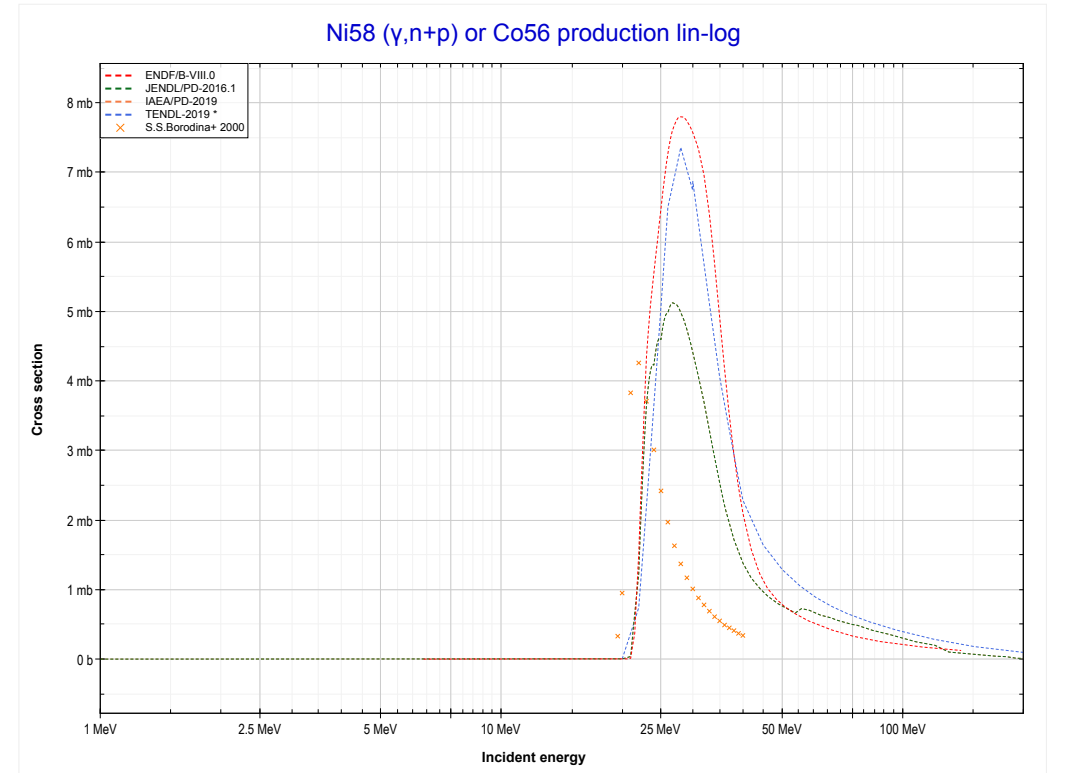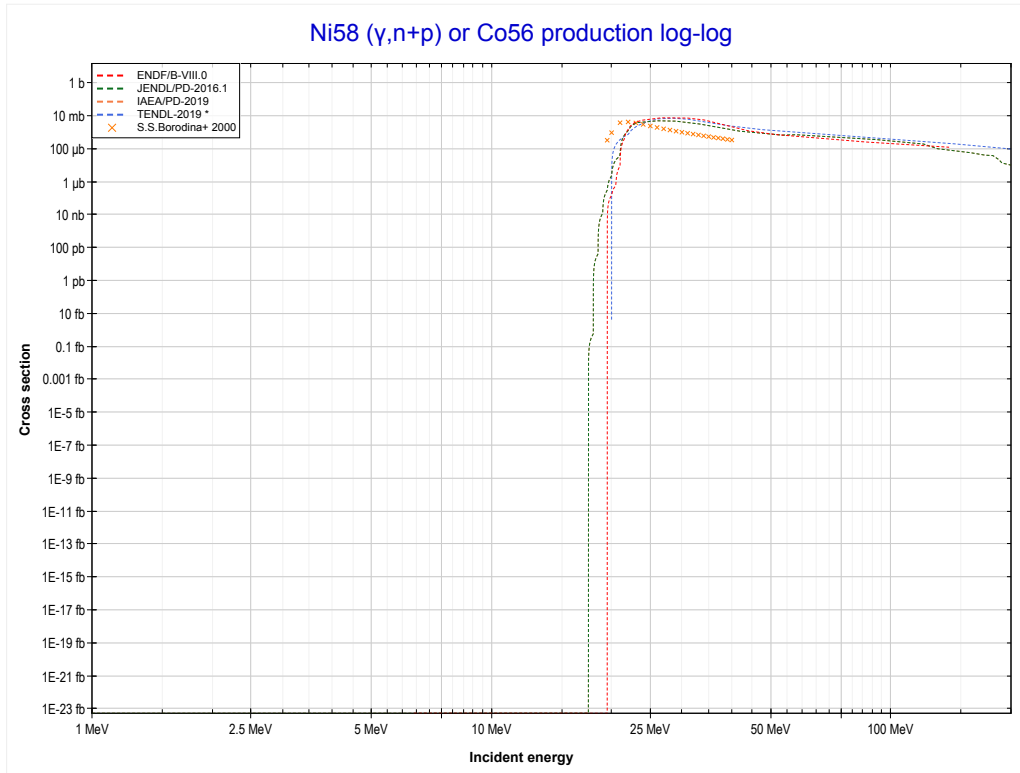
Reaction	Q-Value
Ni58(γ,d)Co56	-17324.02 keV
Ni58(γ,n+p)Co56	-19548.59 keV

<< 26-Fe-56	**28-Ni-58**	28-Ni-60 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (Co57 production)**	28-Ni-60 MT4 (γ,n) >>

Ni58 (γ,p) or Co57 production log-log

Ni58 (γ,p) or Co57 production lin-log
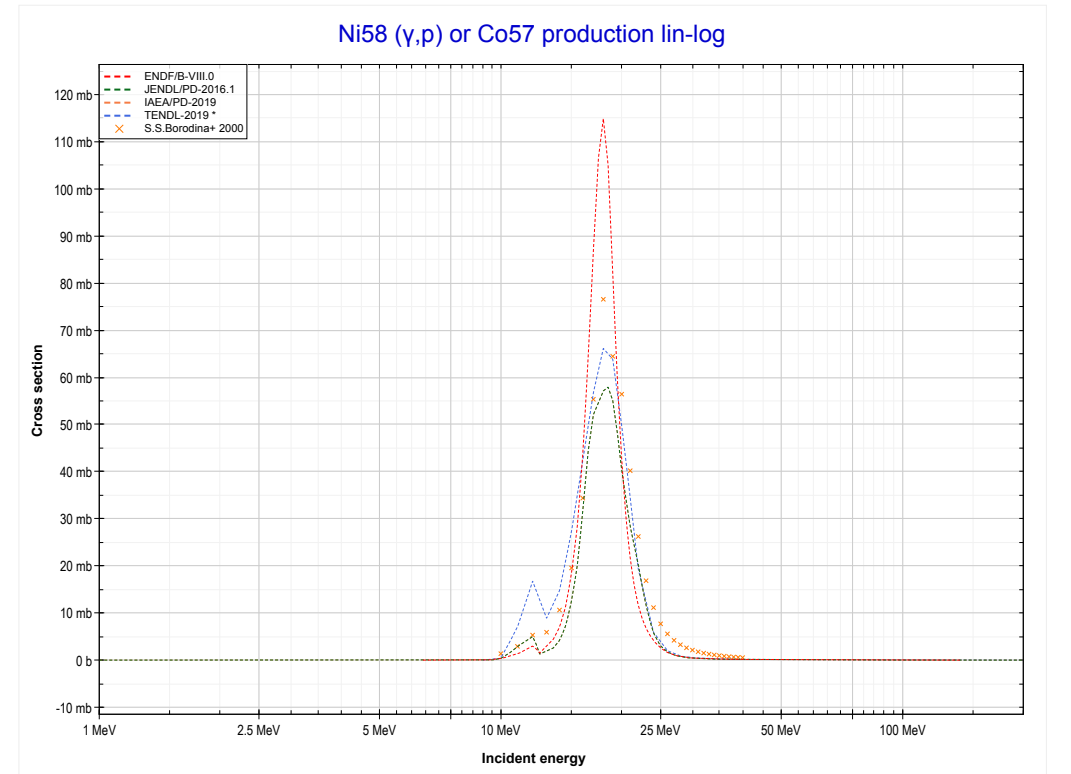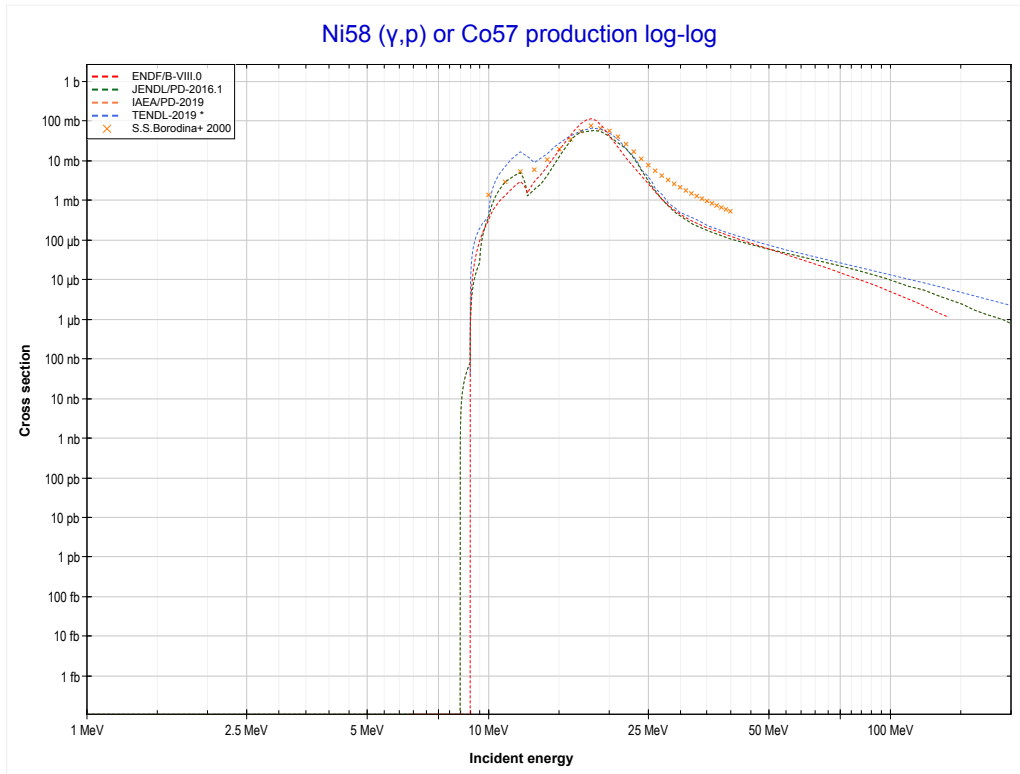
Reaction	Q-Value
Ni58(γ,p)Co57	-8172.07 keV

<< 28-Ni-58	**28-Ni-60**	28-Ni-61 >>
<< 28-Ni-58 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Ni59 production)**	MT16 (γ,2n) >>

Ni60 (γ,n) or Ni59 production log-log

Ni60 (γ,n) or Ni59 production lin-log
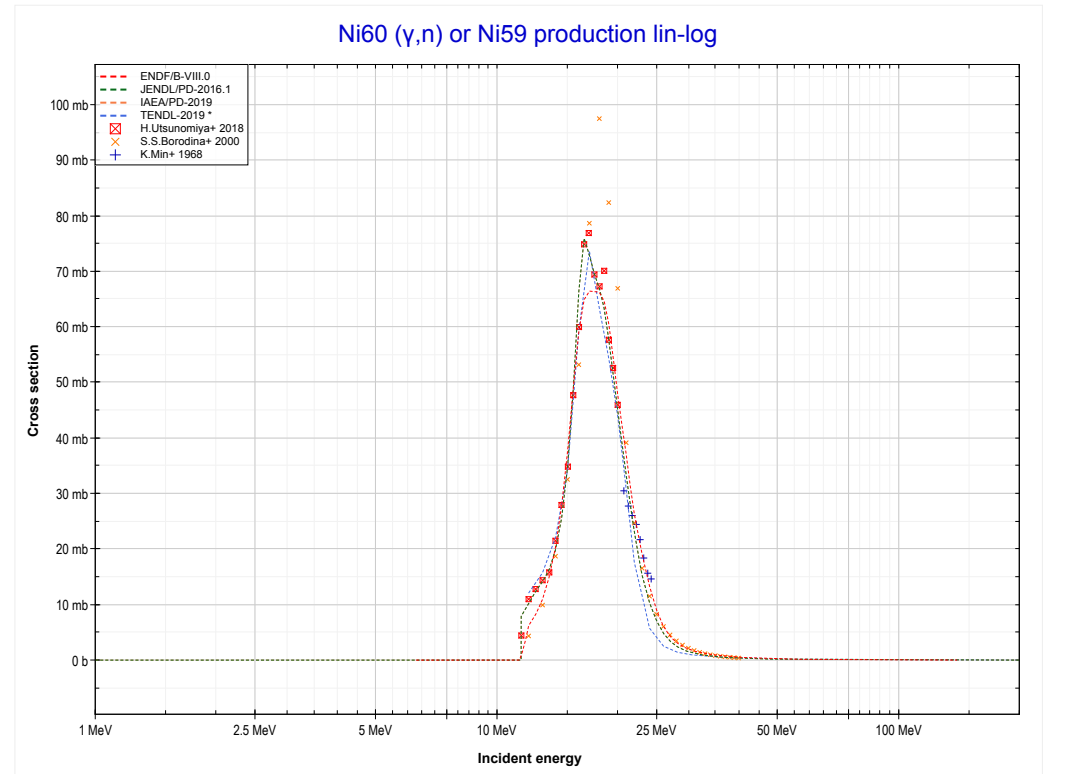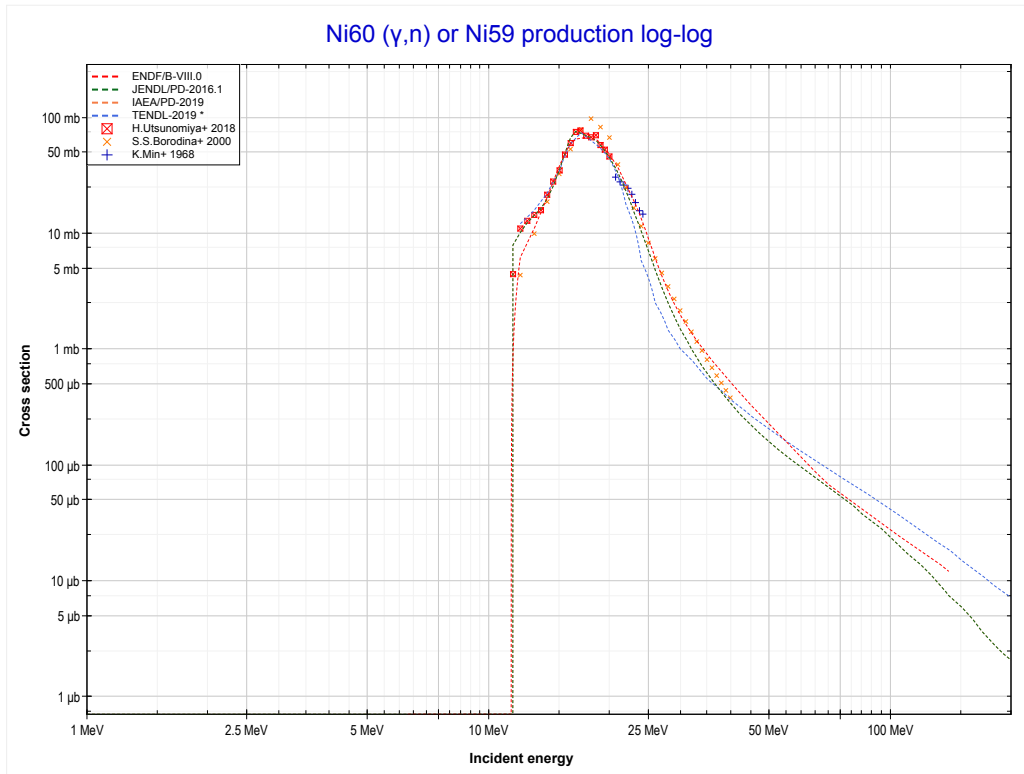
Reaction	Q-Value
Ni60(γ,n)Ni59	-11387.72 keV

<< 28-Ni-58	28-Ni-60	29-Cu-63 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Ni58 production)	MT28 (γ,n+p) >>
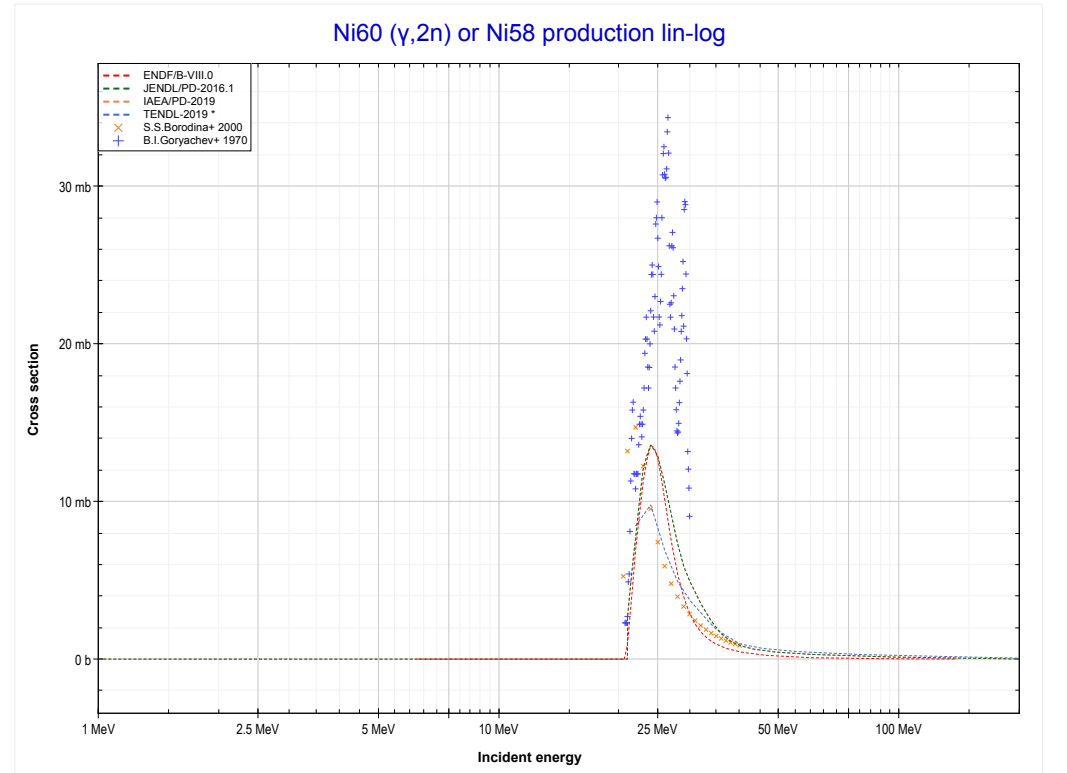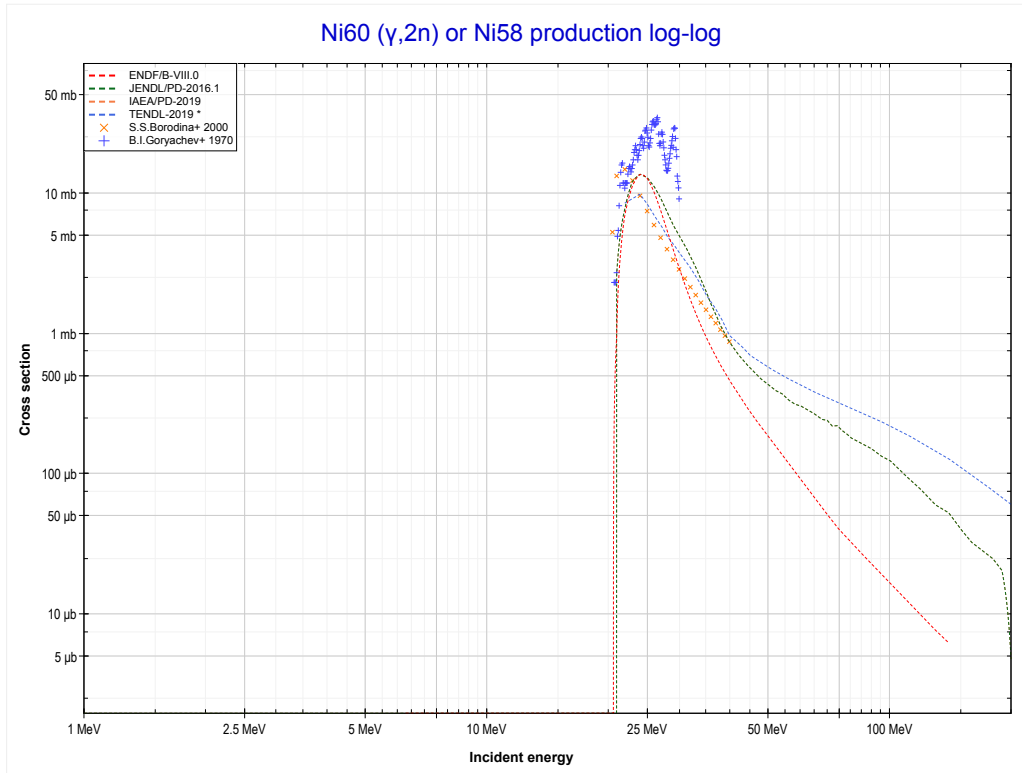
Reaction	Q-Value
Ni60(γ,2n)Ni58	-20387.03 keV

<< 28-Ni-58	**28-Ni-60**	29-Cu-63 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Co58 production)**	MT103 (γ,p) >>

Ni60 (γ,n+p) or Co58 production log-log

Ni60 (γ,n+p) or Co58 production lin-log
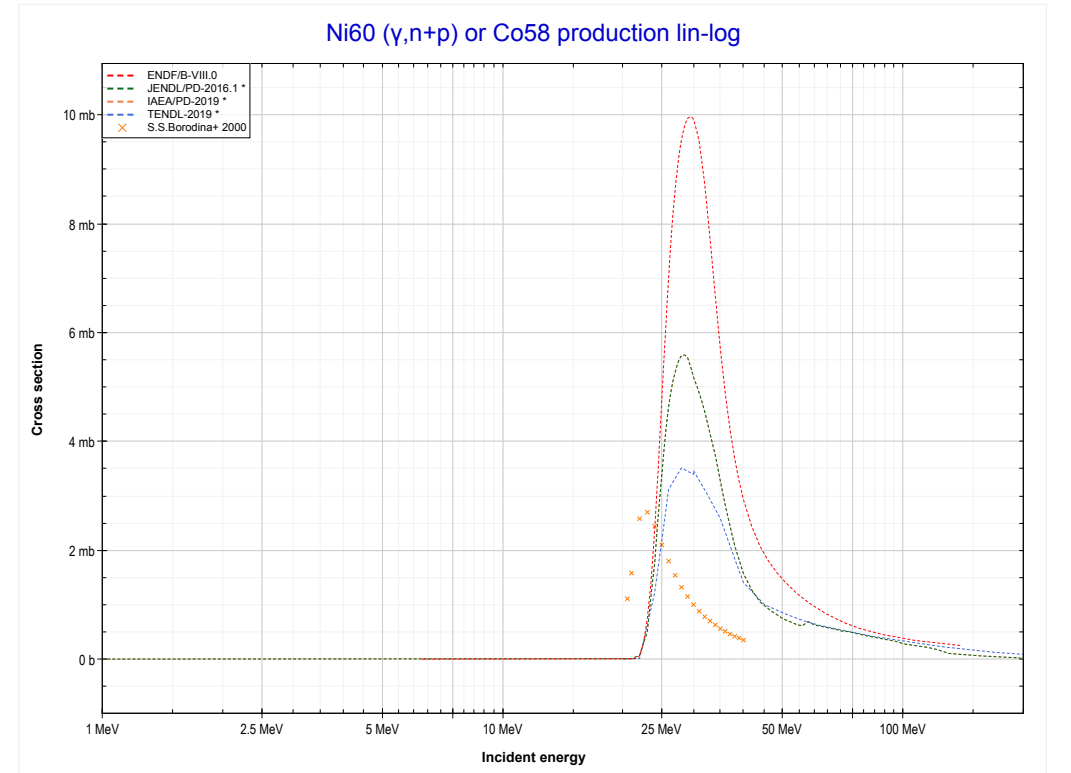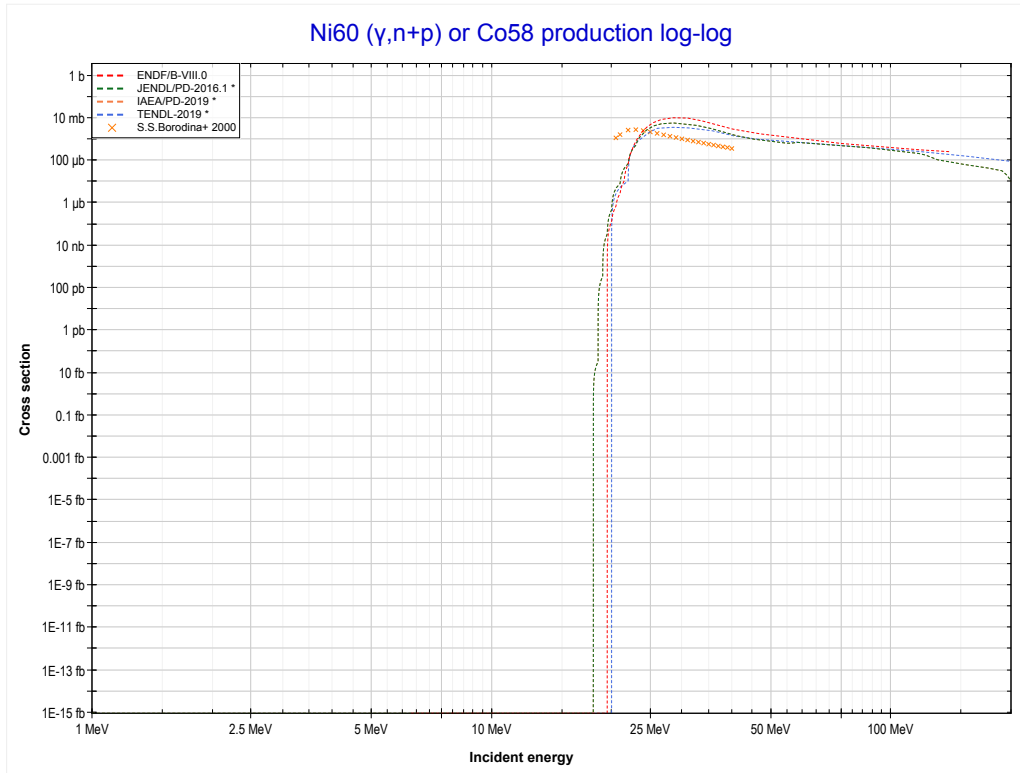
Reaction	Q-Value
Ni60(γ,d)Co58	-17761.62 keV
Ni60(γ,n+p)Co58	-19986.19 keV

<< 28-Ni-58	**28-Ni-60**	29-Cu-63 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (Co59 production)**	28-Ni-61 MT4 (γ,n) >>

Ni60 (γ,p) or Co59 production log-log

Ni60 (γ,p) or Co59 production lin-log
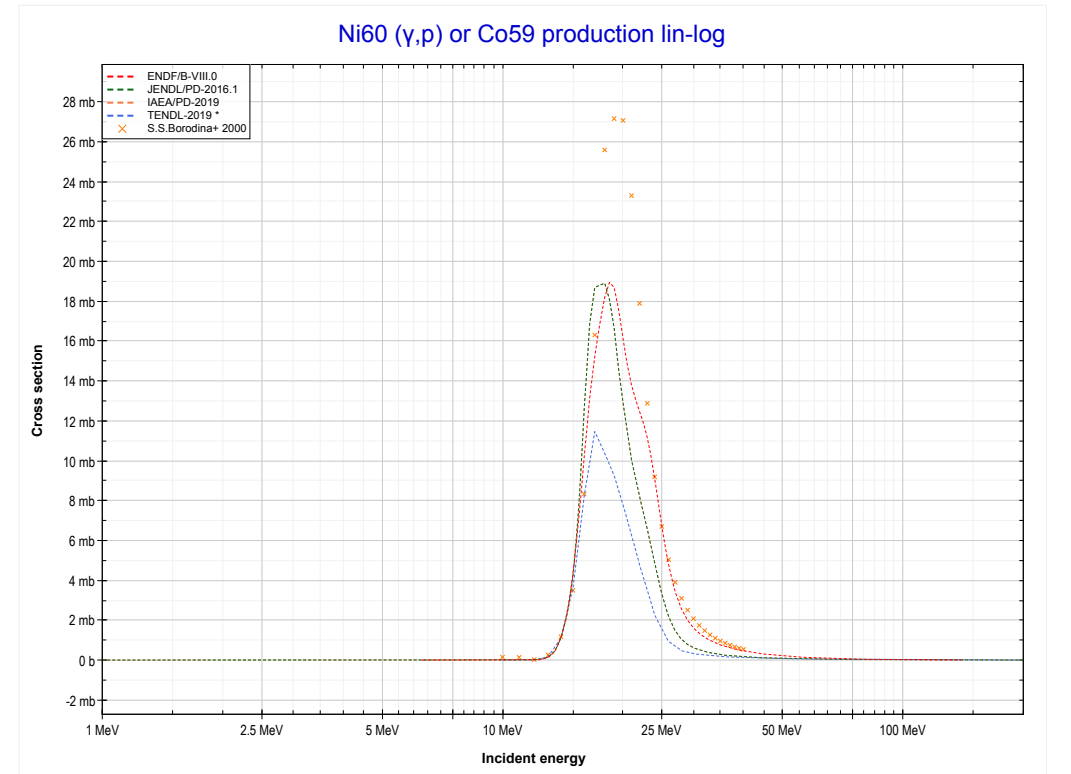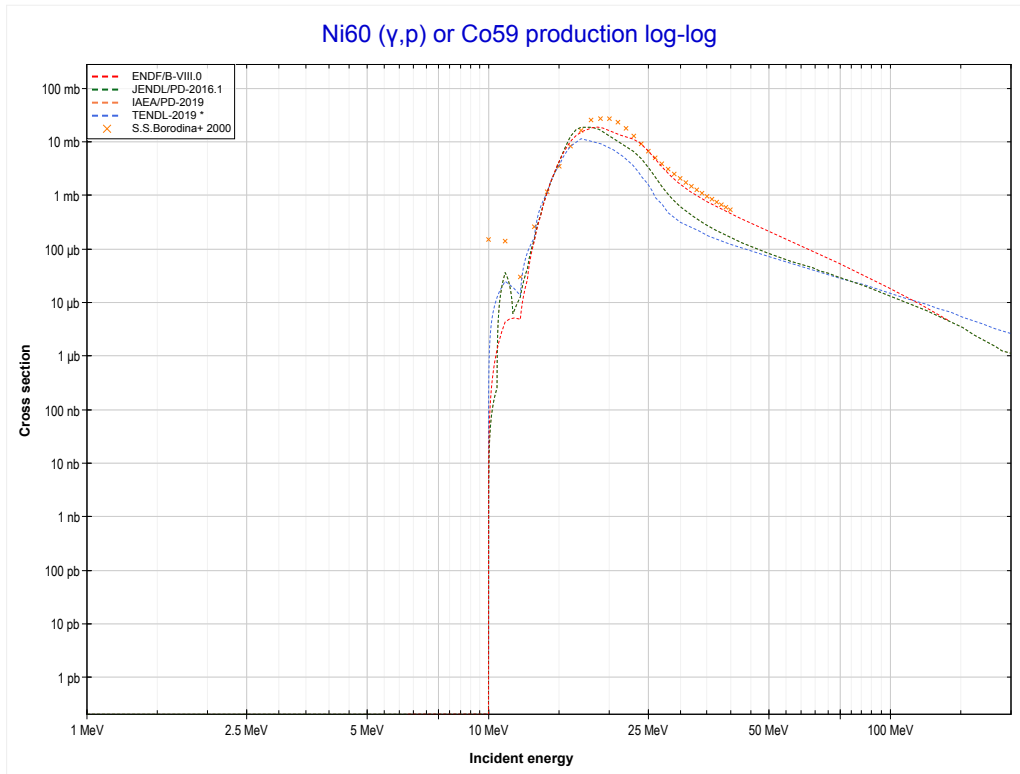
Reaction	Q-Value
Ni60(γ,p)Co59	-9532.37 keV

<< 28-Ni-60	**28-Ni-61**	28-Ni-64 >>
<< 28-Ni-60 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Ni60 production)**	28-Ni-64 MT4 (γ,n) >>

Ni61 (γ,n) or Ni60 production log-log

Ni61 (γ,n) or Ni60 production lin-log
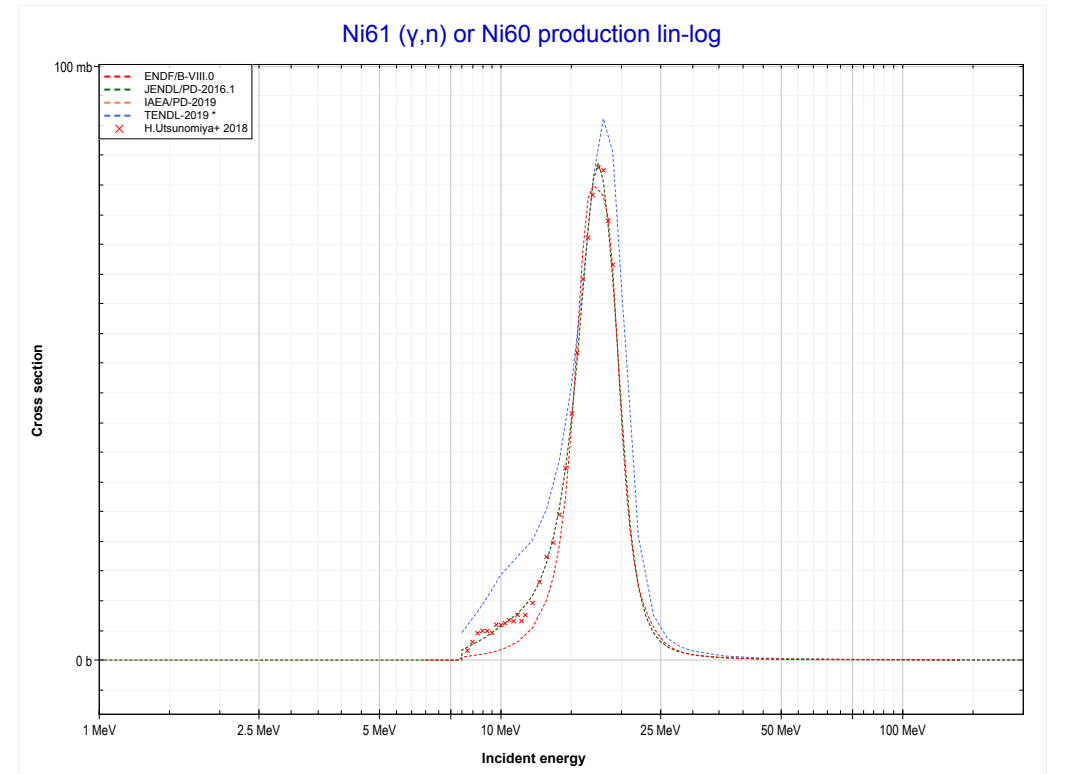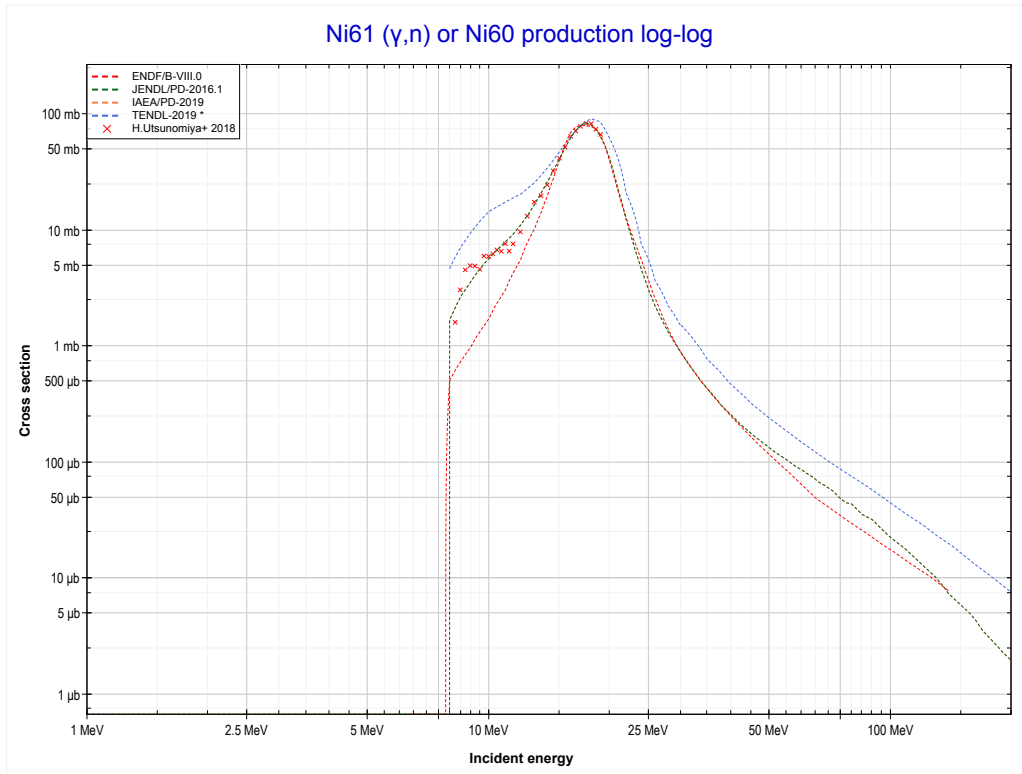
Reaction	Q-Value
Ni61(γ,n)Ni60	-7820.12 keV

<< 28-Ni-61	**28-Ni-64**	29-Cu-63 >>
<< 28-Ni-61 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ni63 production)**	29-Cu-63 MT4 (γ,n) >>

Ni64 (γ,n) or Ni63 production log-log

Ni64 (γ,n) or Ni63 production lin-log
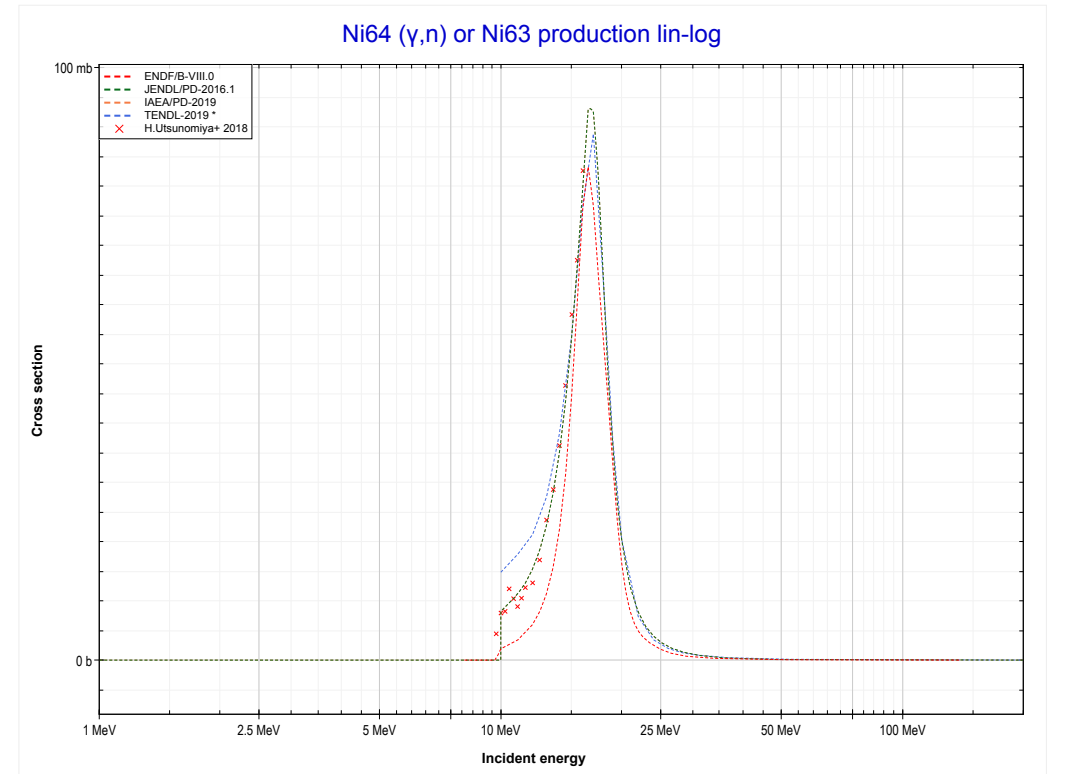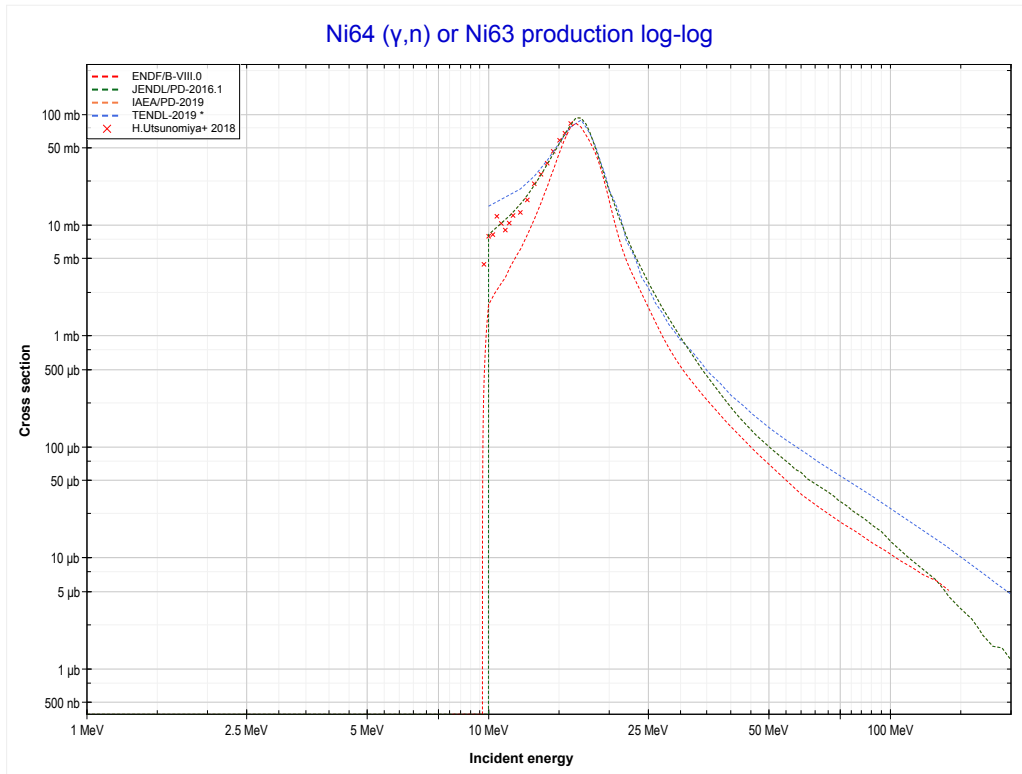
Reaction	Q-Value
Ni64(γ,n)Ni63	-9657.42 keV

<< 28-Ni-64	**29-Cu-63**	29-Cu-65 >>
<< 28-Ni-64 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Cu62 production)**	MT16 (γ,2n) >>

Cu63 (γ,n) or Cu62 production log-log

Cu63 (γ,n) or Cu62 production lin-log
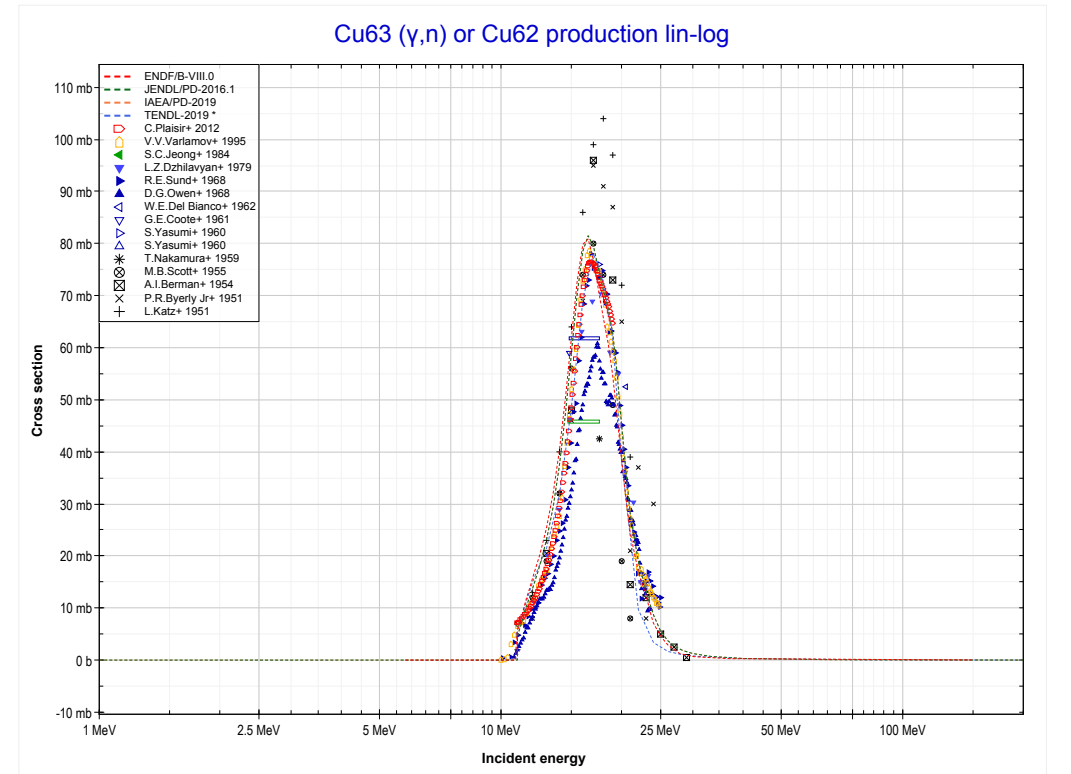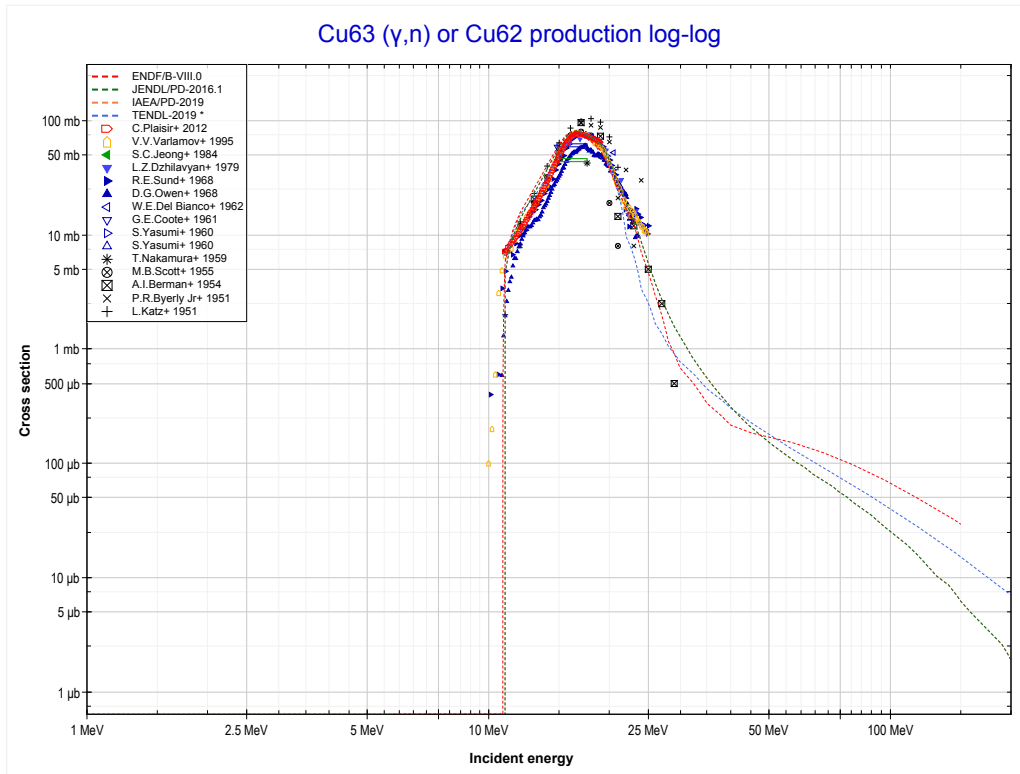
Reaction	Q-Value
Cu63(γ,n)Cu62	-10863.72 keV

<< 28-Ni-60	**29-Cu-63**	32-Ge-70 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Cu61 production)**	MT28 (γ,n+p) >>

Cu63 (γ,2n) or Cu61 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- M.L.P.Antunes+ 1995
- R.E.Sund+ 1968
- A.I.Berman+ 1954

Cu63 (γ,2n) or Cu61 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- M.L.P.Antunes+ 1995
- R.E.Sund+ 1968
- A.I.Berman+ 1954
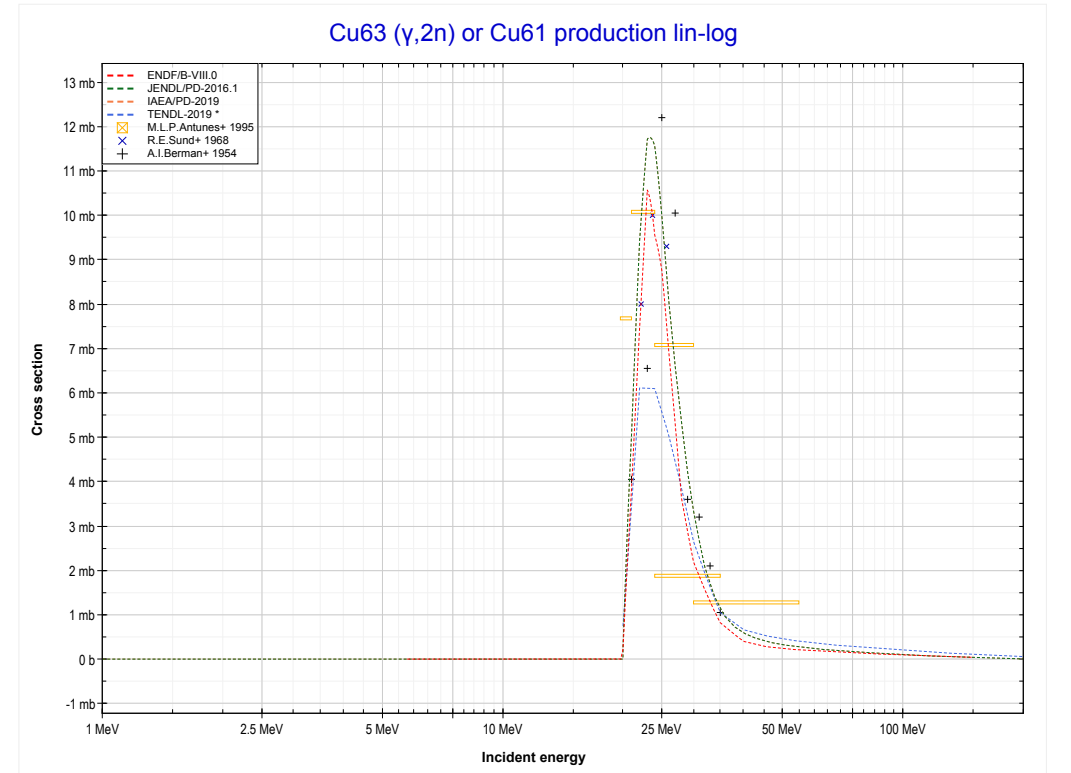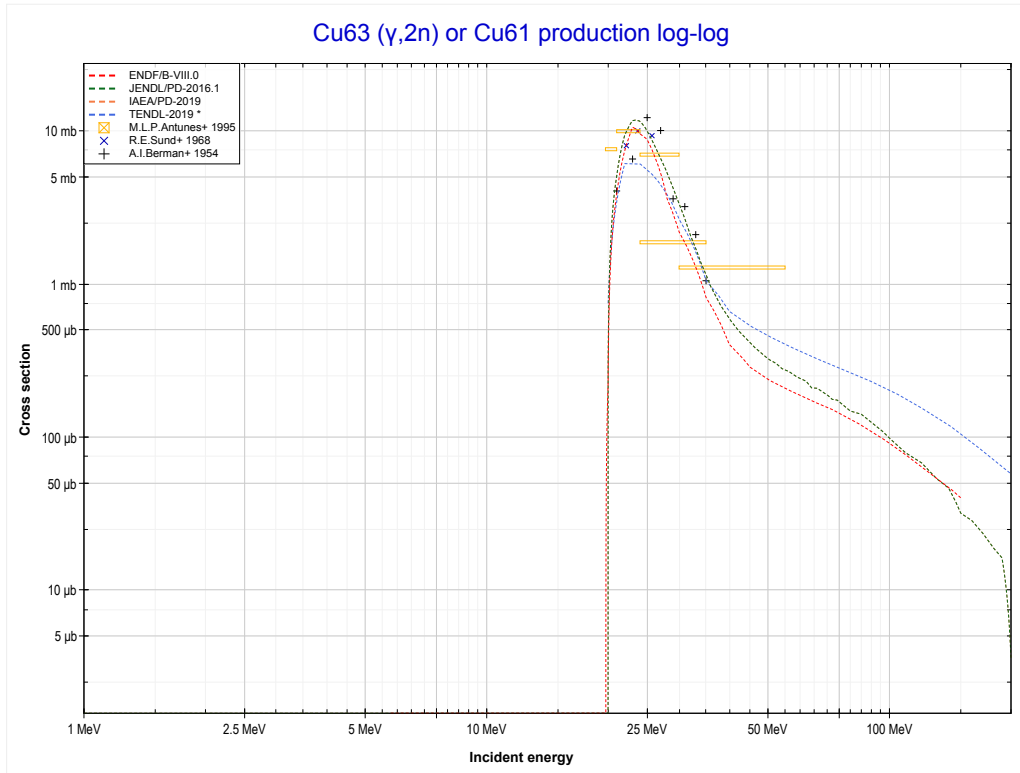
Reaction	Q-Value
Cu63(γ,2n)Cu61	-19738.33 keV

<< 28-Ni-60	**29-Cu-63**	29-Cu-65 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Ni61 production)**	MT103 (γ,p) >>

Cu63 (γ,n+p) or Ni61 production log-log

Cu63 (γ,n+p) or Ni61 production lin-log
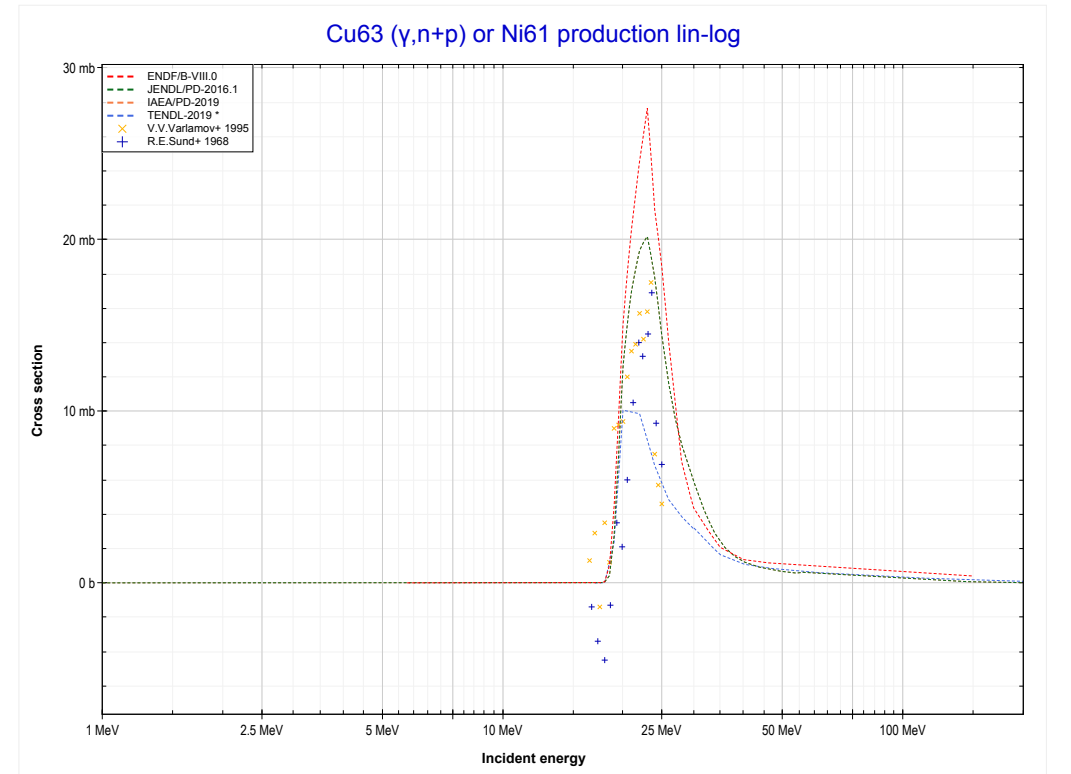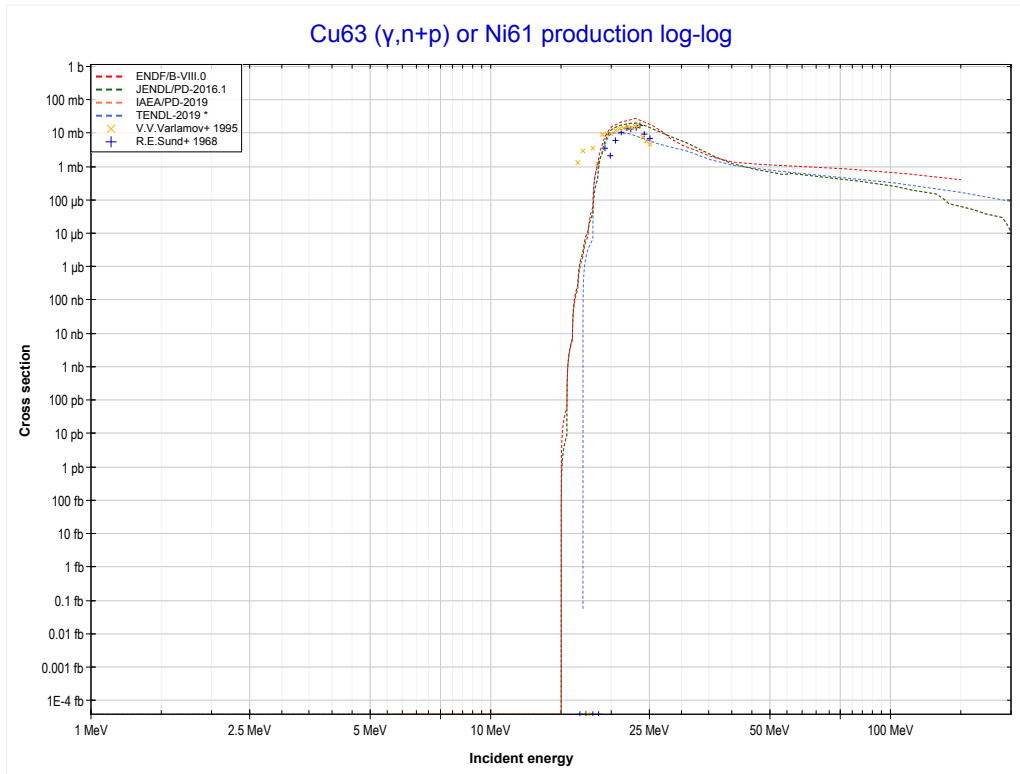
Reaction	Q-Value
Cu63(γ,d)Ni61	-14493.62 keV
Cu63(γ,n+p)Ni61	-16718.19 keV

<< 28-Ni-60	29-Cu-63	29-Cu-65 >>
<< MT28 (γ,n+p)	MT103 (γ,p) or MT5 (Ni62 production)	MT111 (γ,2p) >>

Cu63 (γ,p) or Ni62 production log-log

Cu63 (γ,p) or Ni62 production lin-log
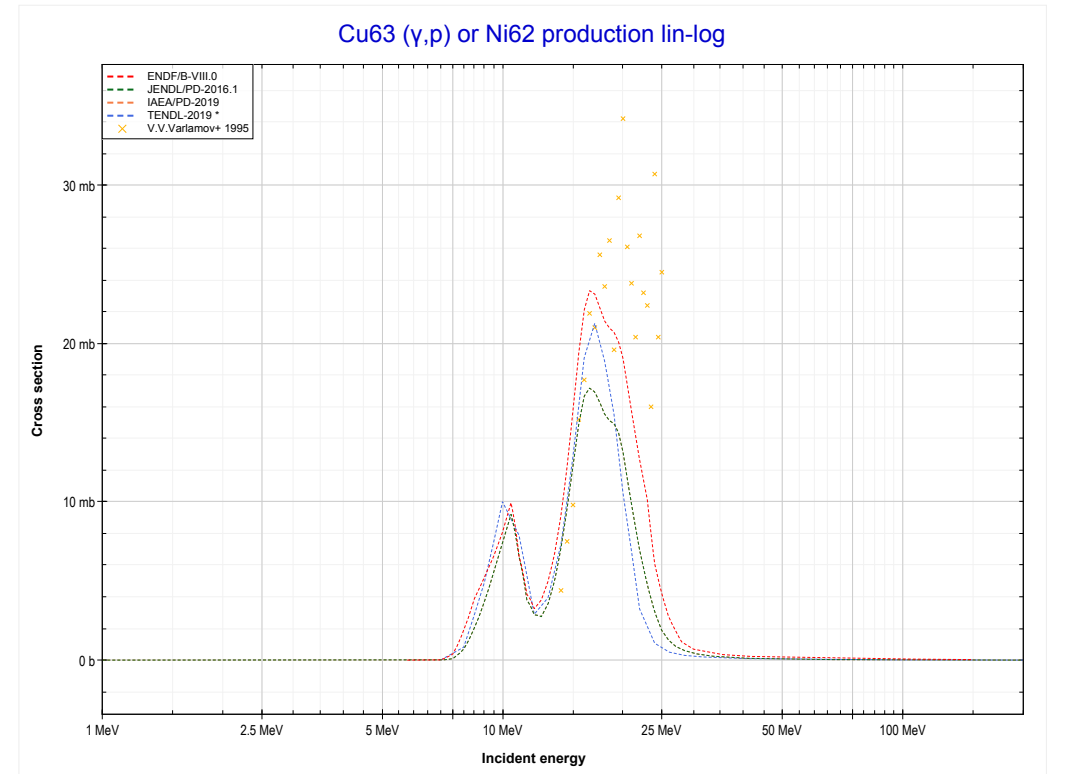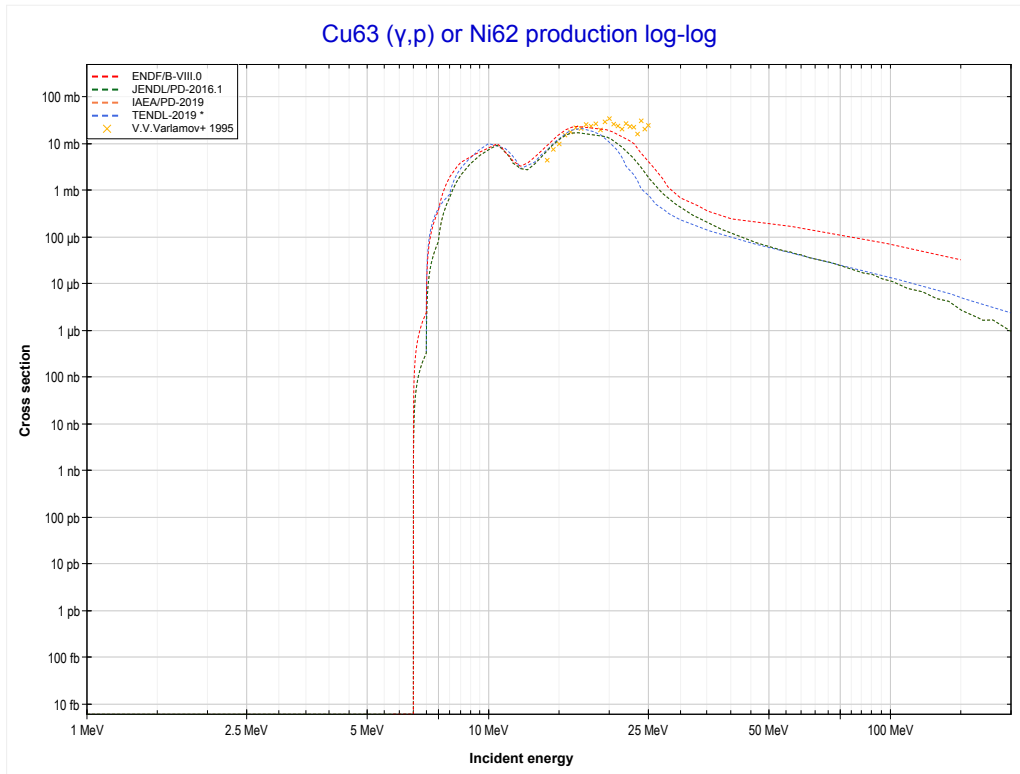
Reaction	Q-Value
Cu63(γ,p)Ni62	-6122.47 keV

<< 2-He-3	**29-Cu-63**	
<< MT103 (γ,p)	**MT111 (γ,2p) or MT5 (Co61 production)**	29-Cu-65 MT4 (γ,n) >>

Cu63 (γ,2p) or Co61 production log-log

Cu63 (γ,2p) or Co61 production lin-log
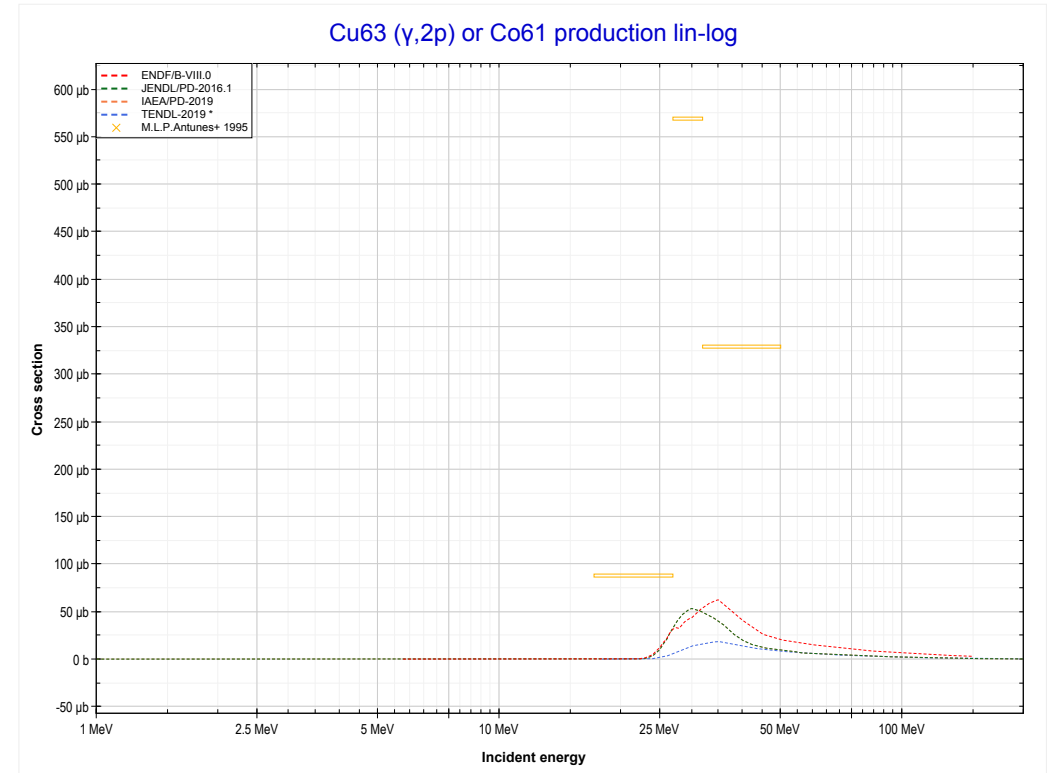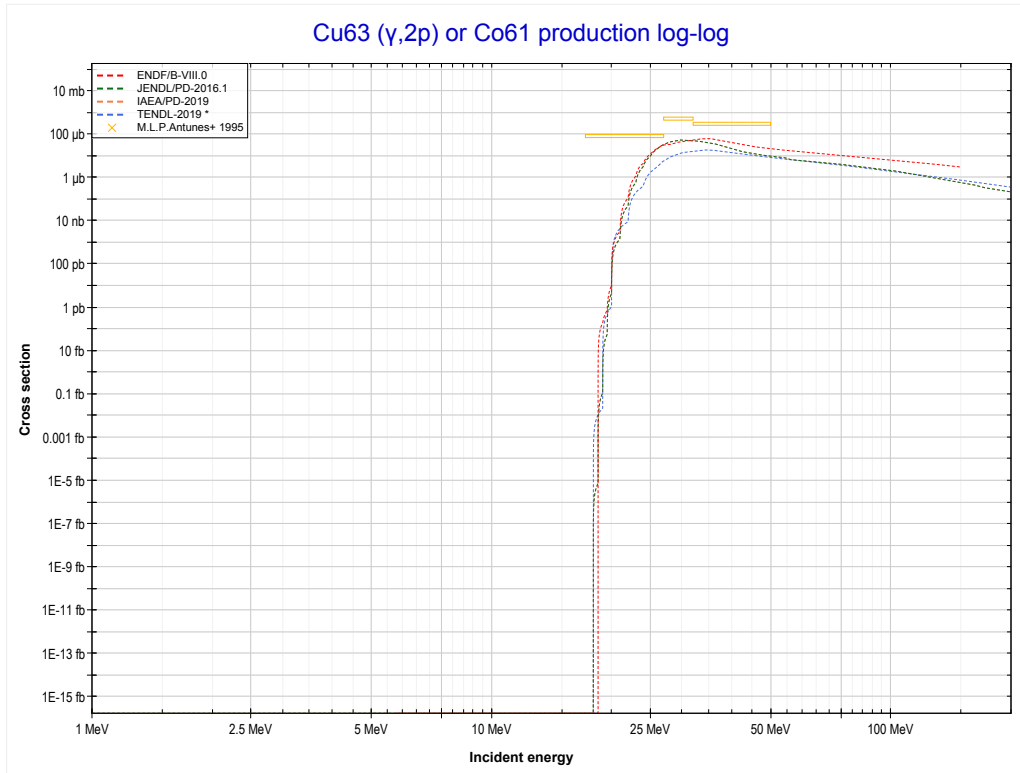
Reaction	Q-Value
Cu63(γ,2p)Co61	-17259.64 keV

<< 29-Cu-63	**29-Cu-65**	30-Zn-64 >>
<< 29-Cu-63 MT111 (γ,2p)	**MT4 (γ,n) or MT5 (Cu64 production)**	MT28 (γ,n+p) >>

Cu65 (γ,n) or Cu64 production log-log

Cu65 (γ,n) or Cu64 production lin-log
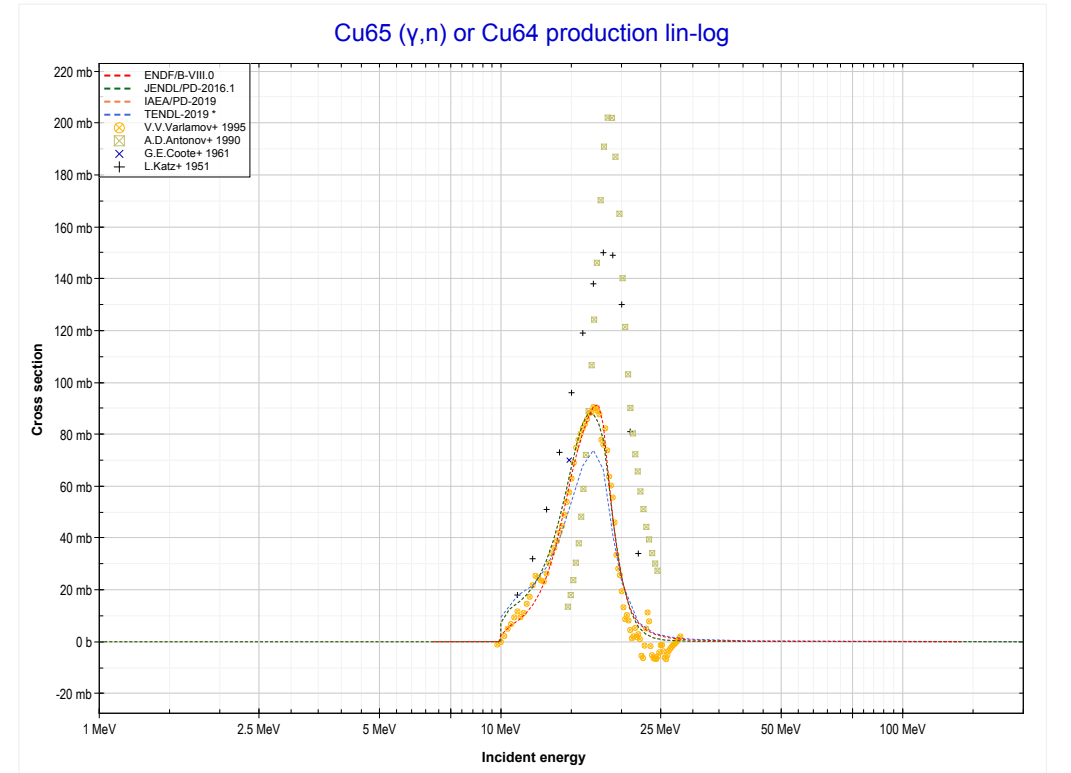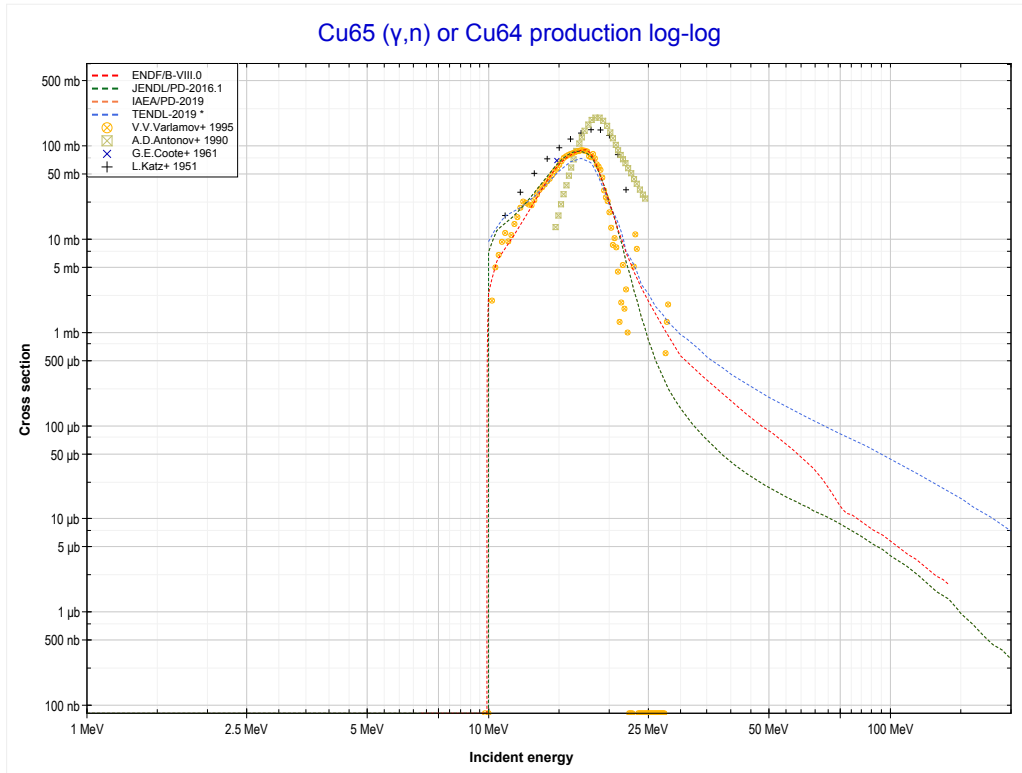
Reaction	Q-Value
Cu65(γ,n)Cu64	-9910.52 keV

<< 29-Cu-63	**29-Cu-65**	30-Zn-64 >>
<< MT4 (γ,n)	**MT28 (γ,n+p) or MT5 (Ni63 production)**	MT103 (γ,p) >>

Cu65 (γ,n+p) or Ni63 production log-log

Cu65 (γ,n+p) or Ni63 production lin-log
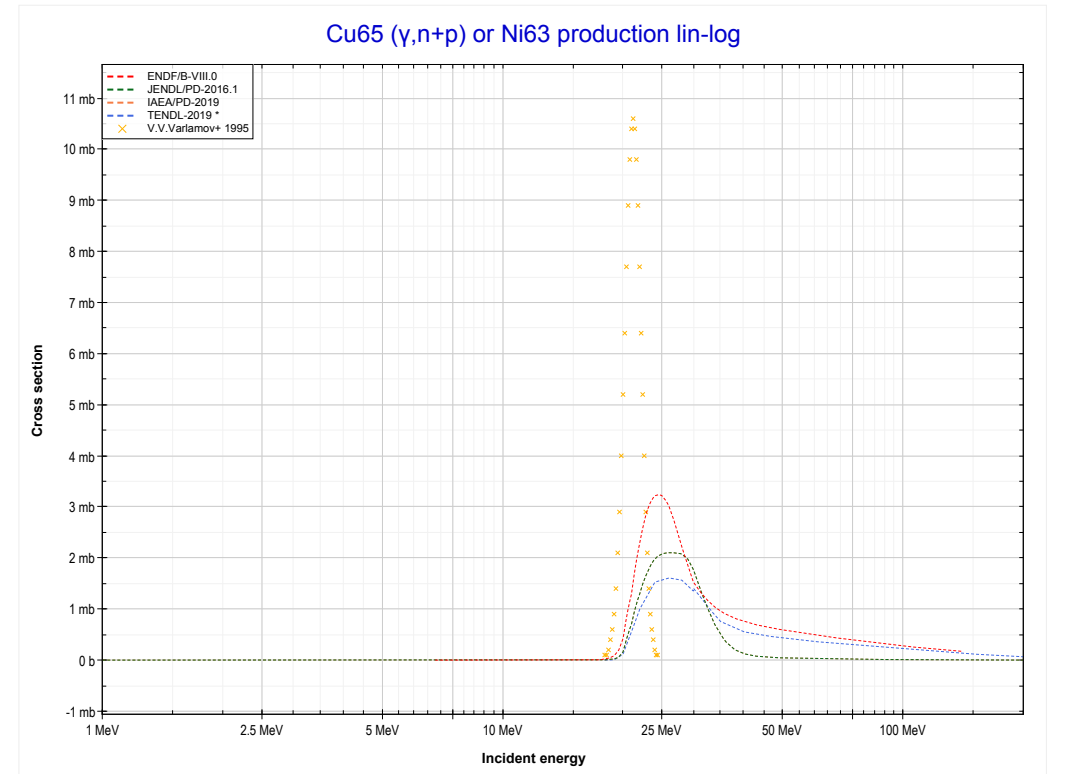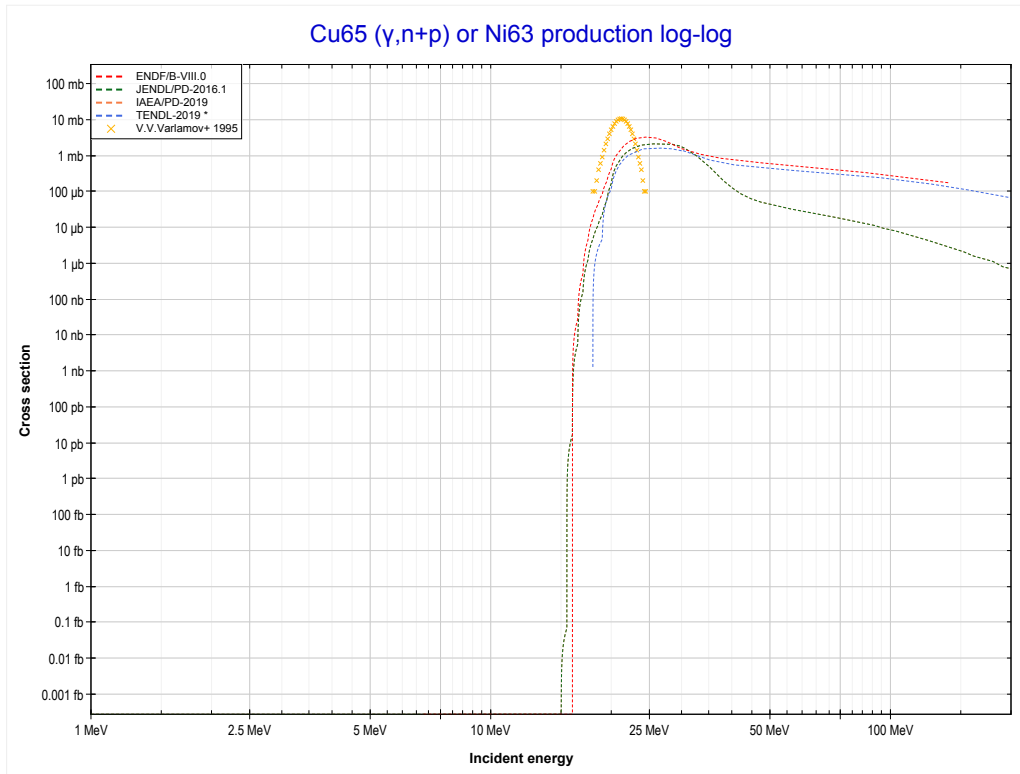
Reaction	Q-Value
Cu65(γ,d)Ni63	-14886.62 keV
Cu65(γ,n+p)Ni63	-17111.19 keV

<< 29-Cu-63	**29-Cu-65**	30-Zn-67 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (Ni64 production)**	MT107 (γ,α) >>

Cu65 (γ,p) or Ni64 production log-log

Cu65 (γ,p) or Ni64 production lin-log
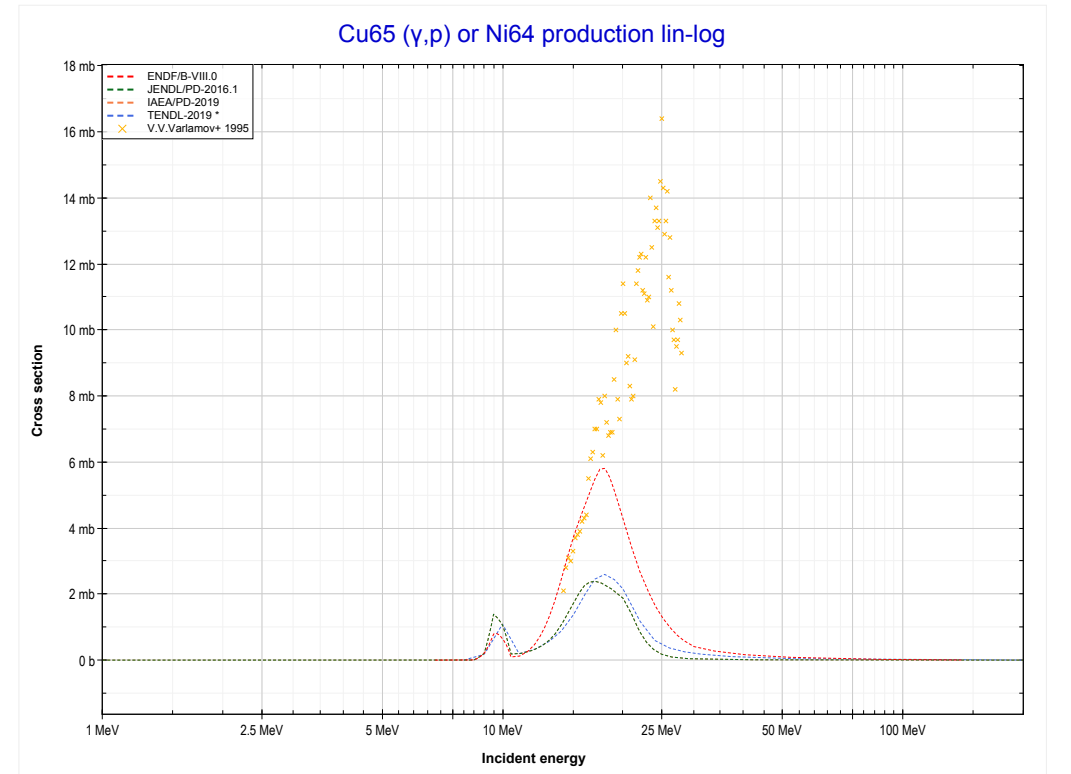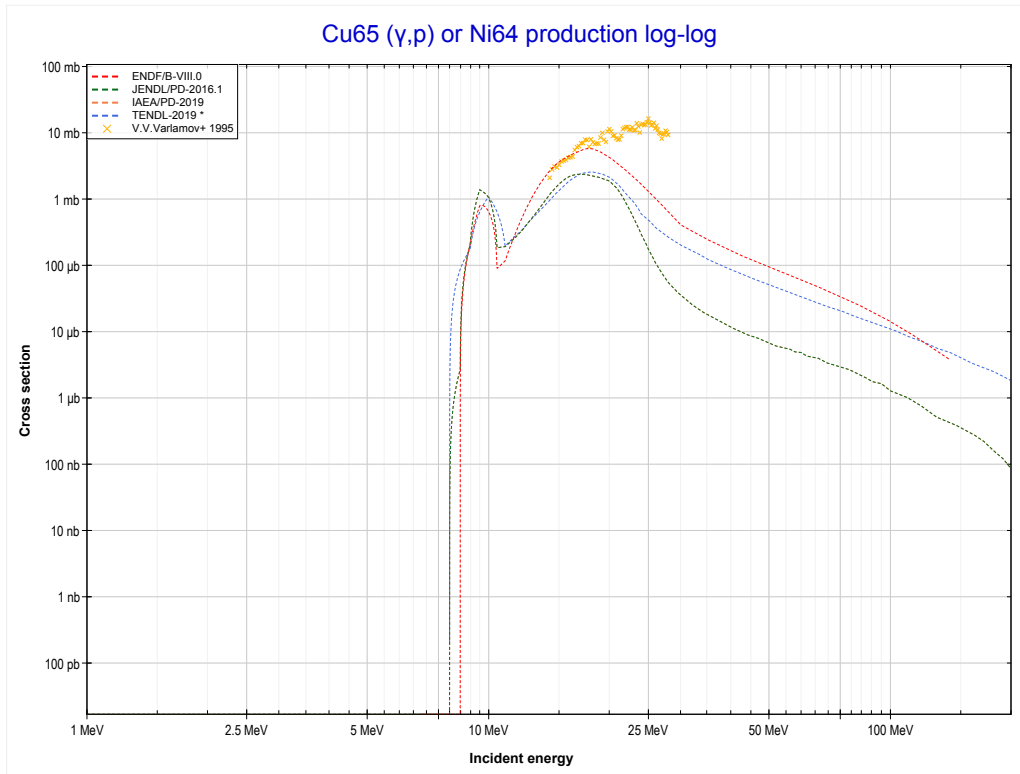
Reaction	Q-Value
Cu65(γ,p)Ni64	-7453.77 keV

<< 23-V-51	**29-Cu-65**	32-Ge-76 >>
<< MT103 (γ,p)	**MT107 (γ,α) or MT5 (Co61 production)**	30-Zn-64 MT4 (γ,n) >>

Cu65 (γ,α) or Co61 production log-log

Cu65 (γ,α) or Co61 production lin-log
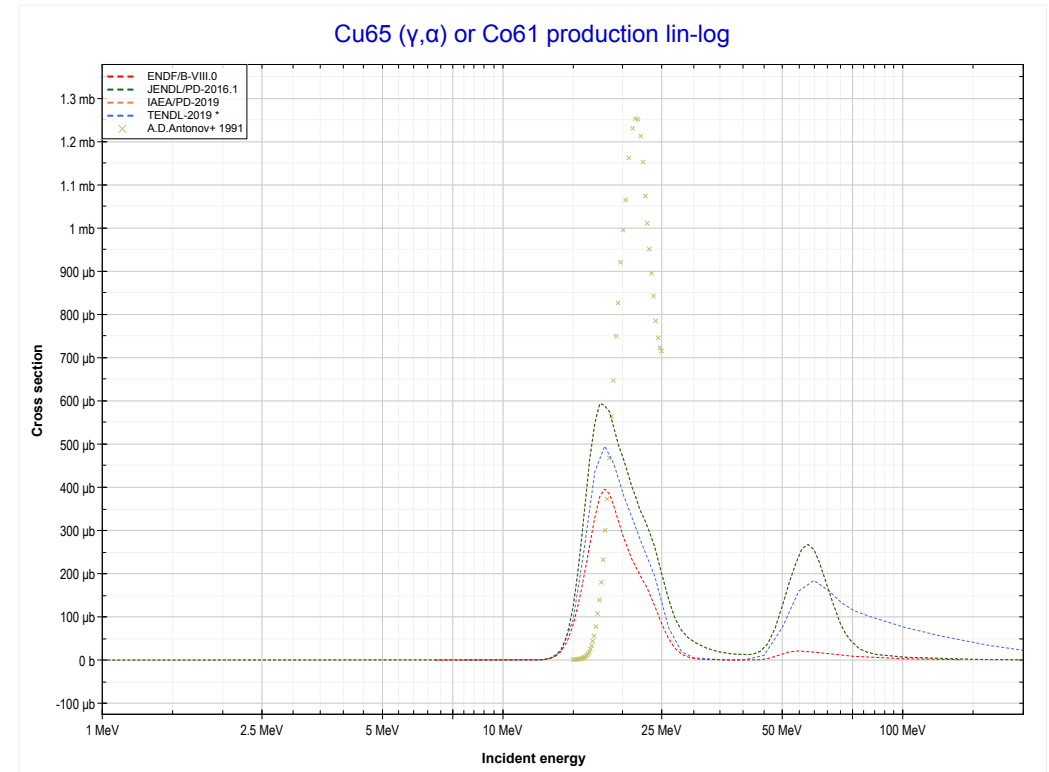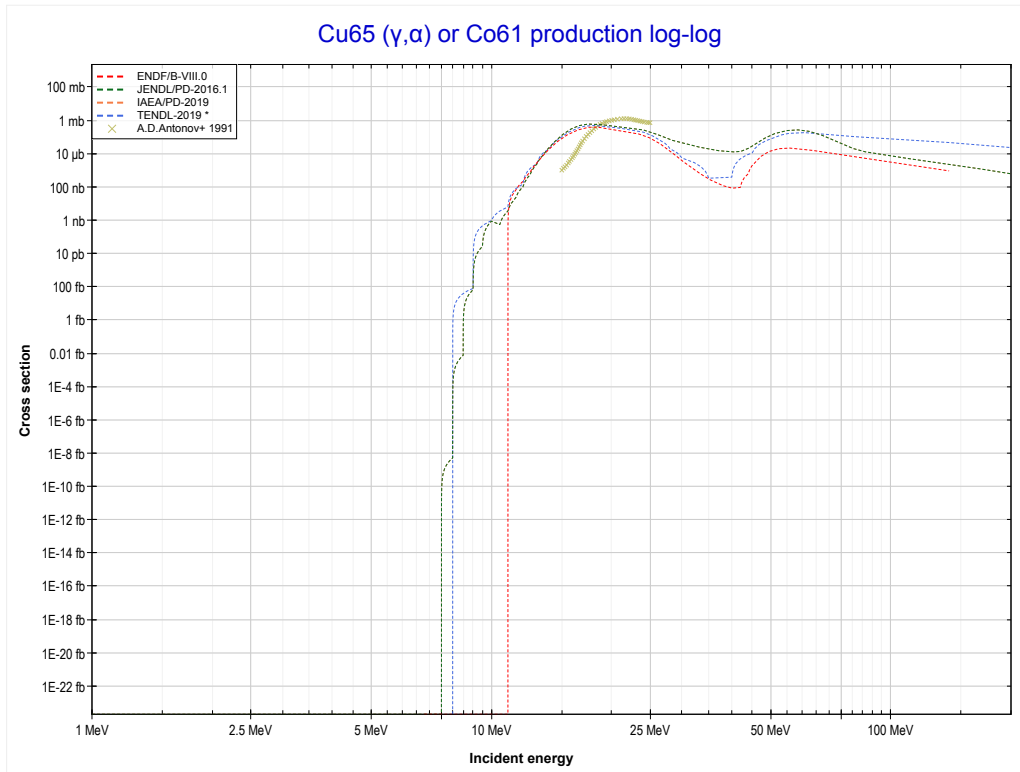
Reaction	Q-Value
Cu65(γ,α)Co61	-6790.52 keV
Cu65(γ,p+t)Co61	-26604.38 keV
Cu65(γ,n+He3)Co61	-27368.13 keV
Cu65(γ,2d)Co61	-30637.04 keV
Cu65(γ,n+p+d)Co61	-32861.61 keV
Cu65(γ,2n+2p)Co61	-35086.18 keV

<< 29-Cu-65	**30-Zn-64**	30-Zn-65 >>
<< 29-Cu-65 MT107 (γ,α)	**MT4 (γ,n) or MT5 (Zn63 production)**	MT28 (γ,n+p) >>

Zn64 (γ,n) or Zn63 production log-log

Zn64 (γ,n) or Zn63 production lin-log
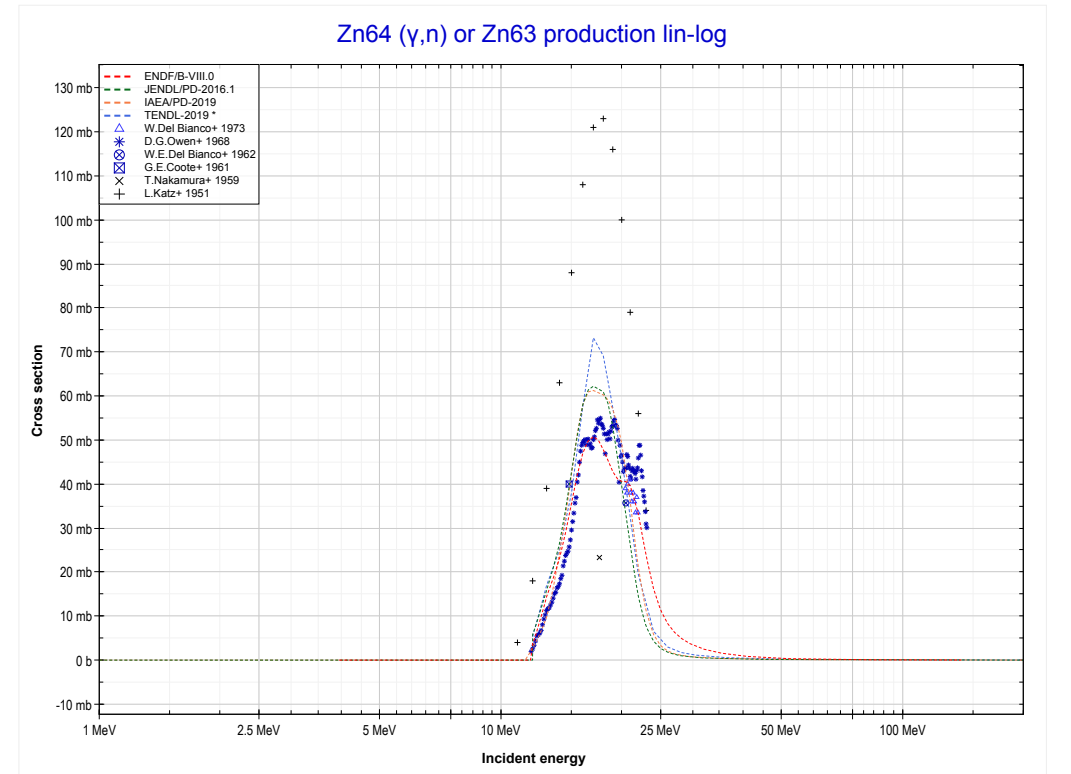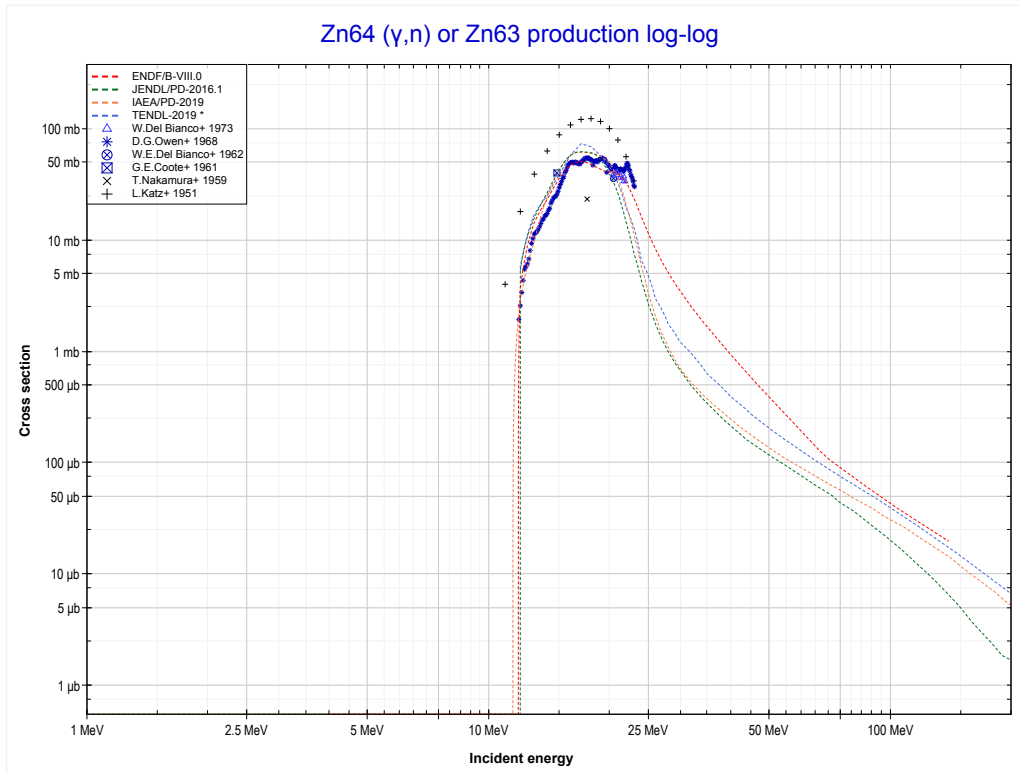
Reaction	Q-Value
Zn64(γ,n)Zn63	-11861.92 keV

<< 29-Cu-65	**30-Zn-64**	30-Zn-66 >>
<< MT4 (γ,n)	**MT28 (γ,n+p) or MT5 (Cu62 production)**	MT104 (γ,d) >>

Zn64 (γ,n+p) or Cu62 production log-log

Zn64 (γ,n+p) or Cu62 production lin-log
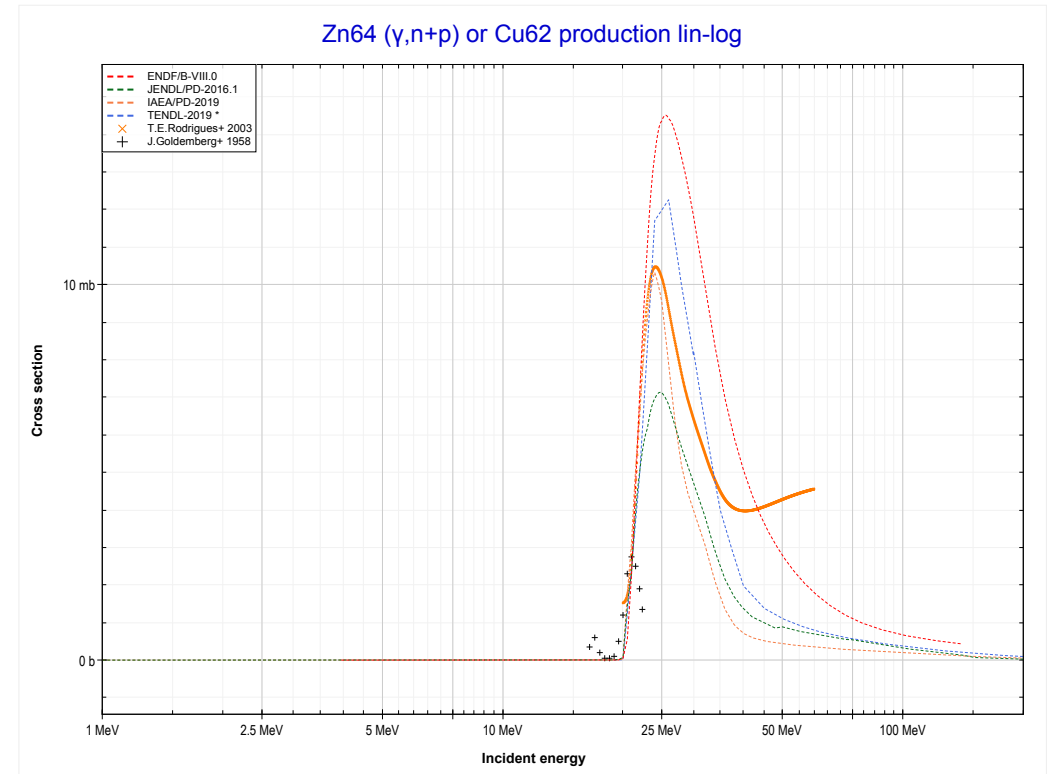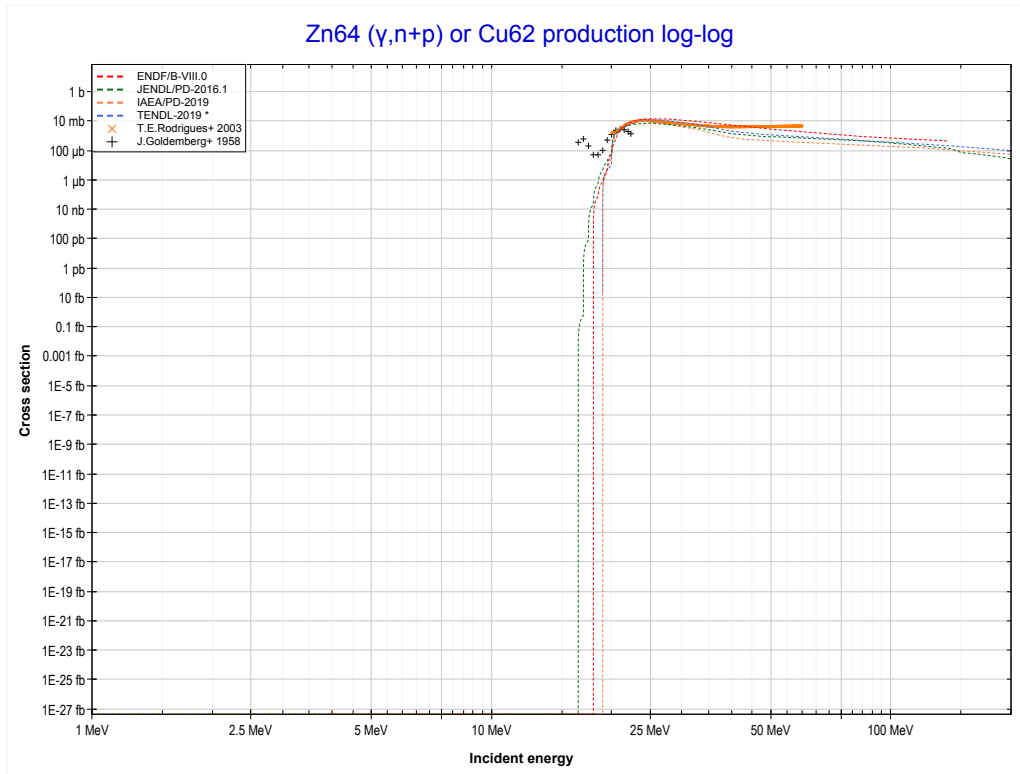
Reaction	Q-Value
Zn64(γ,d)Cu62	-16352.32 keV
Zn64(γ,n+p)Cu62	-18576.89 keV

<< 22-Ti-46	**30-Zn-64**	30-Zn-66 >>
<< MT28 (γ,n+p)	**MT104 (γ,d) or MT5 (Cu62 production)**	30-Zn-65 MT4 (γ,n) >>

Zn64 (γ,d) or Cu62 production log-log

Zn64 (γ,d) or Cu62 production lin-log
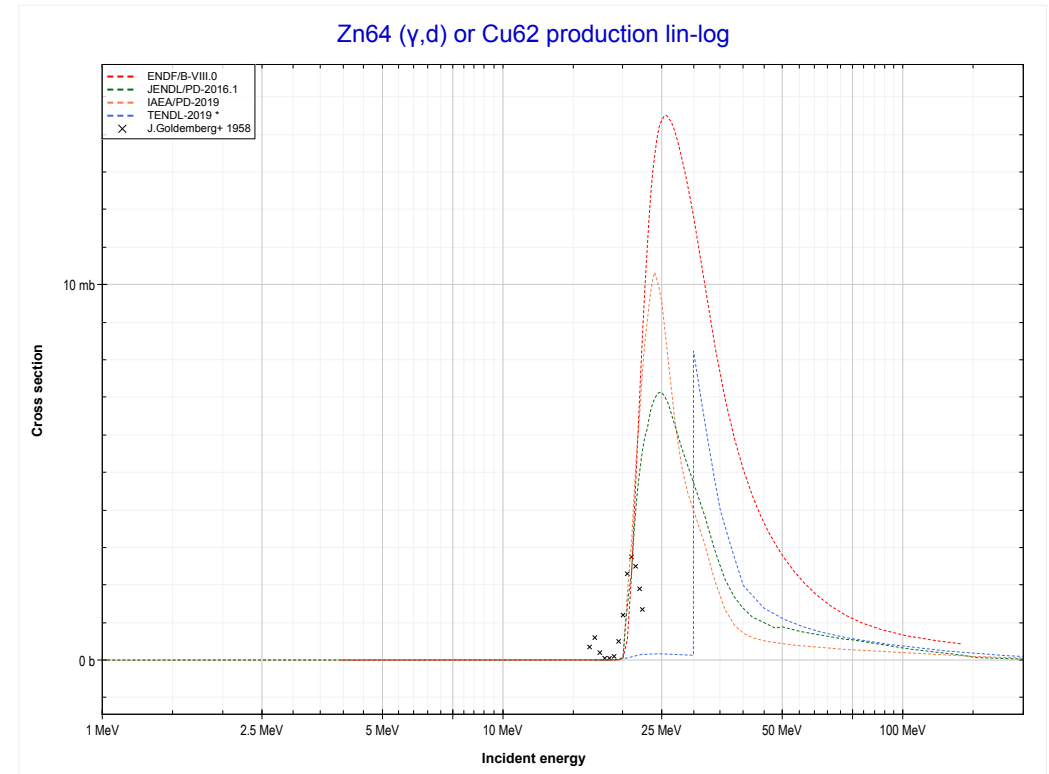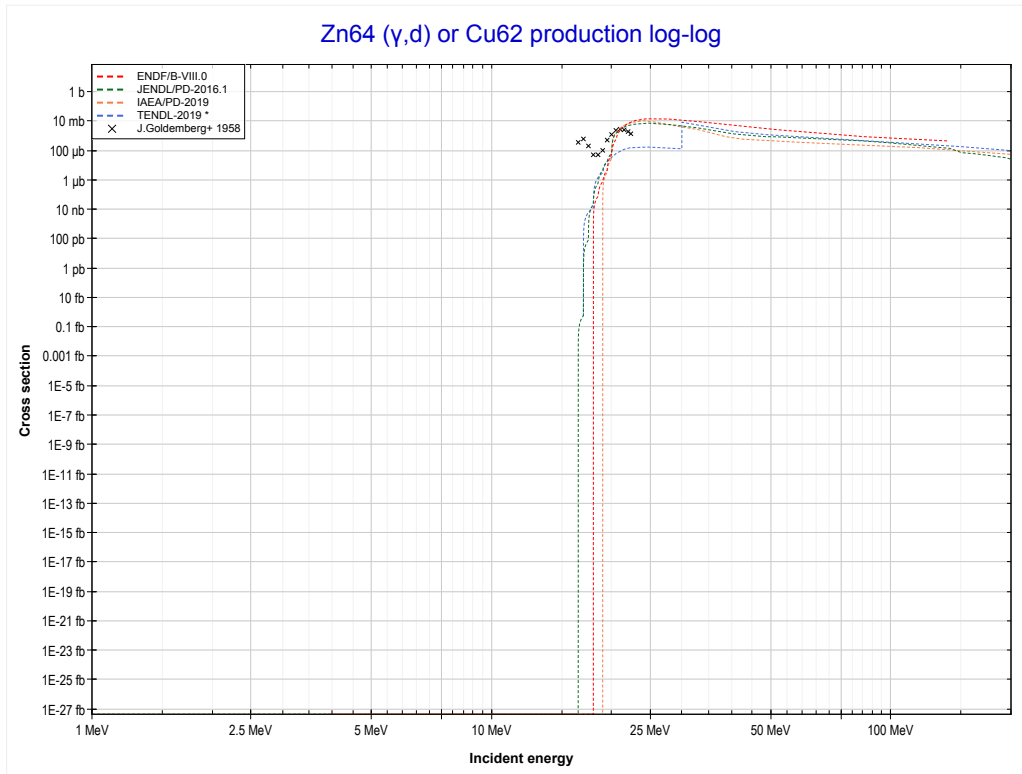
Reaction	Q-Value
Zn64(γ,d)Cu62	-16352.32 keV
Zn64(γ,n+p)Cu62	-18576.89 keV

<< 30-Zn-64	30-Zn-65	30-Zn-67 >>
<< 30-Zn-64 MT104 (γ,d)	MT4 (γ,n) or MT5 (Zn64 production)	30-Zn-66 MT28 (γ,n+p) >>

Zn65 (γ,n) or Zn64 production log-log

Zn65 (γ,n) or Zn64 production lin-log
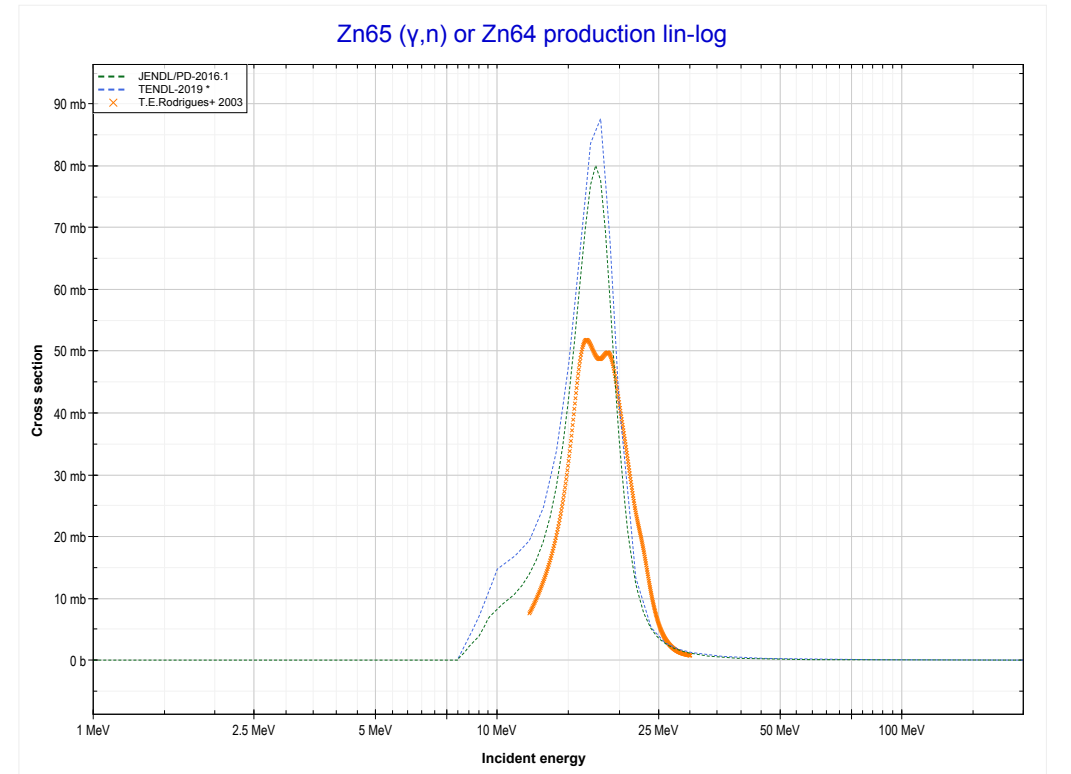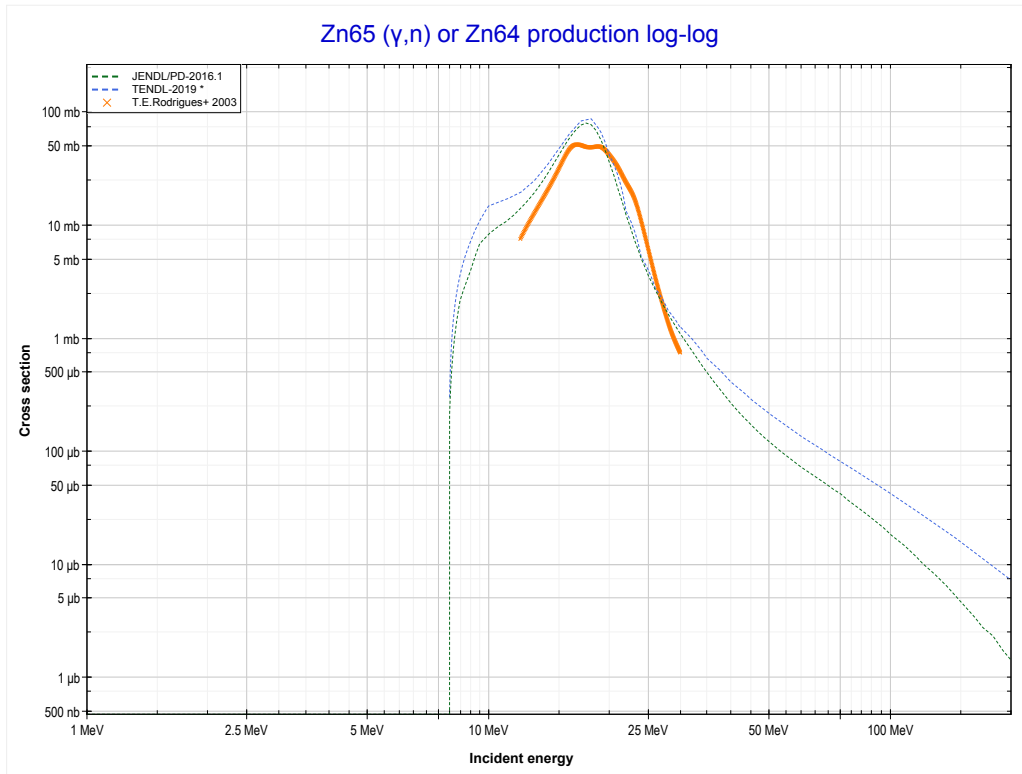
Reaction	Q-Value
Zn65(γ,n)Zn64	-7979.32 keV

<< 30-Zn-64	**30-Zn-66**	32-Ge-70 >>
<< 30-Zn-65 MT4 (γ,n)	**MT28 (γ,n+p) or MT5 (Cu64 production)**	MT104 (γ,d) >>

Zn66 (γ,n+p) or Cu64 production log-log

Zn66 (γ,n+p) or Cu64 production lin-log
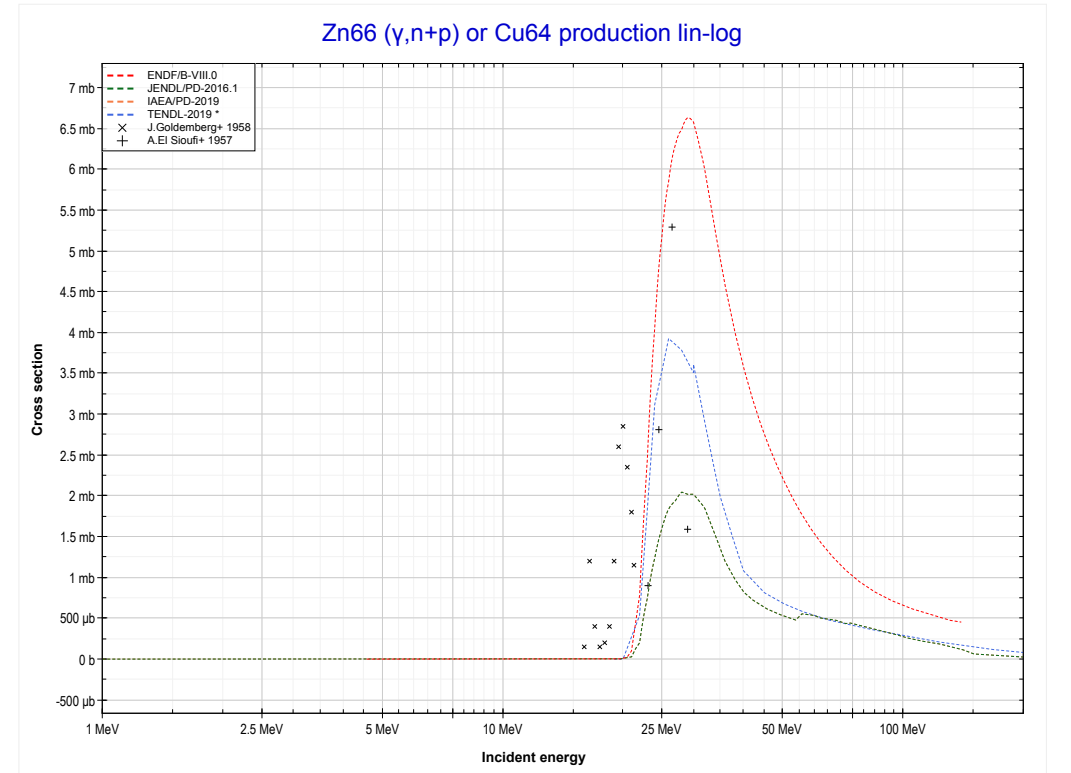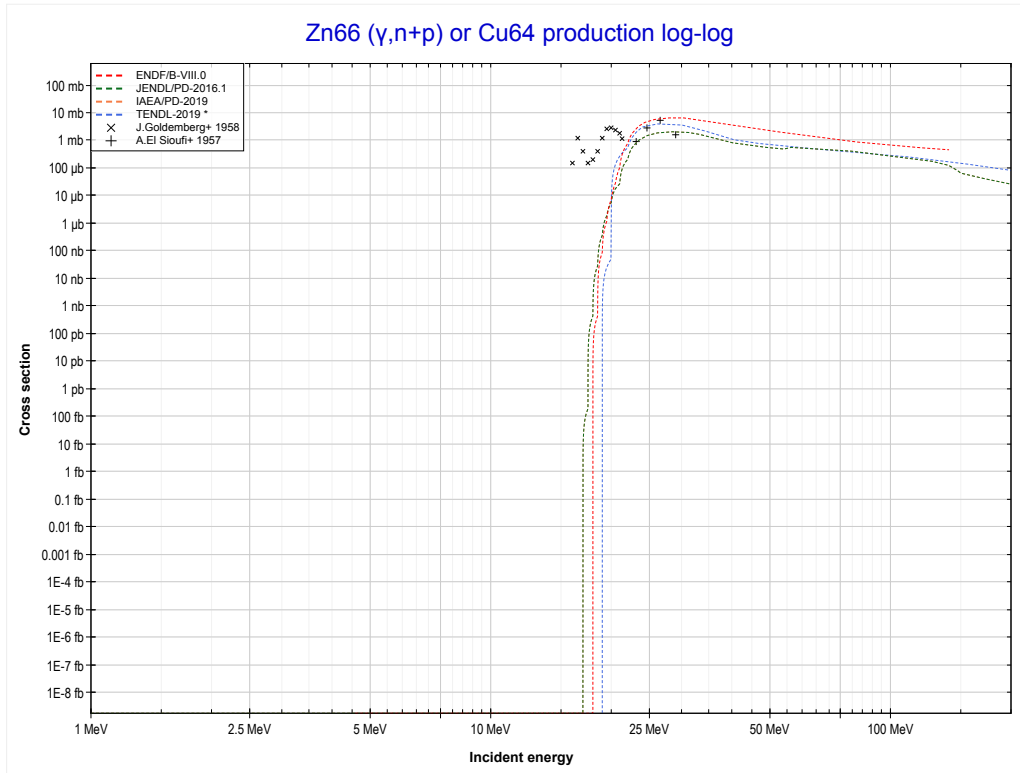
Reaction	Q-Value
Zn66(γ,d)Cu64	-16610.42 keV
Zn66(γ,n+p)Cu64	-18834.99 keV

<< 30-Zn-64	**30-Zn-66**	32-Ge-70 >>
<< MT28 (γ,n+p)	**MT104 (γ,d) or MT5 (Cu64 production)**	30-Zn-67 MT4 (γ,n) >>

Zn66 (γ,d) or Cu64 production log-log

Zn66 (γ,d) or Cu64 production lin-log
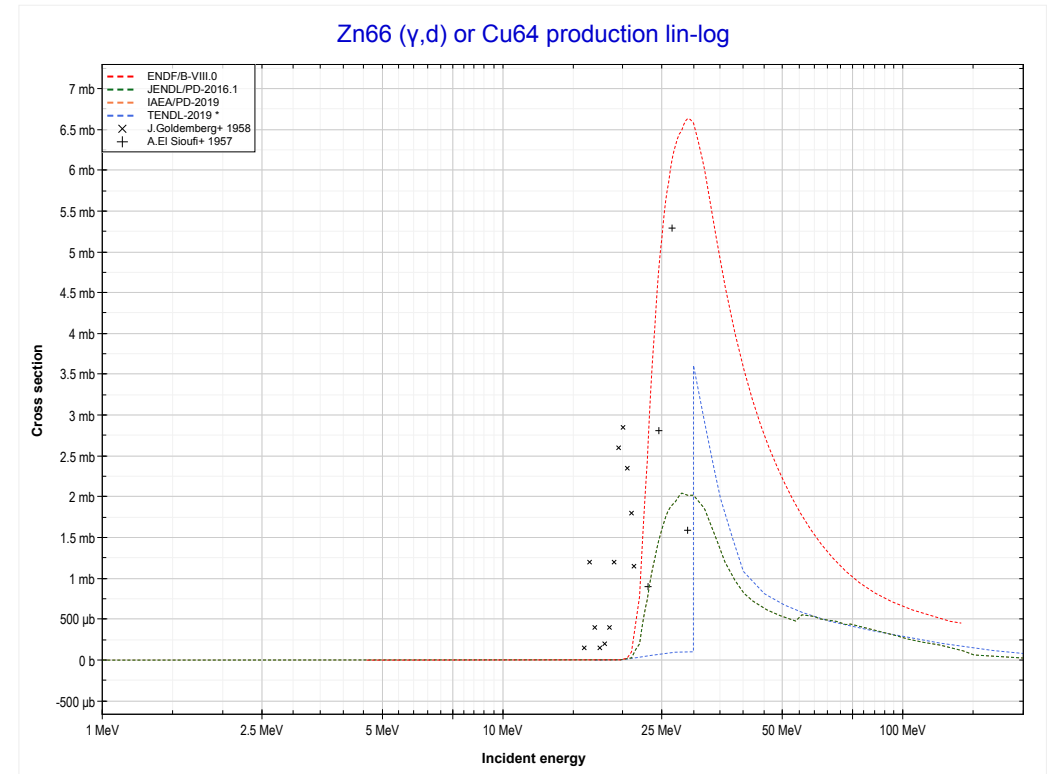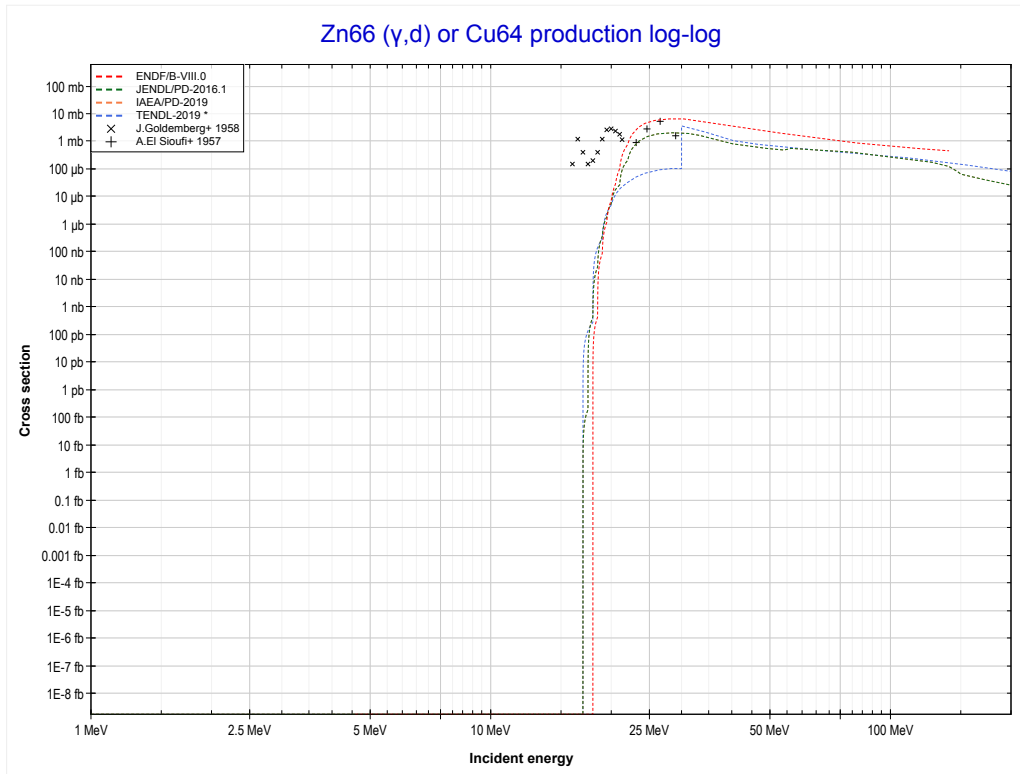
Reaction	Q-Value
Zn66(γ,d)Cu64	-16610.42 keV
Zn66(γ,n+p)Cu64	-18834.99 keV

<< 30-Zn-65	**30-Zn-67**	30-Zn-70 >>
<< 30-Zn-66 MT104 (γ,d)	**MT4 (γ,n) or MT5 (Zn66 production)**	MT103 (γ,p) >>

Zn67 (γ,n) or Zn66 production log-log

Zn67 (γ,n) or Zn66 production lin-log
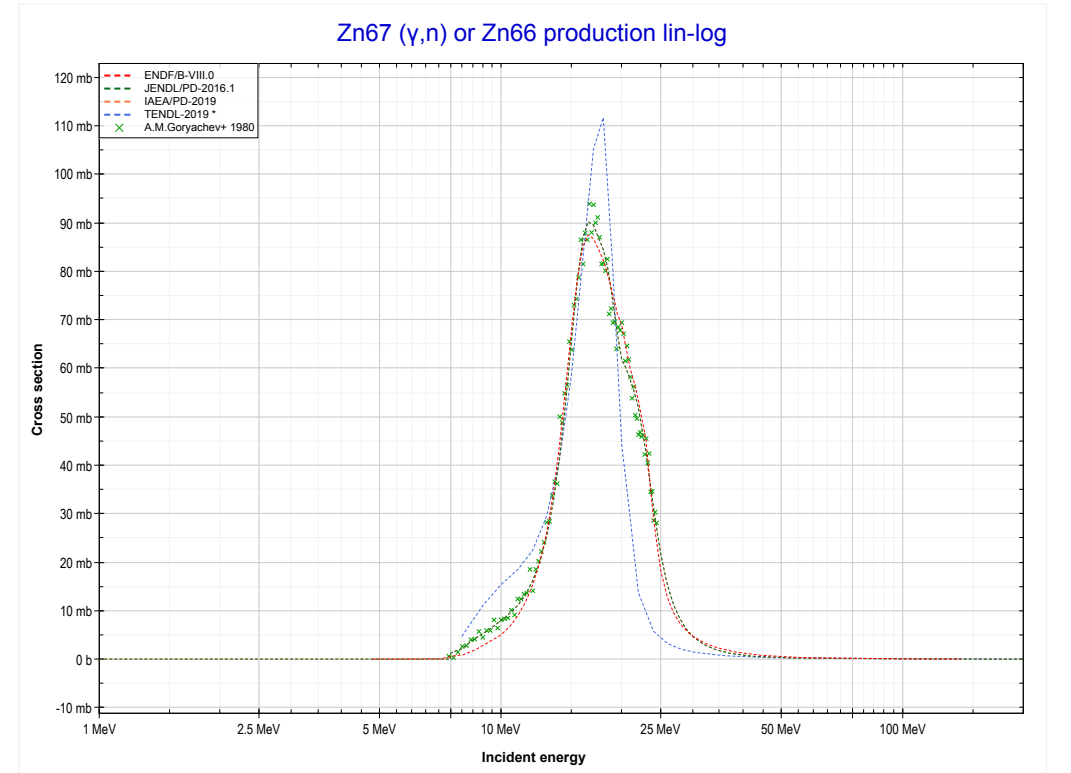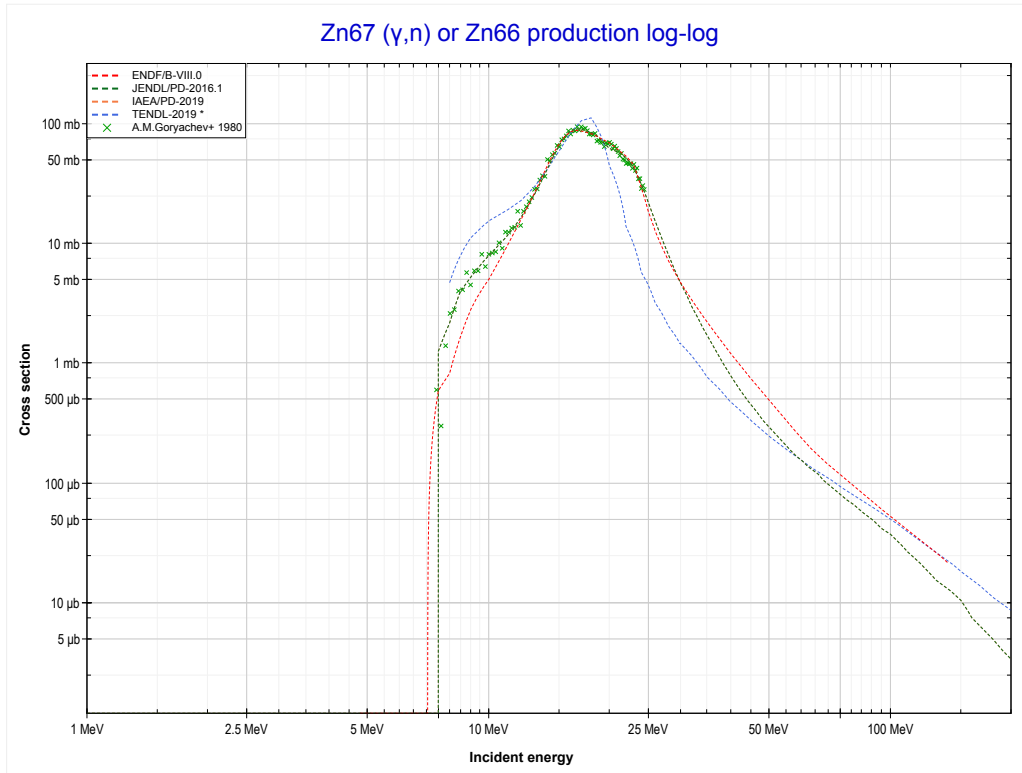
Reaction	Q-Value
Zn67(γ,n)Zn66	-7052.42 keV

<< 29-Cu-65	**30-Zn-67**	30-Zn-68 >>
<< MT4 (γ,n)	**MT103 (γ,p) or MT5 (Cu66 production)**	30-Zn-68 MT103 (γ,p) >>

Zn67 (γ,p) or Cu66 production log-log

Zn67 (γ,p) or Cu66 production lin-log
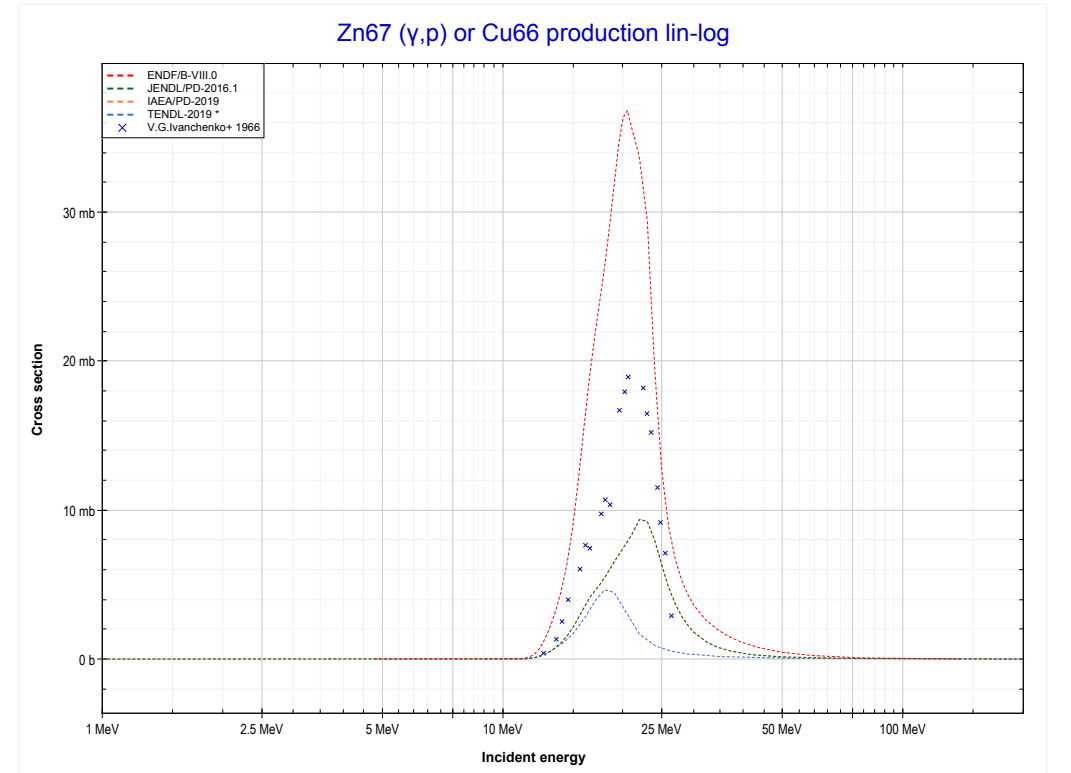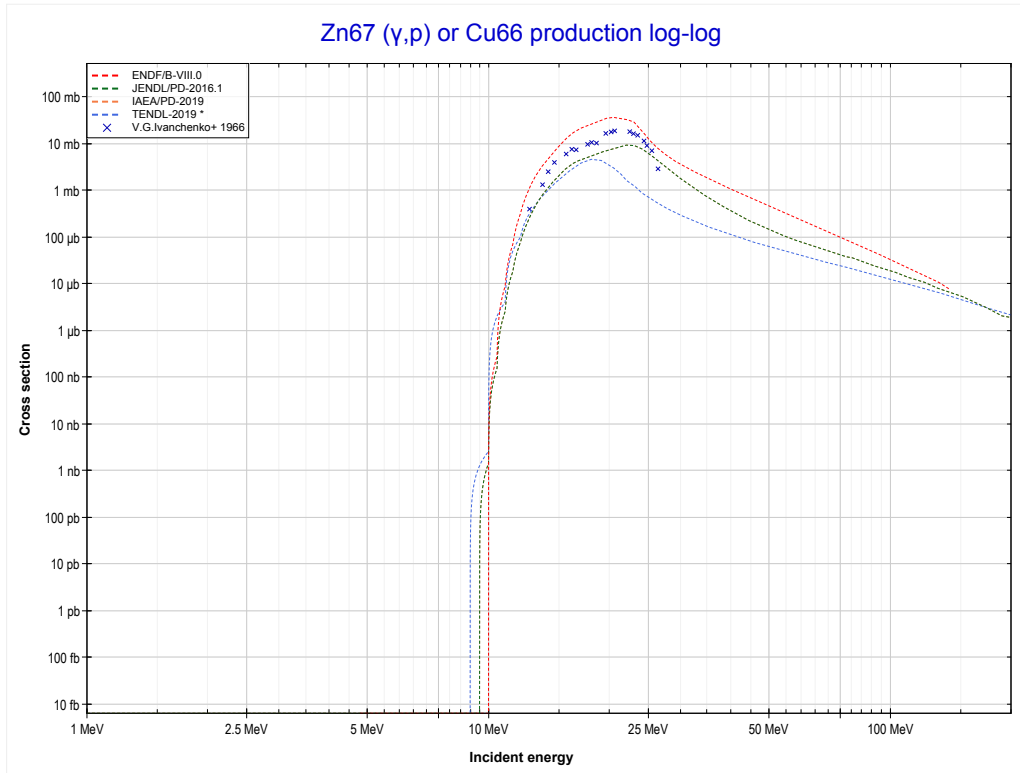
Reaction	Q-Value
Zn67(γ,p)Cu66	-8910.97 keV

<< 30-Zn-67	**30-Zn-68**	32-Ge-70 >>
<< 30-Zn-67 MT103 (γ,p)	**MT103 (γ,p) or MT5 (Cu67 production)**	30-Zn-70 MT4 (γ,n) >>

Zn68 (γ,p) or Cu67 production log-log

Zn68 (γ,p) or Cu67 production lin-log
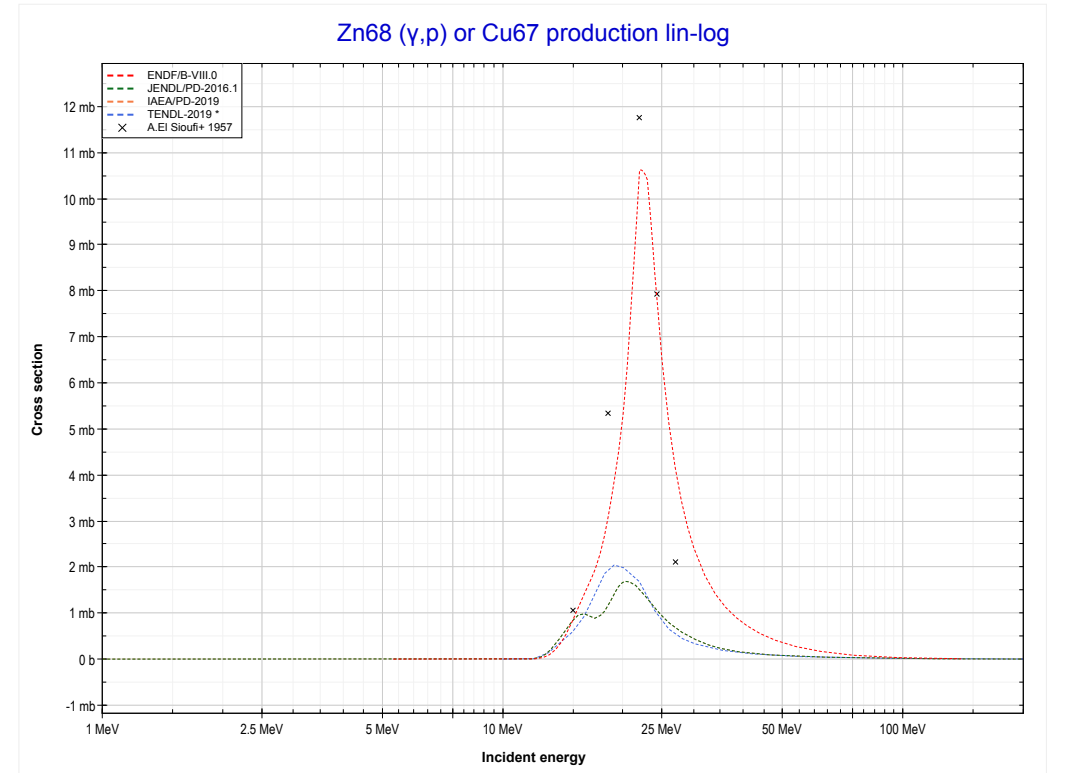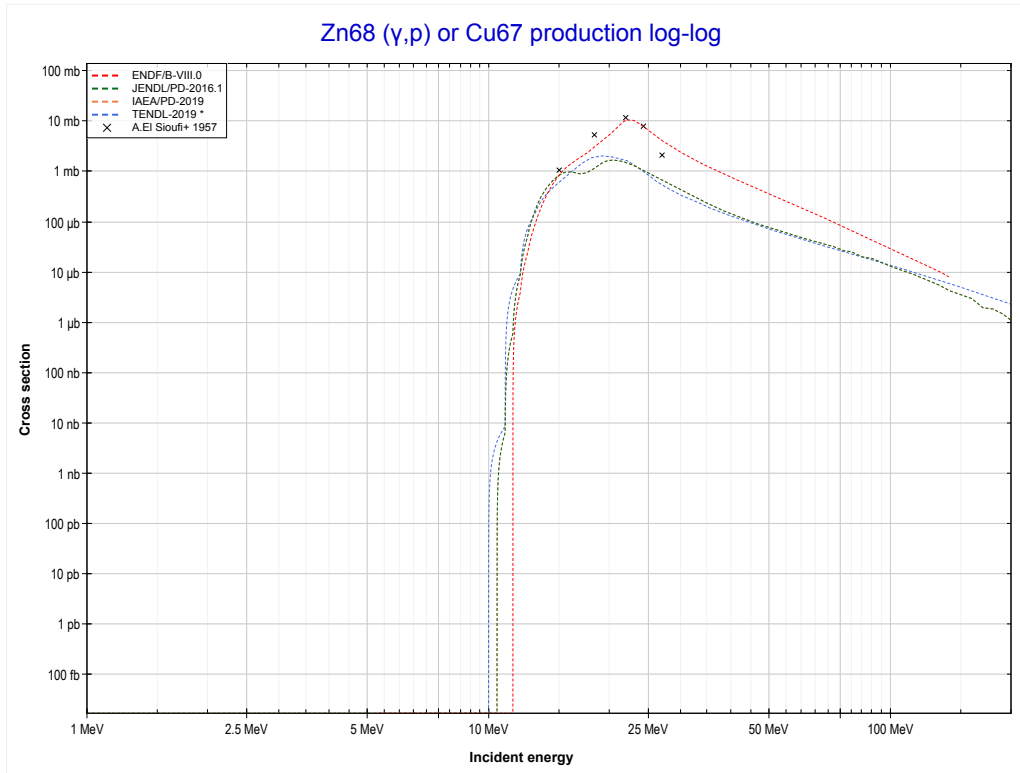
Reaction	Q-Value
Zn68(γ,p)Cu67	-9976.57 keV

<< 30-Zn-67	**30-Zn-70**	32-Ge-70 >>
<< 30-Zn-68 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Zn69 production)**	32-Ge-70 MT4 (γ,n) >>

Zn70 (γ,n) or Zn69 production log-log

Zn70 (γ,n) or Zn69 production lin-log
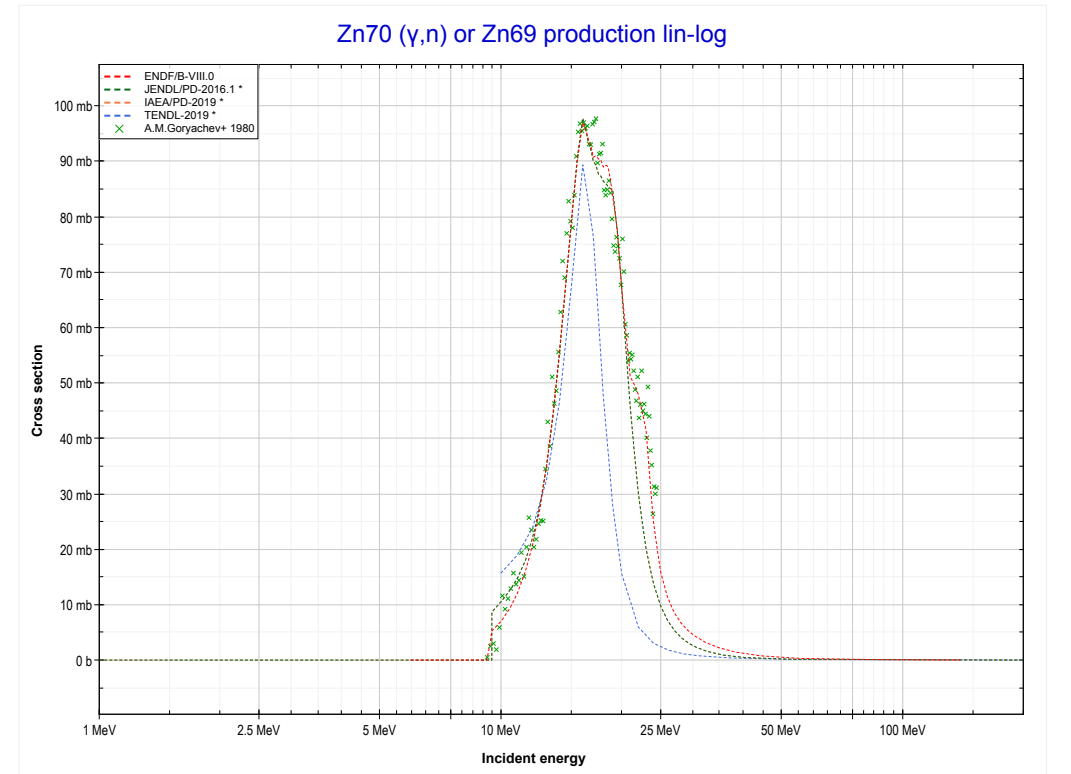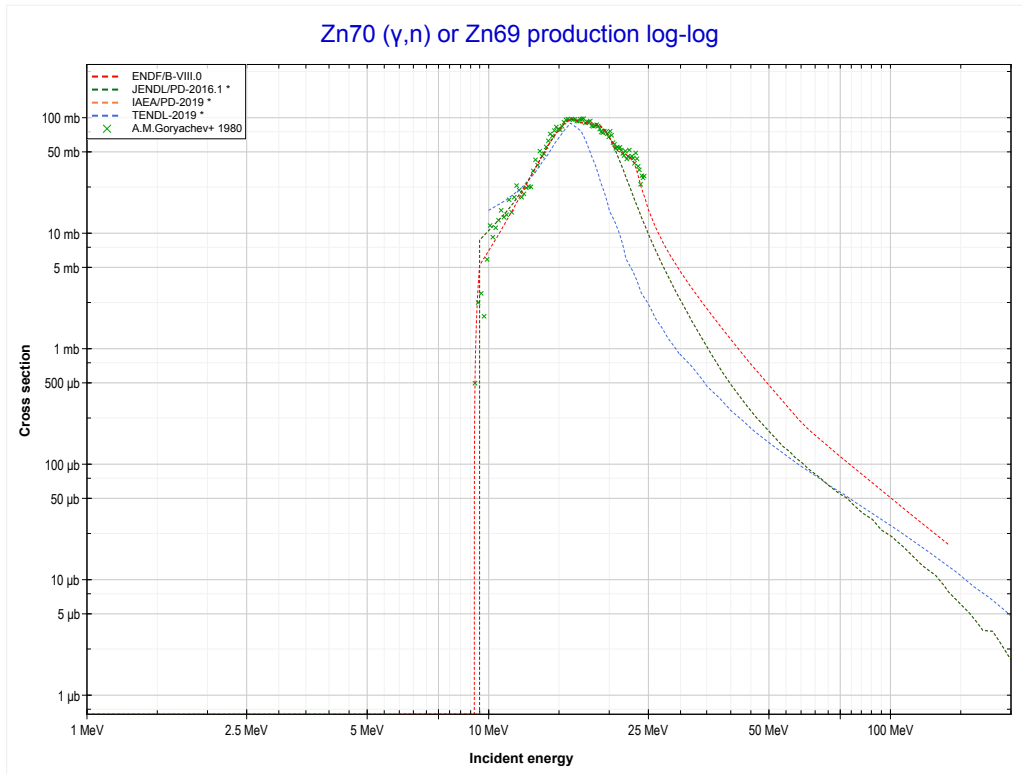
Reaction	Q-Value
Zn70(γ,n)Zn69	-9218.22 keV

<< 30-Zn-70	**32-Ge-70**	32-Ge-72 >>
<< 30-Zn-70 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ge69 production)**	MT16 (γ,2n) >>

Ge70 (γ,n) or Ge69 production log-log

Ge70 (γ,n) or Ge69 production lin-log
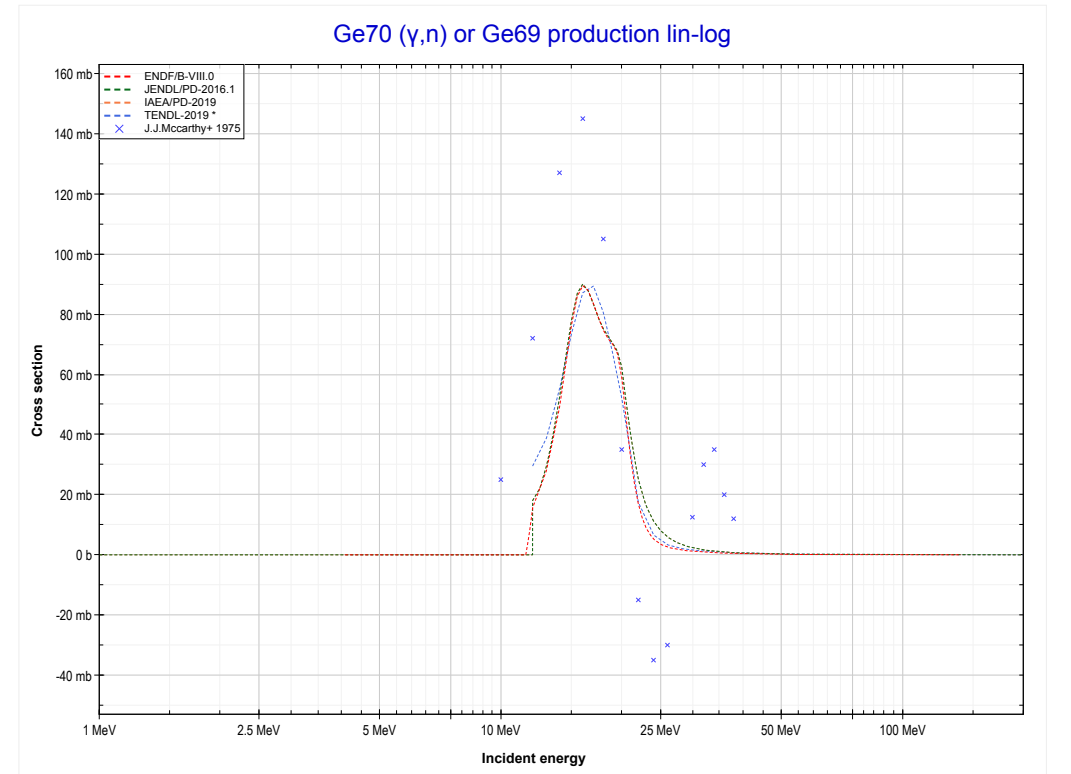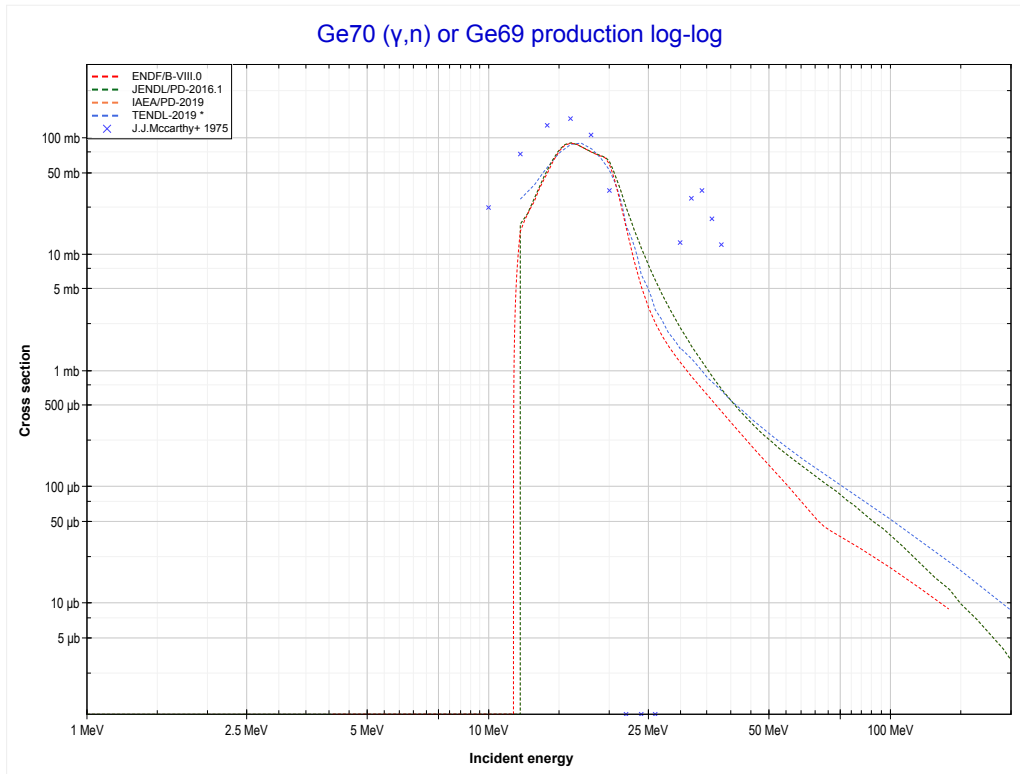
Reaction	Q-Value
Ge70(γ,n)Ge69	-11532.52 keV

<< 29-Cu-63	32-Ge-70	32-Ge-72 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Ge68 production)	MT28 (γ,n+p) >>

Ge70 (γ,2n) or Ge68 production log-log

Ge70 (γ,2n) or Ge68 production lin-log
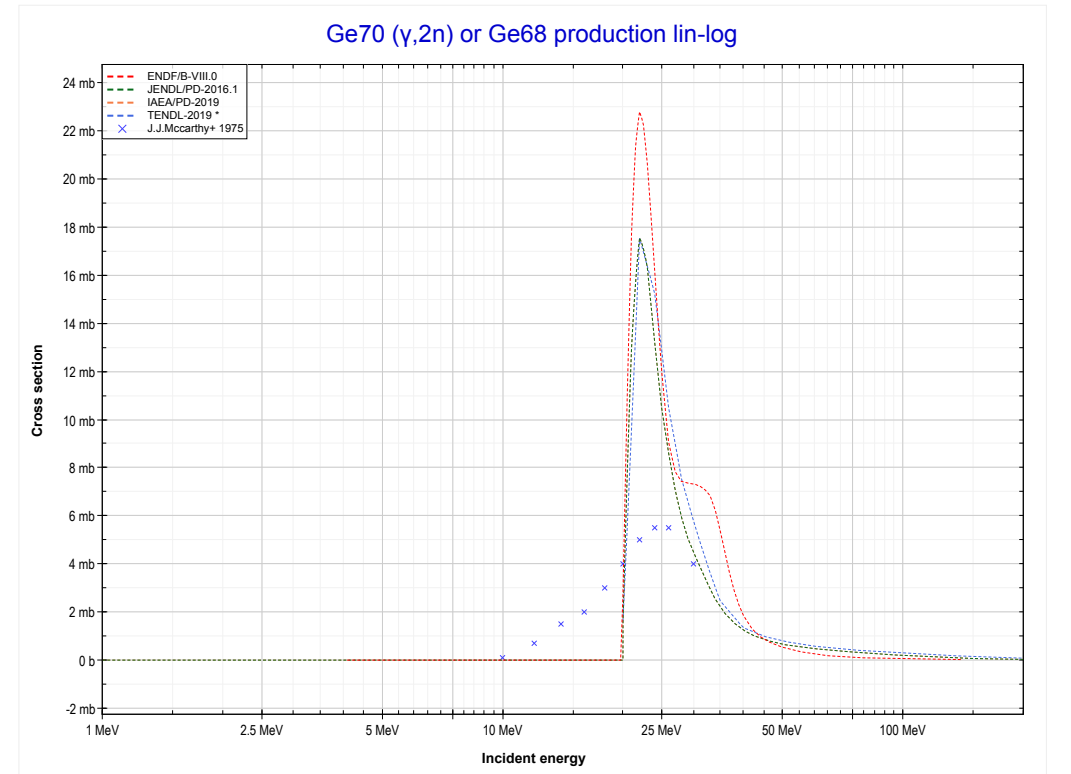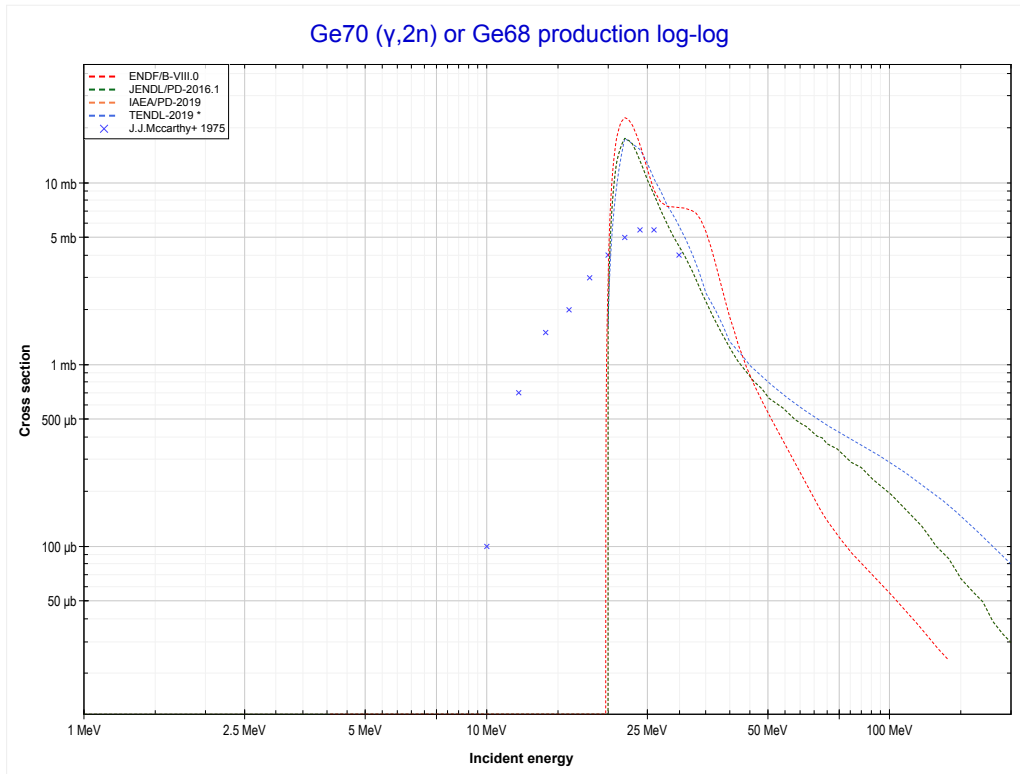
Reaction	Q-Value
Ge70(γ,2n)Ge68	-19725.73 keV

<< 30-Zn-66	**32-Ge-70**	32-Ge-72 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Ga68 production)**	MT103 (γ,p) >>

Ge70 (γ,n+p) or Ga68 production log-log

Ge70 (γ,n+p) or Ga68 production lin-log
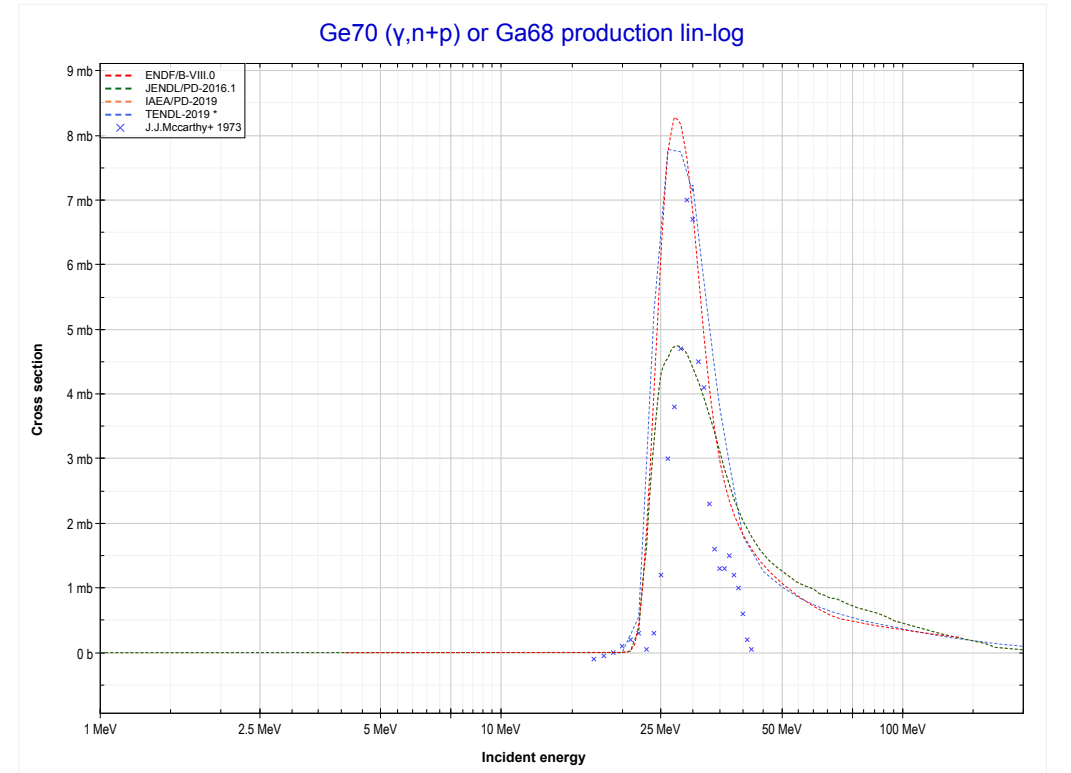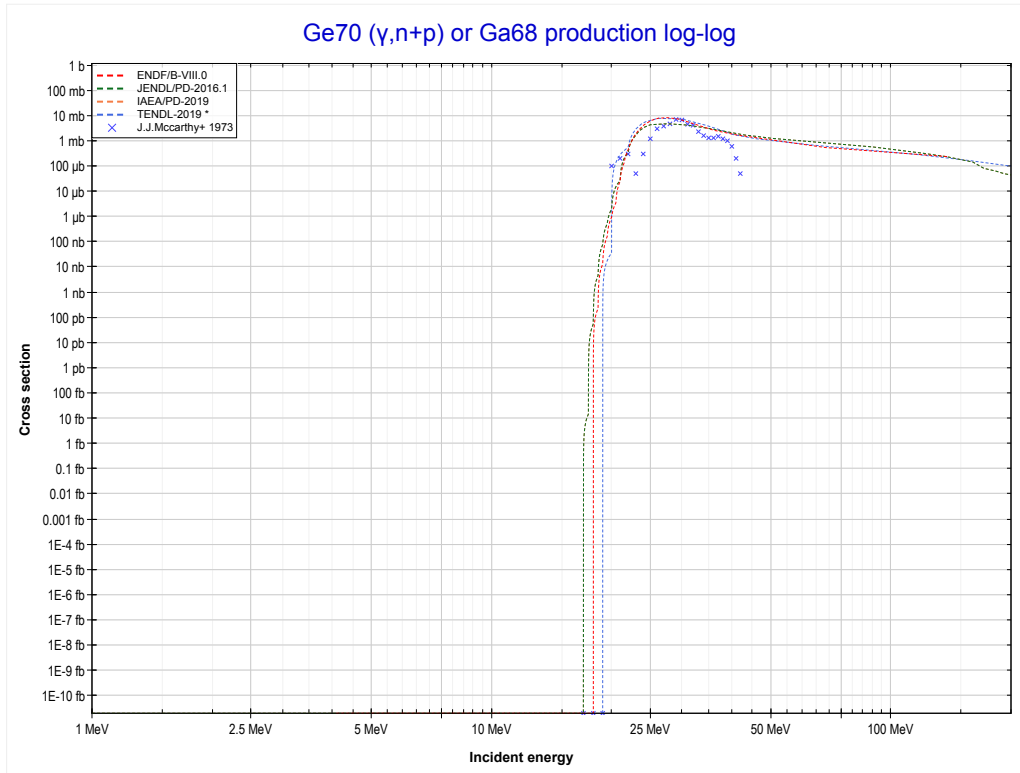
Reaction	Q-Value
Ge70(γ,d)Ga68	-16611.62 keV
Ge70(γ,n+p)Ga68	-18836.19 keV

<< 30-Zn-68	32-Ge-70	39-Y-89 >>
<< MT28 (γ,n+p)	MT103 (γ,p) or MT5 (Ga69 production)	MT104 (γ,d) >>

Ge70 (γ,p) or Ga69 production log-log

Ge70 (γ,p) or Ga69 production lin-log
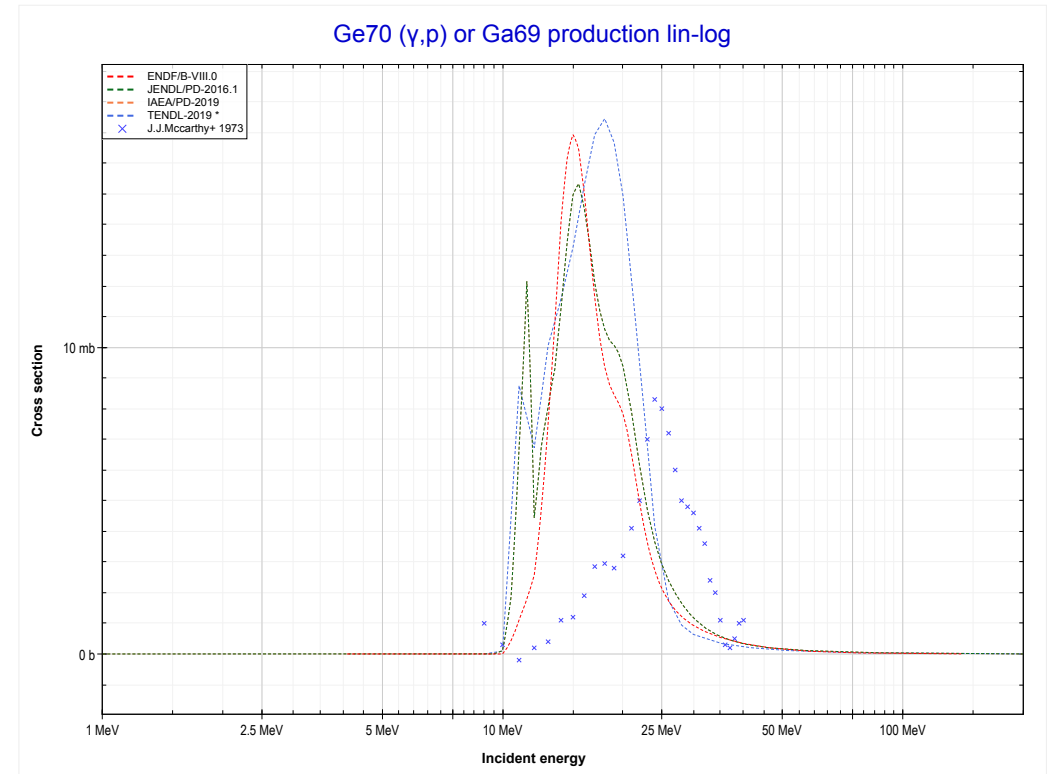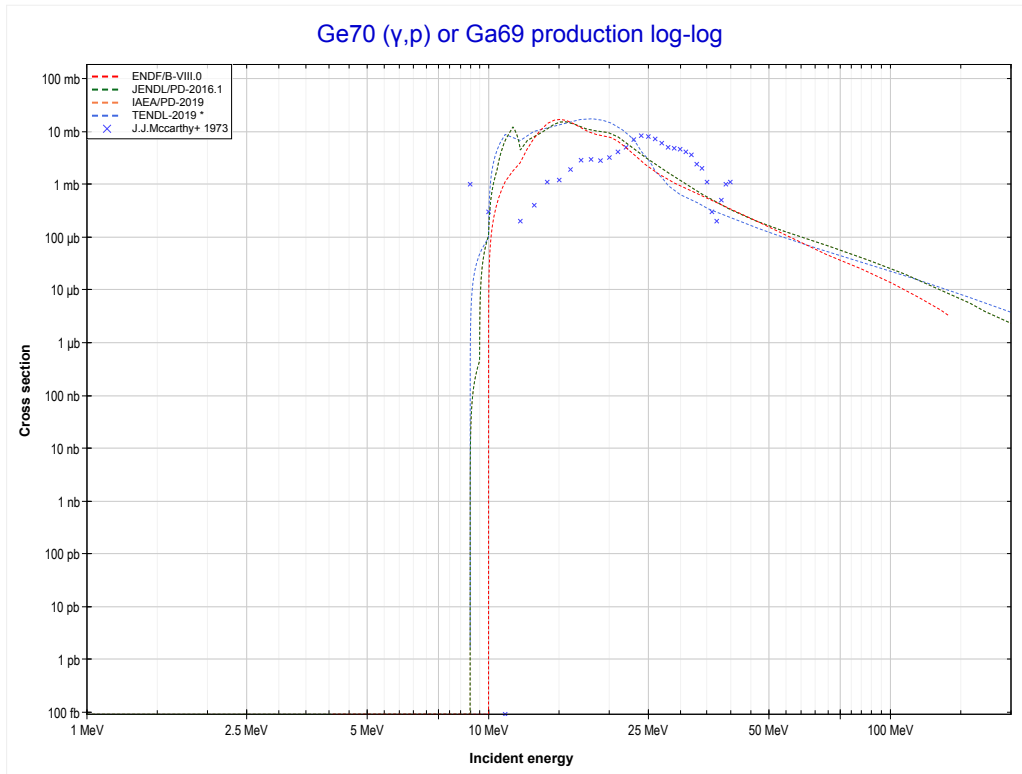
Reaction	Q-Value
Ge70(γ,p)Ga69	-8523.07 keV

<< 30-Zn-66	**32-Ge-70**	32-Ge-72 >>
<< MT103 (γ,p)	**MT104 (γ,d) or MT5 (Ga68 production)**	32-Ge-72 MT4 (γ,n) >>

Ge70 (γ,d) or Ga68 production log-log

Ge70 (γ,d) or Ga68 production lin-log
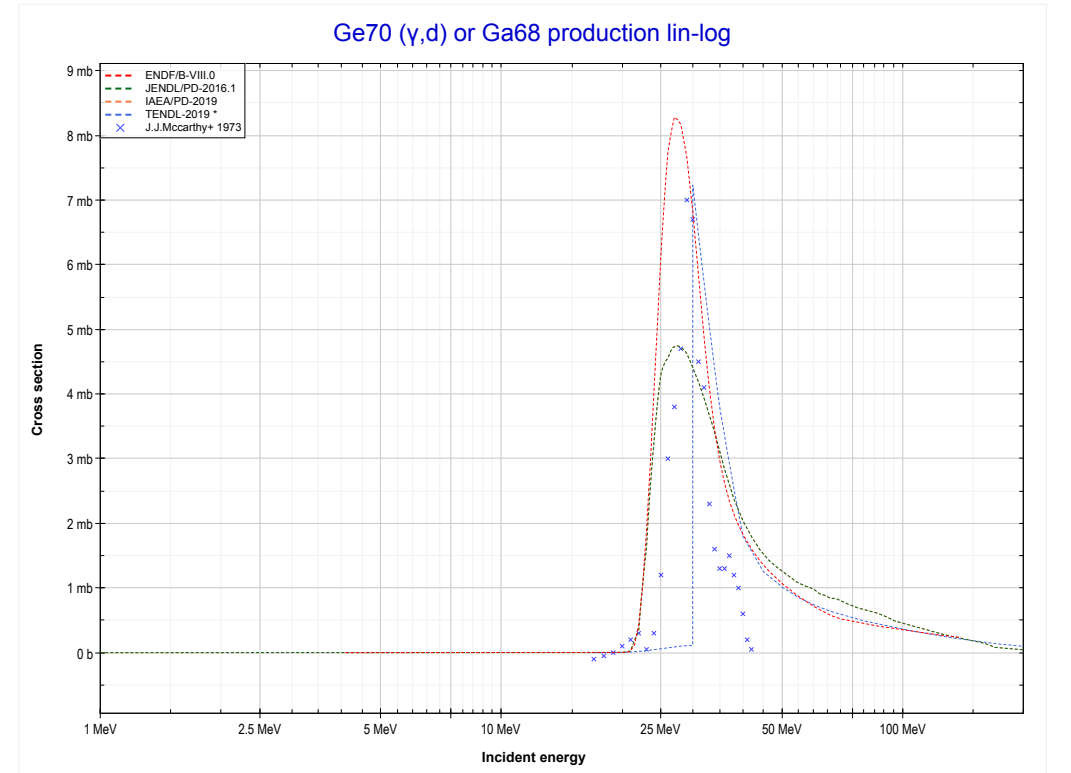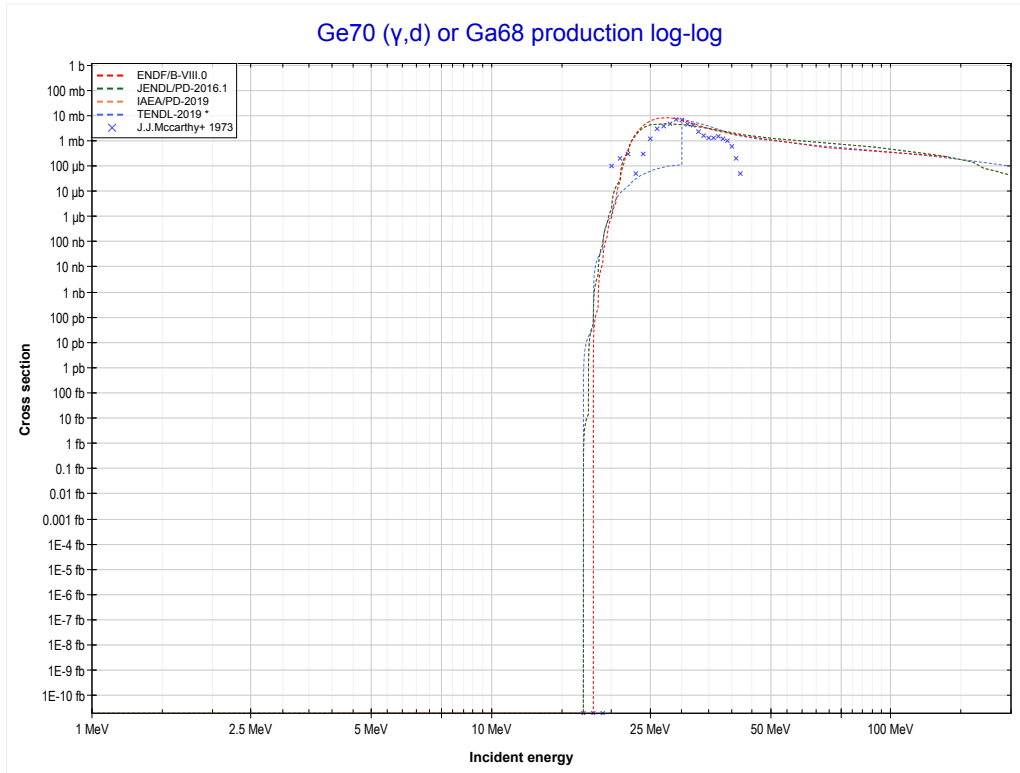
Reaction	Q-Value
Ge70(γ,d)Ga68	-16611.62 keV
Ge70(γ,n+p)Ga68	-18836.19 keV

<< 32-Ge-70	**32-Ge-72**	32-Ge-73 >>
<< 32-Ge-70 MT104 (γ,d)	**MT4 (γ,n) or MT5 (Ge71 production)**	MT16 (γ,2n) >>

Ge72 (γ,n) or Ge71 production log-log

Ge72 (γ,n) or Ge71 production lin-log
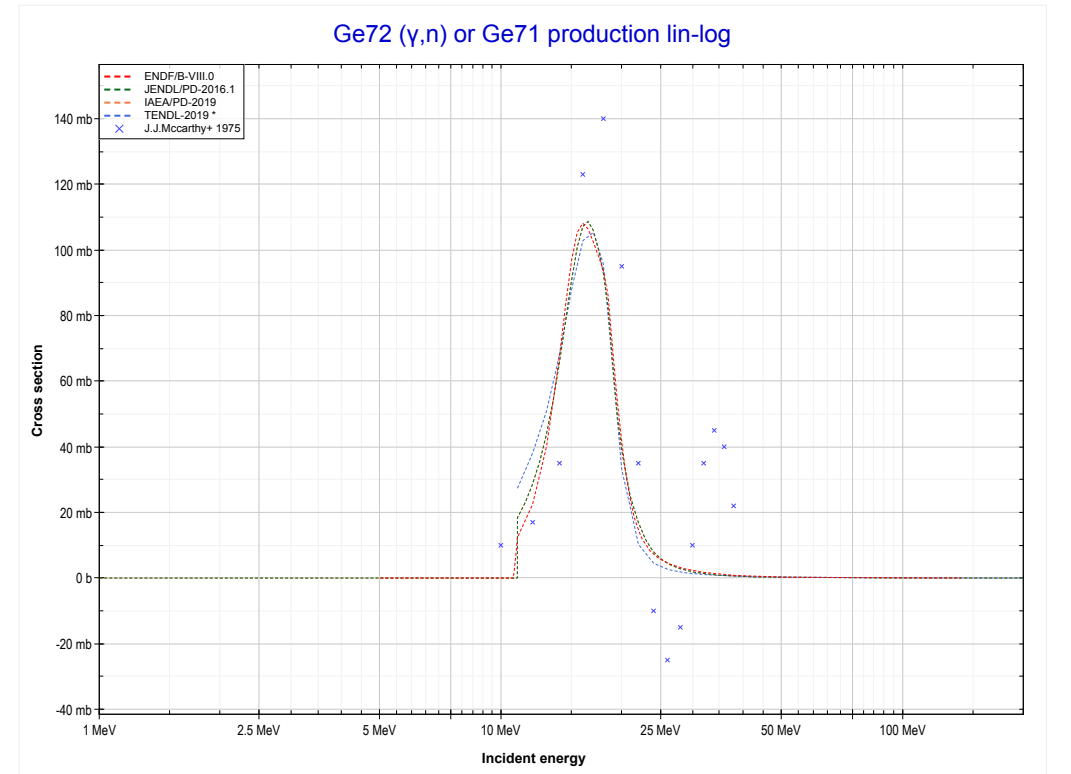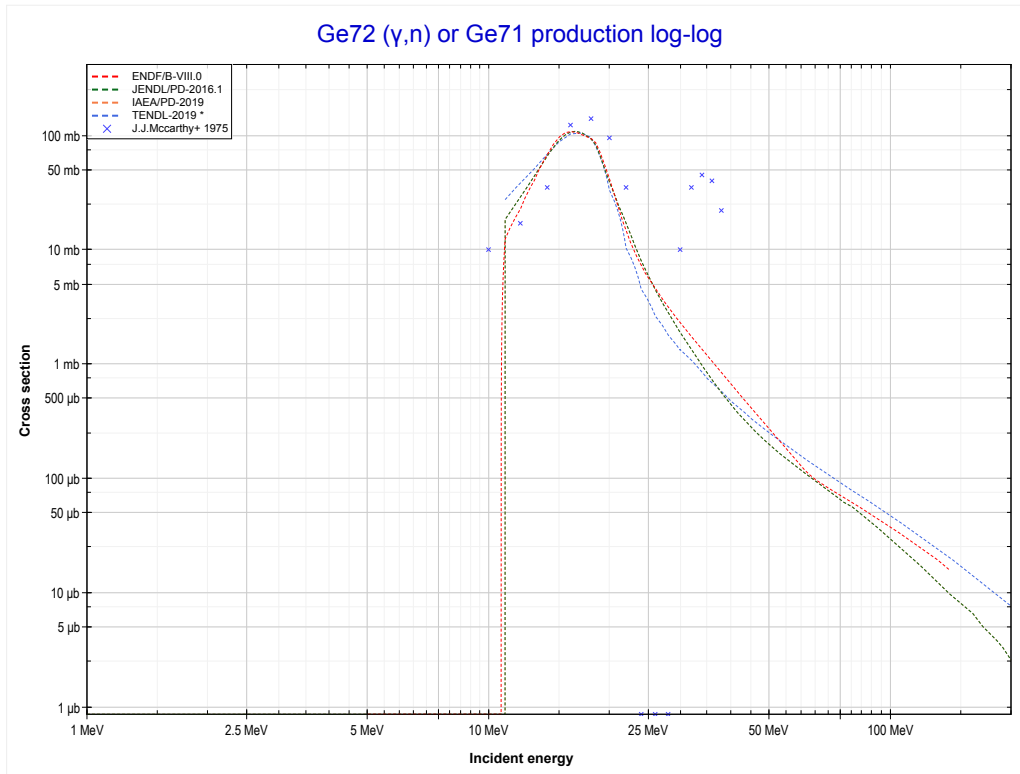
Reaction	Q-Value
Ge72(γ,n)Ge71	-10750.72 keV

<< 32-Ge-70	**32-Ge-72**	32-Ge-74 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ge70 production)**	MT28 (γ,n+p) >>

Ge72 (γ,2n) or Ge70 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- P.Carlos+ 1976
- J.J.Mccarthy+ 1975

Ge72 (γ,2n) or Ge70 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- P.Carlos+ 1976
- J.J.Mccarthy+ 1975
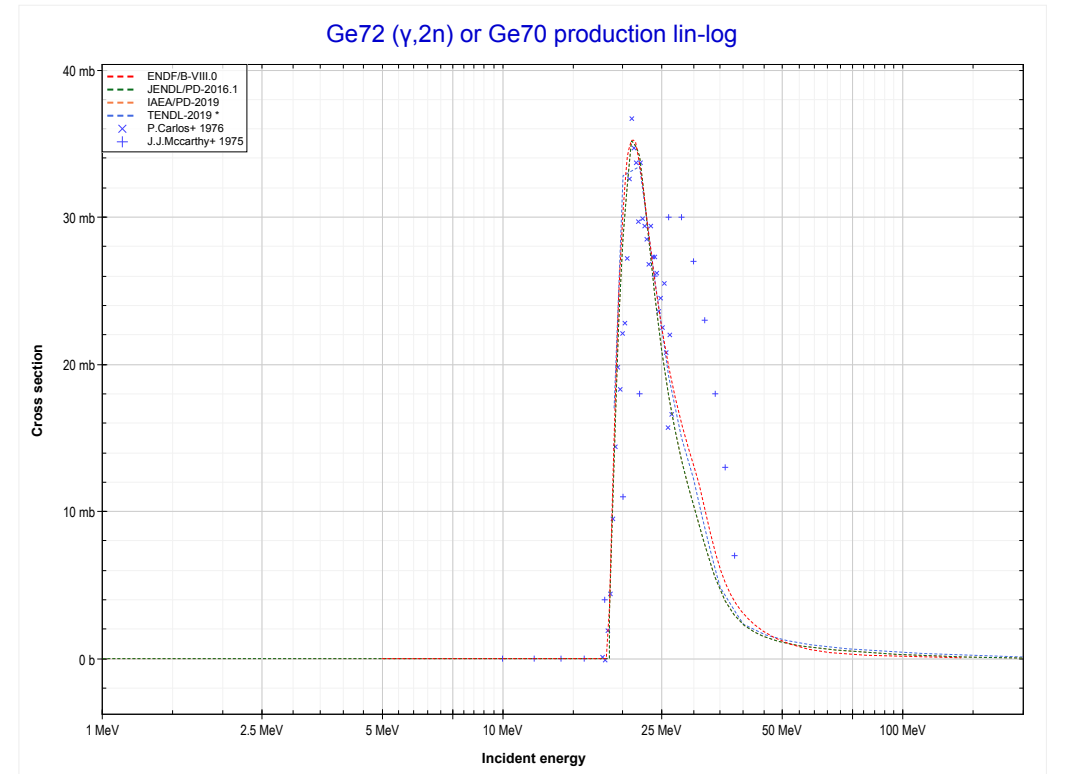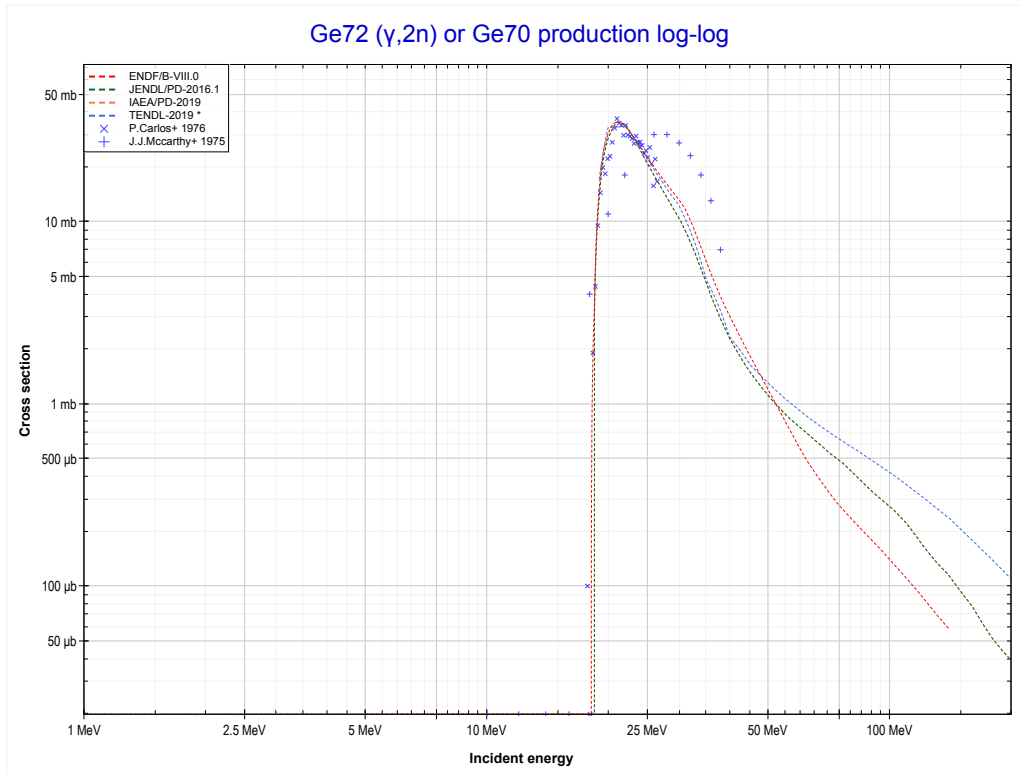
Reaction	Q-Value
Ge72(γ,2n)Ge70	-18166.63 keV

<< 32-Ge-70	**32-Ge-72**	32-Ge-76 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Ga70 production)**	MT104 (γ,d) >>

Ge72 (γ,n+p) or Ga70 production log-log

Ge72 (γ,n+p) or Ga70 production lin-log
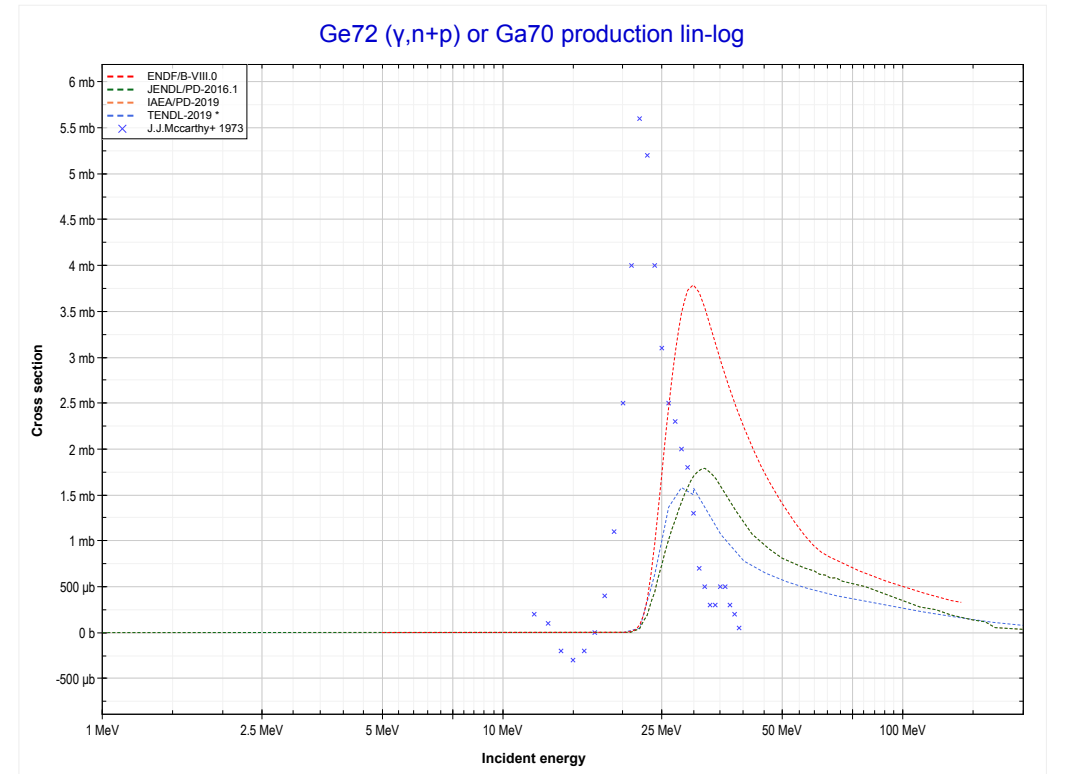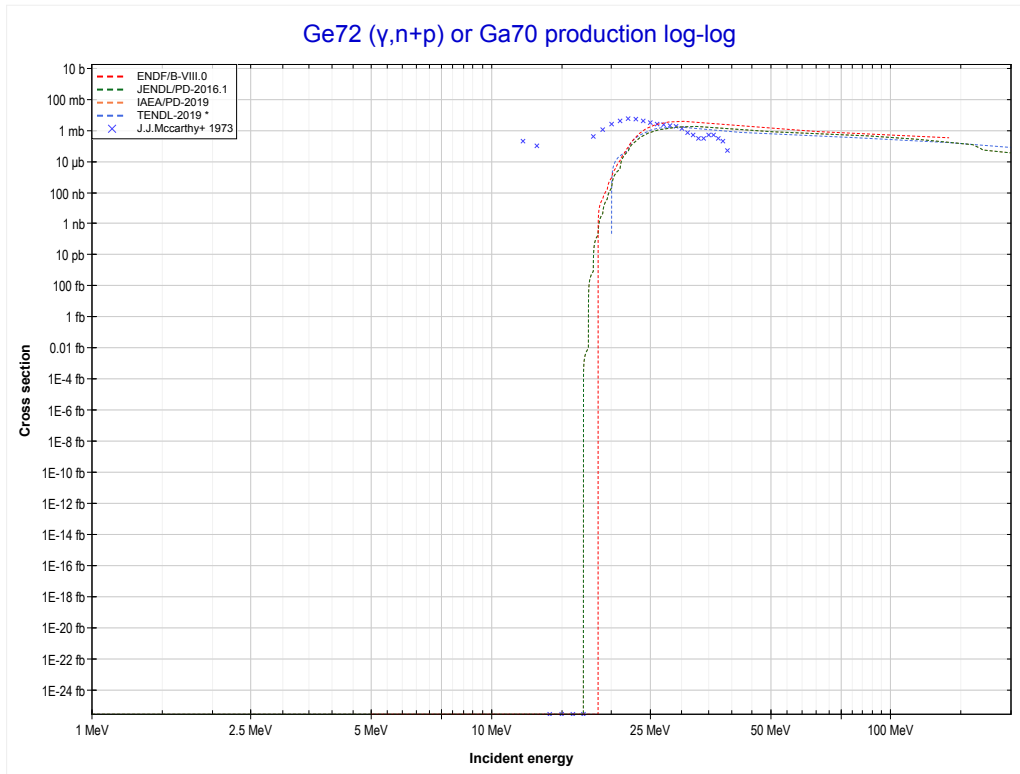
Reaction	Q-Value
Ge72(γ,d)Ga70	-16811.52 keV
Ge72(γ,n+p)Ga70	-19036.09 keV

<< 32-Ge-70	**32-Ge-72**	32-Ge-76 >>
<< MT28 (γ,n+p)	**MT104 (γ,d) or MT5 (Ga70 production)**	32-Ge-73 MT4 (γ,n) >>

Ge72 (γ,d) or Ga70 production log-log

Ge72 (γ,d) or Ga70 production lin-log
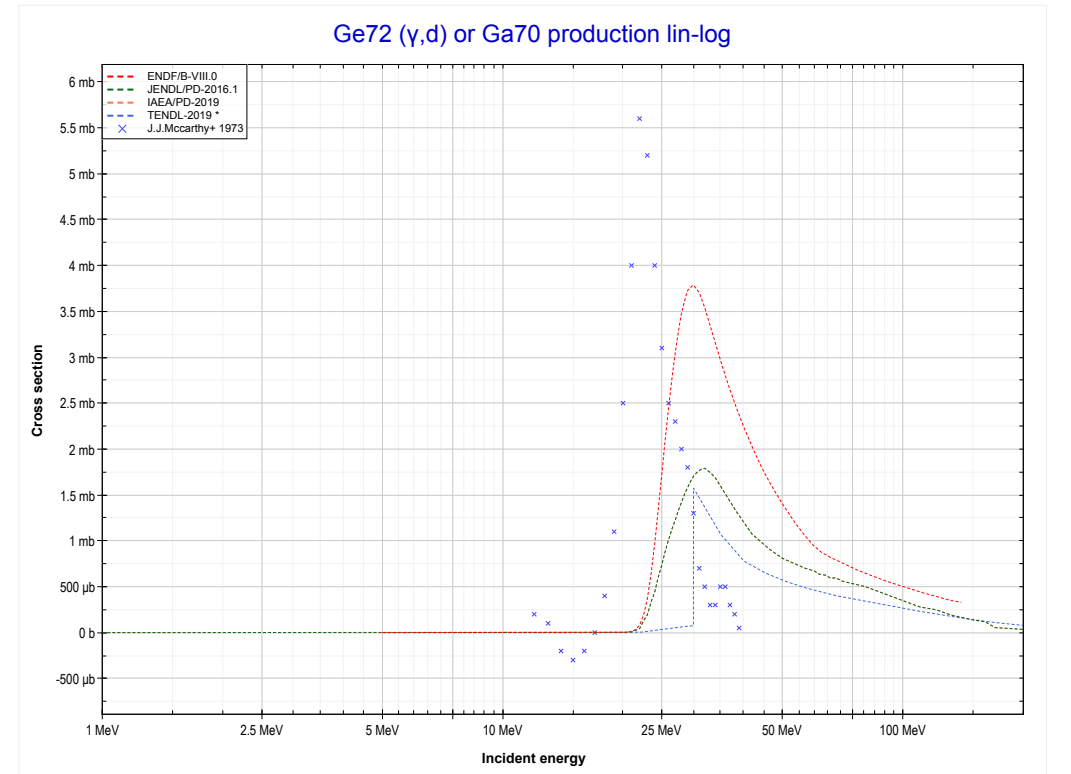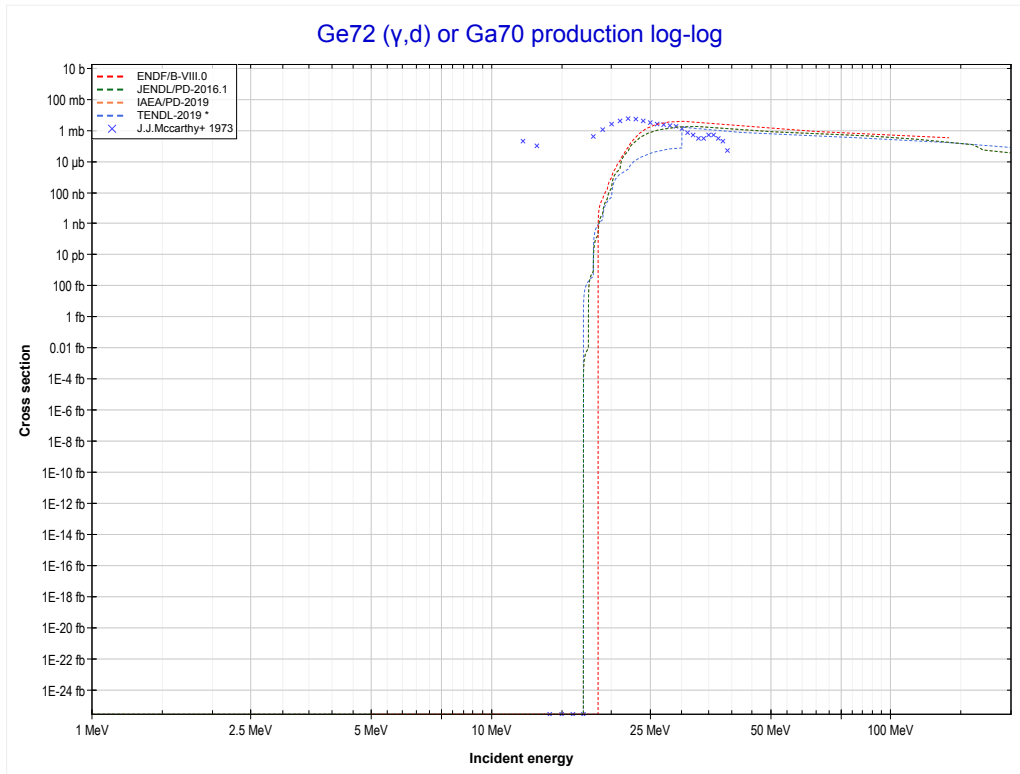
Reaction	Q-Value
Ge72(γ,d)Ga70	-16811.52 keV
Ge72(γ,n+p)Ga70	-19036.09 keV

<< 32-Ge-72	32-Ge-73	32-Ge-74 >>
<< 32-Ge-72 MT104 (γ,d)	MT4 (γ,n) or MT5 (Ge72 production)	32-Ge-74 MT4 (γ,n) >>

Ge73 (γ,n) or Ge72 production log-log

Ge73 (γ,n) or Ge72 production lin-log
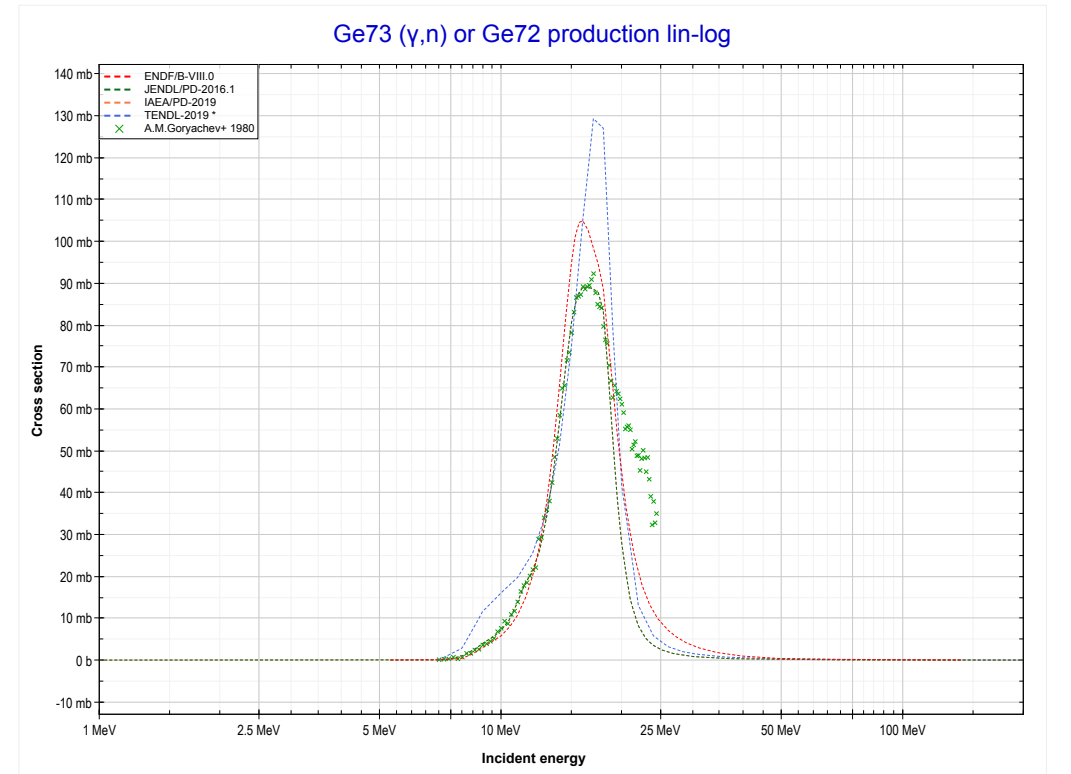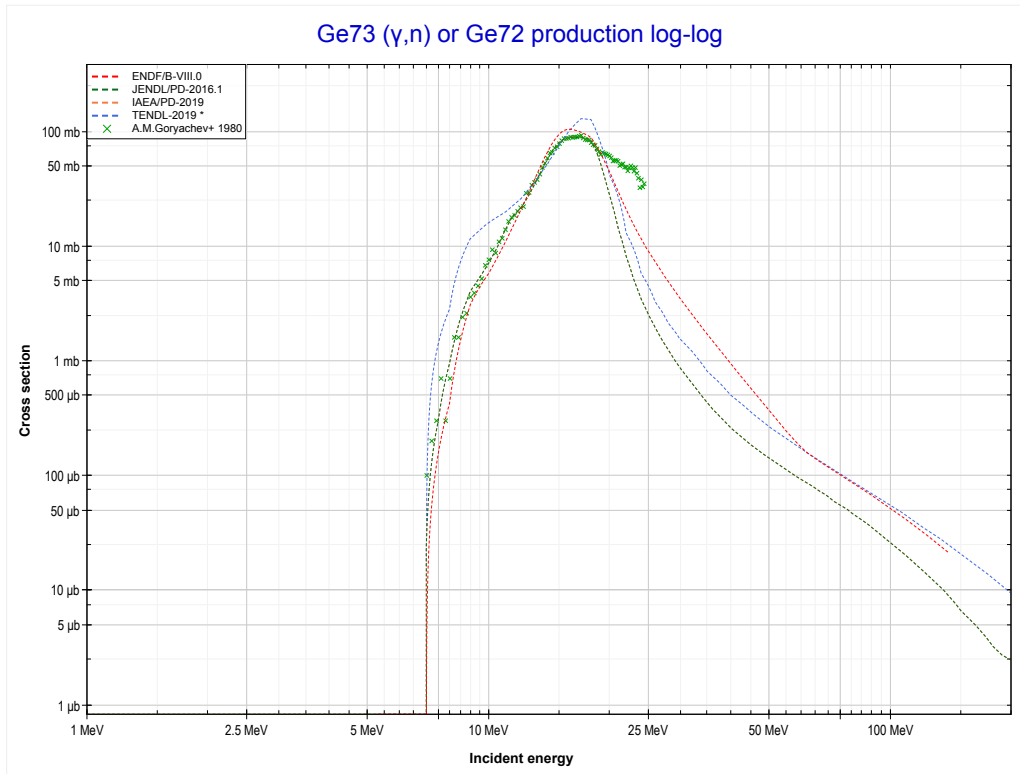
Reaction	Q-Value
Ge73(γ,n)Ge72	-6782.94 keV

<< 32-Ge-73	**32-Ge-74**	32-Ge-76 >>
<< 32-Ge-73 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ge73 production)**	MT16 (γ,2n) >>

Ge74 (γ,n) or Ge73 production log-log

Ge74 (γ,n) or Ge73 production lin-log
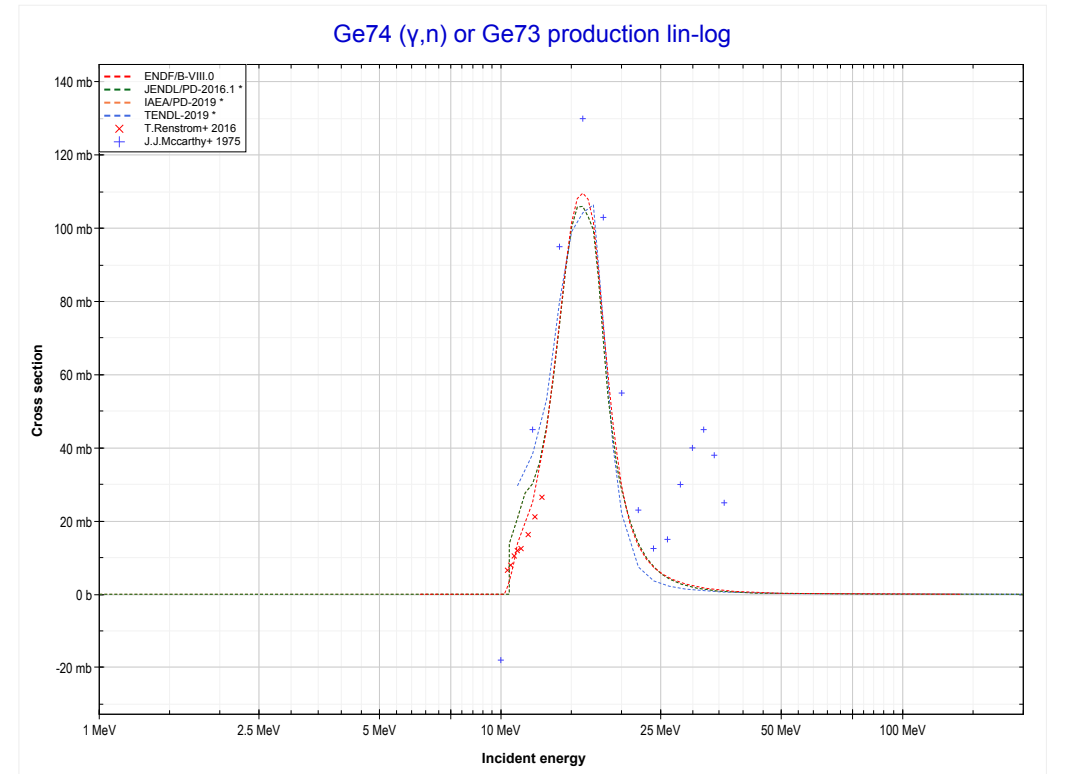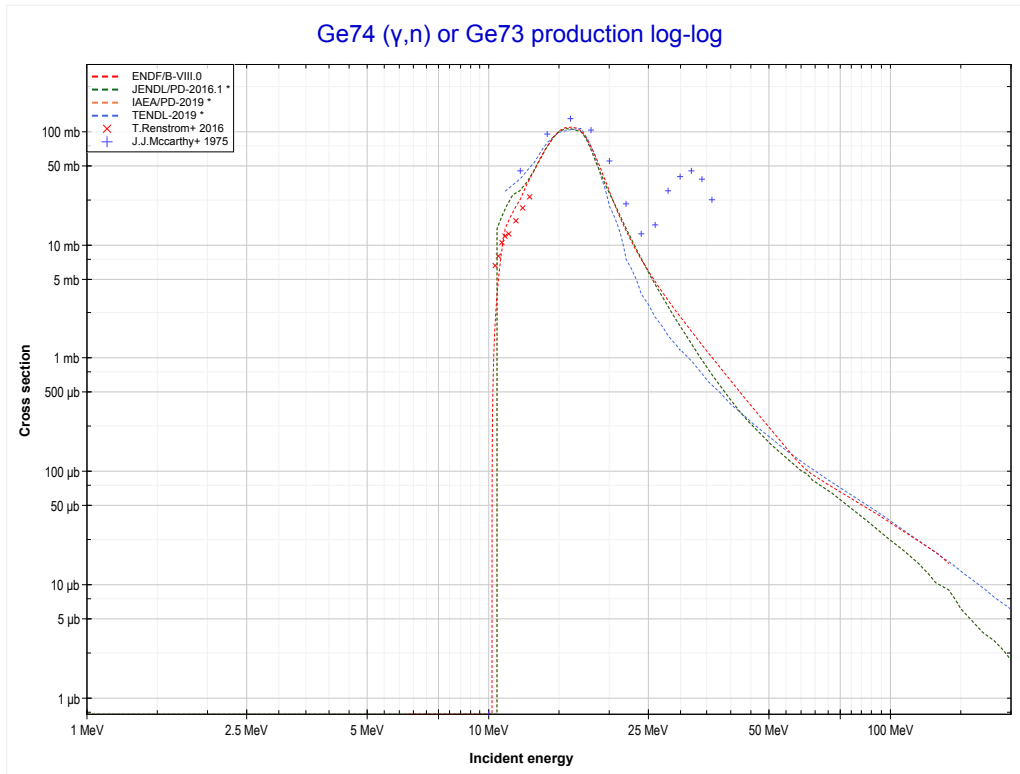
Reaction	Q-Value
Ge74(γ,n)Ge73	-10196.24 keV

<< 32-Ge-72	**32-Ge-74**	32-Ge-76 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ge72 production)**	32-Ge-76 MT4 (γ,n) >>

Ge74 (γ,2n) or Ge72 production log-log

Ge74 (γ,2n) or Ge72 production lin-log
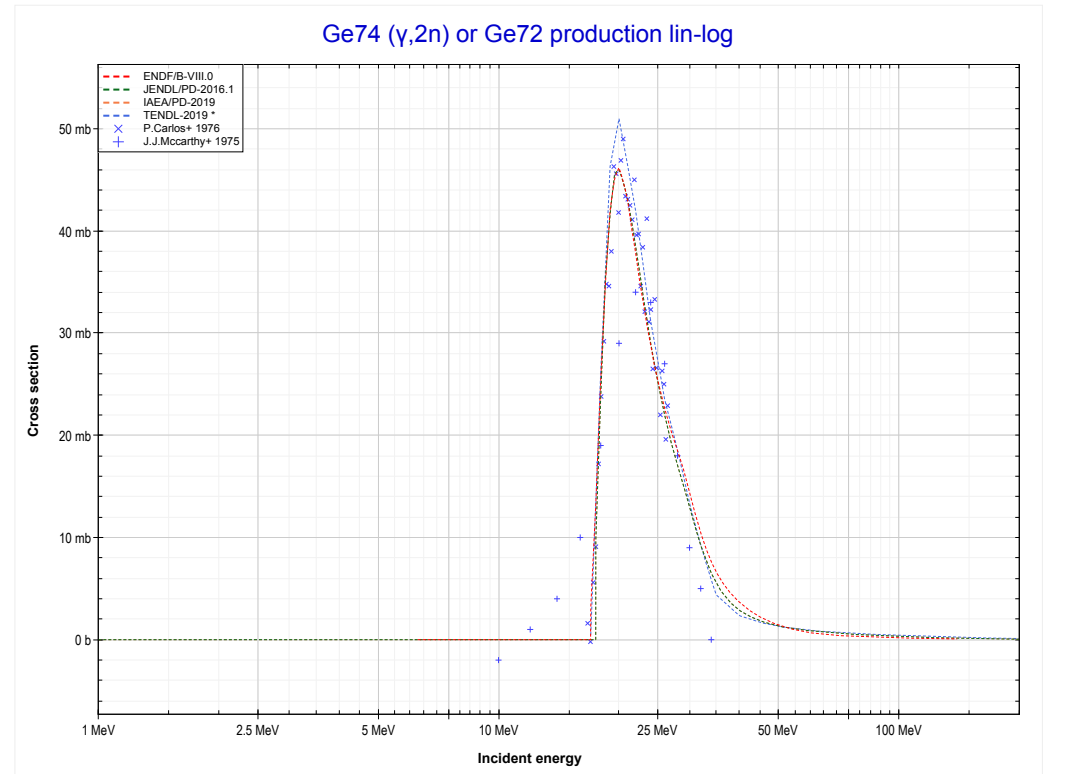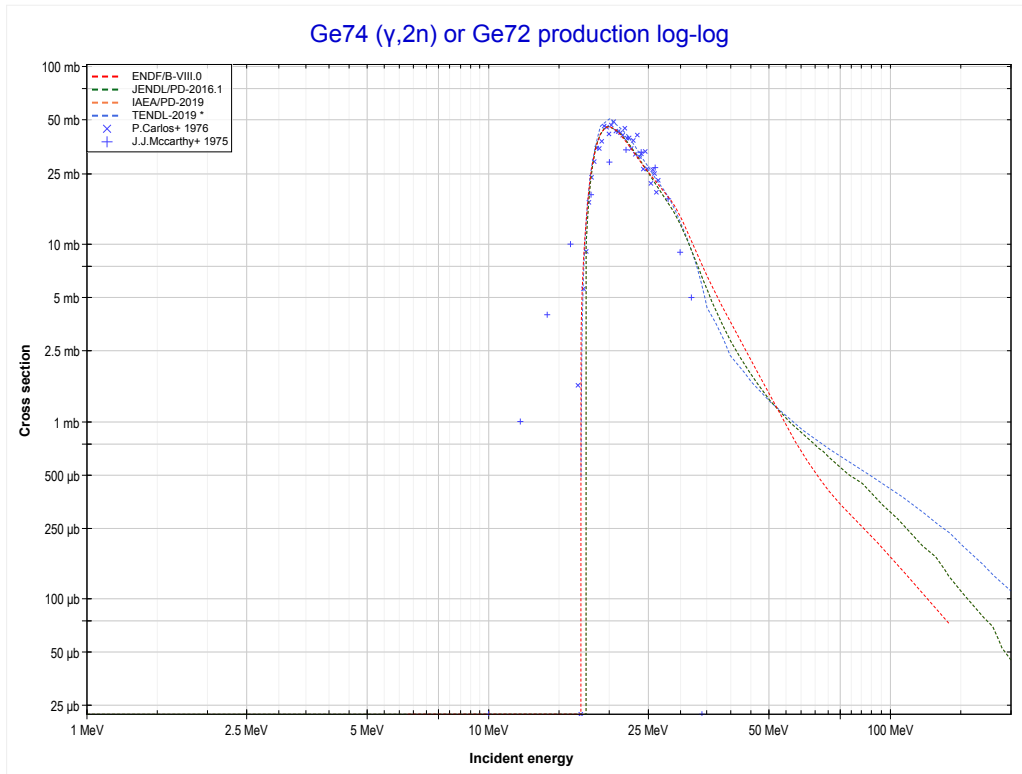
Reaction	Q-Value
Ge74(γ,2n)Ge72	-16979.18 keV

<< 32-Ge-74	**32-Ge-76**	34-Se-74 >>
<< 32-Ge-74 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Ge75 production)**	MT16 (γ,2n) >>

Ge76 (γ,n) or Ge75 production log-log

Ge76 (γ,n) or Ge75 production lin-log
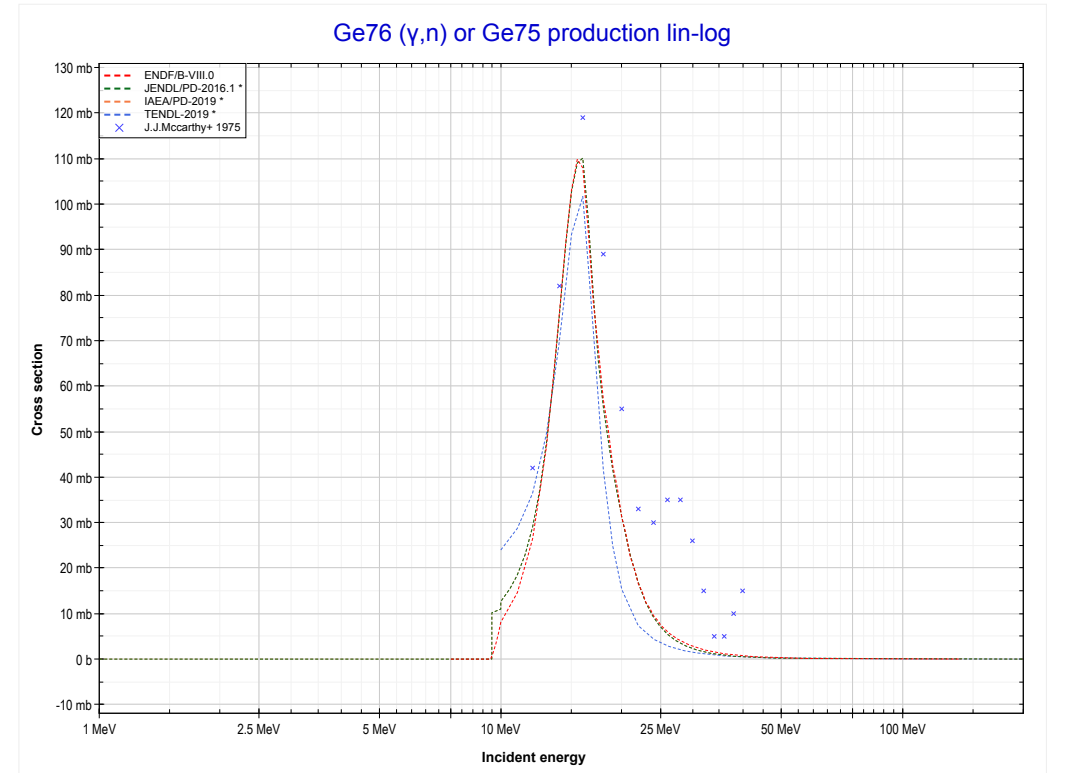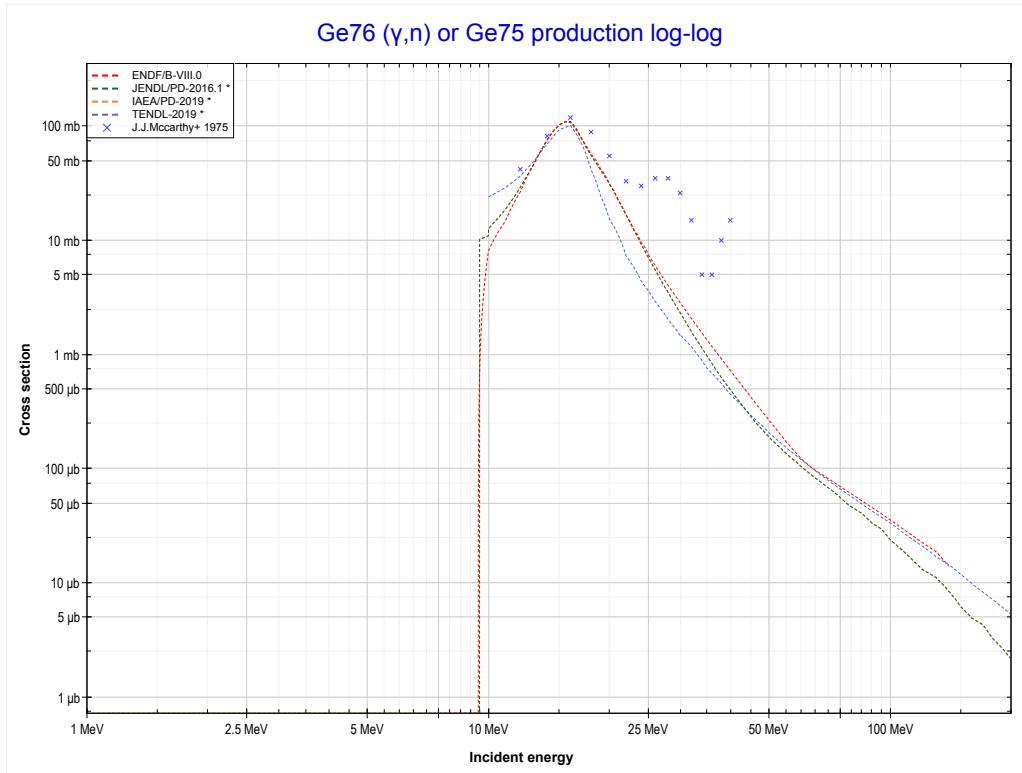
Reaction	Q-Value
Ge76(γ,n)Ge75	-9427.25 keV

<< 32-Ge-74	**32-Ge-76**	33-As-75 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ge74 production)**	MT28 (γ,n+p) >>

Ge76 (γ,2n) or Ge74 production log-log

Ge76 (γ,2n) or Ge74 production lin-log
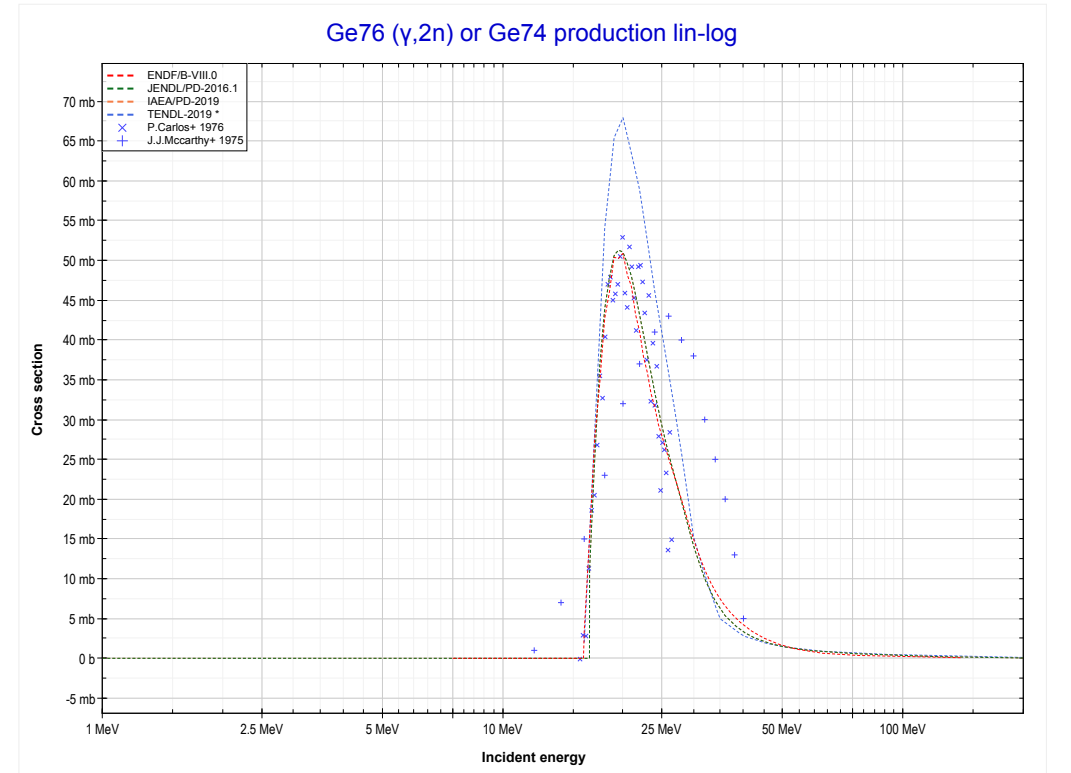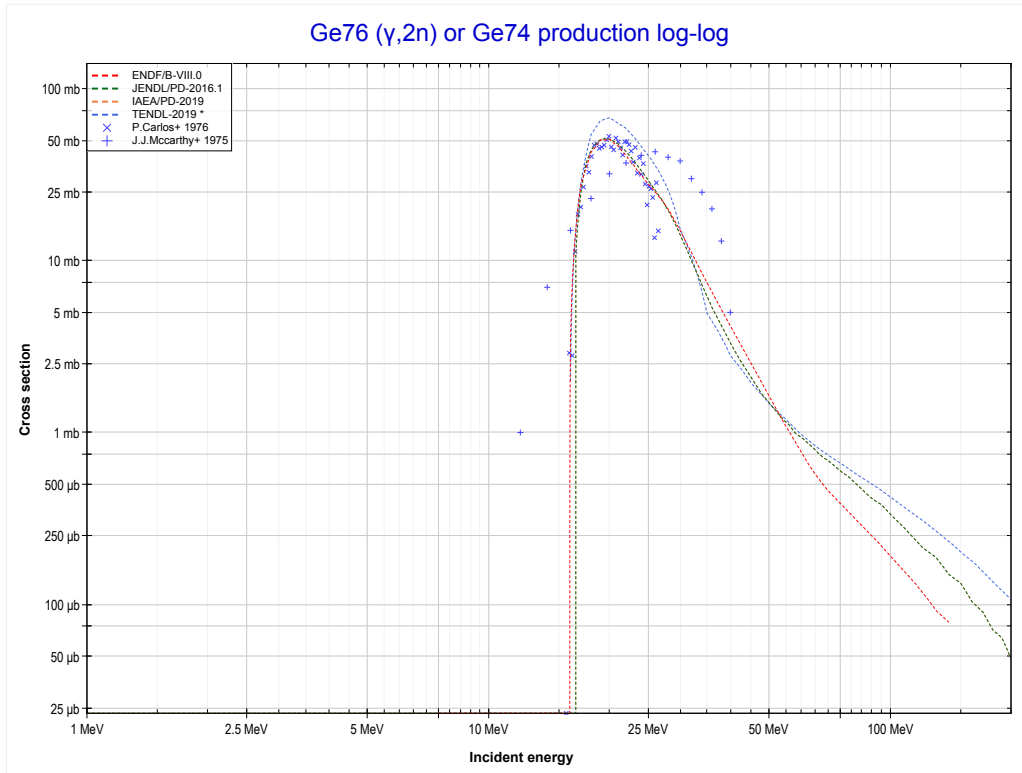
Reaction	Q-Value
Ge76(γ,2n)Ge74	-15933.08 keV

<< 32-Ge-72	32-Ge-76	40-Zr-90 >>
<< MT16 (γ,2n)	MT28 (γ,n+p) or MT5 (Ga74 production)	MT104 (γ,d) >>

Ge76 (γ,n+p) or Ga74 production log-log

Ge76 (γ,n+p) or Ga74 production lin-log
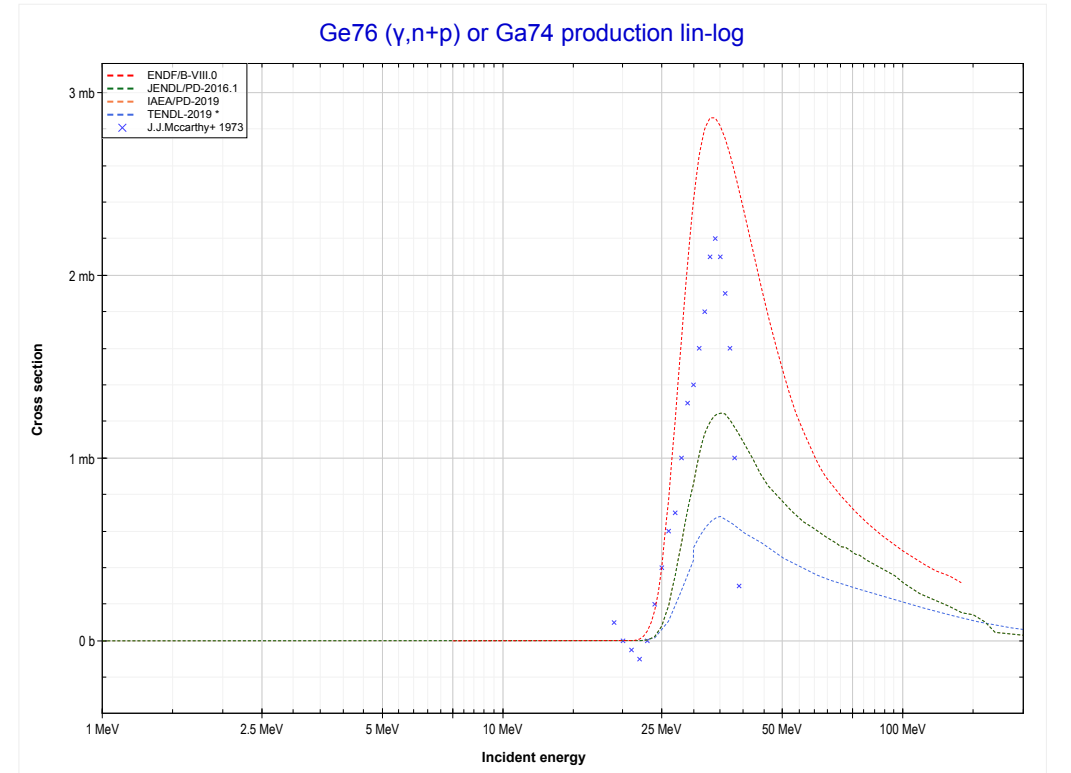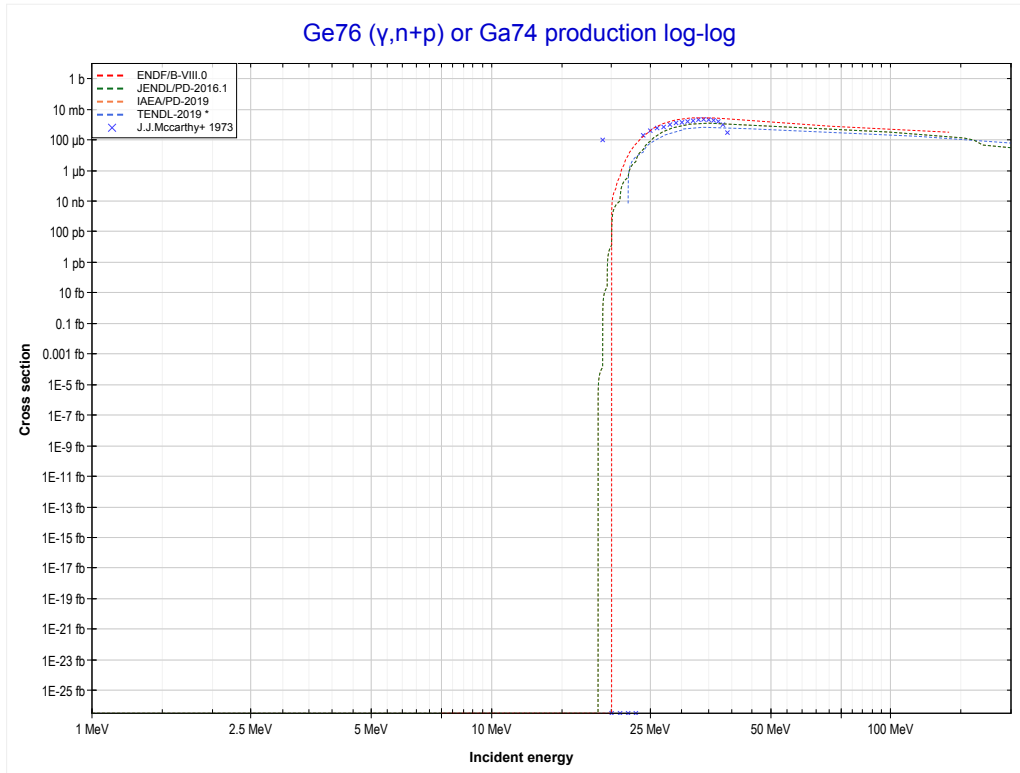
Reaction	Q-Value
Ge76(γ,d)Ga74	-18299.01 keV
Ge76(γ,n+p)Ga74	-20523.58 keV

<< 32-Ge-72	32-Ge-76	40-Zr-90 >>
<< MT28 (γ,n+p)	MT104 (γ,d) or MT5 (Ga74 production)	MT107 (γ,α) >>

Ge76 (γ,d) or Ga74 production log-log

Ge76 (γ,d) or Ga74 production lin-log
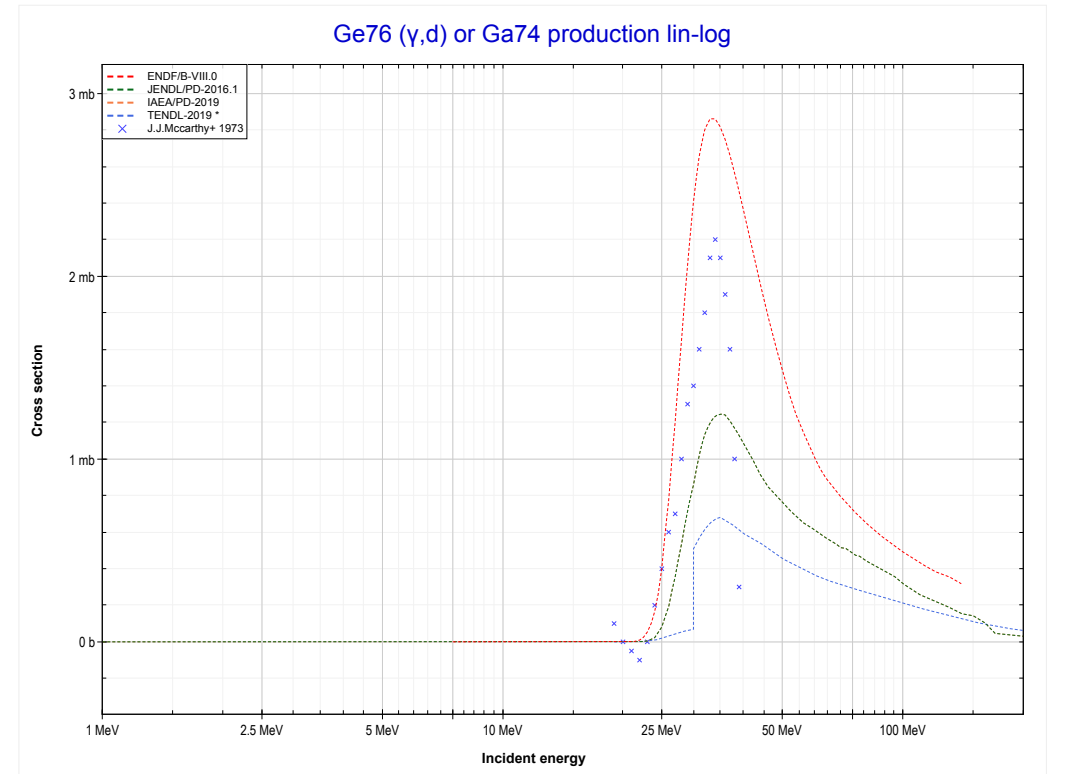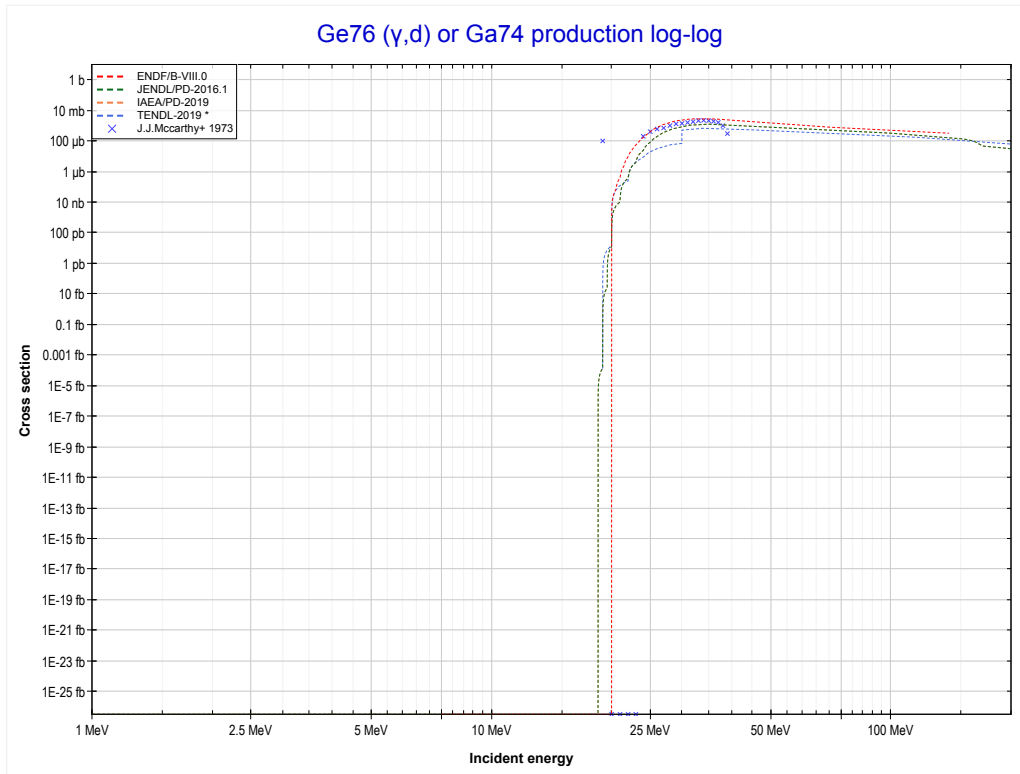
Reaction	Q-Value
Ge76(γ,d)Ga74	-18299.01 keV
Ge76(γ,n+p)Ga74	-20523.58 keV

<< 29-Cu-65	**32-Ge-76**	37-Rb-87 >>
<< MT104 (γ,d)	**MT107 (γ,α) or MT5 (Zn72 production)**	33-As-75 MT16 (γ,2n) >>

Ge76 (γ,α) or Zn72 production log-log

Ge76 (γ,α) or Zn72 production lin-log
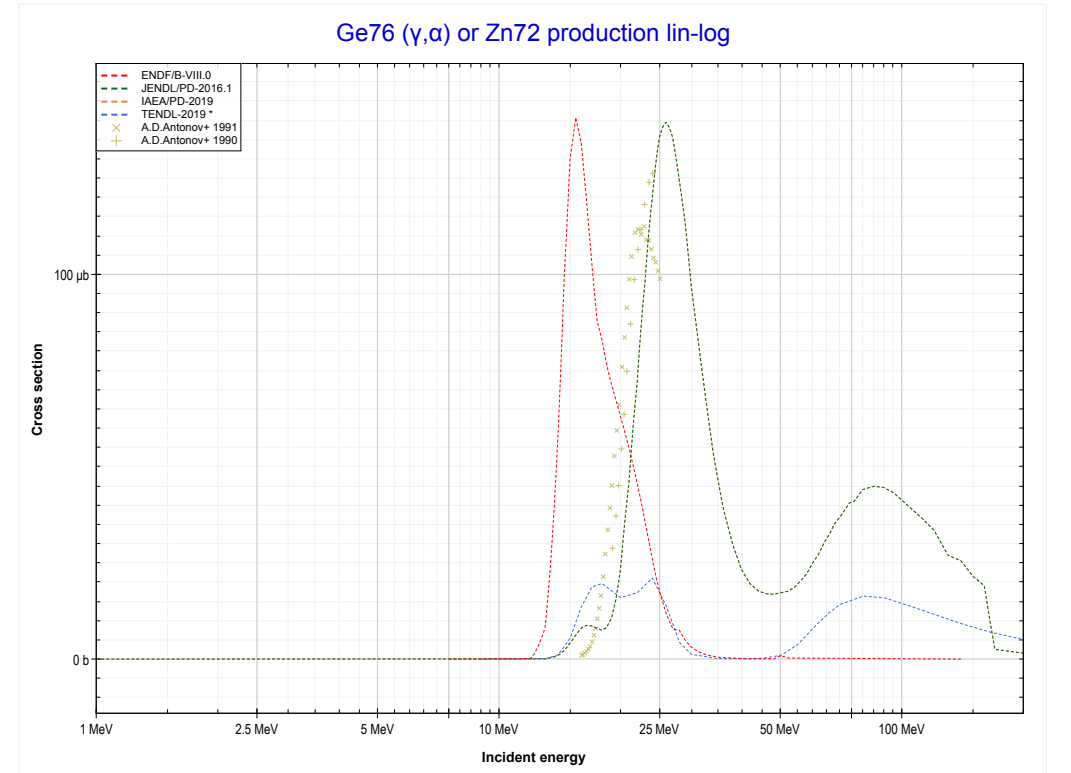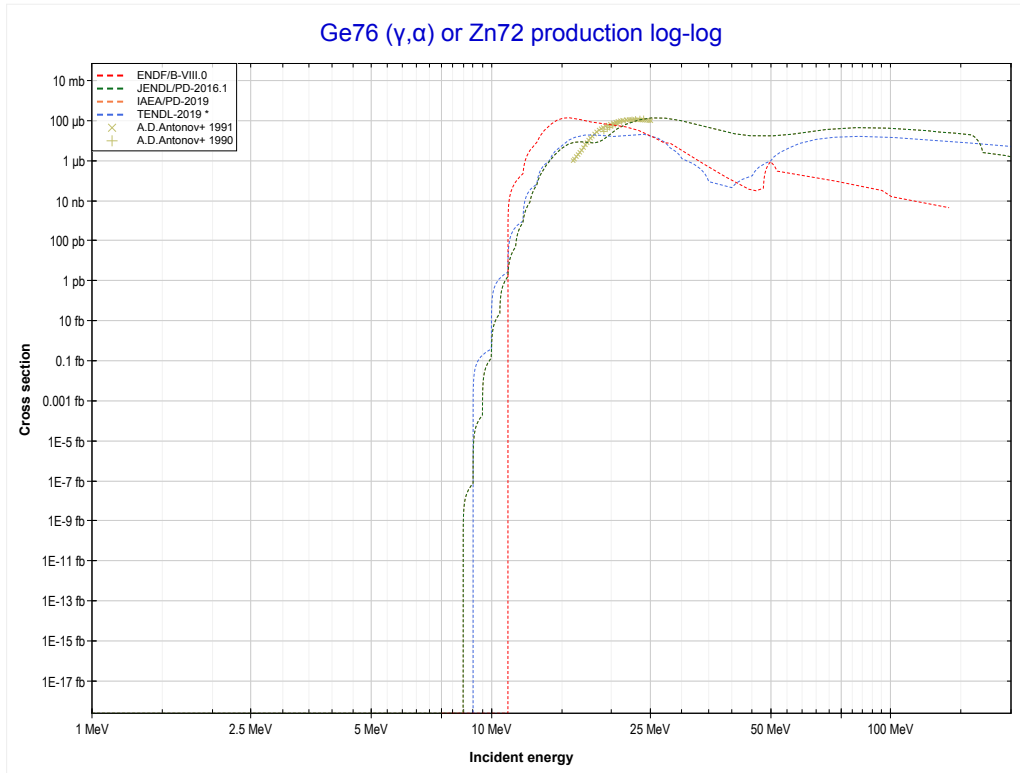
Reaction	Q-Value
Ge76(γ,α)Zn72	-7492.30 keV
Ge76(γ,p+t)Zn72	-27306.17 keV
Ge76(γ,n+He3)Zn72	-28069.92 keV
Ge76(γ,2d)Zn72	-31338.83 keV
Ge76(γ,n+p+d)Zn72	-33563.40 keV
Ge76(γ,2n+2p)Zn72	-35787.96 keV

<< 32-Ge-76	**33-As-75**	34-Se-76 >>
<< 32-Ge-76 MT107 (γ,α)	**MT16 (γ,2n) or MT5 (As73 production)**	34-Se-74 MT4 (γ,n) >>

As75 (γ,2n) or As73 production log-log

As75 (γ,2n) or As73 production lin-log
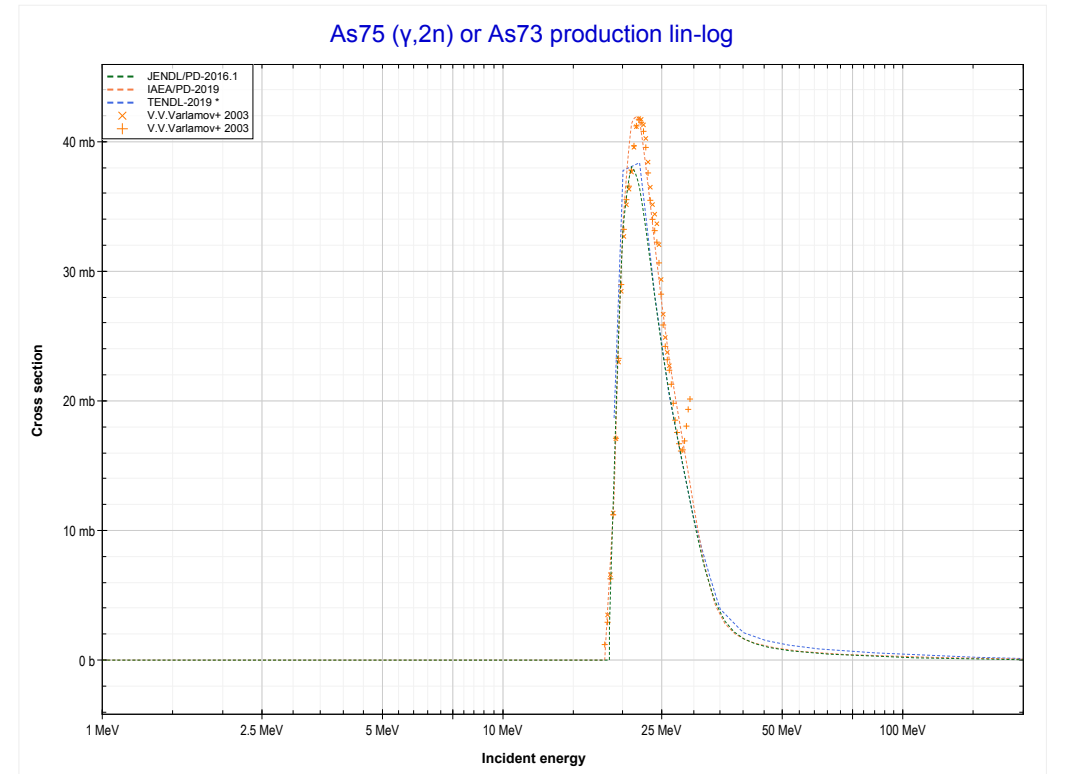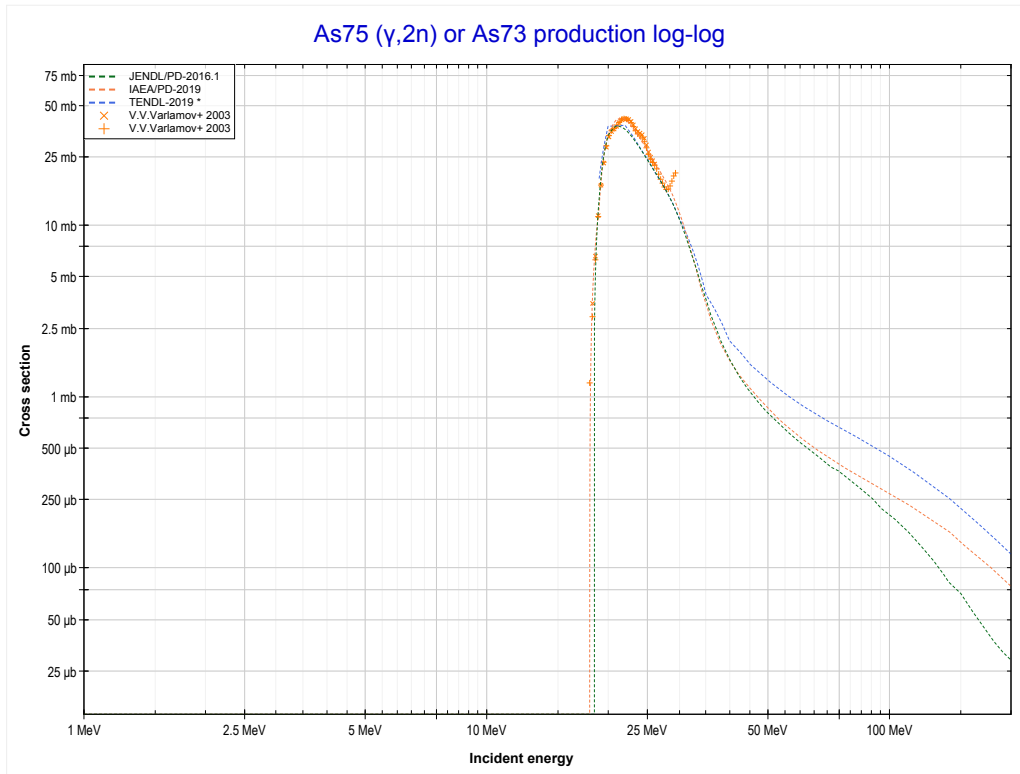
Reaction	Q-Value
As75(γ,2n)As73	-18223.83 keV

<< 32-Ge-76	**34-Se-74**	34-Se-76 >>
<< 33-As-75 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Se73 production)**	34-Se-76 MT4 (γ,n) >>

Se74 (γ,n) or Se73 production log-log

Se74 (γ,n) or Se73 production lin-log
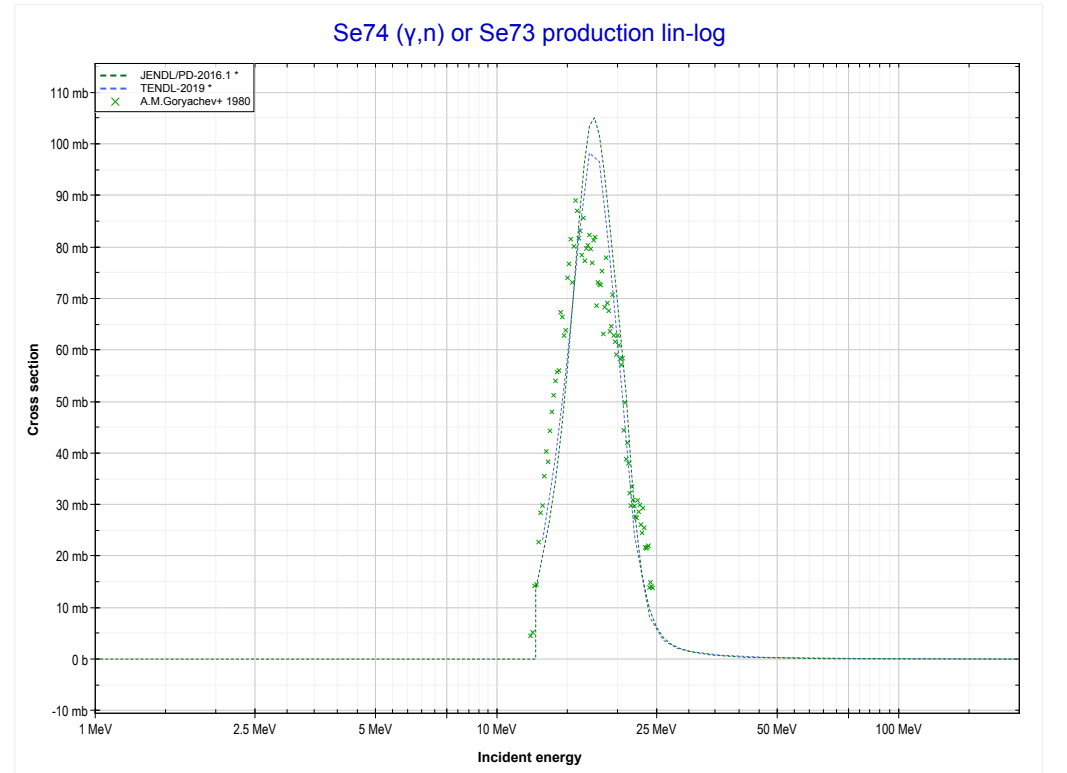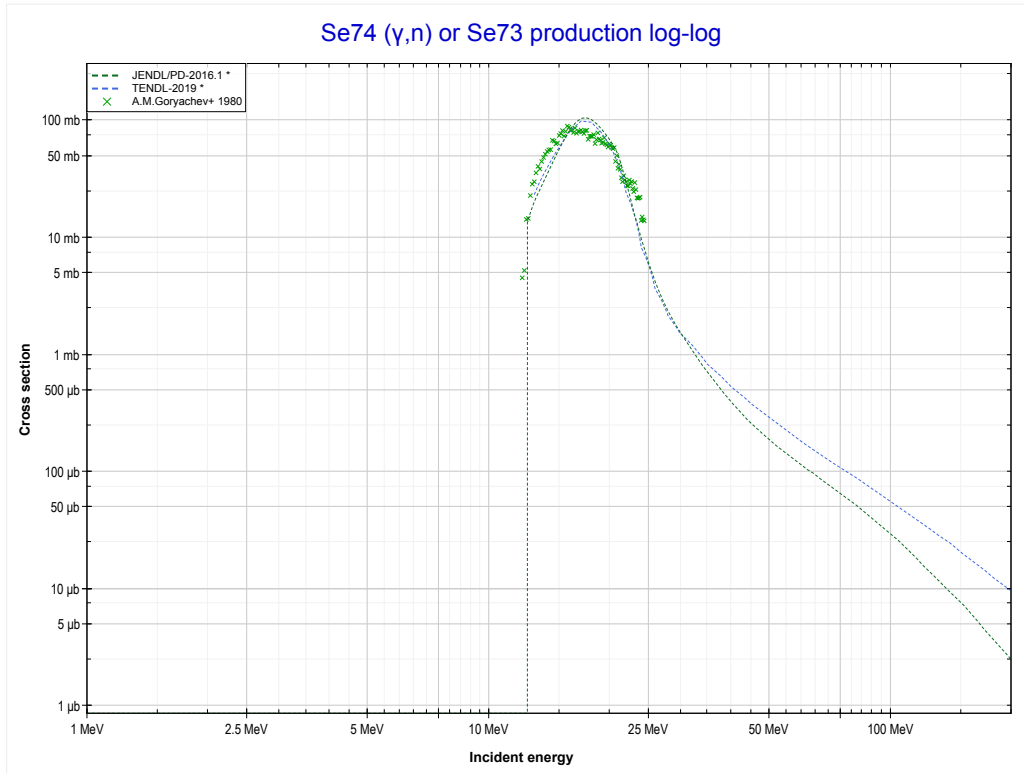
Reaction	Q-Value
Se74(γ,n)Se73	-12057.52 keV

<< 34-Se-74	**34-Se-76**	34-Se-77 >>
<< 34-Se-74 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Se75 production)**	MT16 (γ,2n) >>

Se76 (γ,n) or Se75 production log-log

Se76 (γ,n) or Se75 production lin-log
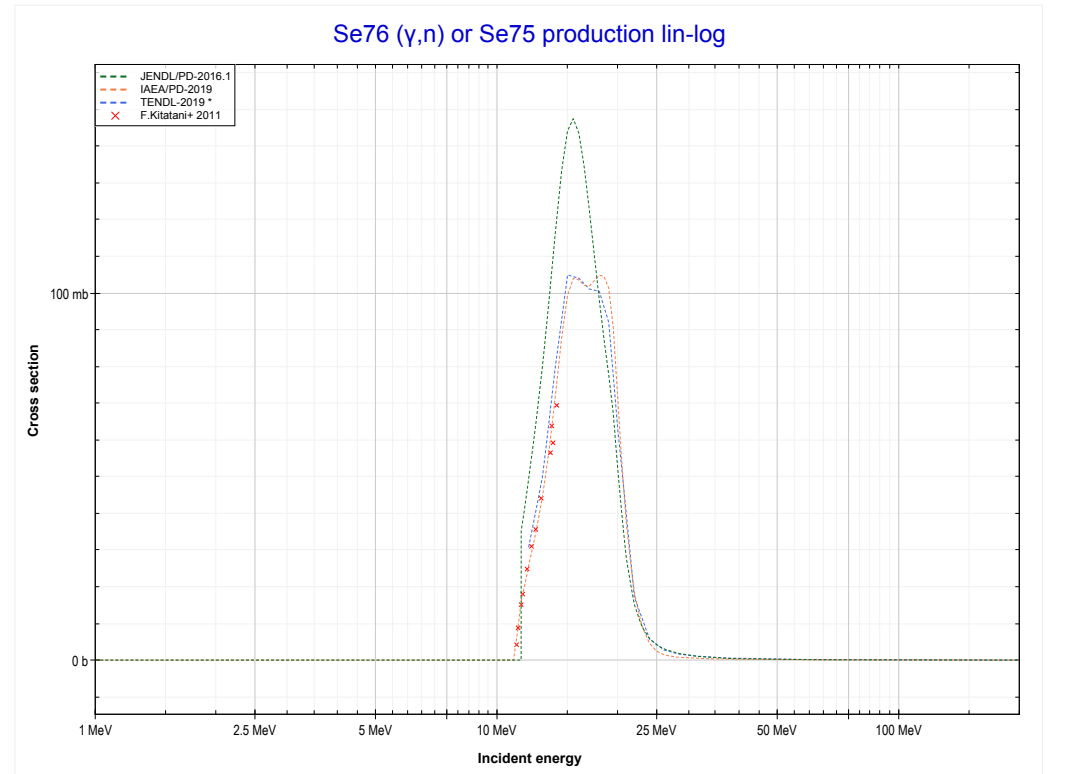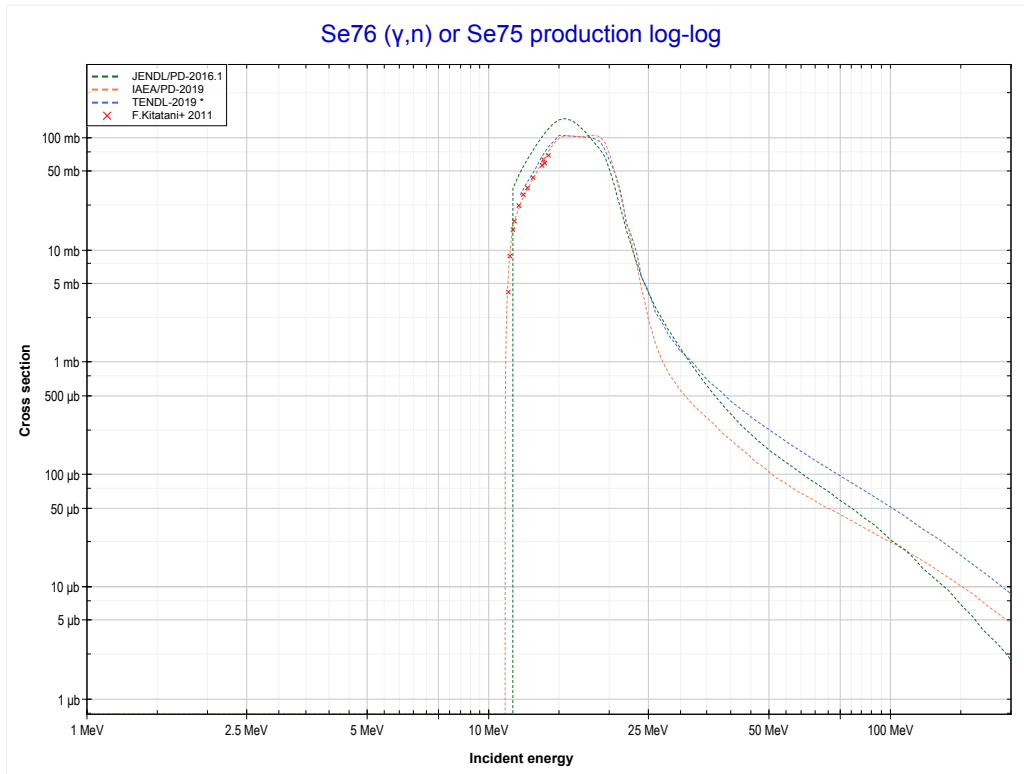
Reaction	Q-Value
Se76(γ,n)Se75	-11153.79 keV

<< 33-As-75	**34-Se-76**	34-Se-78 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Se74 production)**	34-Se-77 MT4 (γ,n) >>

Se76 (γ,2n) or Se74 production log-log

Se76 (γ,2n) or Se74 production lin-log

Legend (both plots):
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- V.V.Varlamov+ 2019
- P.Carlos+ 1976
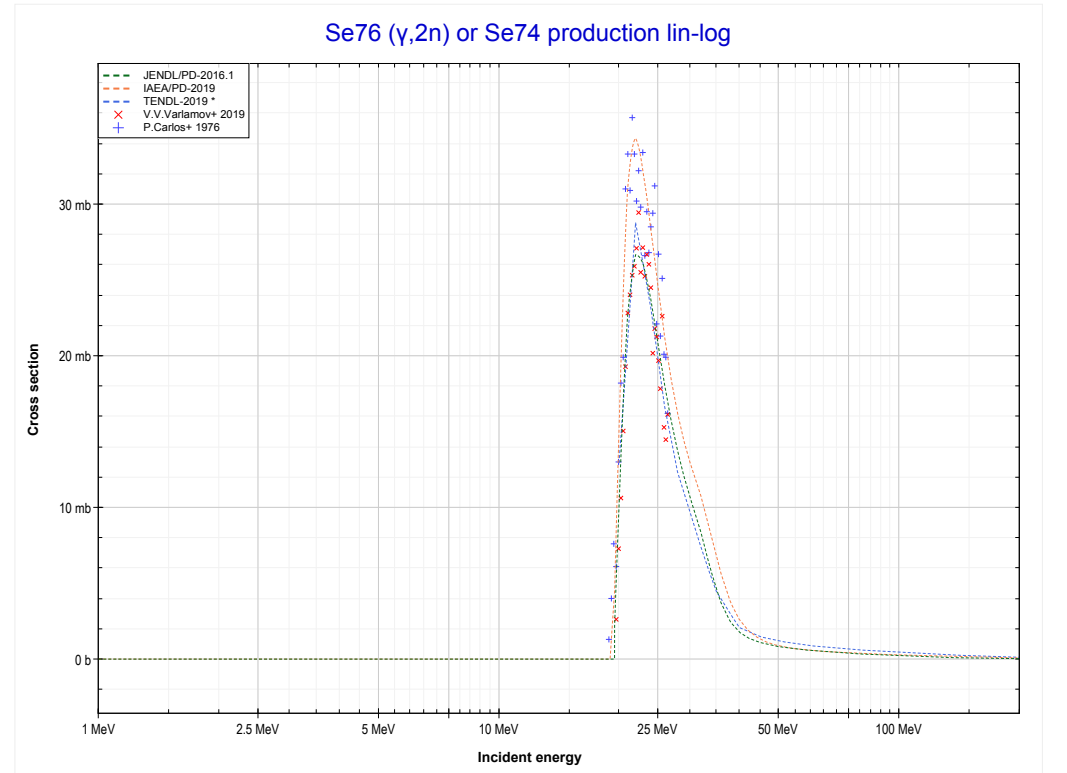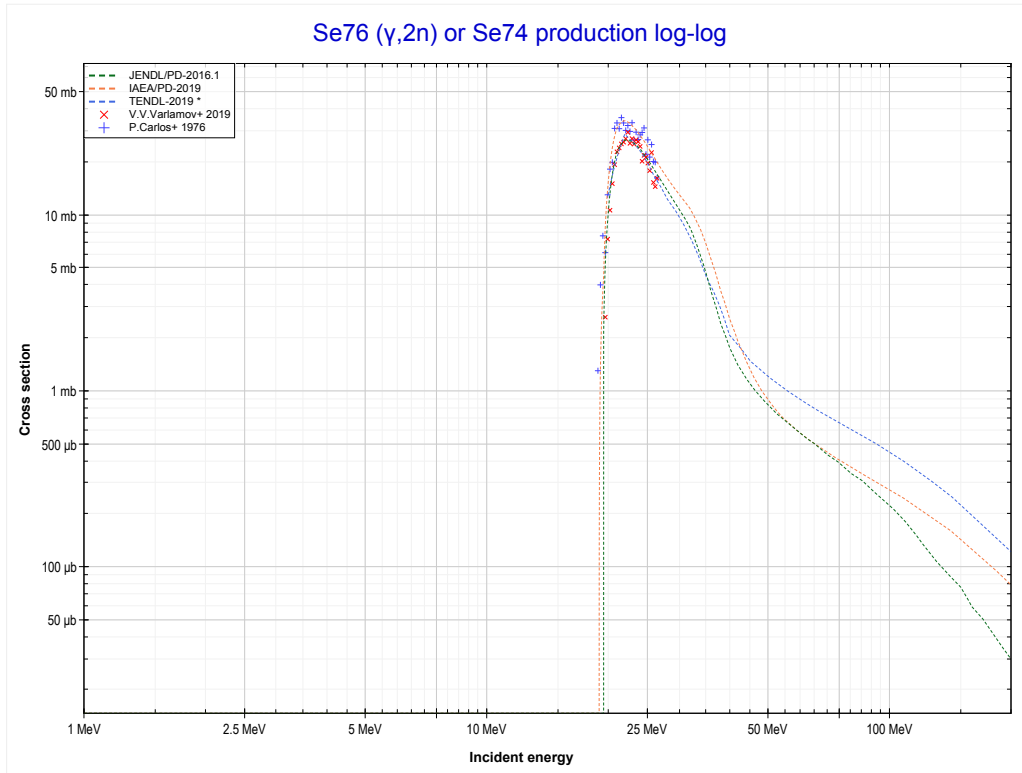
Reaction	Q-Value
Se76(γ,2n)Se74	-19181.38 keV

<< 34-Se-76	**34-Se-77**	34-Se-78 >>
<< 34-Se-76 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Se76 production)**	34-Se-78 MT4 (γ,n) >>

Se77 (γ,n) or Se76 production log-log

Se77 (γ,n) or Se76 production lin-log
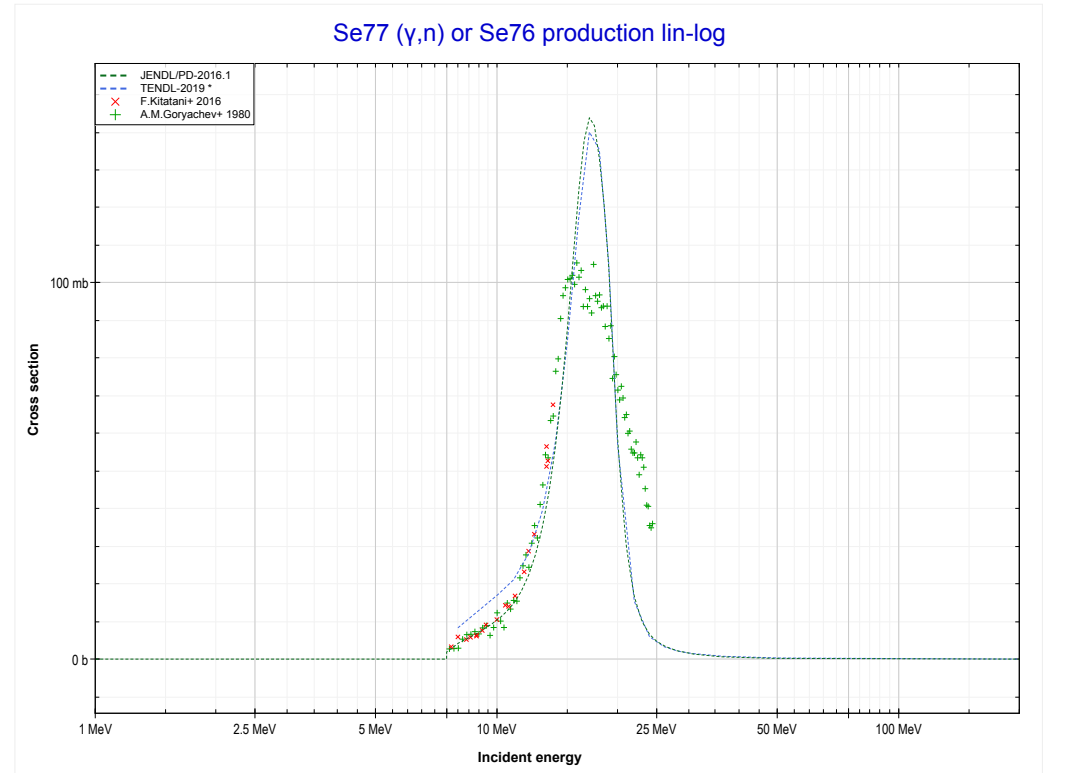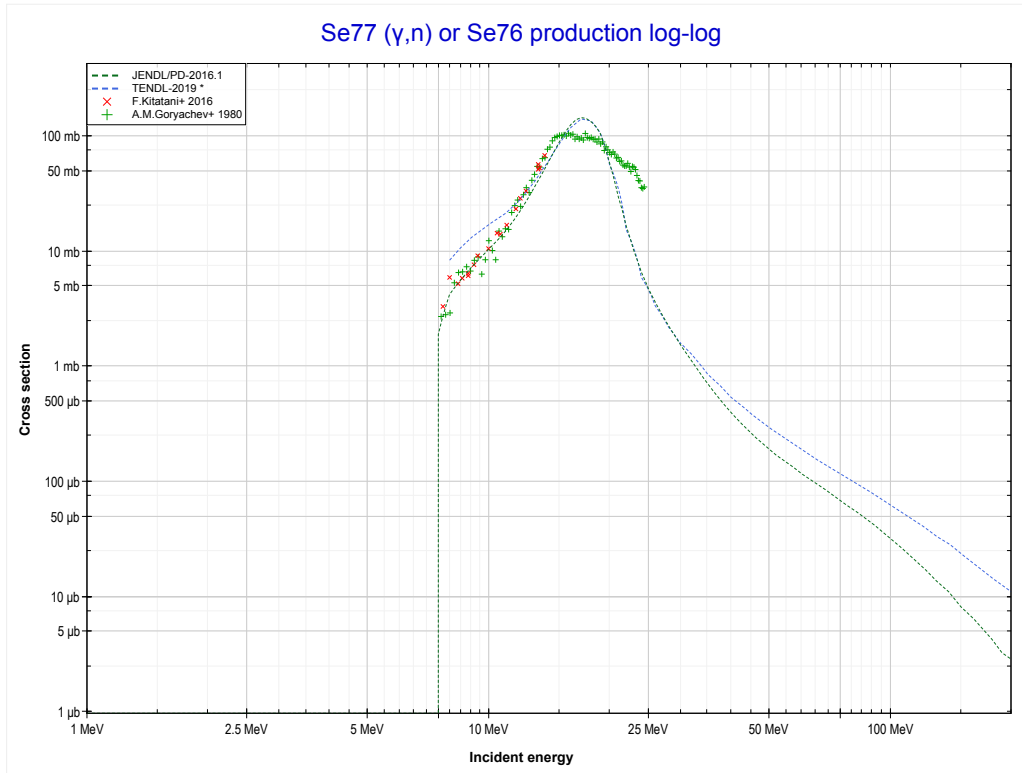
Reaction	Q-Value
Se77(γ,n)Se76	-7418.86 keV

<< 34-Se-77	**34-Se-78**	34-Se-80 >>
<< 34-Se-77 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Se77 production)**	MT16 (γ,2n) >>

Se78 (γ,n) or Se77 production log-log

Se78 (γ,n) or Se77 production lin-log
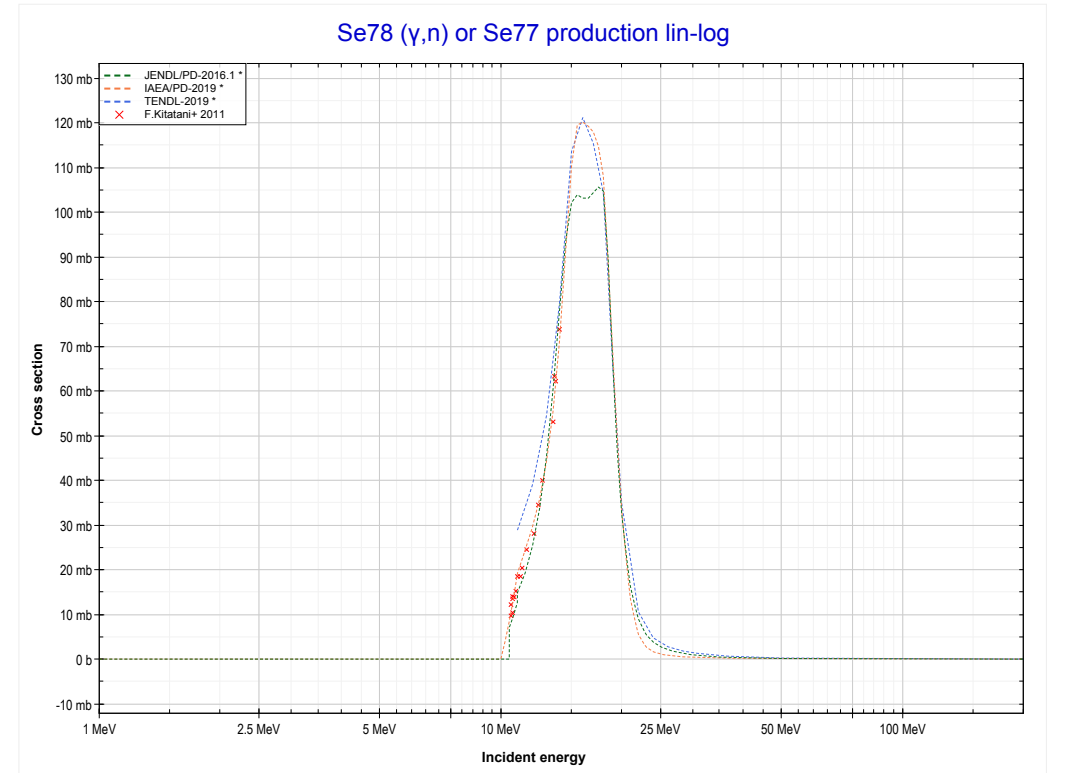
Reaction	Q-Value
Se78(γ,n)Se77	-10497.77 keV

<< 34-Se-76	**34-Se-78**	34-Se-80 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Se76 production)**	34-Se-80 MT4 (γ,n) >>

Se78 (γ,2n) or Se76 production log-log

Se78 (γ,2n) or Se76 production lin-log
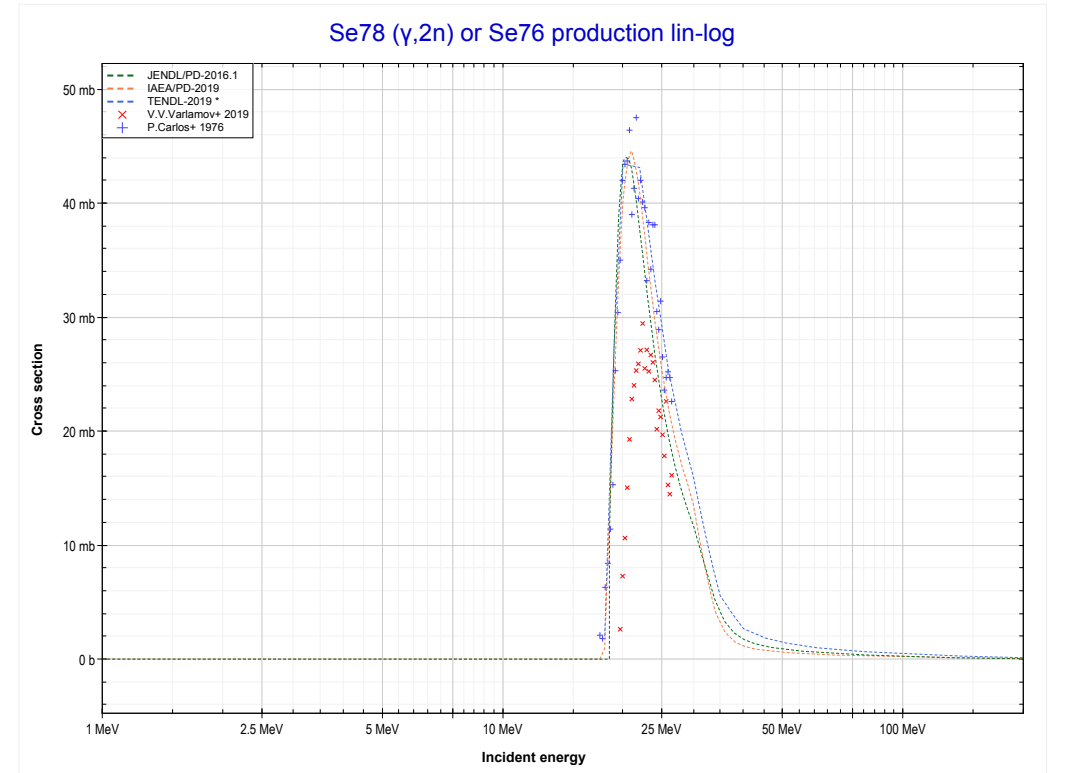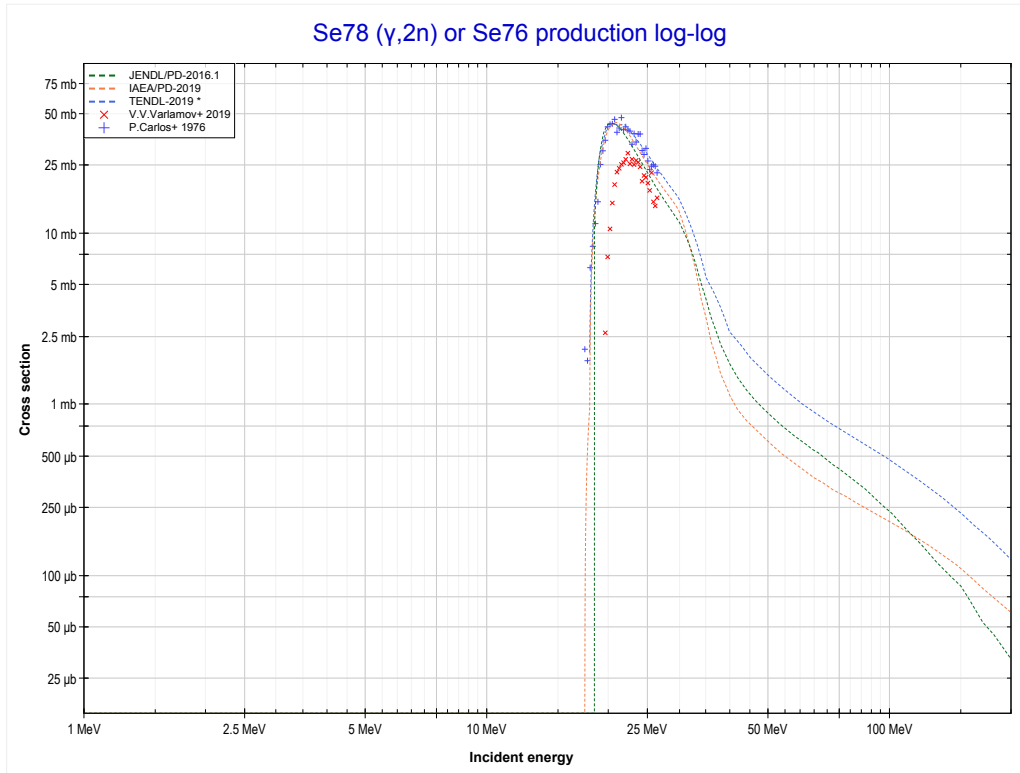
Reaction	Q-Value
Se78(γ,2n)Se76	-17916.62 keV

<< 34-Se-78	**34-Se-80**	34-Se-82 >>
<< 34-Se-78 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Se79 production)**	MT16 (γ,2n) >>

Se80 (γ,n) or Se79 production log-log

Se80 (γ,n) or Se79 production lin-log
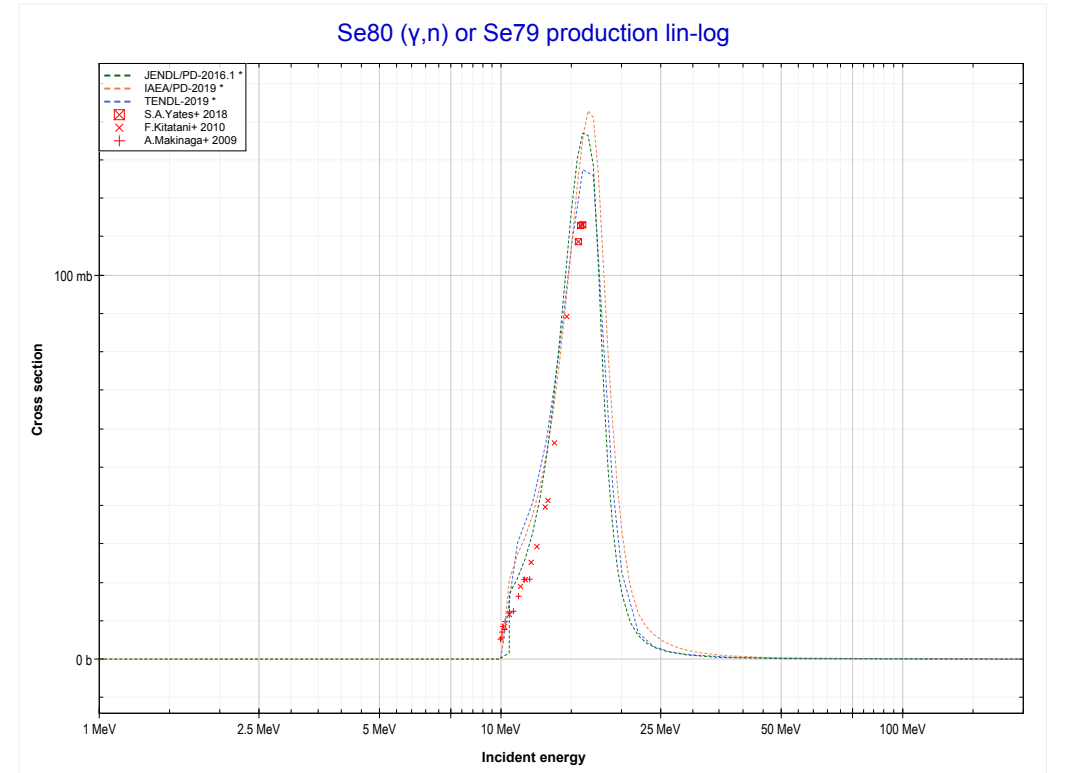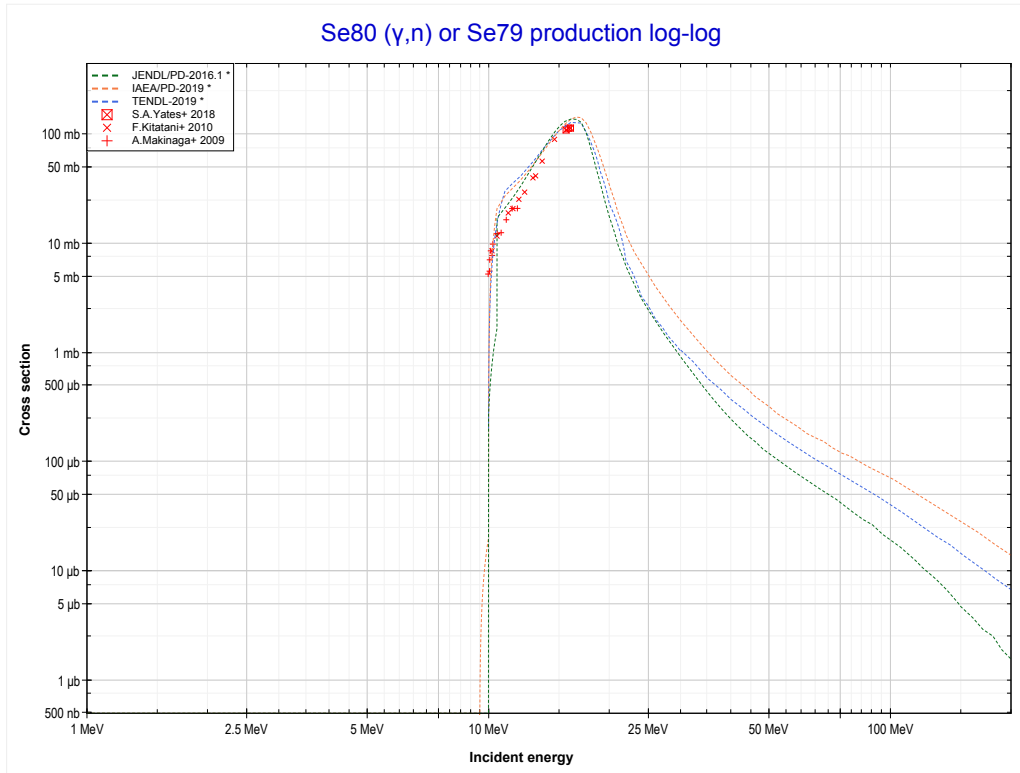
Reaction	Q-Value
Se80(γ,n)Se79	-9913.36 keV

<< 34-Se-78	**34-Se-80**	34-Se-82 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Se78 production)**	34-Se-82 MT4 (γ,n) >>

Se80 (γ,2n) or Se78 production log-log

Se80 (γ,2n) or Se78 production lin-log
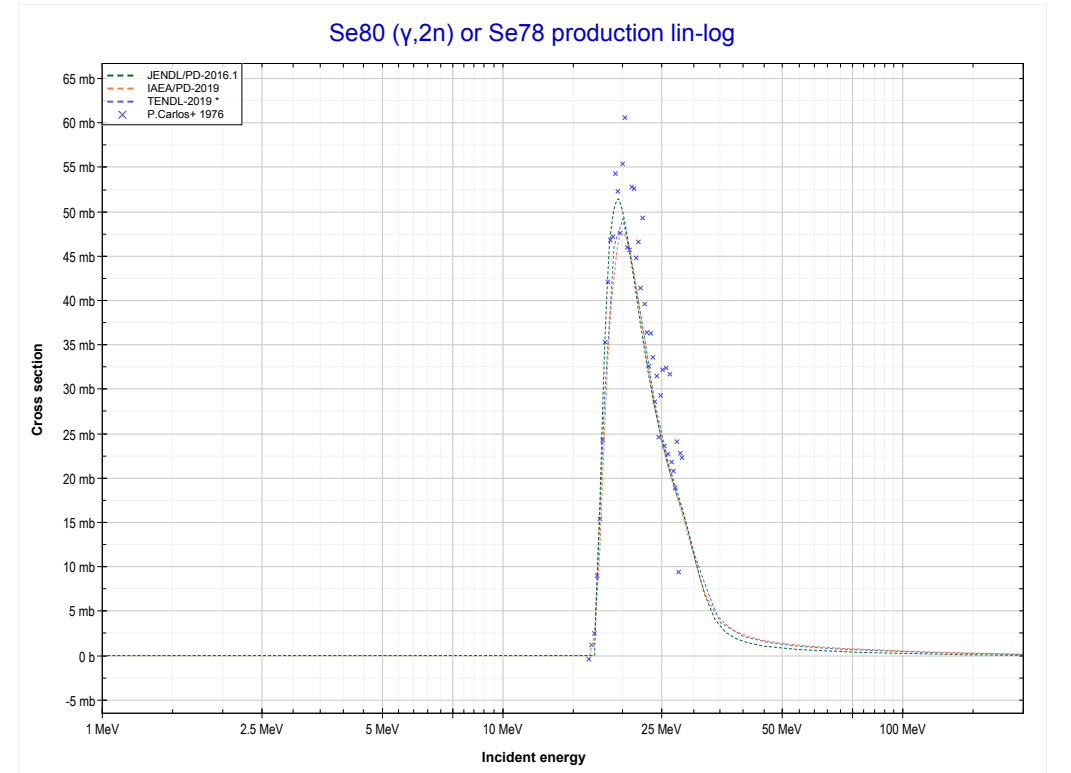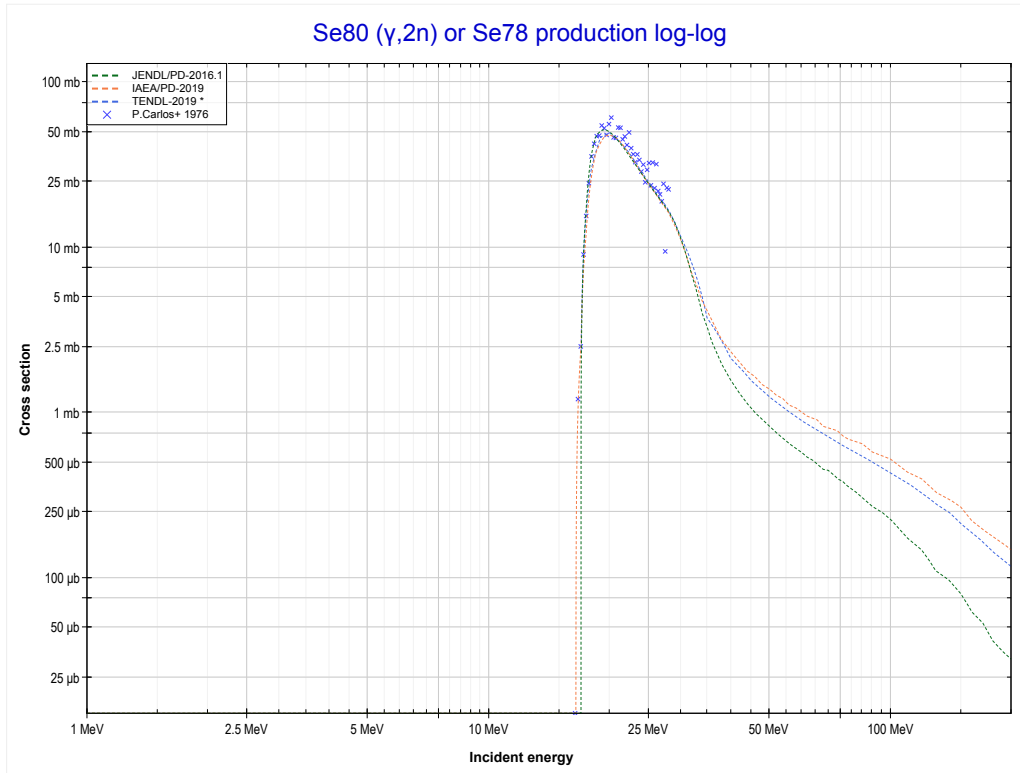
Reaction	Q-Value
Se80(γ,2n)Se78	-16876.19 keV

<< 34-Se-80	**34-Se-82**	35-Br-79 >>
<< 34-Se-80 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Se81 production)**	MT16 (γ,2n) >>

Se82 (γ,n) or Se81 production log-log

Se82 (γ,n) or Se81 production lin-log
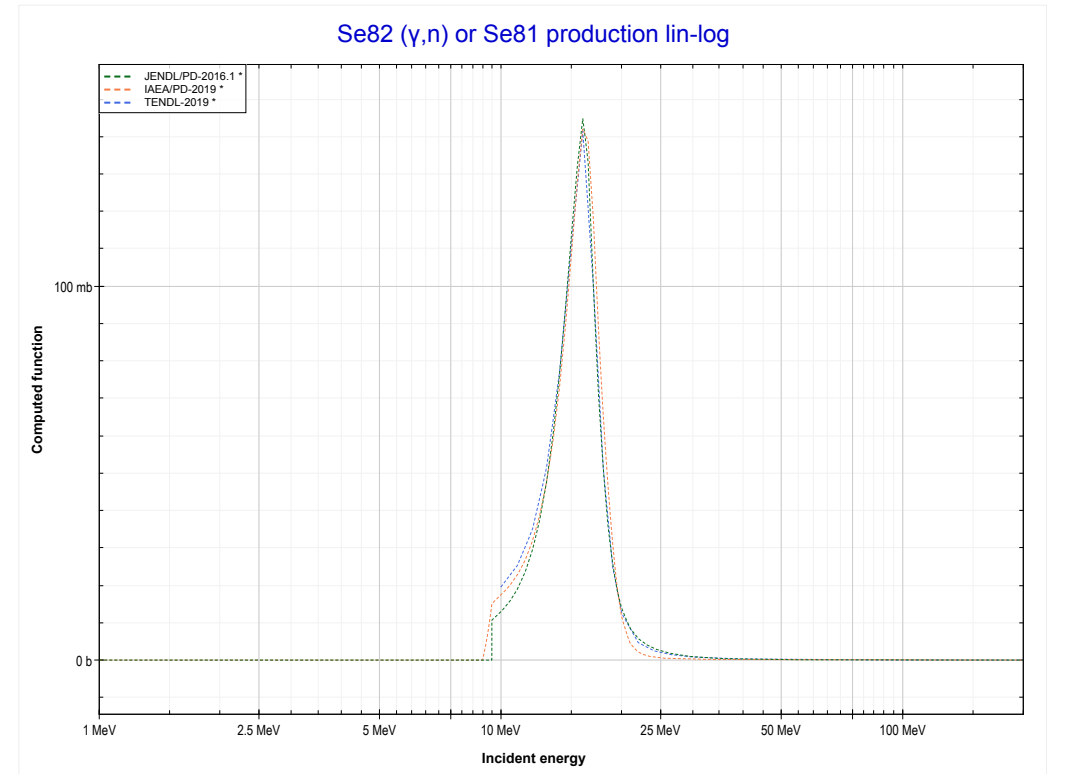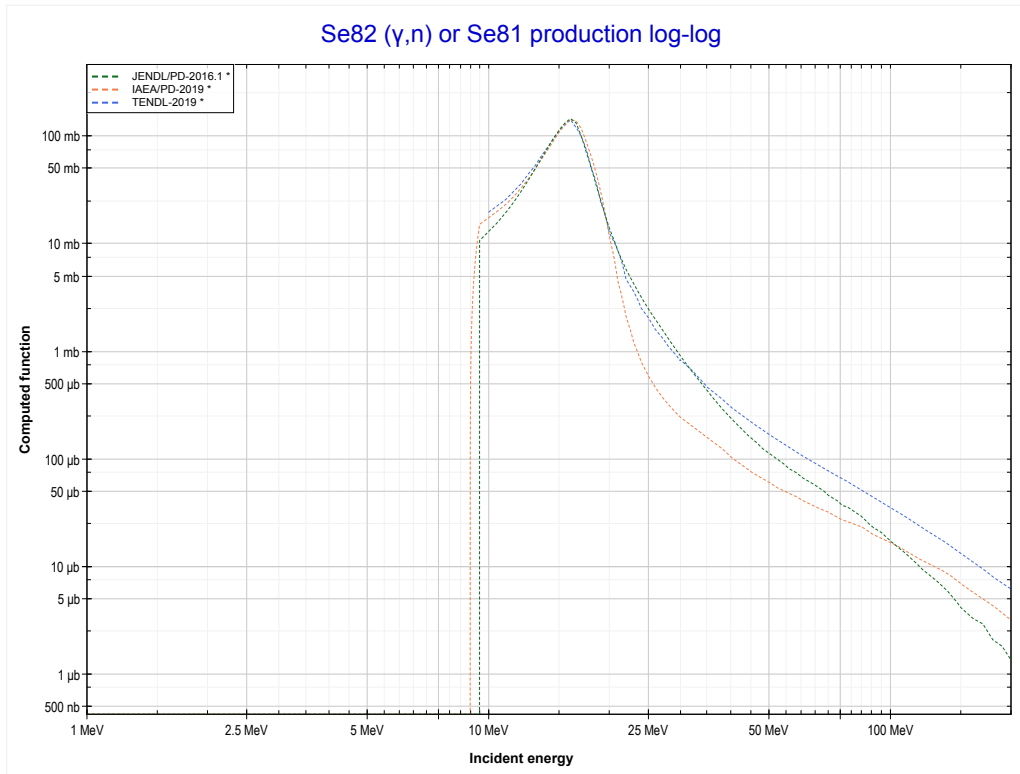
Reaction	Q-Value
Se82(γ,n)Se81	-9276.22 keV

<< 34-Se-80	**34-Se-82**	39-Y-89 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Se80 production)**	35-Br-79 MT4 (γ,n) >>

Se82 (γ,2n) or Se80 production log-log

Se82 (γ,2n) or Se80 production lin-log
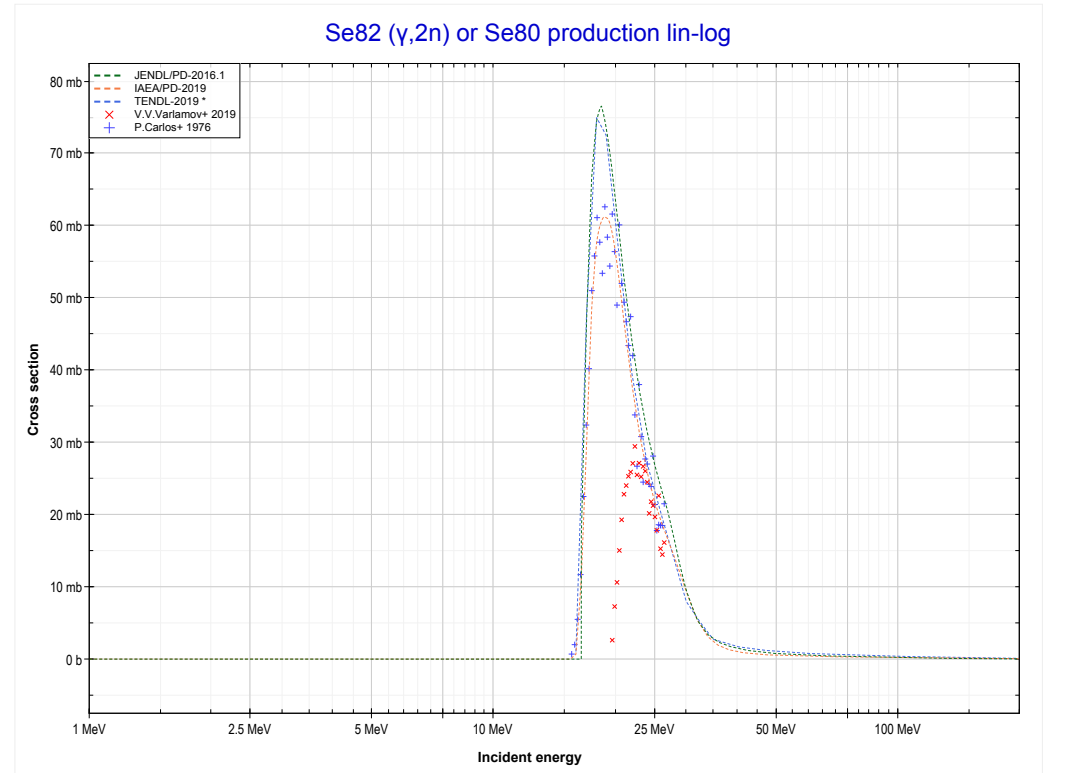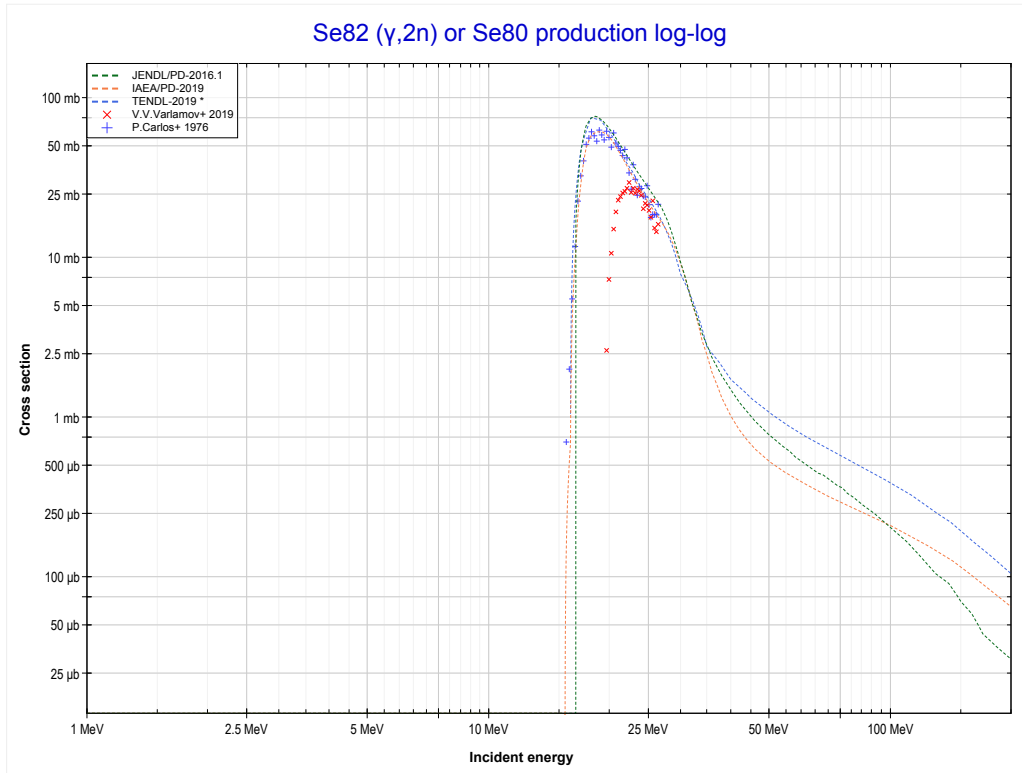
Reaction	Q-Value
Se82(γ,2n)Se80	-15977.03 keV

<< 34-Se-82	35-Br-79	35-Br-81 >>
<< 34-Se-82 MT16 (γ,2n)	MT4 (γ,n) or MT5 (Br78 production)	35-Br-81 MT4 (γ,n) >>

Br79 (γ,n) or Br78 production log-log

Br79 (γ,n) or Br78 production lin-log
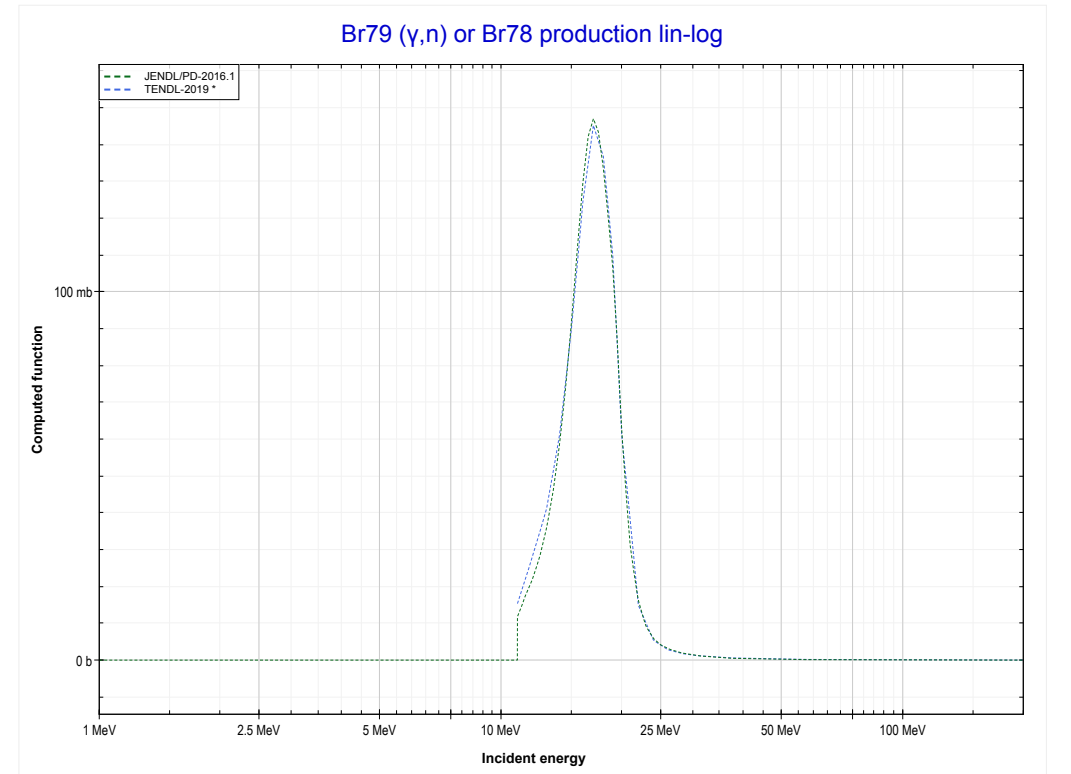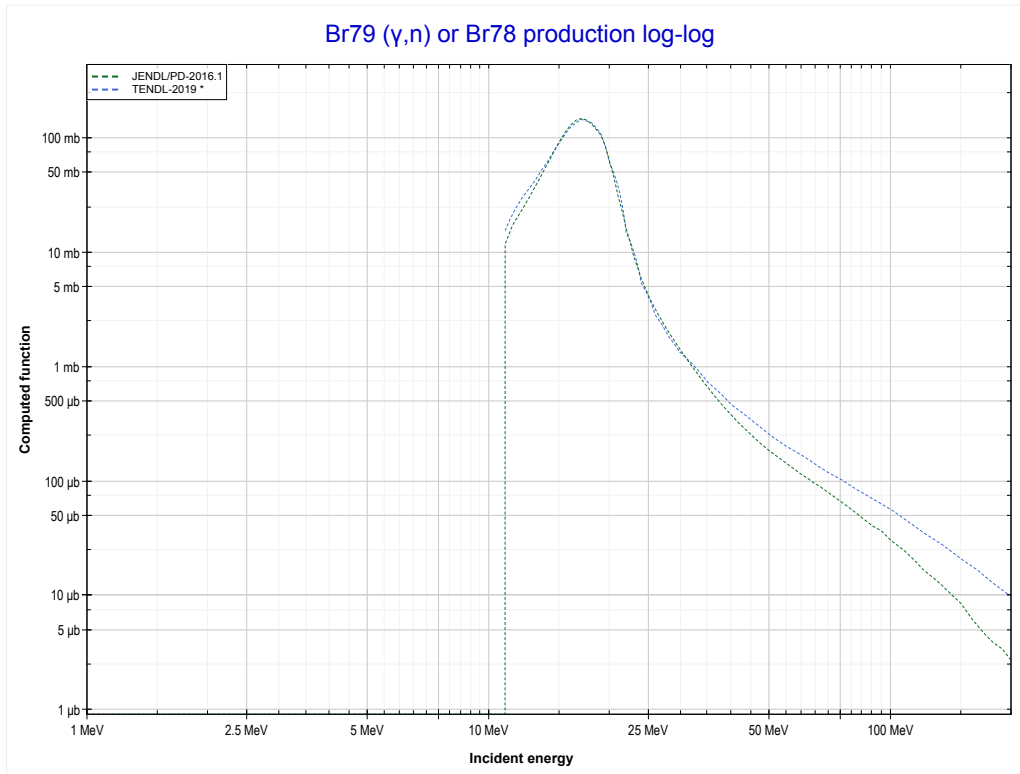
Reaction	Q-Value
Br79(γ,n)Br78	-10687.32 keV

<< 35-Br-79	**35-Br-81**	36-Kr-86 >>
<< 35-Br-79 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Br80 production)**	36-Kr-86 MT4 (γ,n) >>

Br81 (γ,n) or Br80 production log-log

Br81 (γ,n) or Br80 production lin-log
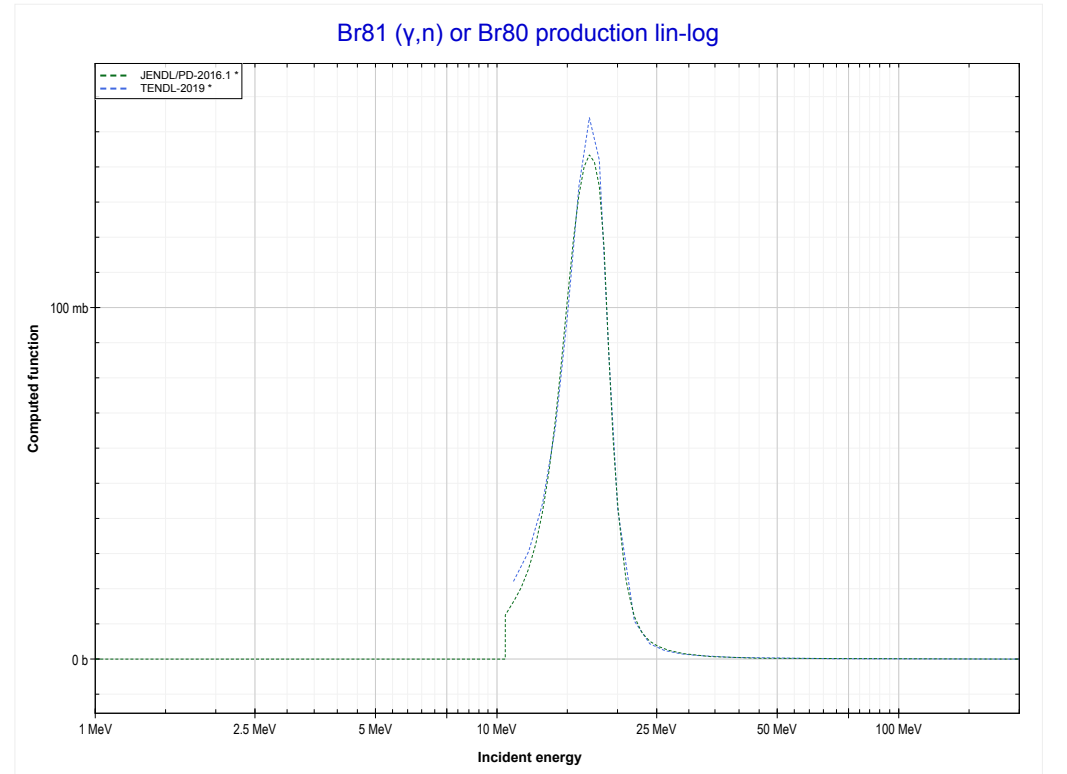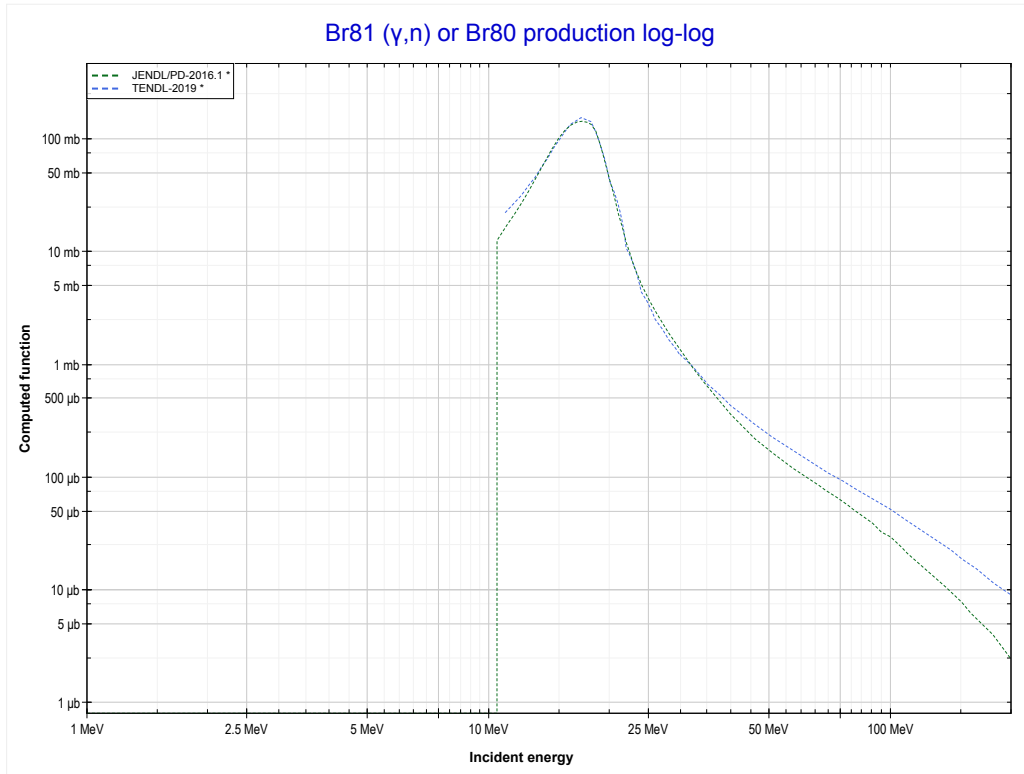
Reaction	Q-Value
Br81(γ,n)Br80	-10159.32 keV

<< 35-Br-81	**36-Kr-86**	37-Rb-85 >>
<< 35-Br-81 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Kr85 production)**	37-Rb-85 MT4 (γ,n) >>

Kr86 (γ,n) or Kr85 production log-log

Kr86 (γ,n) or Kr85 production lin-log

- JENDL/PD-2016.1 *
- TENDL-2019 *
- × R.Raut+ 2013
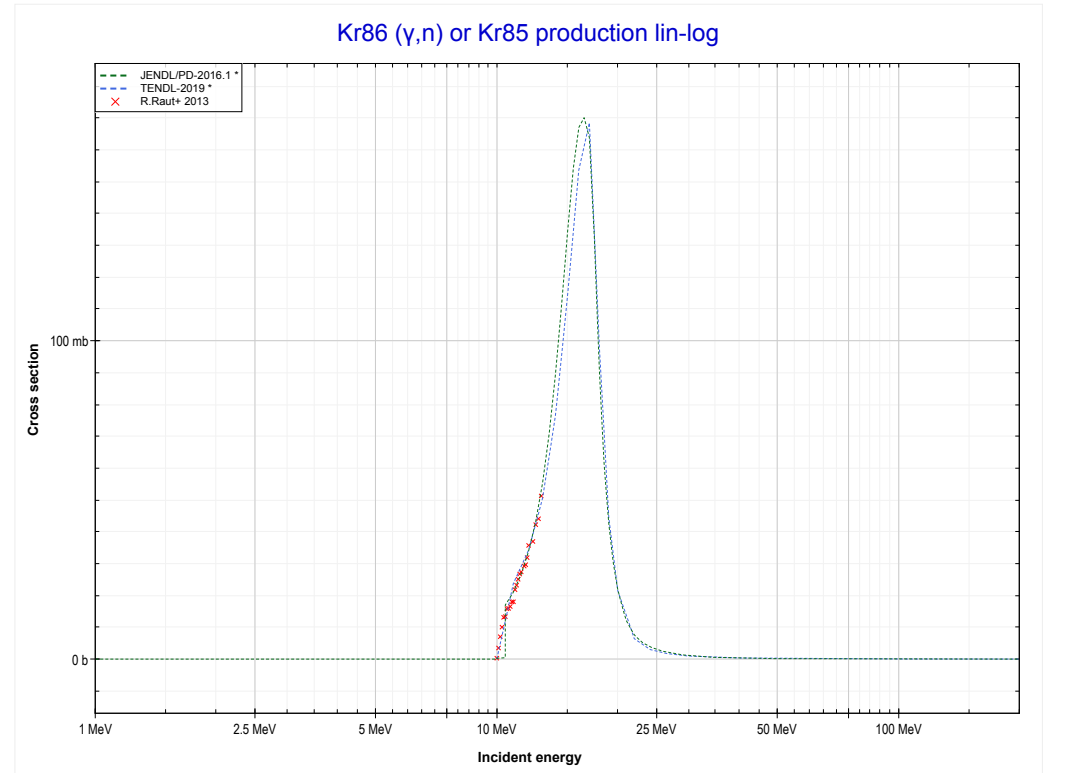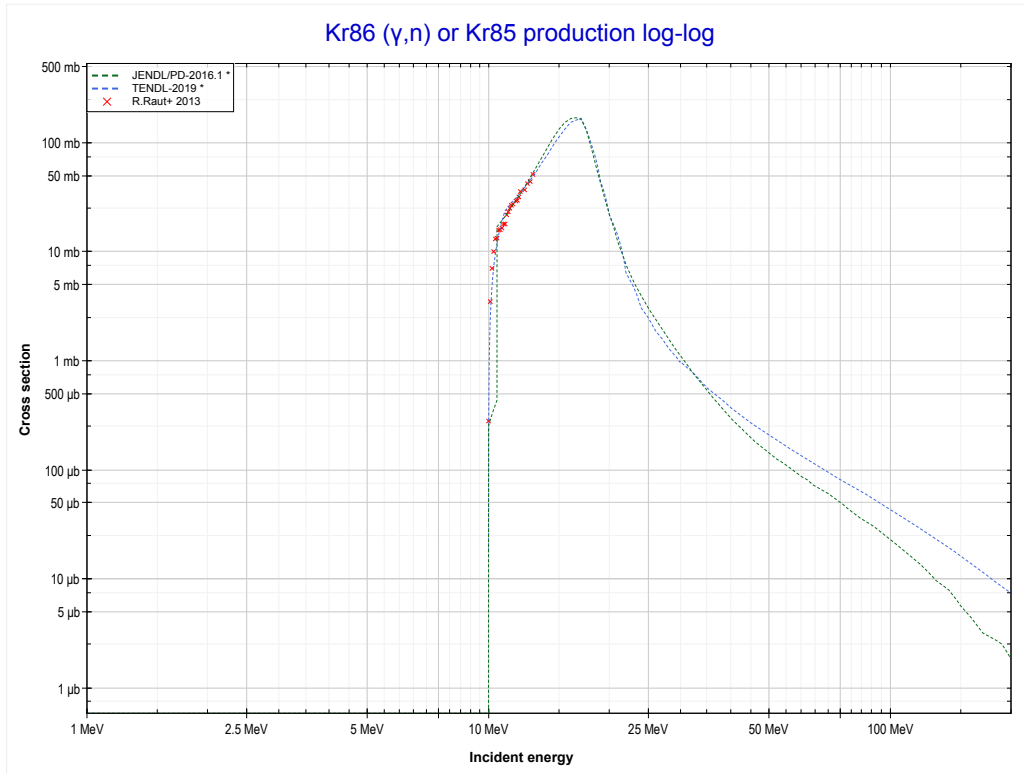
Reaction	Q-Value
Kr86(γ,n)Kr85	-9856.68 keV

<< 36-Kr-86	**37-Rb-85**	39-Y-89 >>
<< 36-Kr-86 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Rb84 production)**	37-Rb-87 MT107 (γ,α) >>

Rb85 (γ,n) or Rb84 production log-log

Rb85 (γ,n) or Rb84 production lin-log
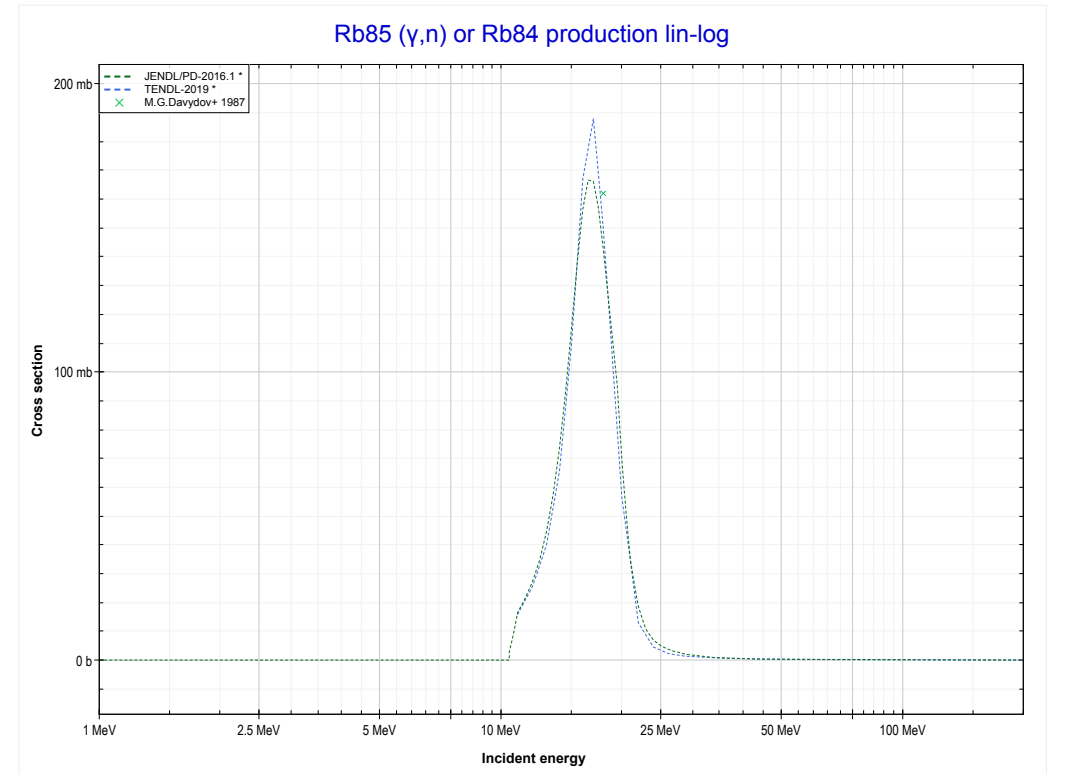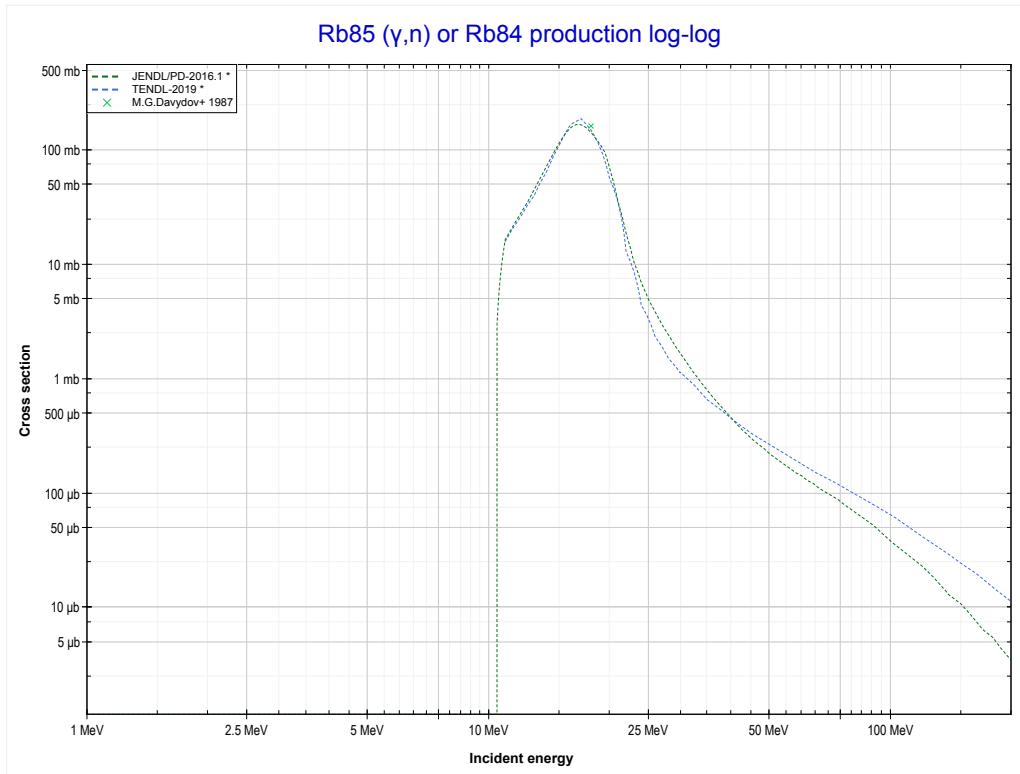
Reaction	Q-Value
Rb85(γ,n)Rb84	-10479.65 keV

<< 32-Ge-76 >>	**37-Rb-87**	40-Zr-96 >>
<< 37-Rb-85 MT4 (γ,n)	**MT107 (γ,α) or MT5 (Br83 production)**	39-Y-89 MT4 (γ,n) >>

Rb87 (γ,α) or Br83 production log-log

Rb87 (γ,α) or Br83 production lin-log
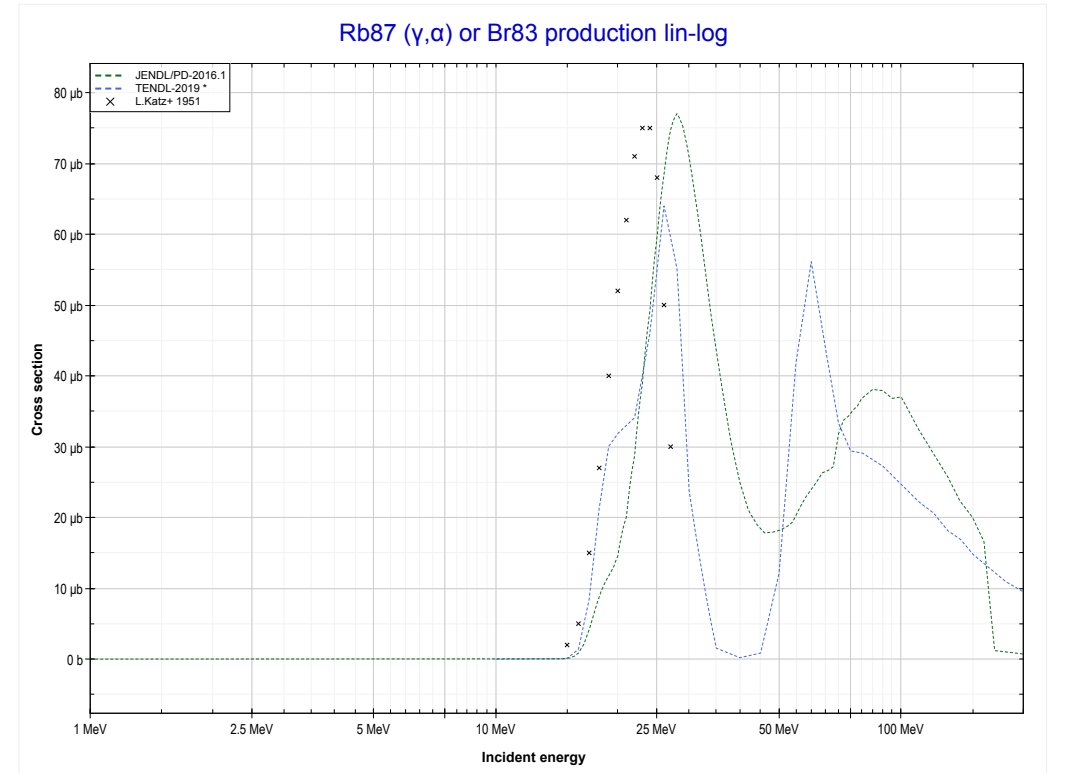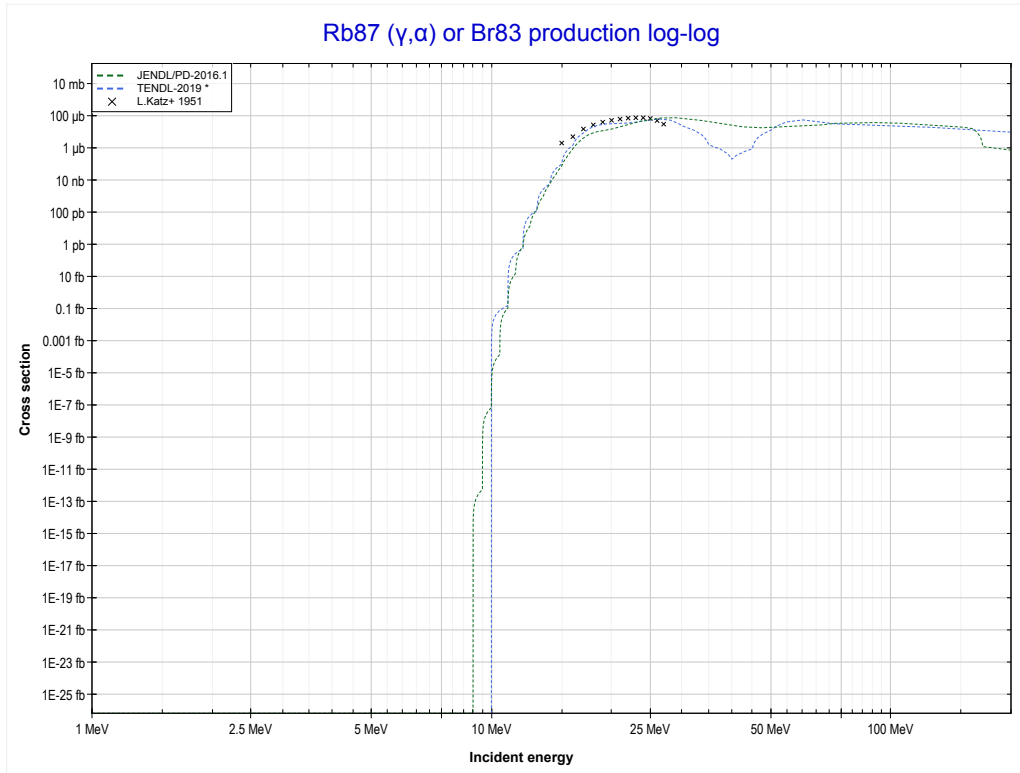
Reaction	Q-Value
Rb87(γ,α)Br83	-8008.71 keV
Rb87(γ,p+t)Br83	-27822.57 keV
Rb87(γ,n+He3)Br83	-28586.33 keV
Rb87(γ,2d)Br83	-31855.23 keV
Rb87(γ,n+p+d)Br83	-34079.80 keV
Rb87(γ,2n+2p)Br83	-36304.37 keV

<< 37-Rb-85	39-Y-89	40-Zr-90 >>
<< 37-Rb-87 MT107 (γ,α)	MT4 (γ,n) or MT5 (Y88 production)	MT16 (γ,2n) >>

Y89 (γ,n) or Y88 production log-log

Y89 (γ,n) or Y88 production lin-log
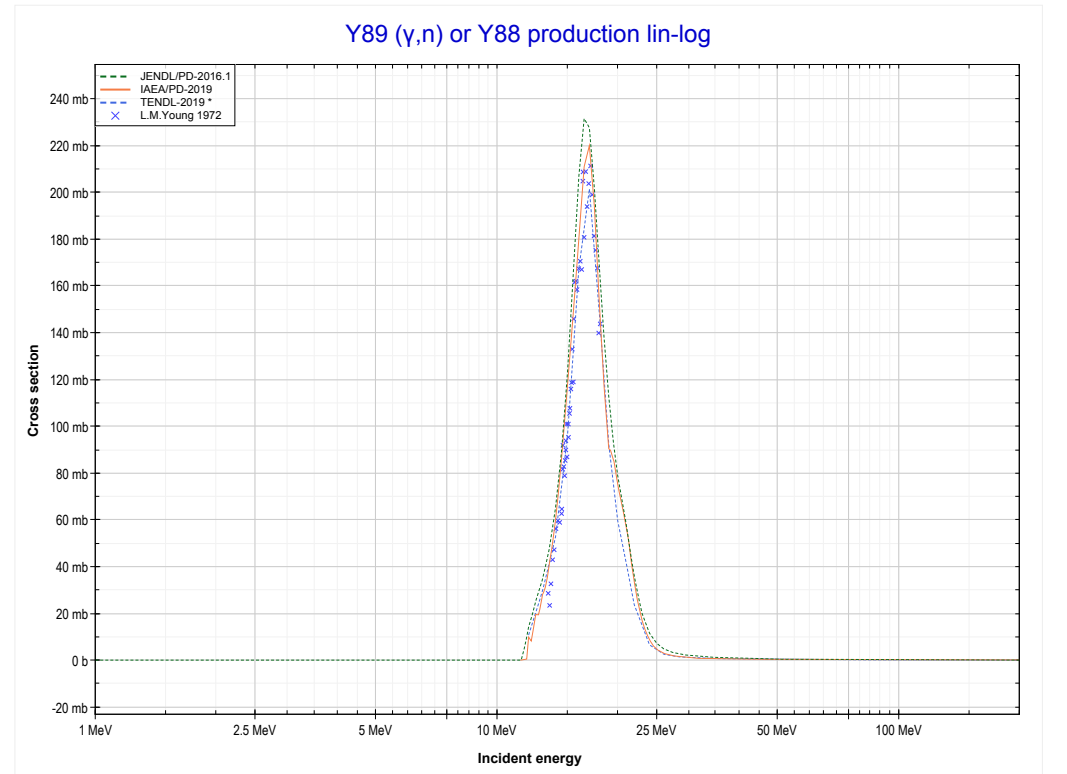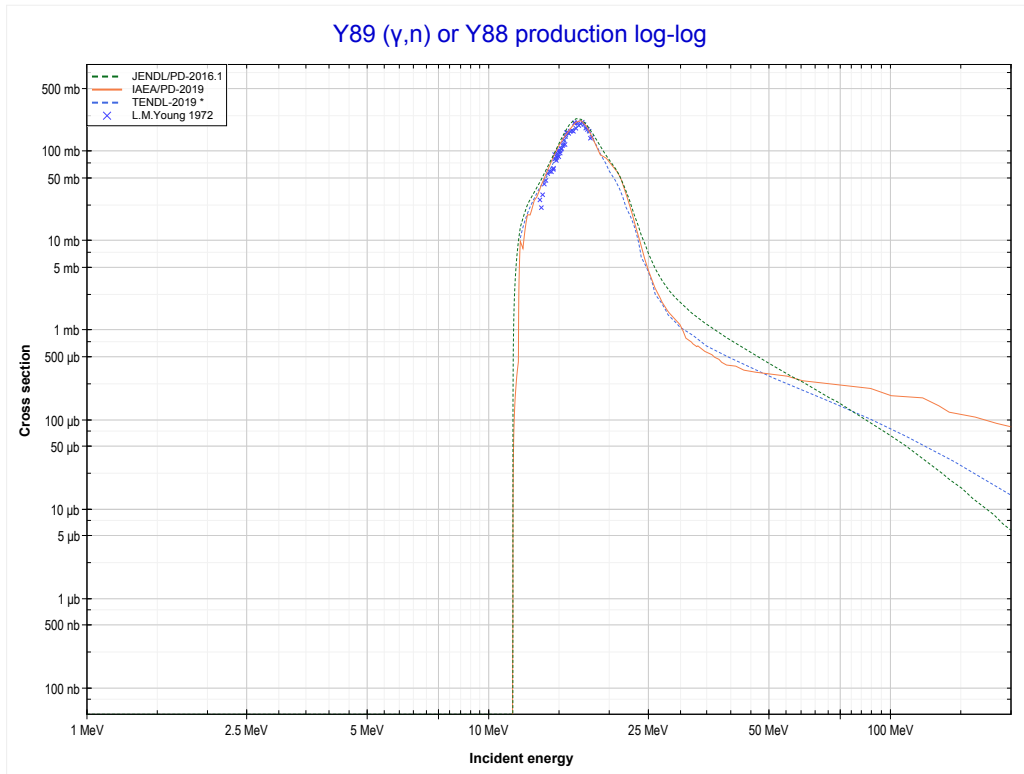
Reaction	Q-Value
Y89(γ,n)Y88	-11480.72 keV

<< 34-Se-82	**39-Y-89**	40-Zr-90 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Y87 production)**	MT103 (γ,p) >>
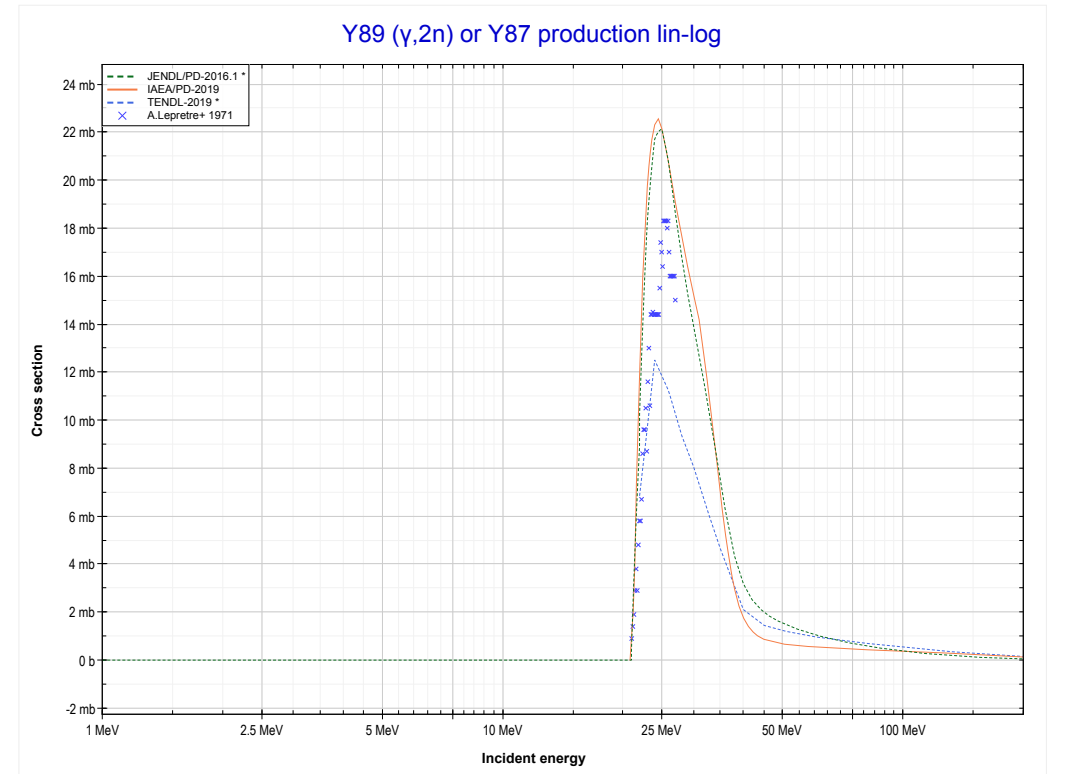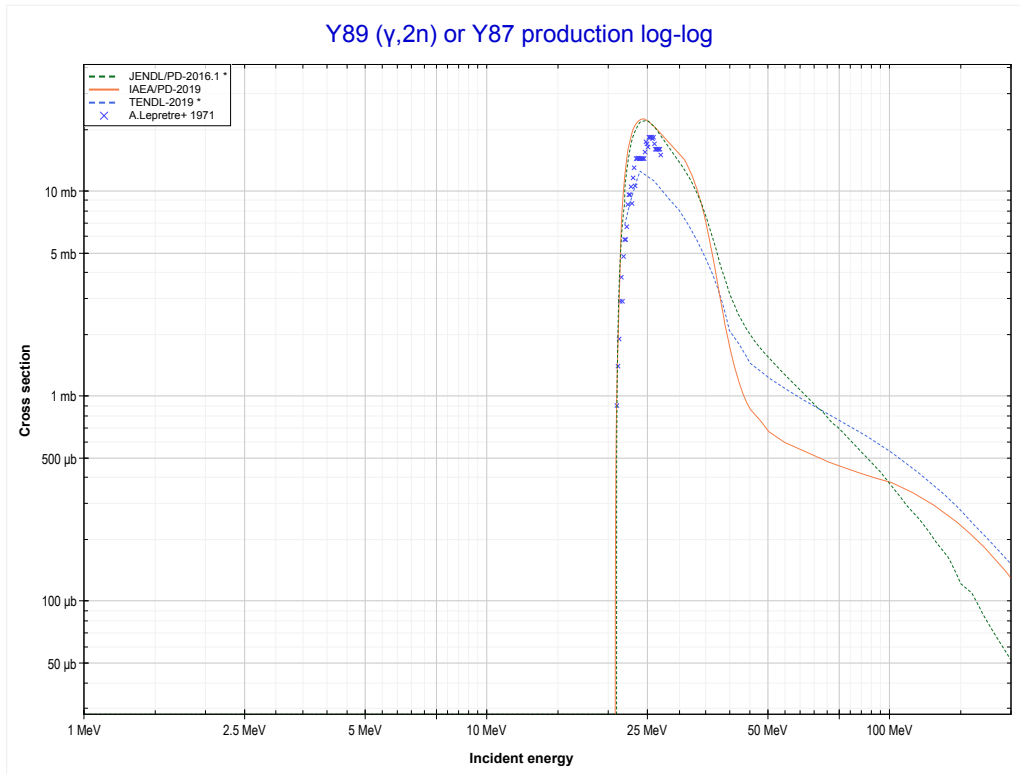
Reaction	Q-Value
Y89(γ,2n)Y87	-20832.63 keV

<< 32-Ge-70	**39-Y-89**	40-Zr-90 >>
<< MT16 (γ,2n)	**MT103 (γ,p) or MT5 (Sr88 production)**	40-Zr-90 MT4 (γ,n) >>

Y89 (γ,p) or Sr88 production log-log

Y89 (γ,p) or Sr88 production lin-log
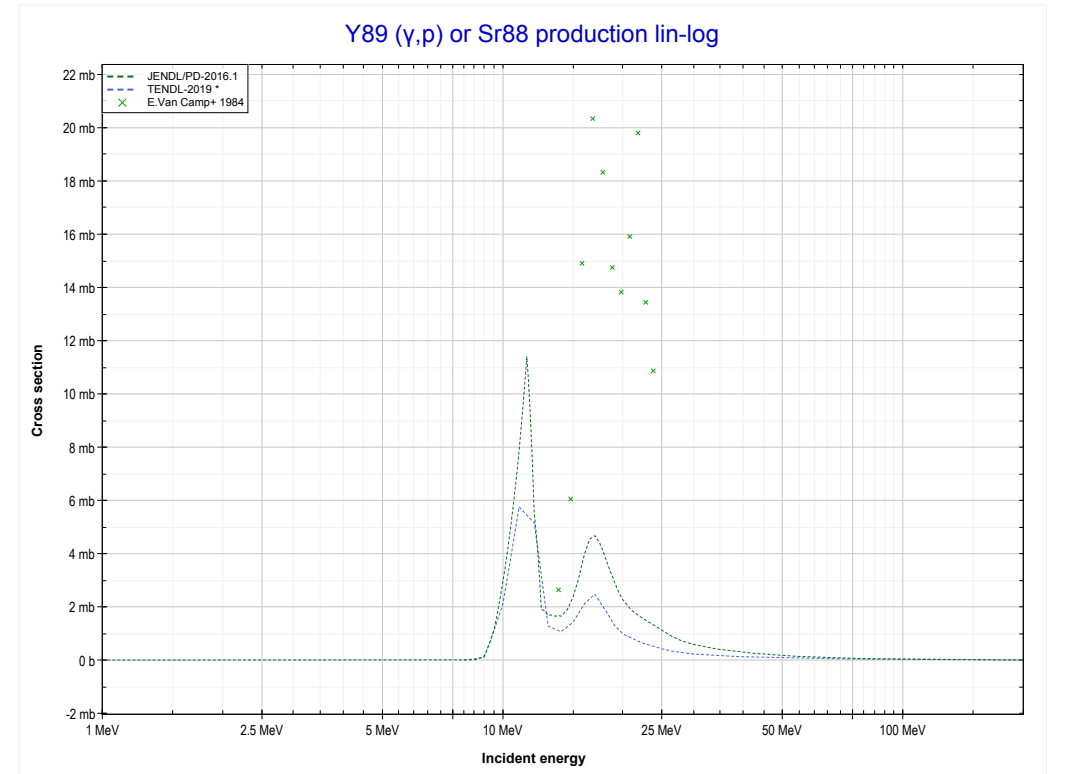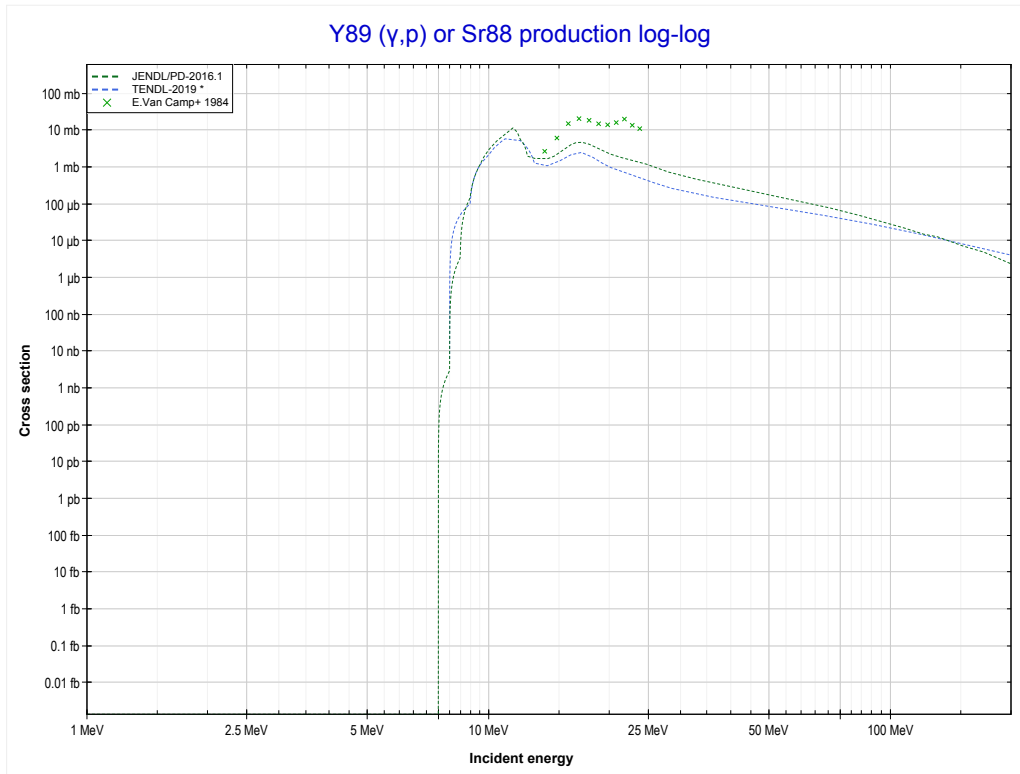
Reaction	Q-Value
Y89(γ,p)Sr88	-7075.75 keV

<< 39-Y-89	40-Zr-90	40-Zr-91 >>
<< 39-Y-89 MT103 (γ,p)	MT4 (γ,n) or MT5 (Zr89 production)	MT16 (γ,2n) >>

Zr90 (γ,n) or Zr89 production log-log

Zr90 (γ,n) or Zr89 production lin-log
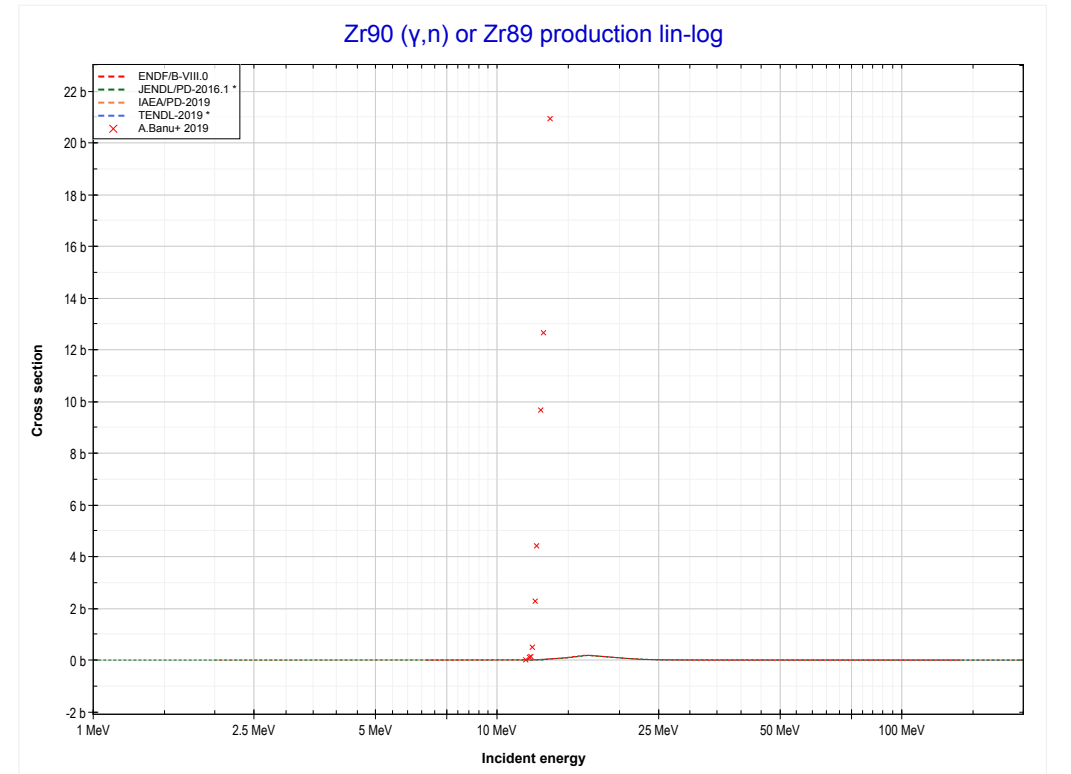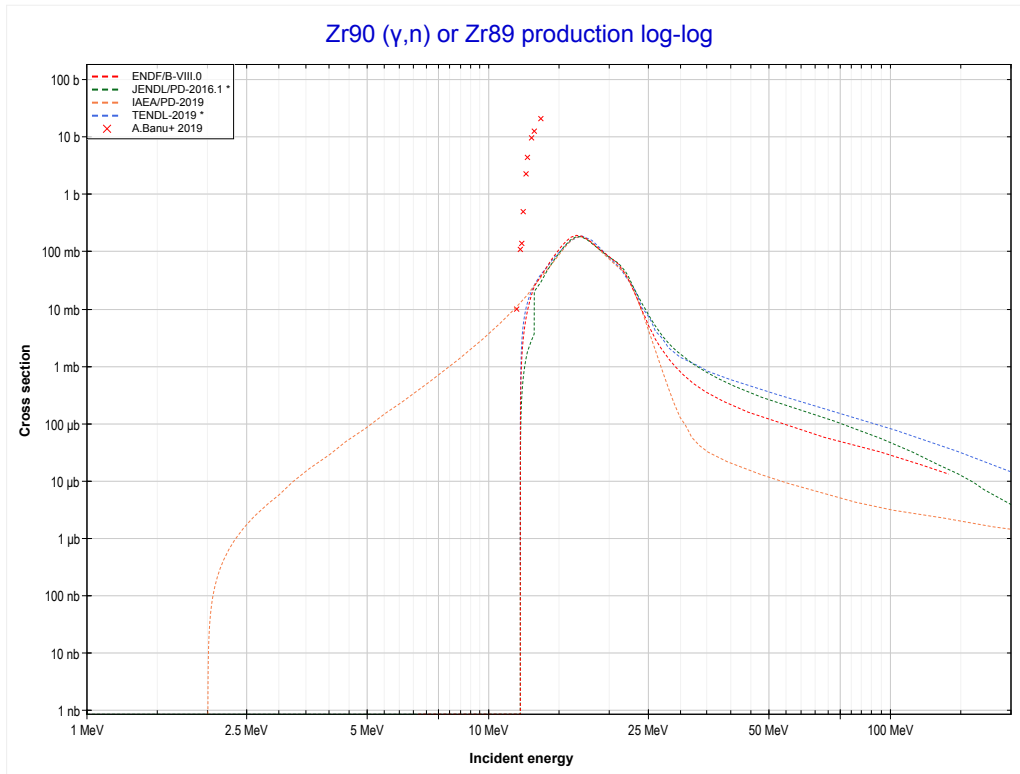
Reaction	Q-Value
Zr90(γ,n)Zr89	-11967.86 keV

<< 39-Y-89	**40-Zr-90**	40-Zr-92 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Zr88 production)**	MT28 (γ,n+p) >>

Zr90 (γ,2n) or Zr88 production log-log

Zr90 (γ,2n) or Zr88 production lin-log
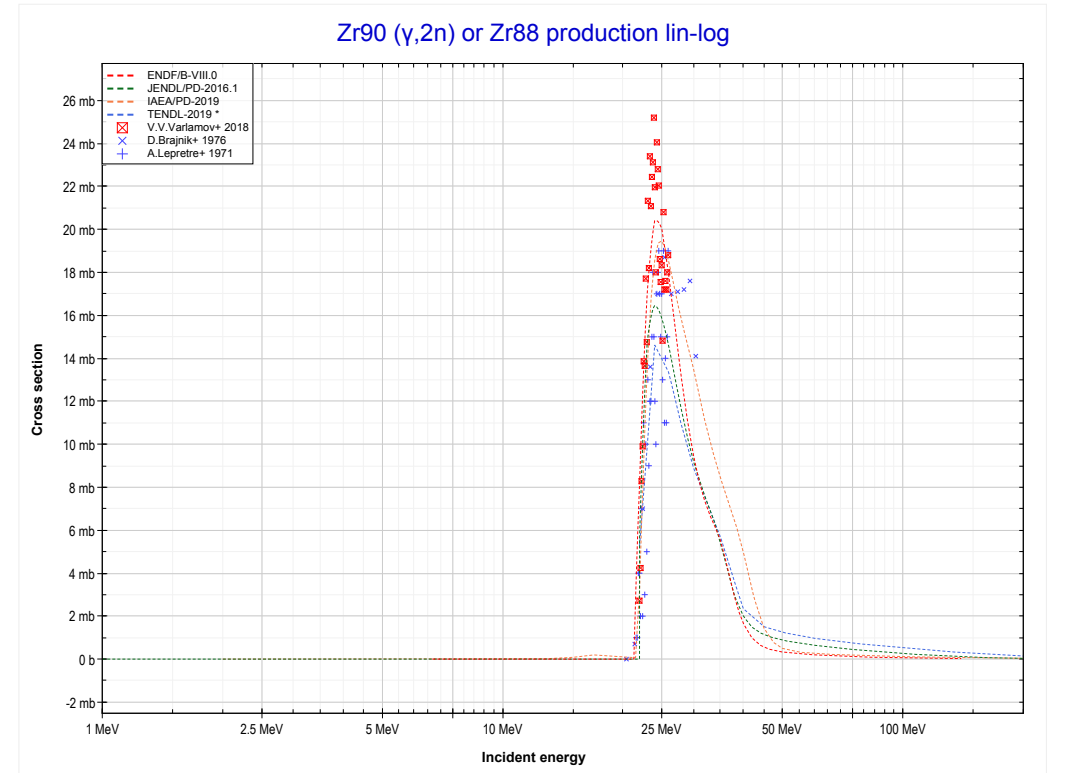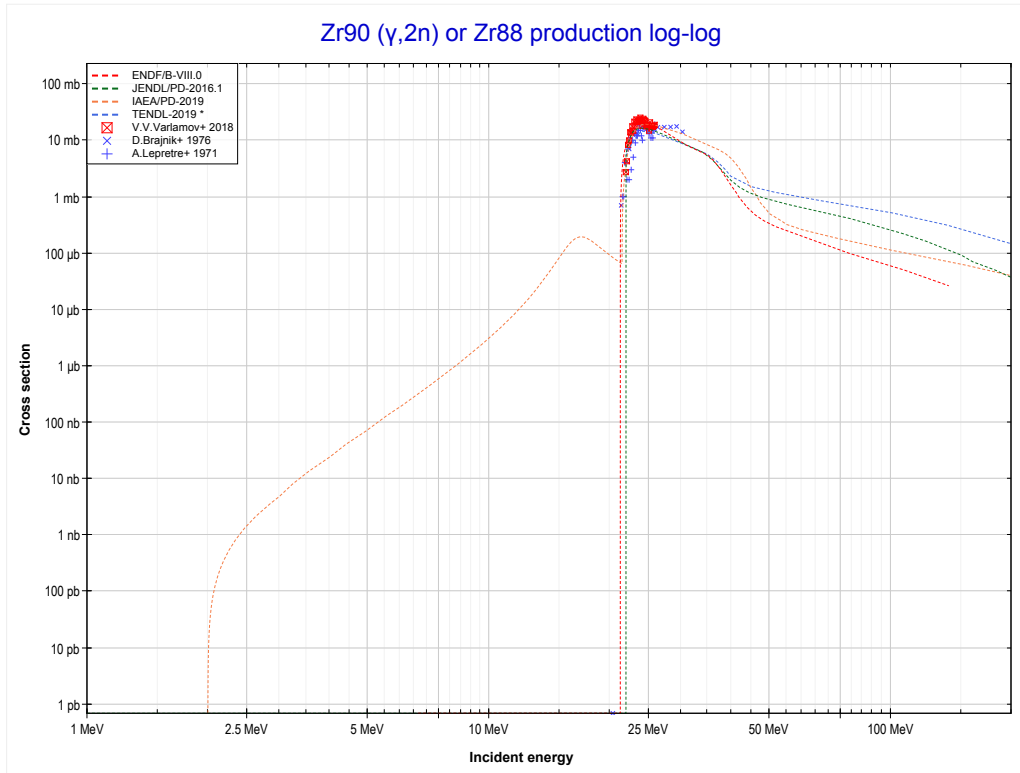
Reaction	Q-Value
Zr90(γ,2n)Zr88	-21286.17 keV

<< 32-Ge-76	**40-Zr-90**	64-Gd-160 >>
<< MT16 (γ,2n)	**MT28 (γ,n+p) or MT5 (Y88 production)**	MT103 (γ,p) >>

Zr90 (γ,n+p) or Y88 production log-log

Zr90 (γ,n+p) or Y88 production lin-log
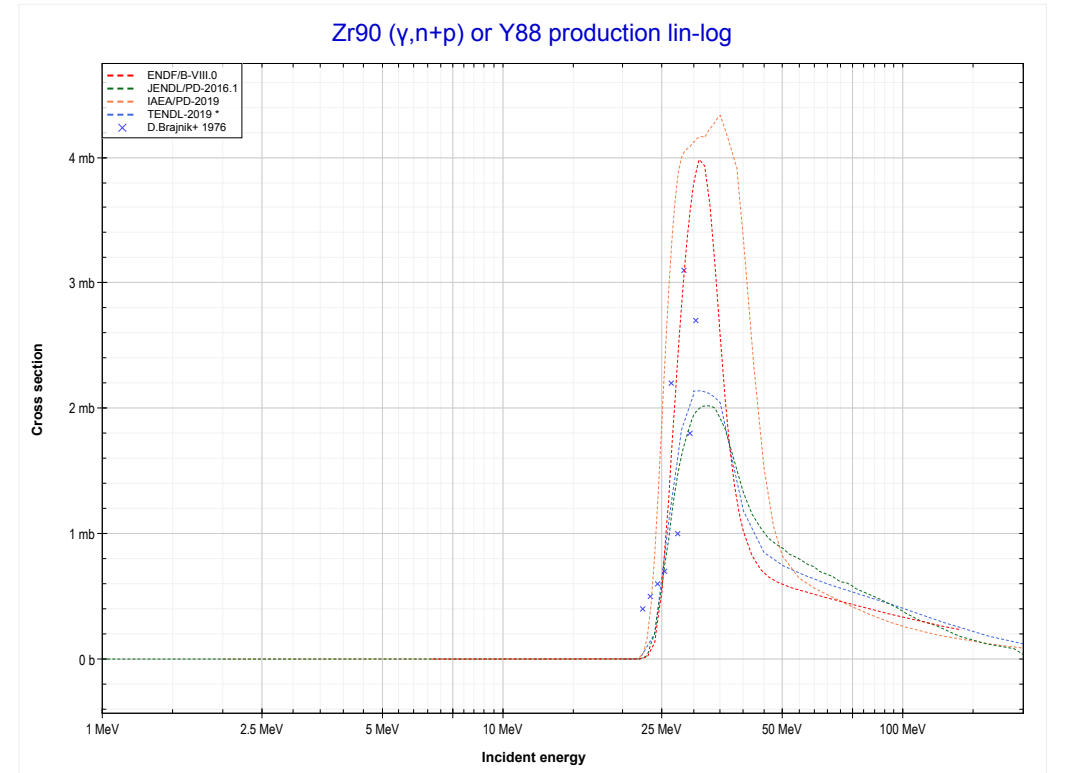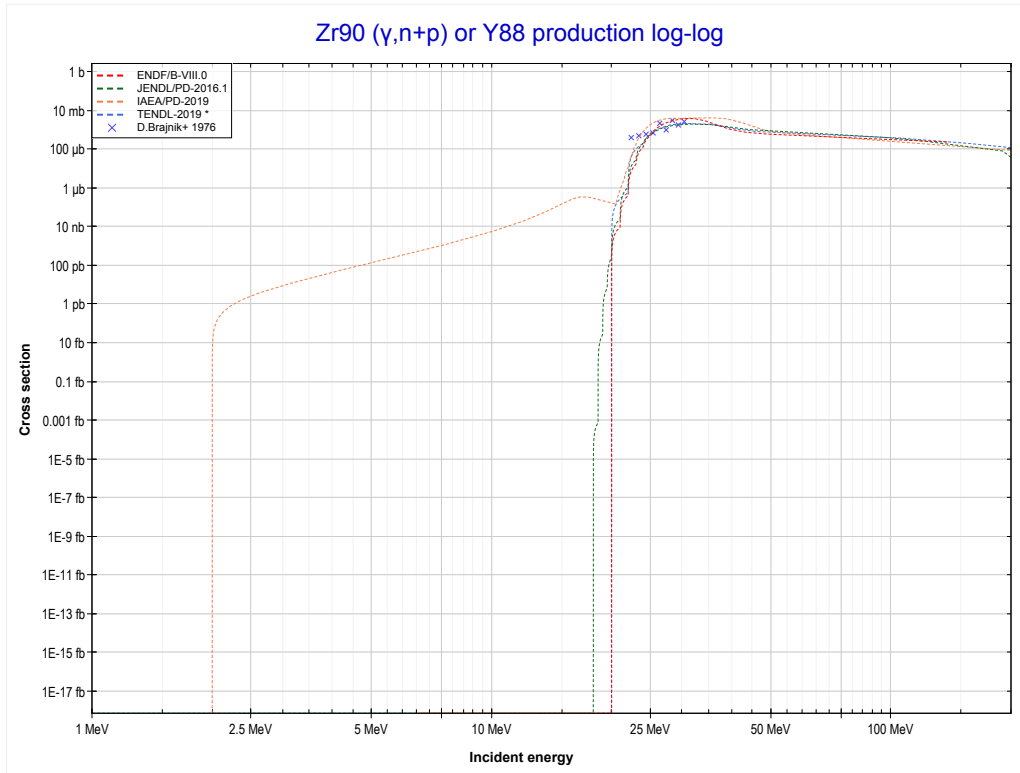
Reaction	Q-Value
Zr90(γ,d)Y88	-17609.26 keV
Zr90(γ,n+p)Y88	-19833.83 keV

<< 39-Y-89	**40-Zr-90**	45-Rh-103 >>
<< MT28 (γ,n+p)	**MT103 (γ,p) or MT5 (Y89 production)**	MT104 (γ,d) >>

Zr90 (γ,p) or Y89 production log-log

Zr90 (γ,p) or Y89 production lin-log
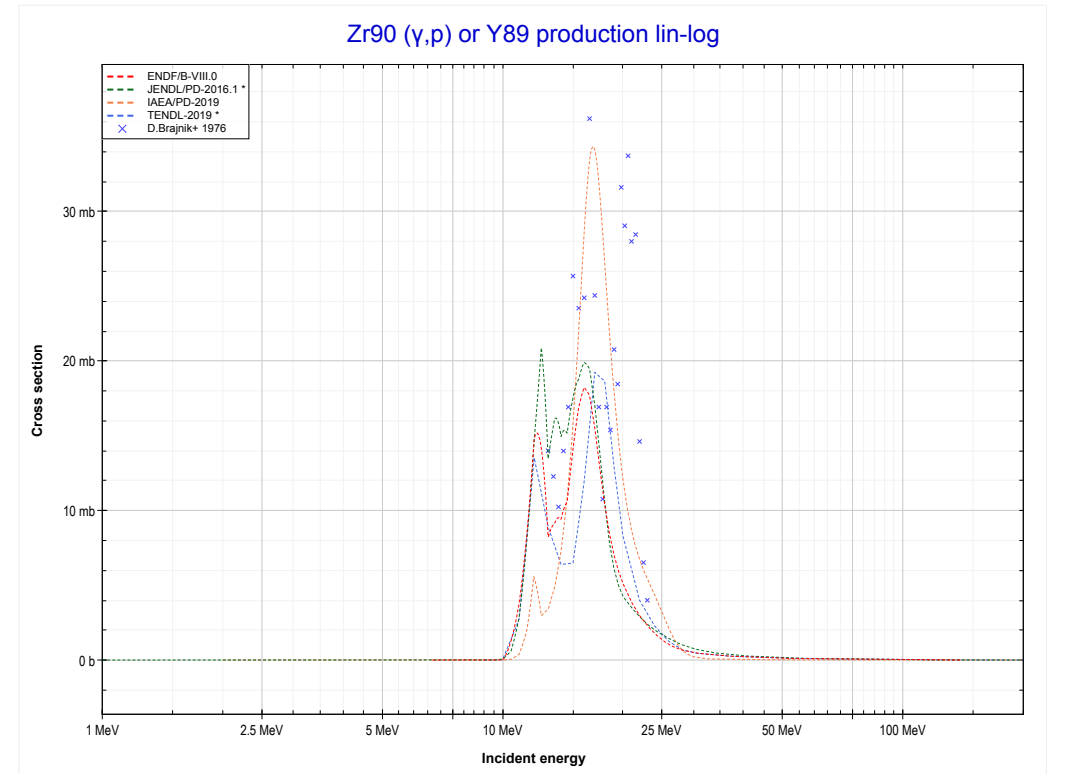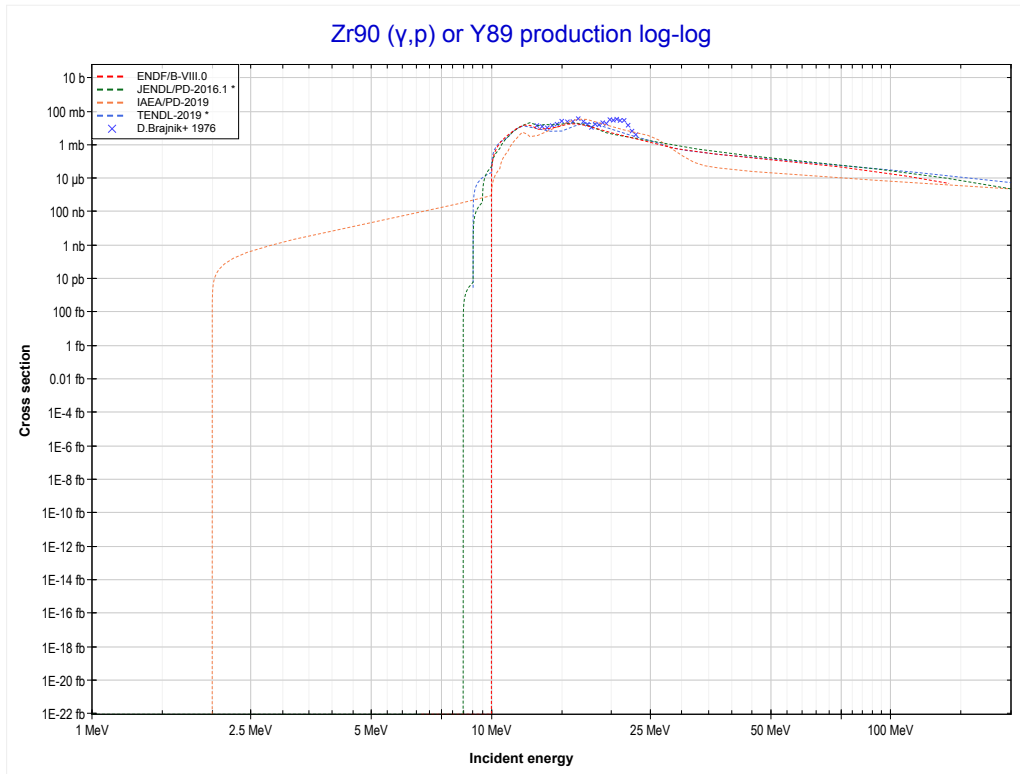
Reaction	Q-Value
Zr90(γ,p)Y89	-8353.11 keV

<< 32-Ge-76	**40-Zr-90**	
<< MT103 (γ,p)	**MT104 (γ,d) or MT5 (Y88 production)**	40-Zr-91 MT4 (γ,n) >>

Zr90 (γ,d) or Y88 production log-log

Zr90 (γ,d) or Y88 production lin-log
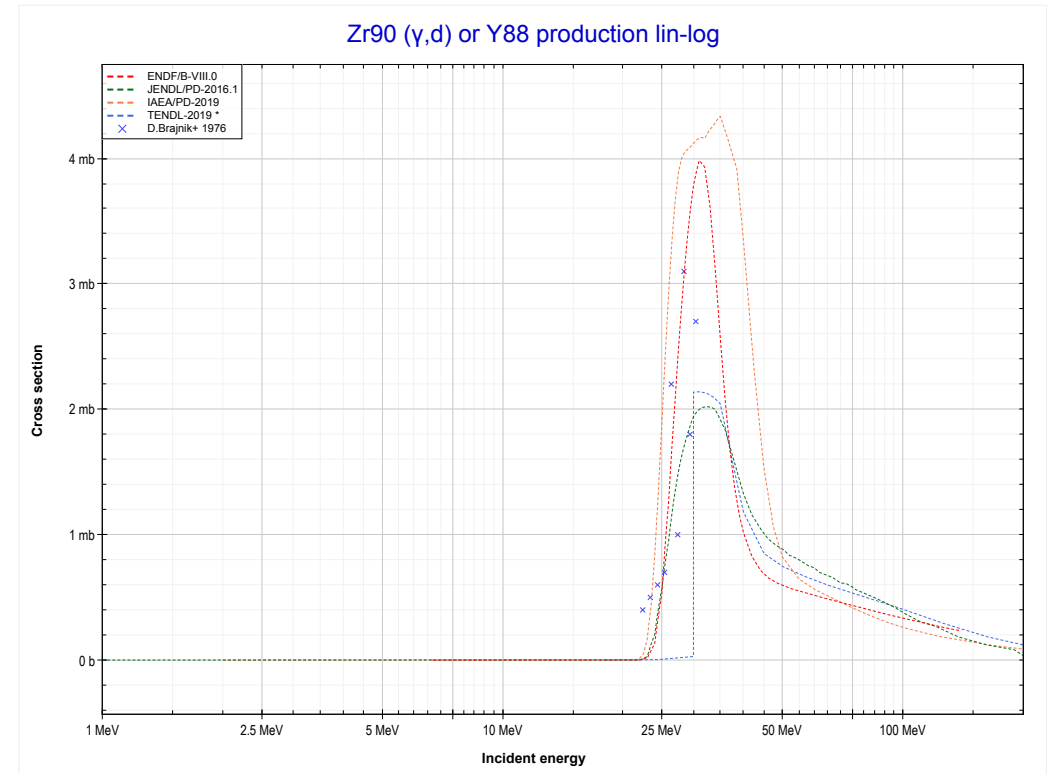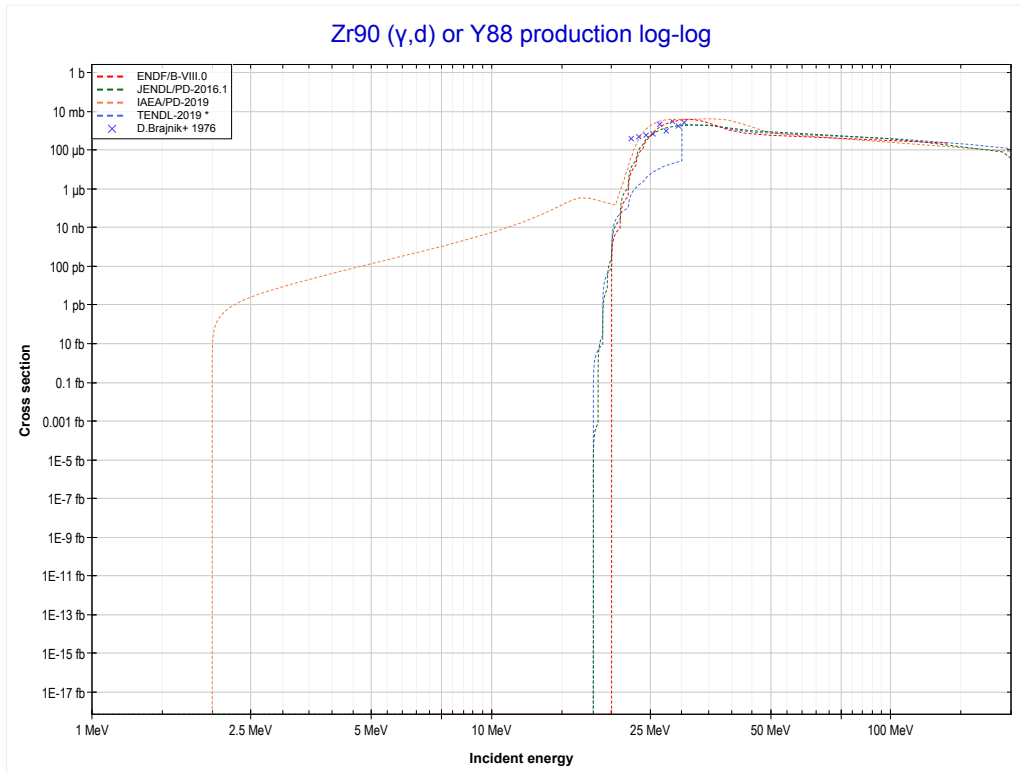
Reaction	Q-Value
Zr90(γ,d)Y88	-17609.26 keV
Zr90(γ,n+p)Y88	-19833.83 keV

<< 40-Zr-90	**40-Zr-91**	40-Zr-92 >>
<< 40-Zr-90 MT104 (γ,d)	**MT4 (γ,n) or MT5 (Zr90 production)**	40-Zr-92 MT4 (γ,n) >>

Zr91 (γ,n) or Zr90 production log-log

Zr91 (γ,n) or Zr90 production lin-log
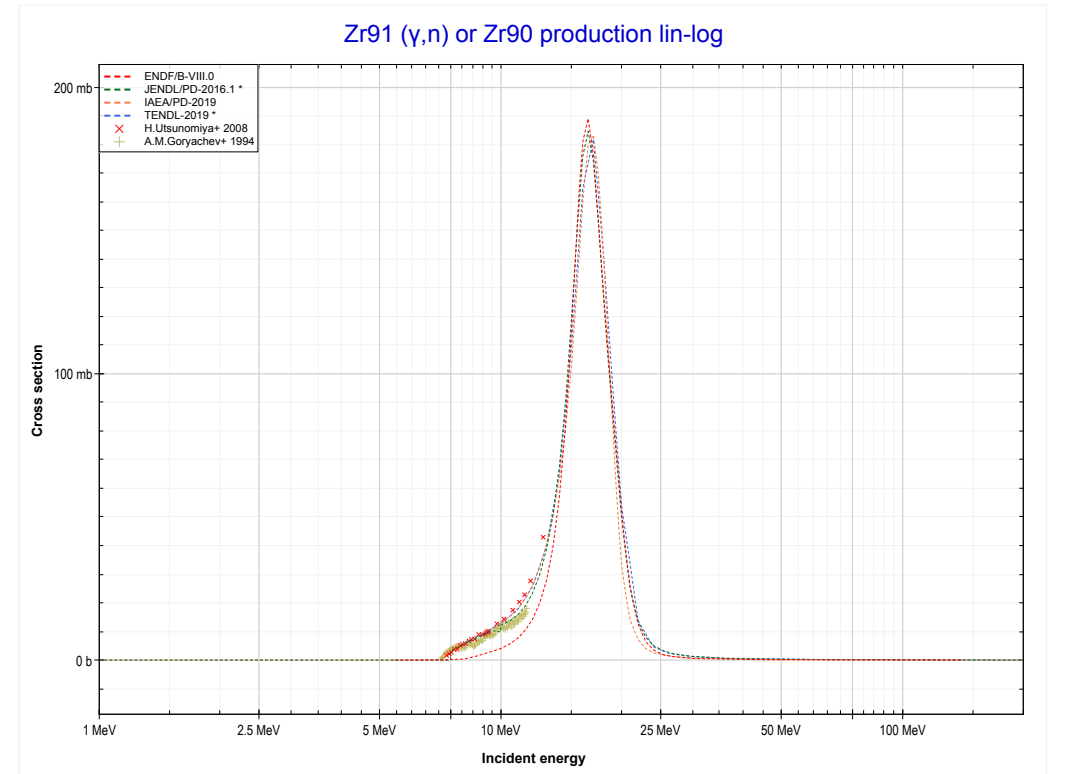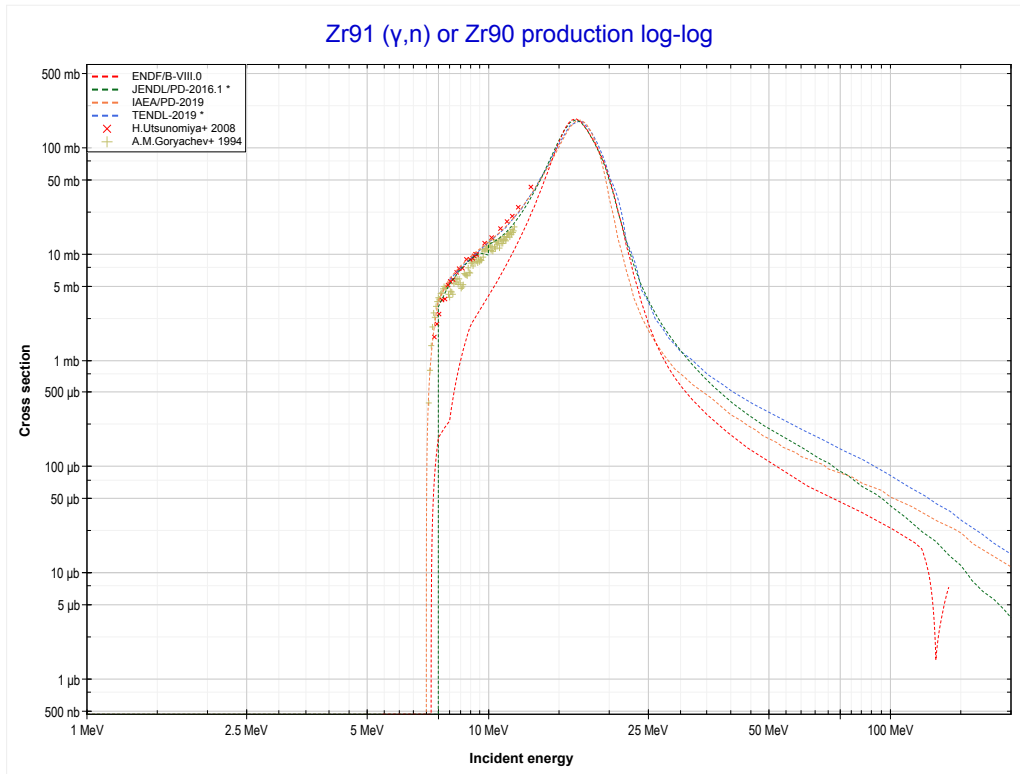
Reaction	Q-Value
Zr91(γ,n)Zr90	-7194.35 keV

<< 40-Zr-91	**40-Zr-92**	40-Zr-94 >>
<< 40-Zr-91 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Zr91 production)**	MT16 (γ,2n) >>

Zr92 (γ,n) or Zr91 production log-log

Zr92 (γ,n) or Zr91 production lin-log
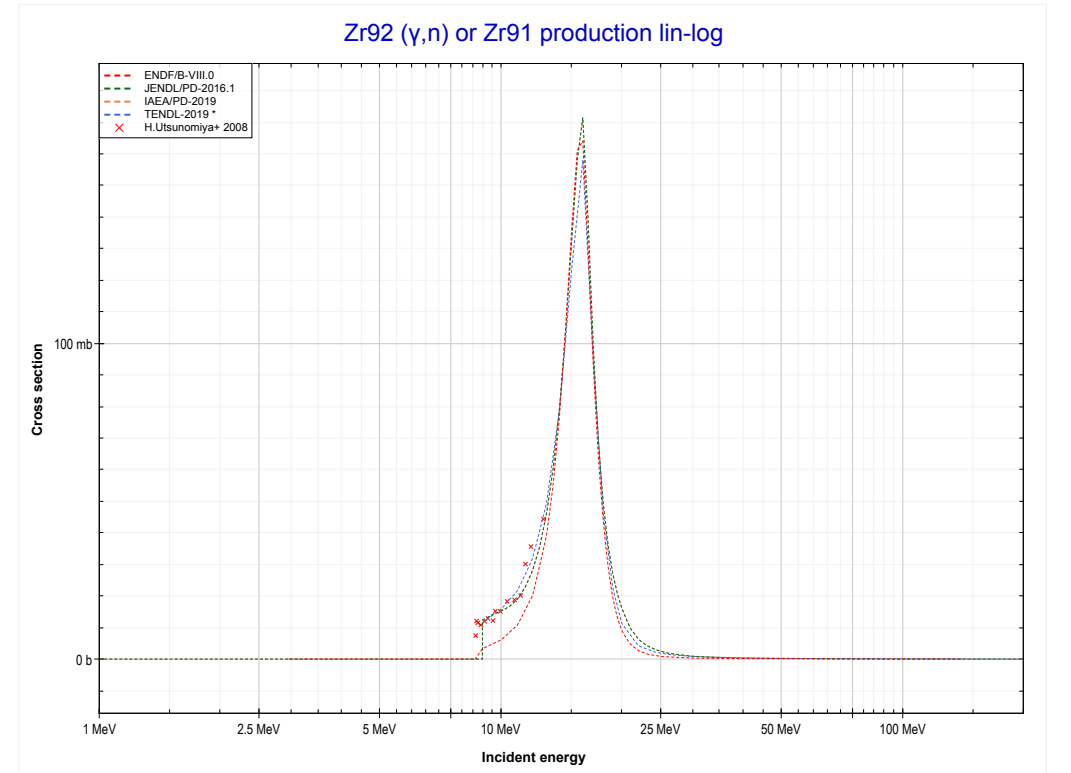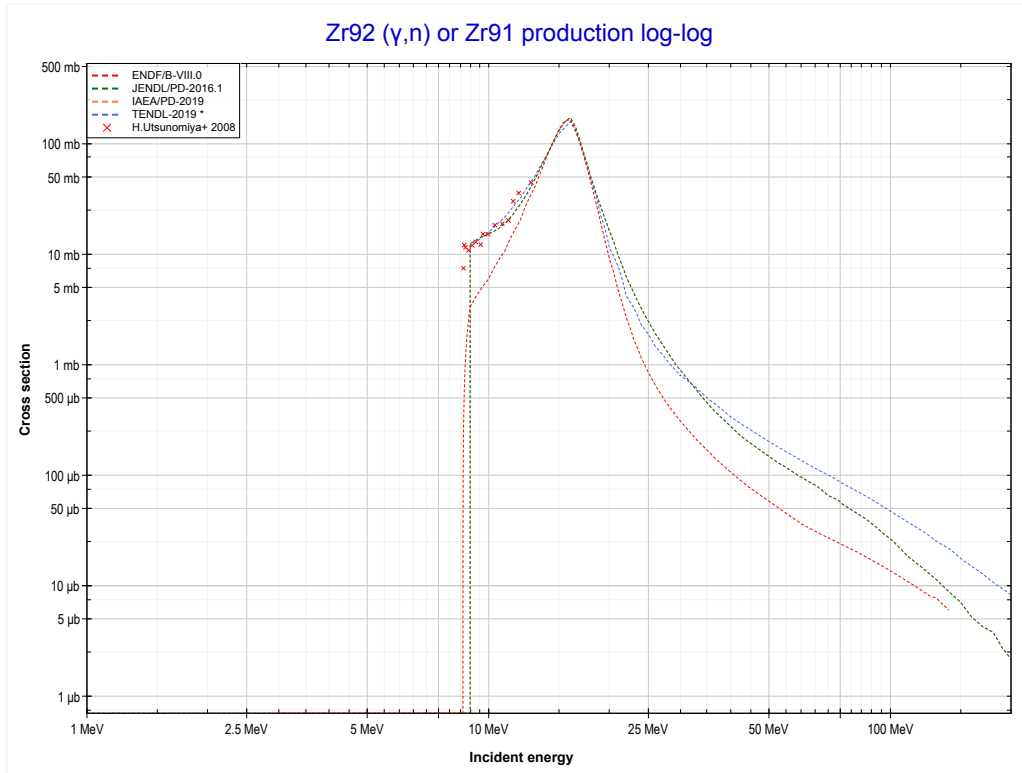
Reaction	Q-Value
Zr92(γ,n)Zr91	-8634.78 keV

<< 40-Zr-90	**40-Zr-92**	42-Mo-98 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Zr90 production)**	40-Zr-94 MT4 (γ,n) >>

Zr92 (γ,2n) or Zr90 production log-log

Zr92 (γ,2n) or Zr90 production lin-log
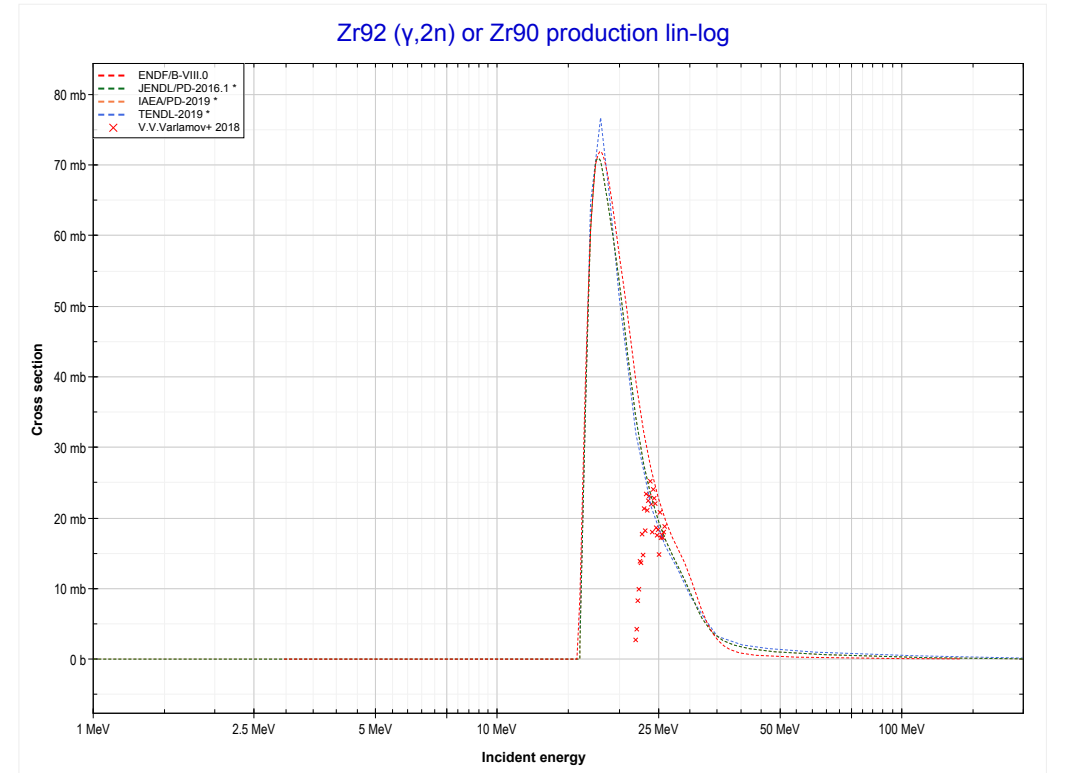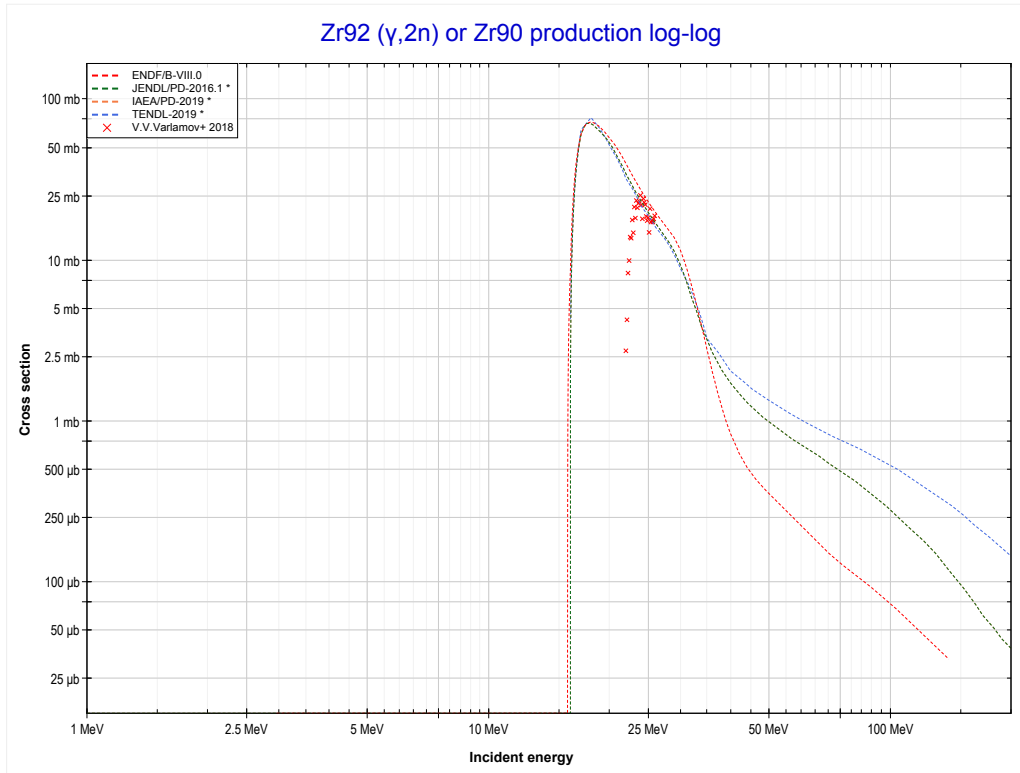
Reaction	Q-Value
Zr92(γ,2n)Zr90	-15829.12 keV

<< 40-Zr-92	**40-Zr-94**	40-Zr-96 >>
<< 40-Zr-92 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Zr93 production)**	MT17 (γ,3n) >>

Zr94 (γ,n) or Zr93 production log-log

Zr94 (γ,n) or Zr93 production lin-log
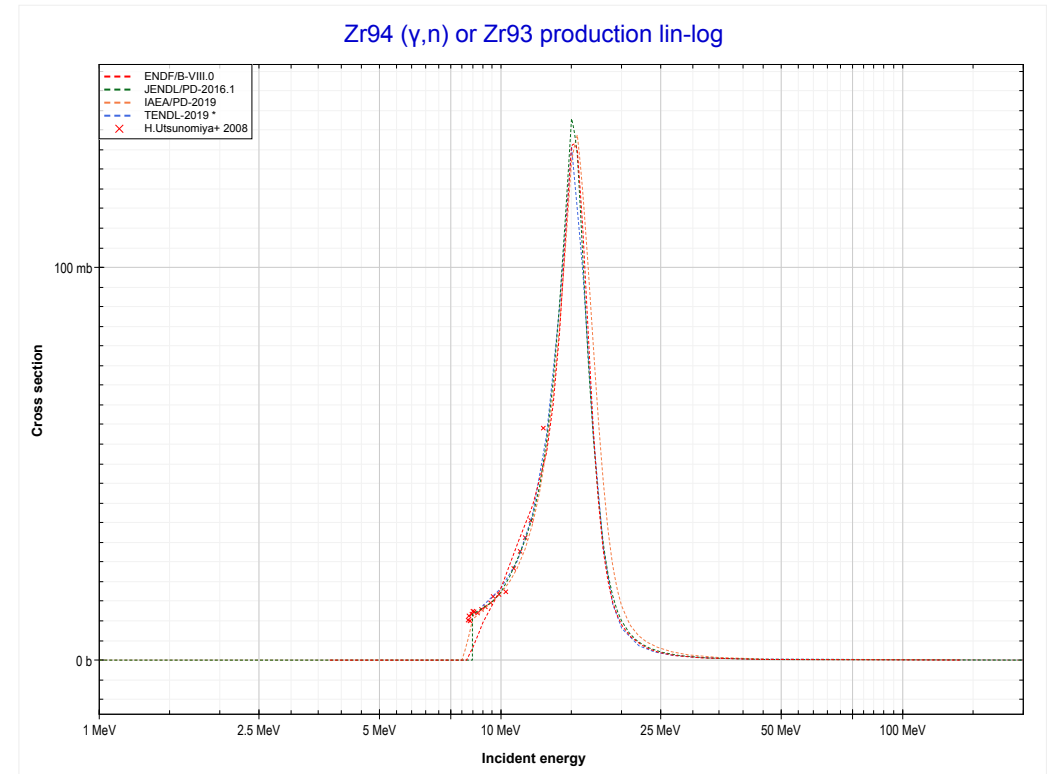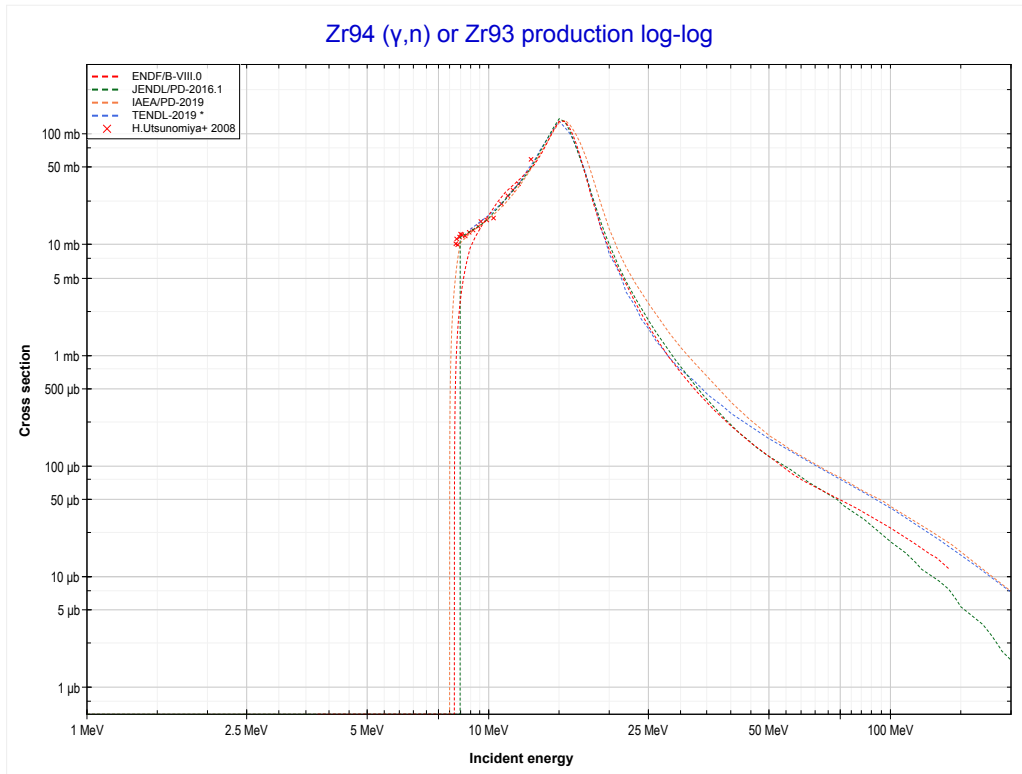
Reaction	Q-Value
Zr94(γ,n)Zr93	-8218.64 keV

<< 27-Co-59	**40-Zr-94**	42-Mo-96 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Zr91 production)**	40-Zr-96 MT4 (γ,n) >>

Zr94 (γ,3n) or Zr91 production log-log

Zr94 (γ,3n) or Zr91 production lin-log
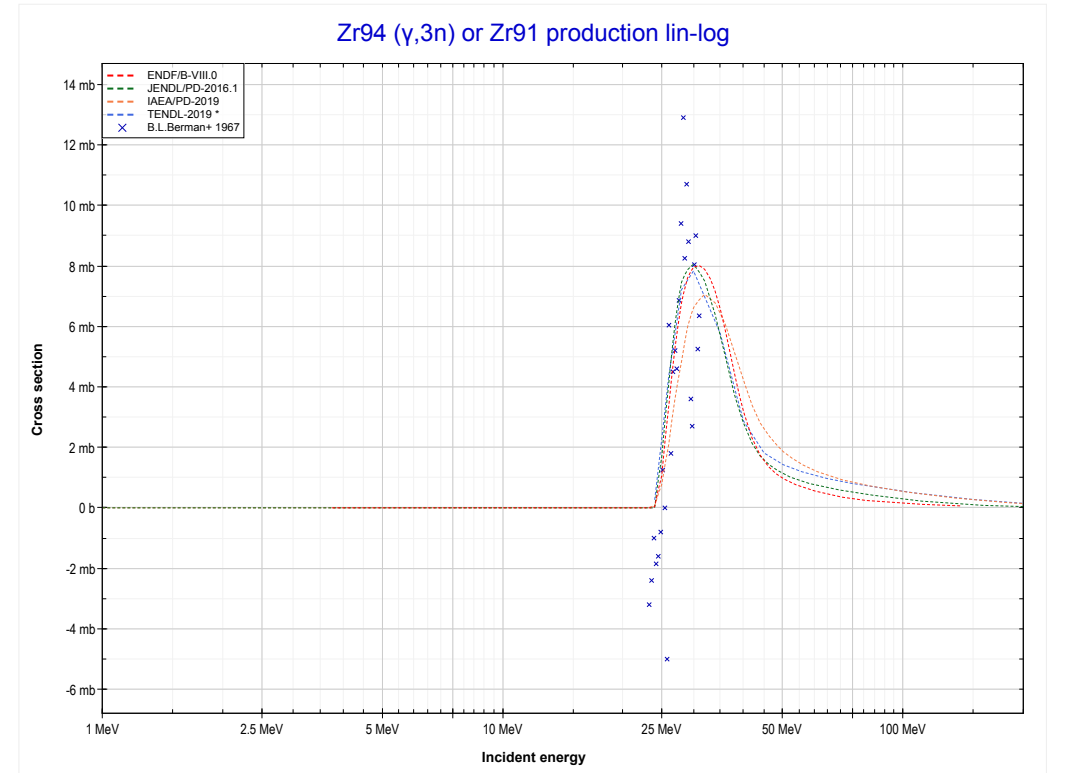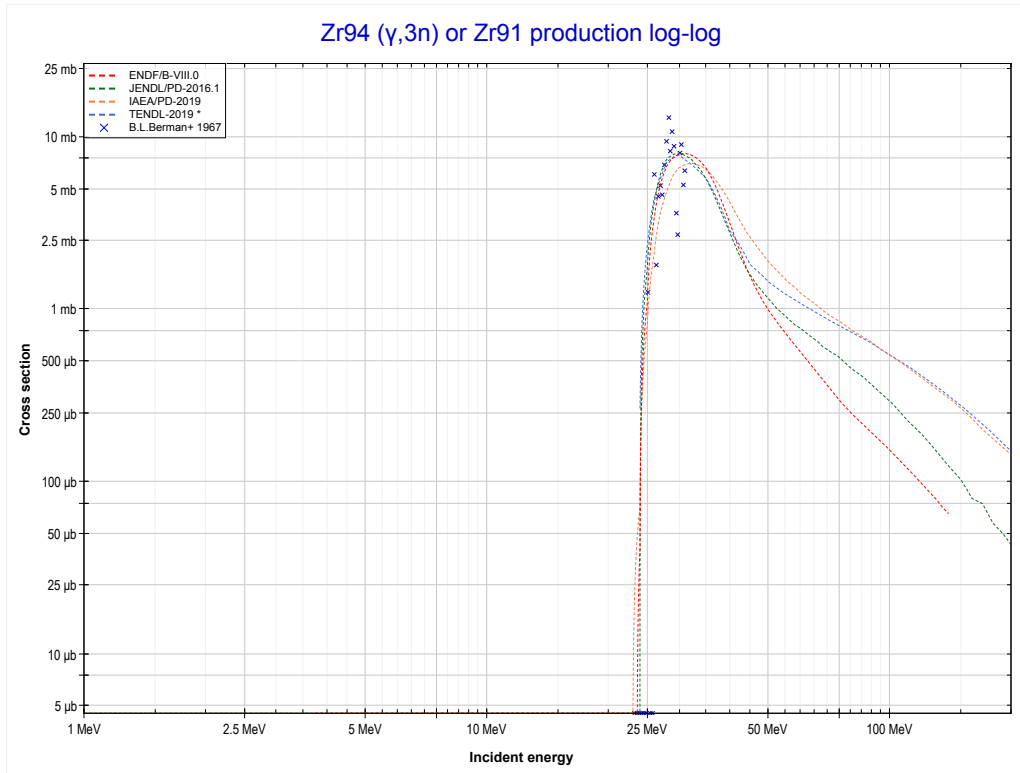
Reaction	Q-Value
Zr94(γ,3n)Zr91	-23587.70 keV

<< 40-Zr-94	**40-Zr-96**	42-Mo-92 >>
<< 40-Zr-94 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Zr95 production)**	MT107 (γ,α) >>

Zr96 (γ,n) or Zr95 production log-log

Zr96 (γ,n) or Zr95 production lin-log
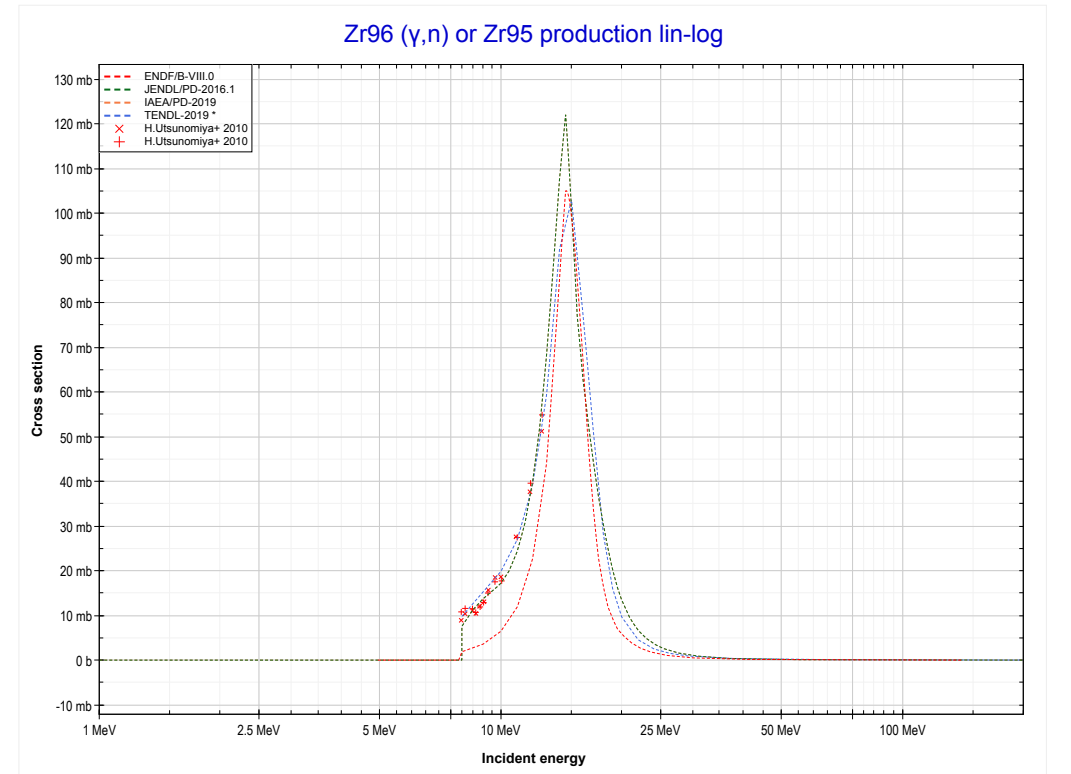
Reaction	Q-Value
Zr96(γ,n)Zr95	-7850.27 keV

<< 37-Rb-87	**40-Zr-96**	41-Nb-93 >>
<< MT4 (γ,n)	**MT107 (γ,α) or MT5 (Sr92 production)**	41-Nb-93 MT107 (γ,α) >>

Zr96 (γ,α) or Sr92 production log-log

Zr96 (γ,α) or Sr92 production lin-log
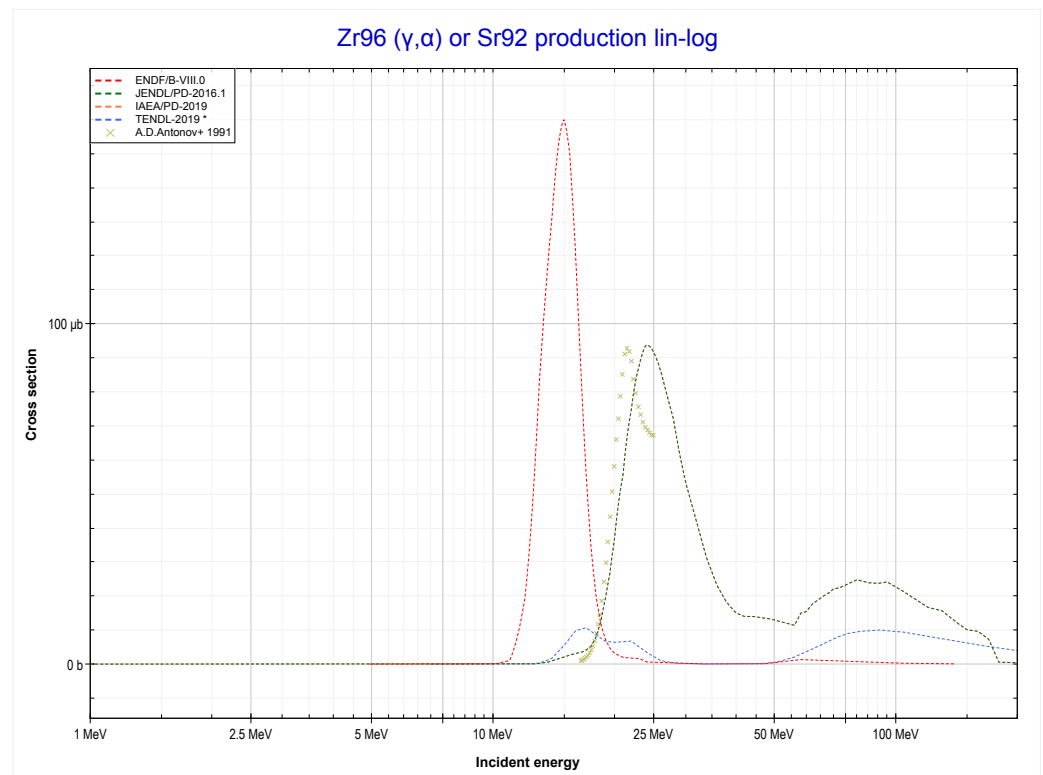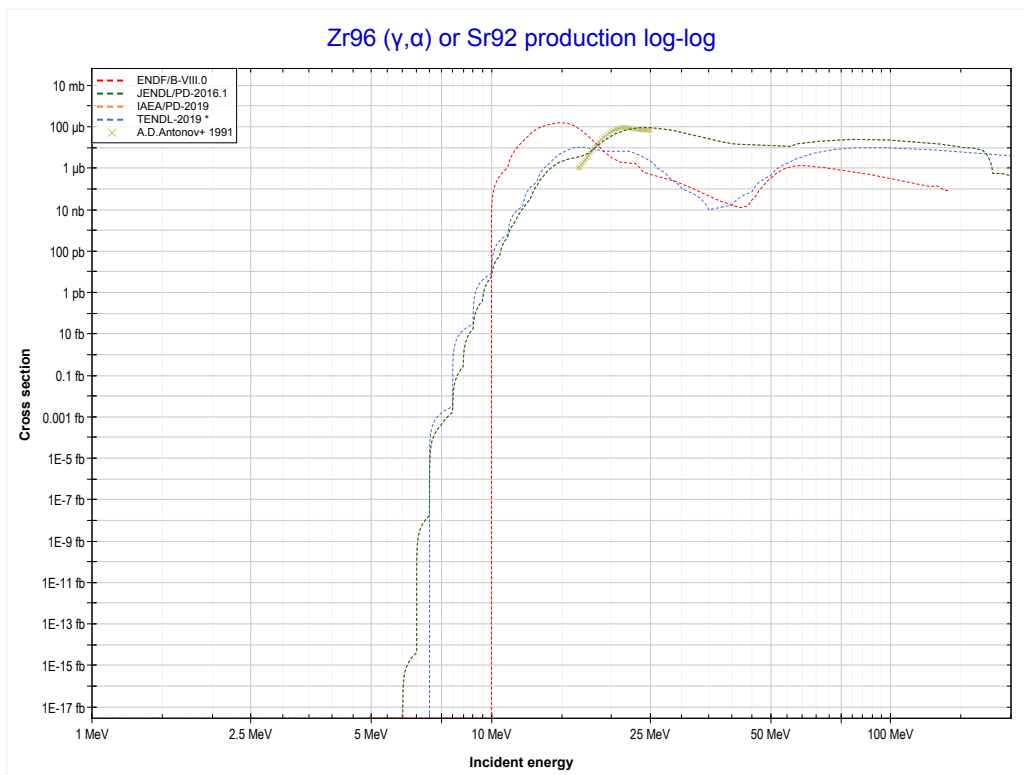
Reaction	Q-Value
Zr96(γ,α)Sr92	-4996.77 keV
Zr96(γ,p+t)Sr92	-24810.63 keV
Zr96(γ,n+He3)Sr92	-25574.39 keV
Zr96(γ,2d)Sr92	-28843.29 keV
Zr96(γ,n+p+d)Sr92	-31067.86 keV
Zr96(γ,2n+2p)Sr92	-33292.43 keV

<< 40-Zr-96	**41-Nb-93**	68-Er-170 >>
<< 40-Zr-96 MT107 (γ,α)	**MT107 (γ,α) or MT5 (Y89 production)**	42-Mo-92 MT4 (γ,n) >>

Nb93 (γ,α) or Y89 production log-log

Nb93 (γ,α) or Y89 production lin-log
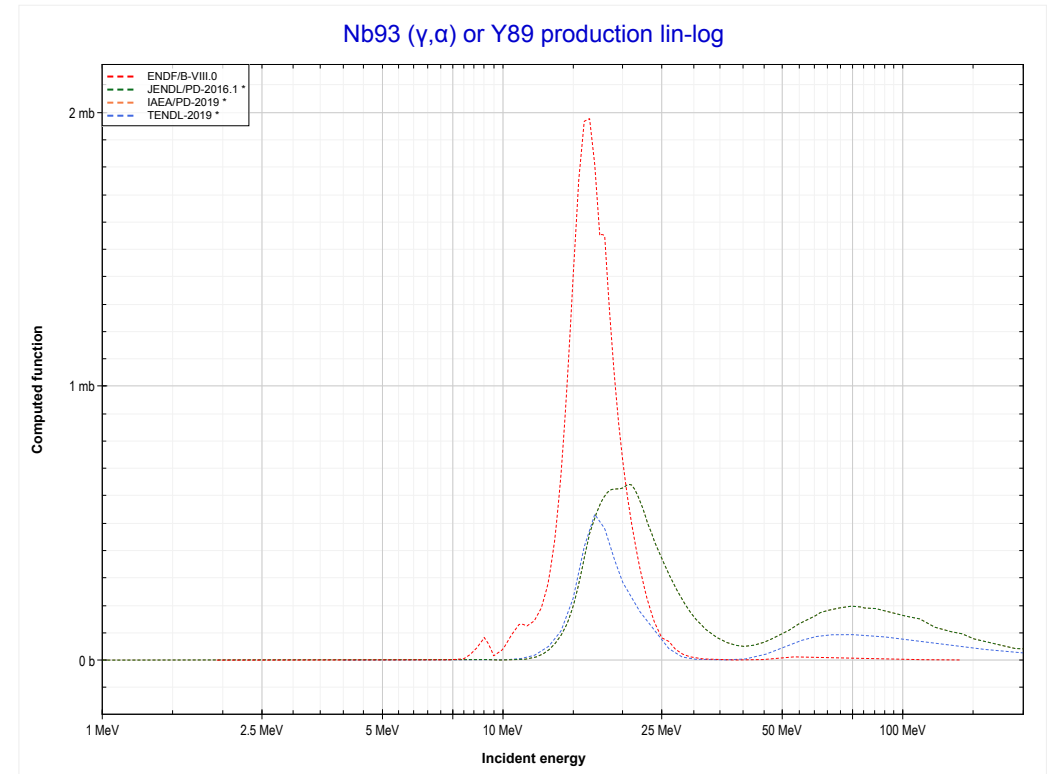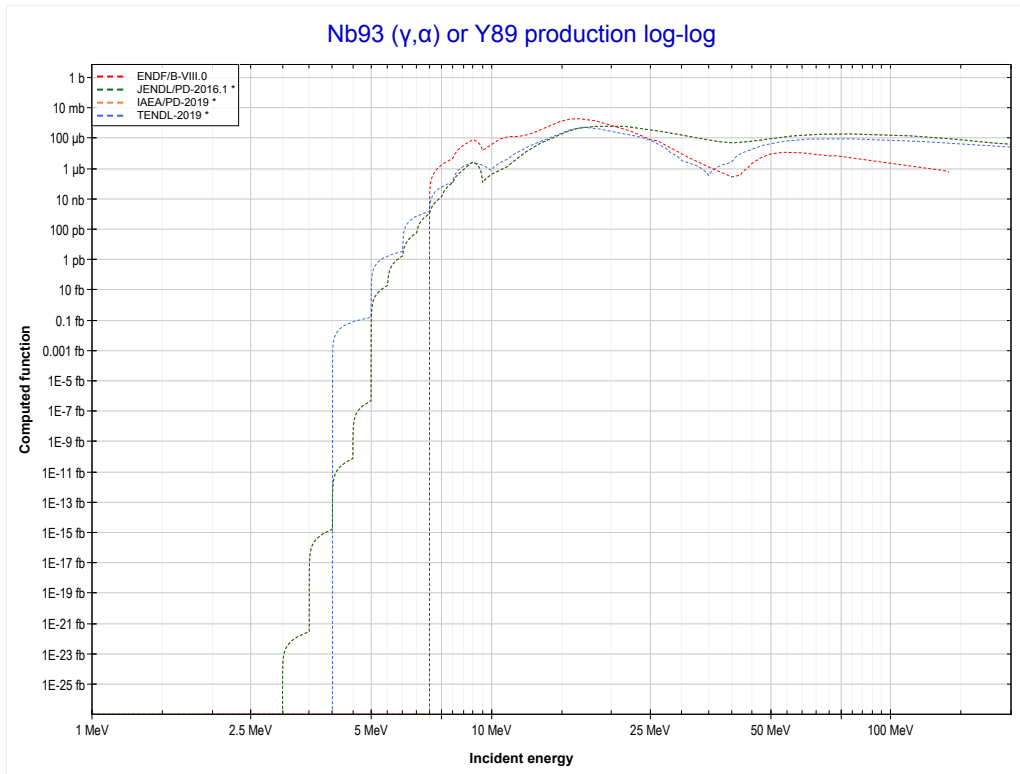
Reaction	Q-Value
Nb93(γ,α)Y89	-1929.32 keV
Nb93(γ,p+t)Y89	-21743.18 keV
Nb93(γ,n+He3)Y89	-22506.93 keV
Nb93(γ,2d)Y89	-25775.84 keV
Nb93(γ,n+p+d)Y89	-28000.41 keV
Nb93(γ,2n+2p)Y89	-30224.98 keV

<< 40-Zr-96	**42-Mo-92**	42-Mo-94 >>
<< 41-Nb-93 MT107 (γ,α)	**MT4 (γ,n) or MT5 (Mo91 production)**	42-Mo-94 MT4 (γ,n) >>

Mo92 (γ,n) or Mo91 production log-log

Mo92 (γ,n) or Mo91 production lin-log
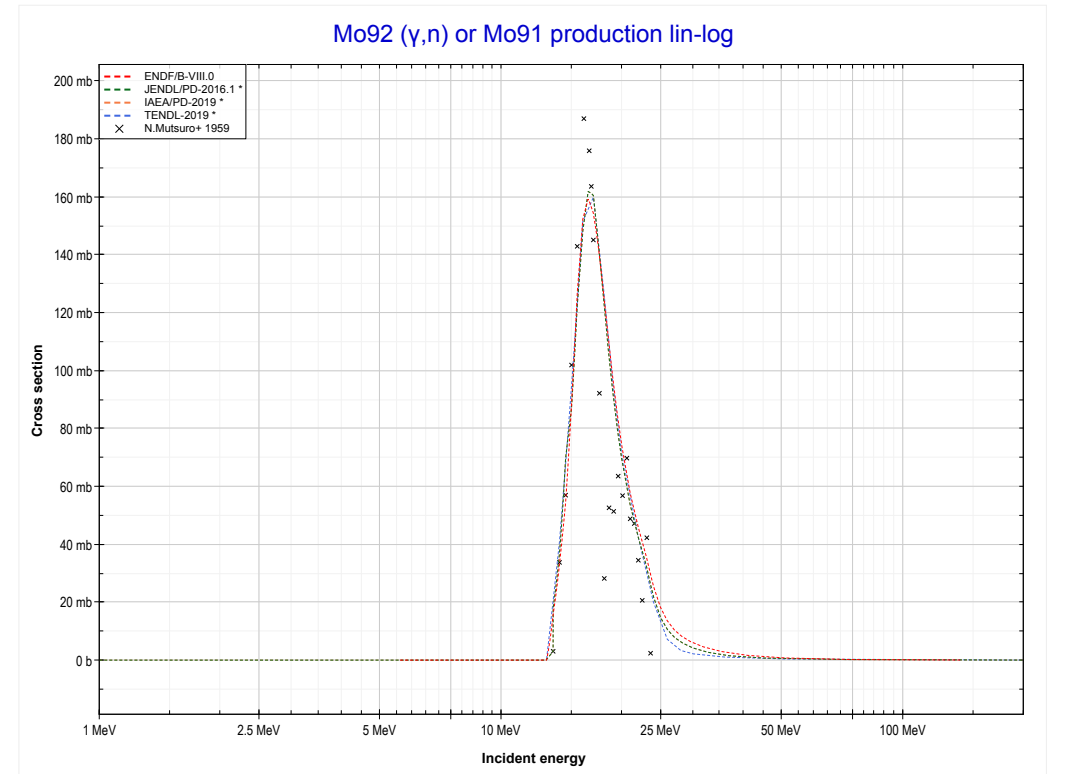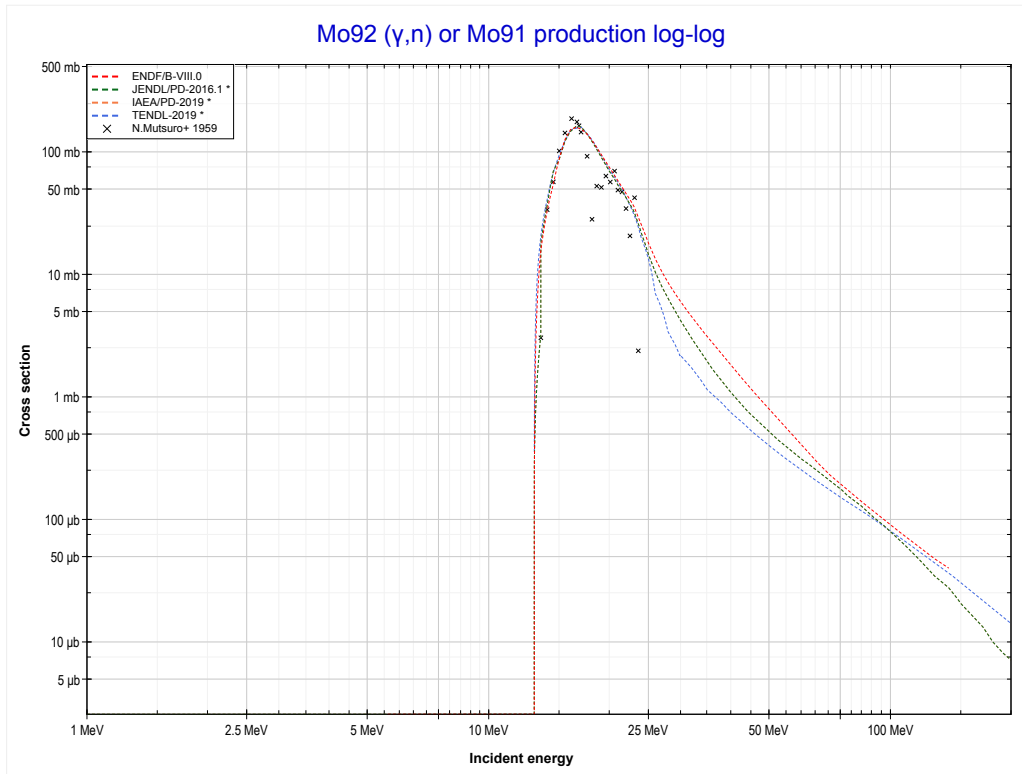
Reaction	Q-Value
Mo92(γ,n)Mo91	-12670.90 keV

<< 42-Mo-92	**42-Mo-94**	42-Mo-95 >>
<< 42-Mo-92 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Mo93 production)**	42-Mo-95 MT4 (γ,n) >>

Mo94 (γ,n) or Mo93 production log-log

Mo94 (γ,n) or Mo93 production lin-log
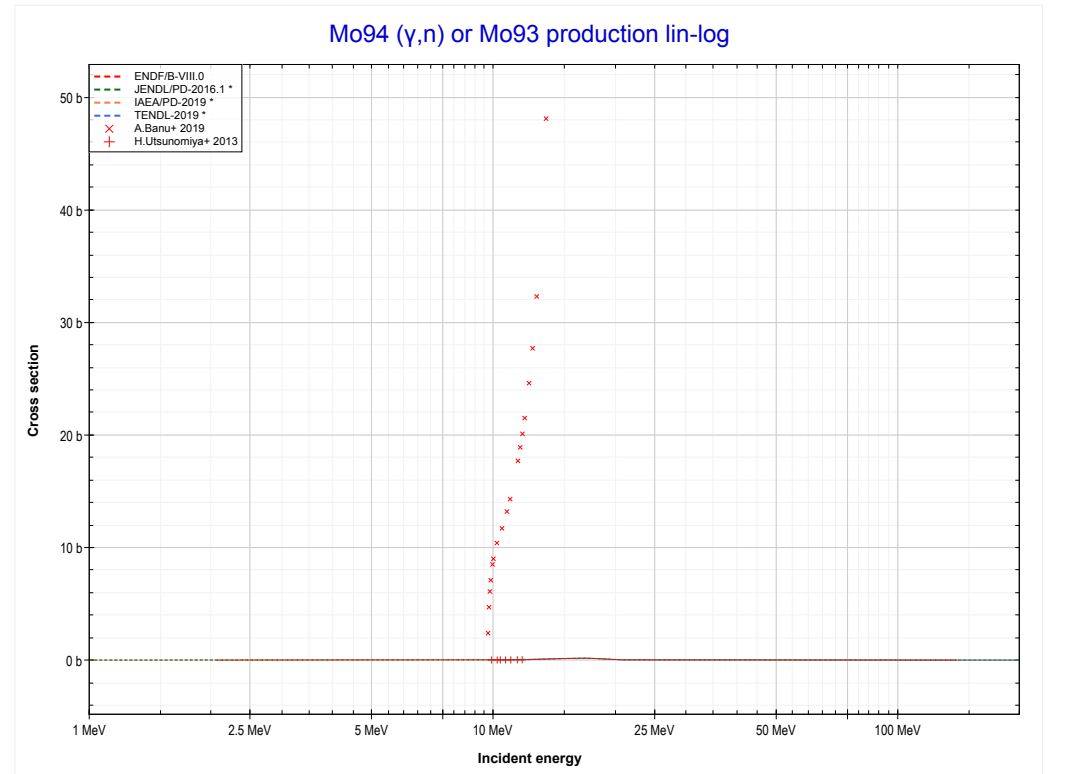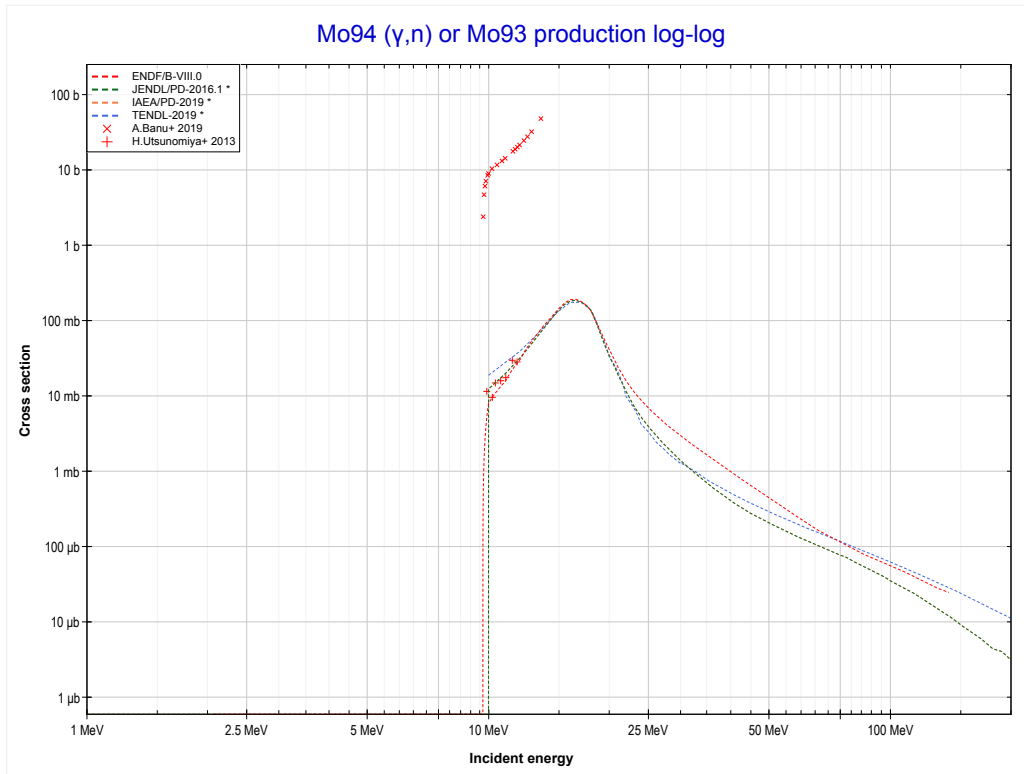
Reaction	Q-Value
Mo94(γ,n)Mo93	-9678.31 keV

<< 42-Mo-94	**42-Mo-95**	42-Mo-96 >>
<< 42-Mo-94 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Mo94 production)**	42-Mo-96 MT4 (γ,n) >>

Mo95 (γ,n) or Mo94 production log-log

Mo95 (γ,n) or Mo94 production lin-log
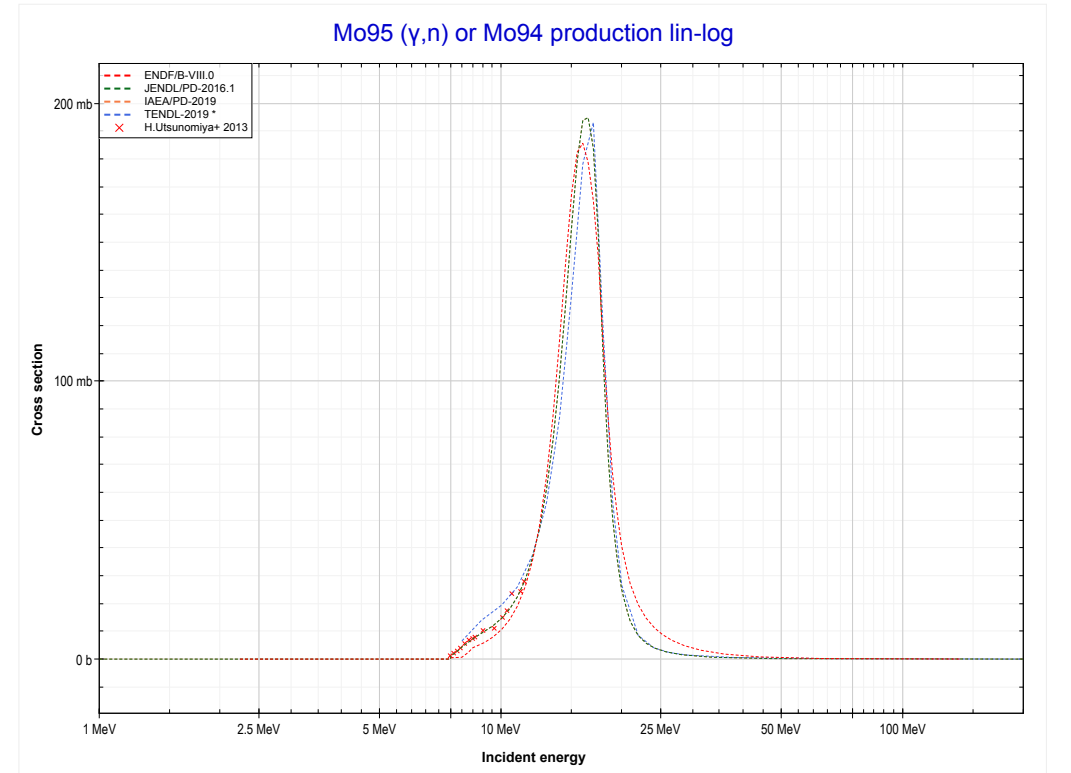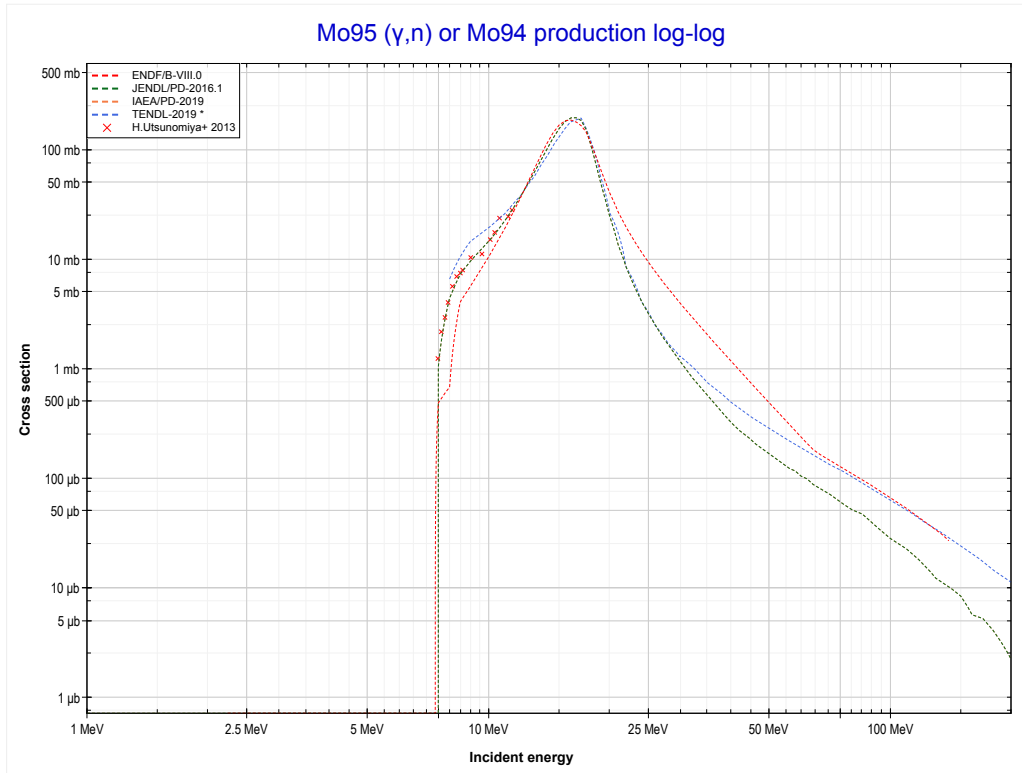
Reaction	Q-Value
Mo95(γ,n)Mo94	-7369.12 keV

<< 42-Mo-95	**42-Mo-96**	42-Mo-97 >>
<< 42-Mo-95 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Mo95 production)**	MT17 (γ,3n) >>

Mo96 (γ,n) or Mo95 production log-log

Mo96 (γ,n) or Mo95 production lin-log
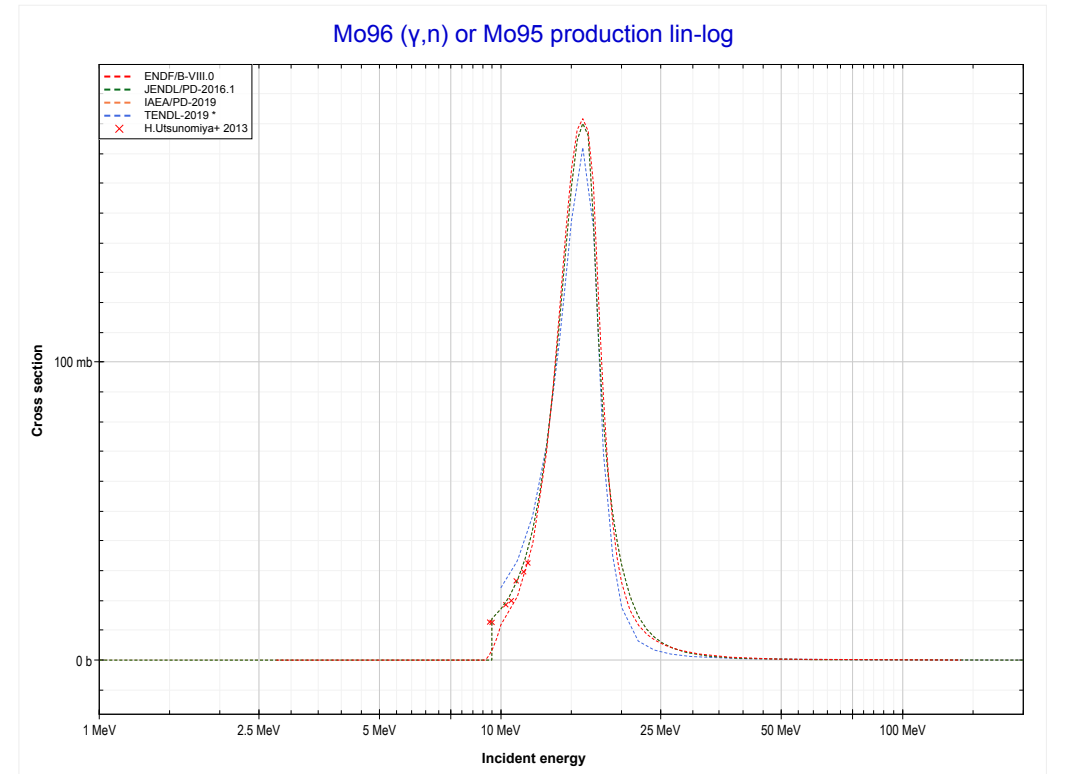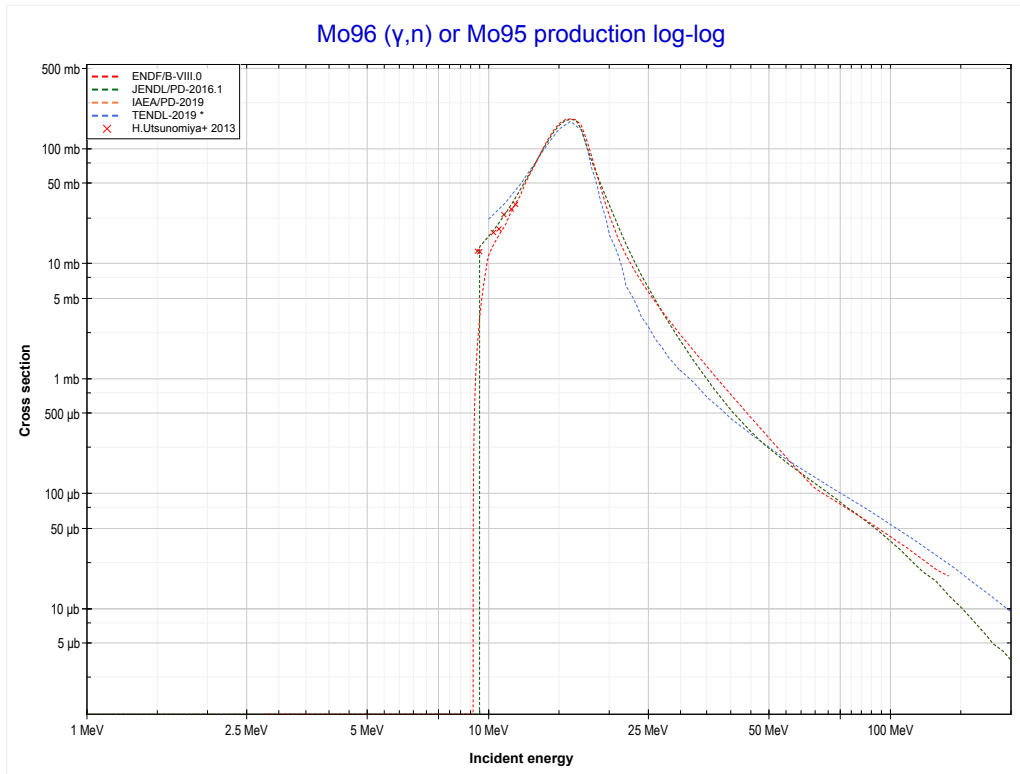
Reaction	Q-Value
Mo96(γ,n)Mo95	-9154.34 keV

<< 40-Zr-94	**42-Mo-96**	42-Mo-98 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Mo93 production)**	42-Mo-97 MT4 (γ,n) >>

Mo96 (γ,3n) or Mo93 production log-log

Mo96 (γ,3n) or Mo93 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1 *
- IAEA/PD-2019 *
- TENDL-2019 *
- × H.Beil+ 1974
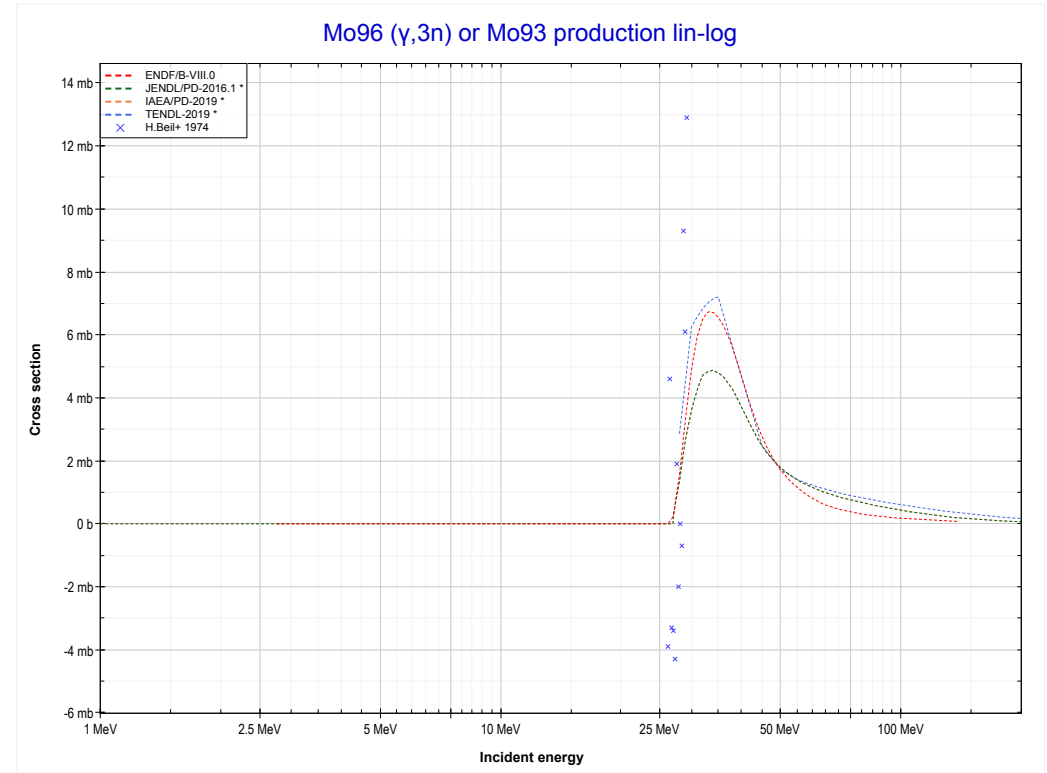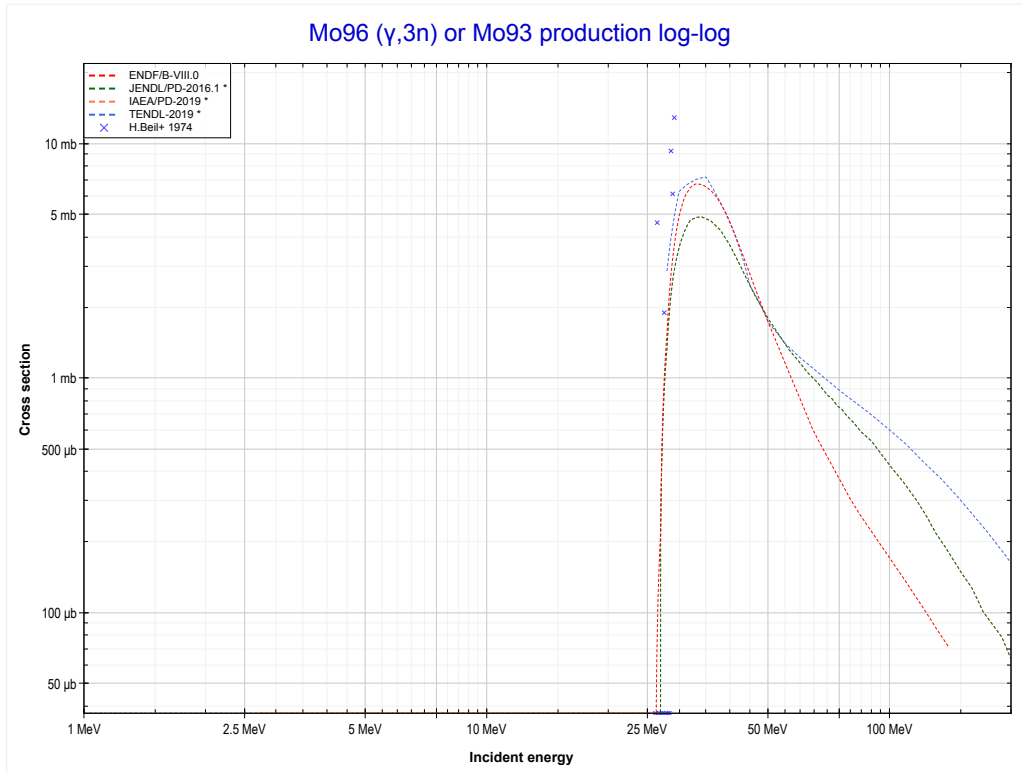
Reaction	Q-Value
Mo96(γ,3n)Mo93	-26201.76 keV

<< 42-Mo-96	**42-Mo-97**	42-Mo-98 >>
<< 42-Mo-96 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Mo96 production)**	42-Mo-98 MT4 (γ,n) >>

Mo97 (γ,n) or Mo96 production log-log

Mo97 (γ,n) or Mo96 production lin-log
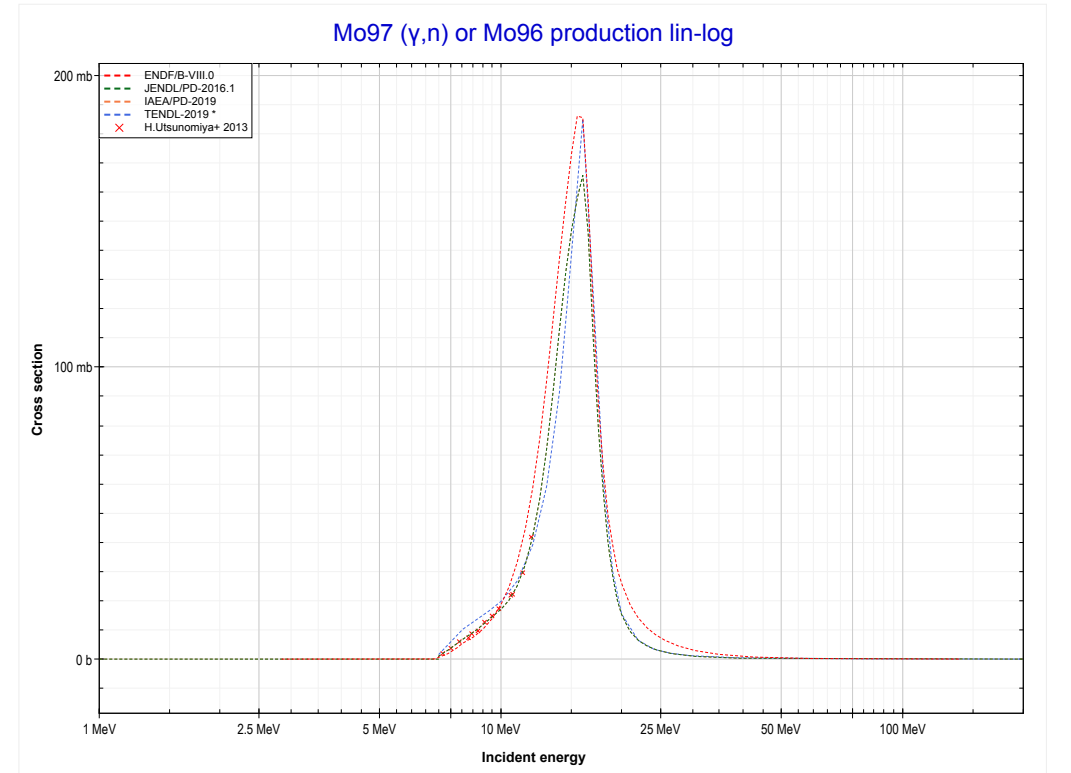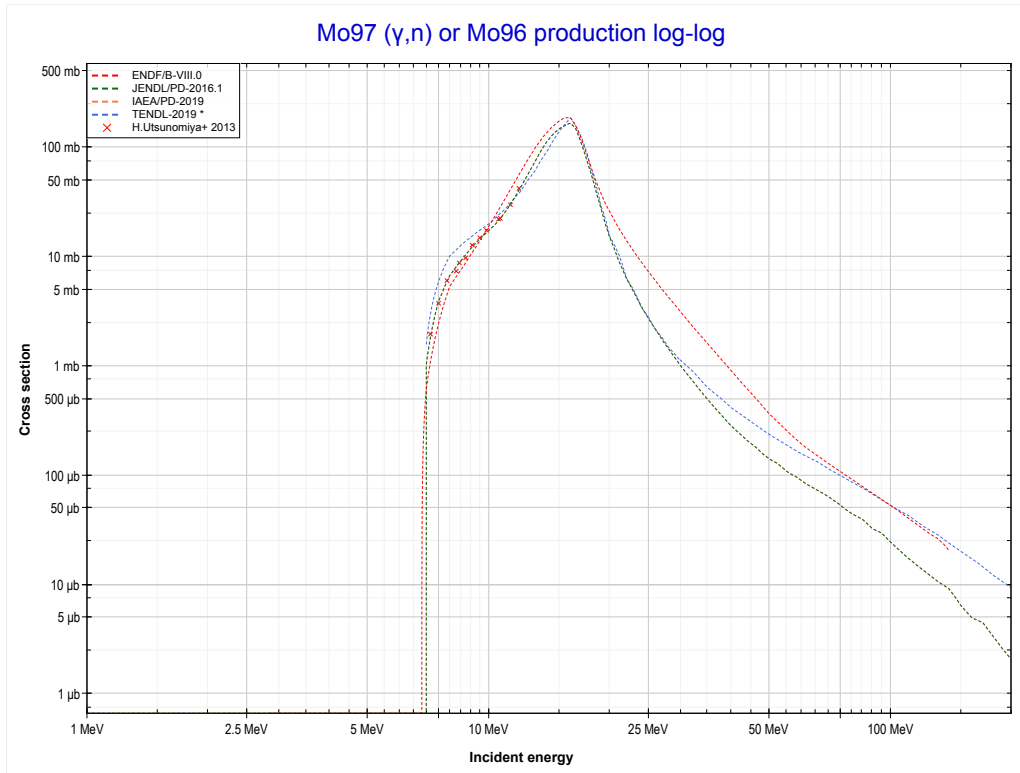
Reaction	Q-Value
Mo97(γ,n)Mo96	-6821.13 keV

<< 42-Mo-97	**42-Mo-98**	42-Mo-100 >>
<< 42-Mo-97 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Mo97 production)**	MT16 (γ,2n) >>

Mo98 (γ,n) or Mo97 production log-log

Mo98 (γ,n) or Mo97 production lin-log
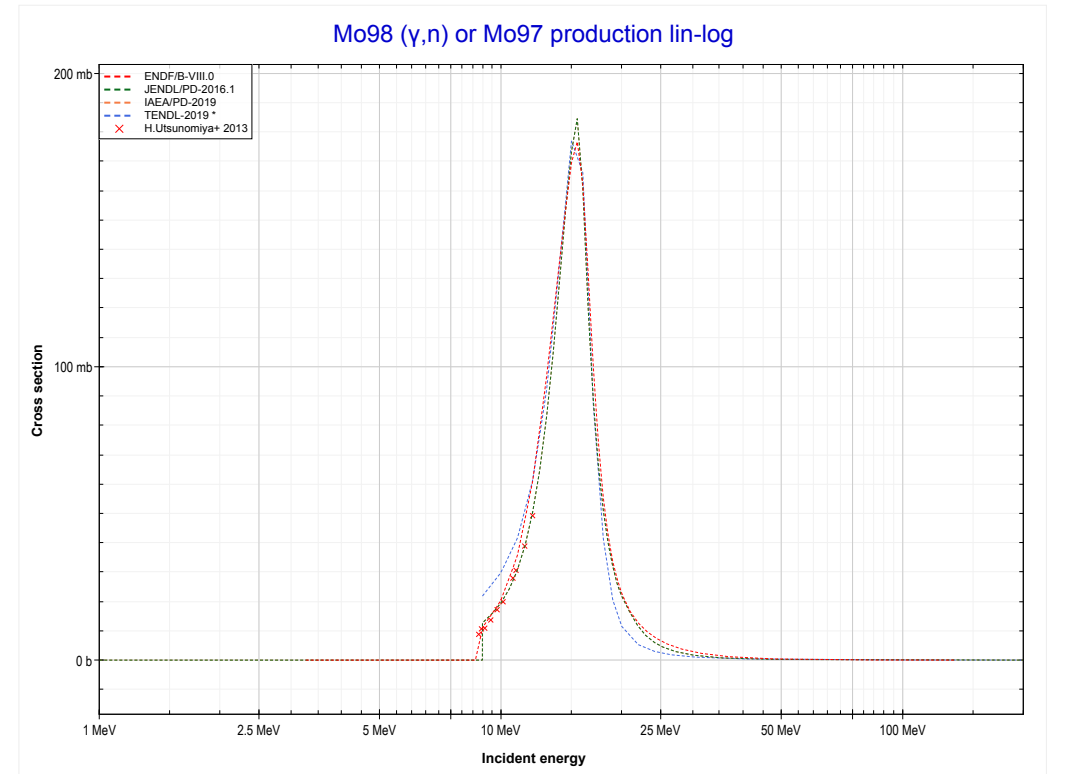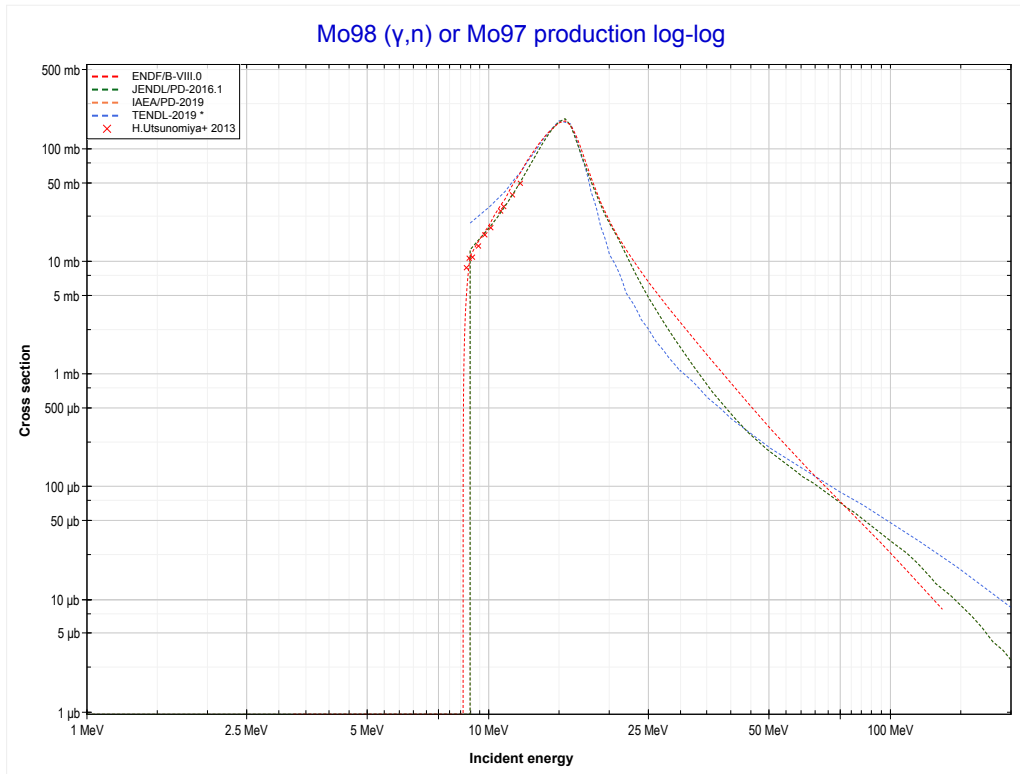
Reaction	Q-Value
Mo98(γ,n)Mo97	-8642.60 keV

<< 40-Zr-92	**42-Mo-98**	45-Rh-103 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Mo96 production)**	MT17 (γ,3n) >>

Mo98 (γ,2n) or Mo96 production log-log

Mo98 (γ,2n) or Mo96 production lin-log
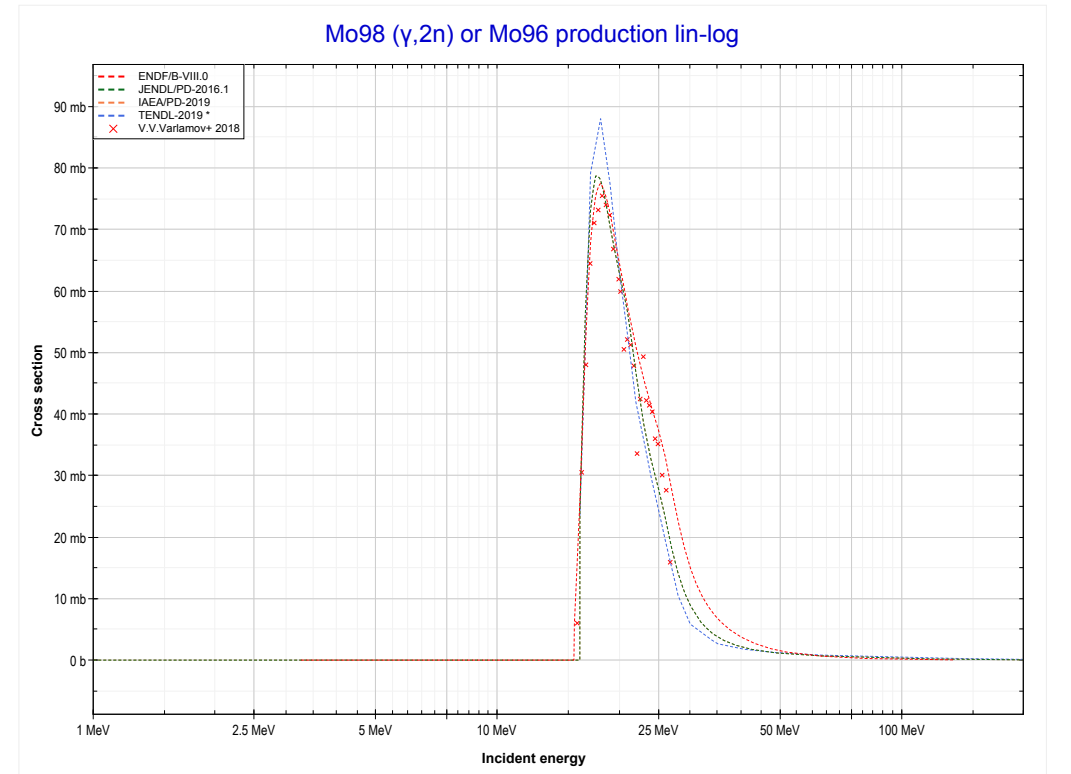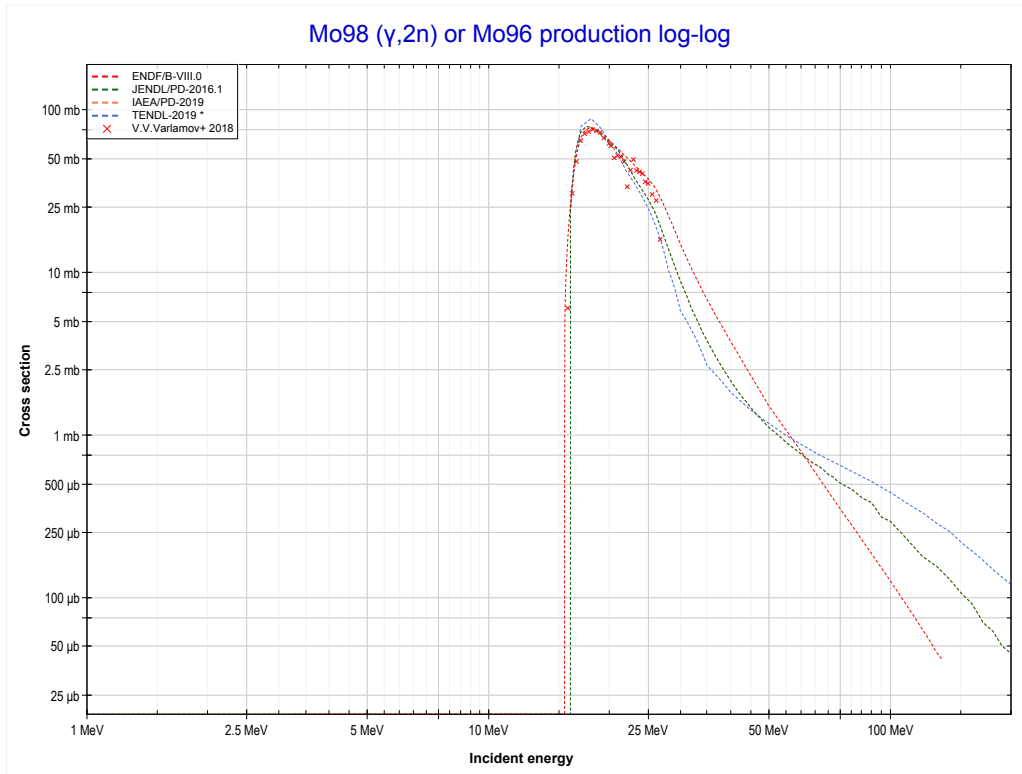
Reaction	Q-Value
Mo98(γ,2n)Mo96	-15463.72 keV

<< 42-Mo-96	**42-Mo-98**	42-Mo-100 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Mo95 production)**	42-Mo-100 MT4 (γ,n) >>

Mo98 (γ,3n) or Mo95 production log-log

Mo98 (γ,3n) or Mo95 production lin-log
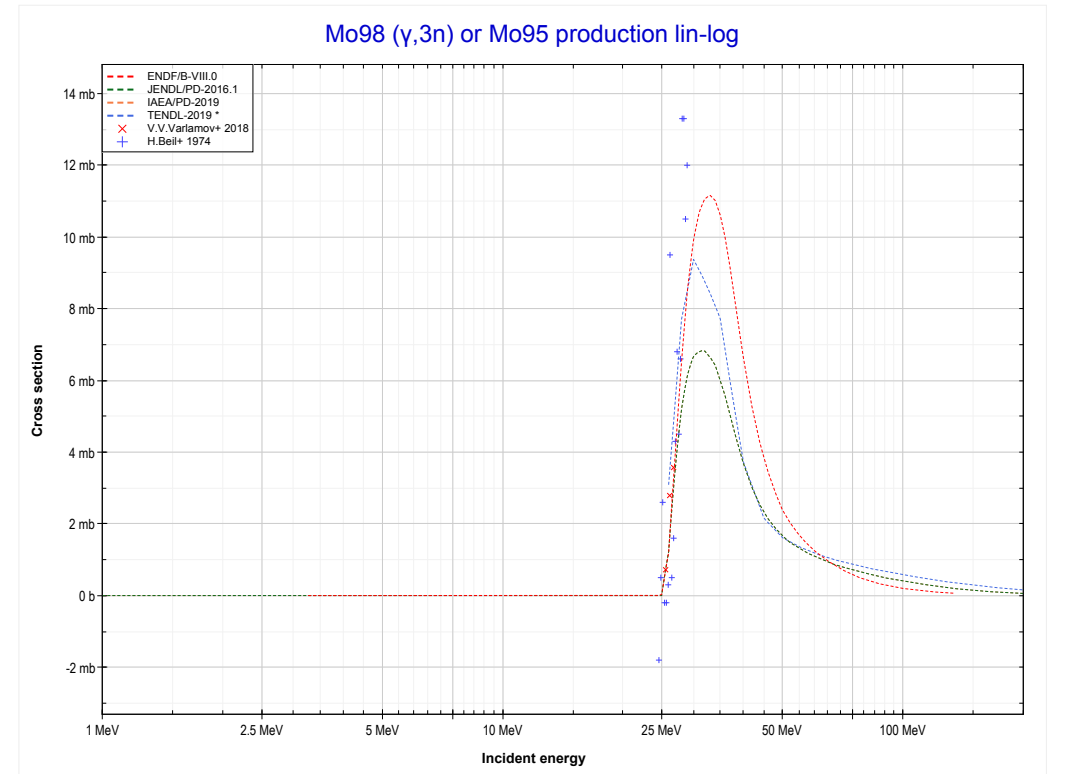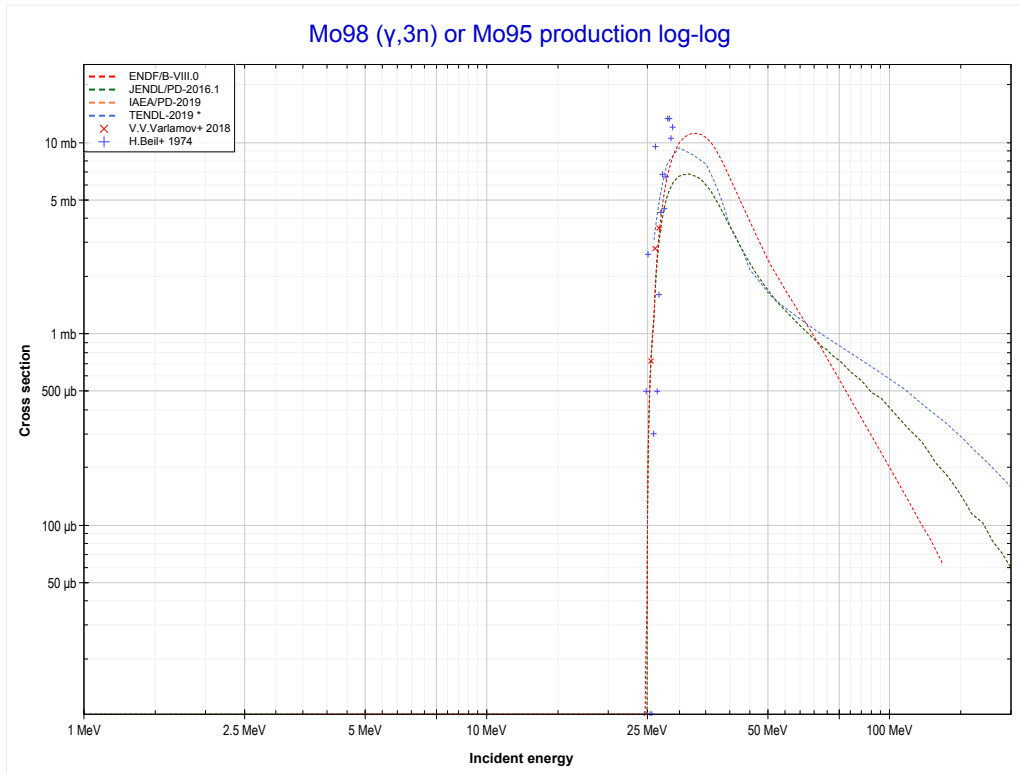
Reaction	Q-Value
Mo98(γ,3n)Mo95	-24618.06 keV

<< 42-Mo-98	**42-Mo-100**	46-Pd-105 >>
<< 42-Mo-98 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Mo99 production)**	MT17 (γ,3n) >>

Mo100 (γ,n) or Mo99 production log-log

Mo100 (γ,n) or Mo99 production lin-log
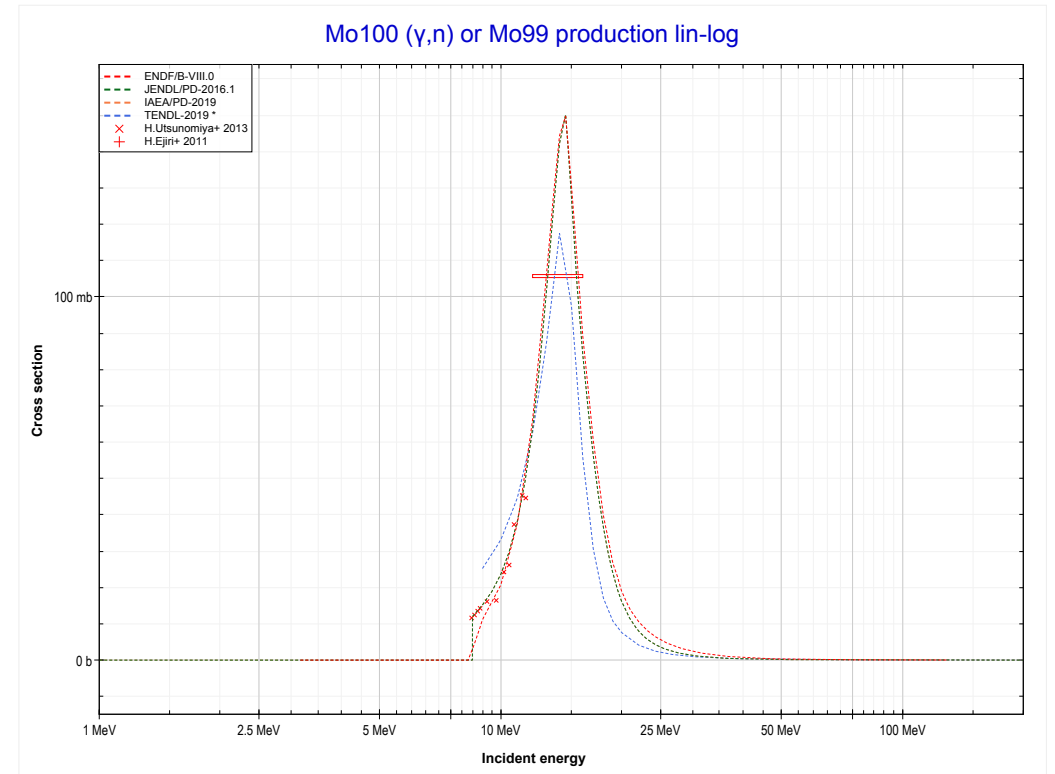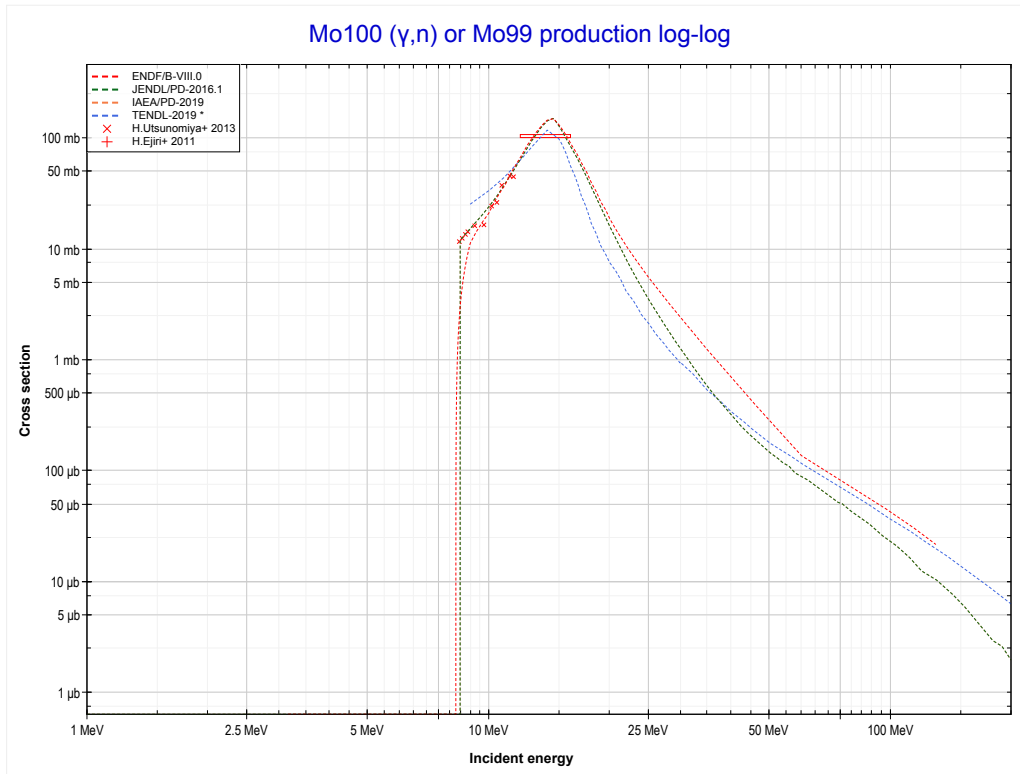
Reaction	Q-Value
Mo100(γ,n)Mo99	-8294.22 keV

<< 42-Mo-98	**42-Mo-100**	49-In-115 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Mo97 production)**	45-Rh-103 MT16 (γ,2n) >>

Mo100 (γ,3n) or Mo97 production log-log

Mo100 (γ,3n) or Mo97 production lin-log
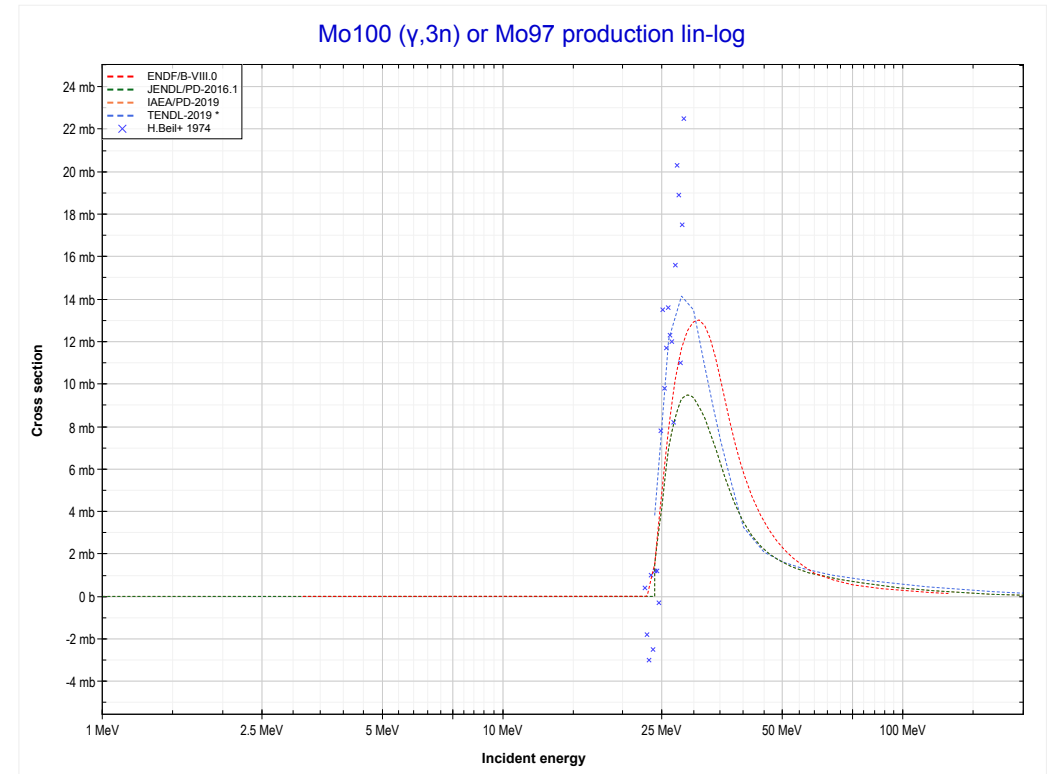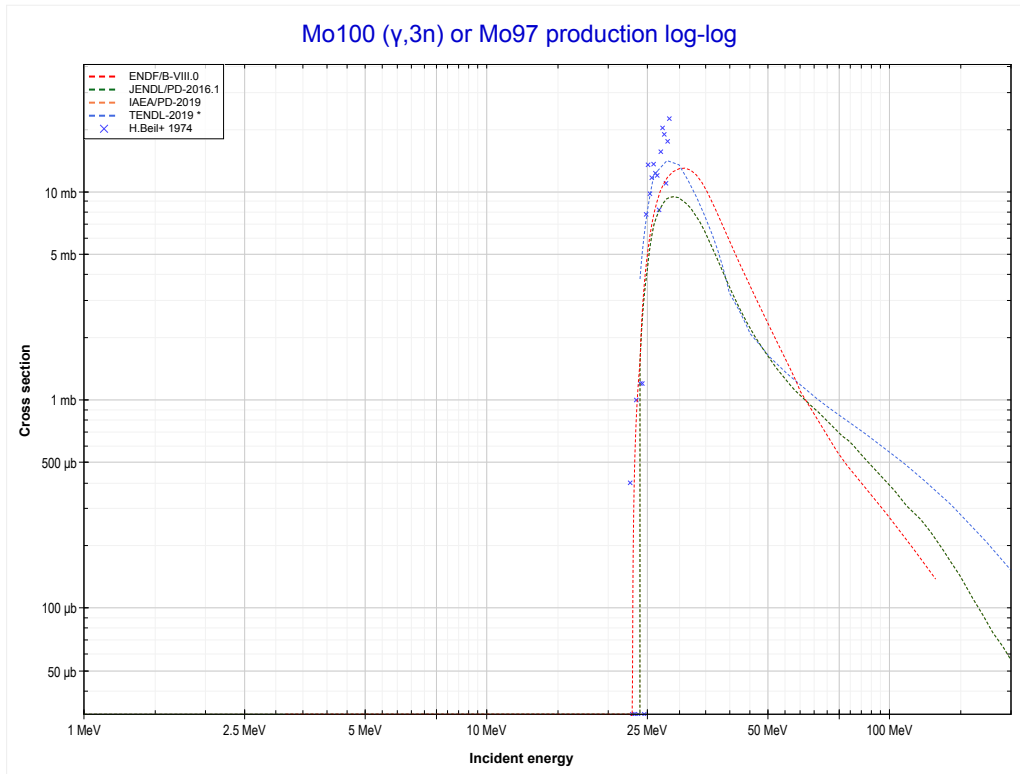
Reaction	Q-Value
Mo100(γ,3n)Mo97	-22862.26 keV

<< 42-Mo-98	45-Rh-103	47-Ag-107 >>
<< 42-Mo-100 MT17 (γ,3n)	MT16 (γ,2n) or MT5 (Rh101 production)	MT103 (γ,p) >>

Rh103 (γ,2n) or Rh101 production log-log

Rh103 (γ,2n) or Rh101 production lin-log
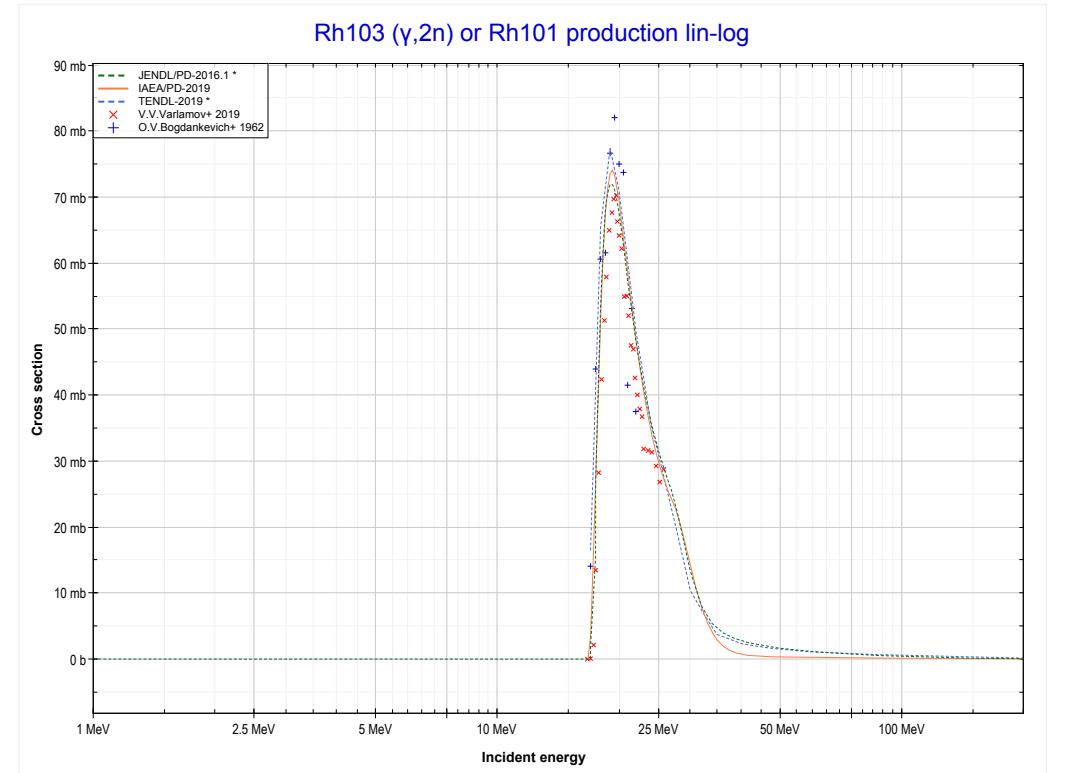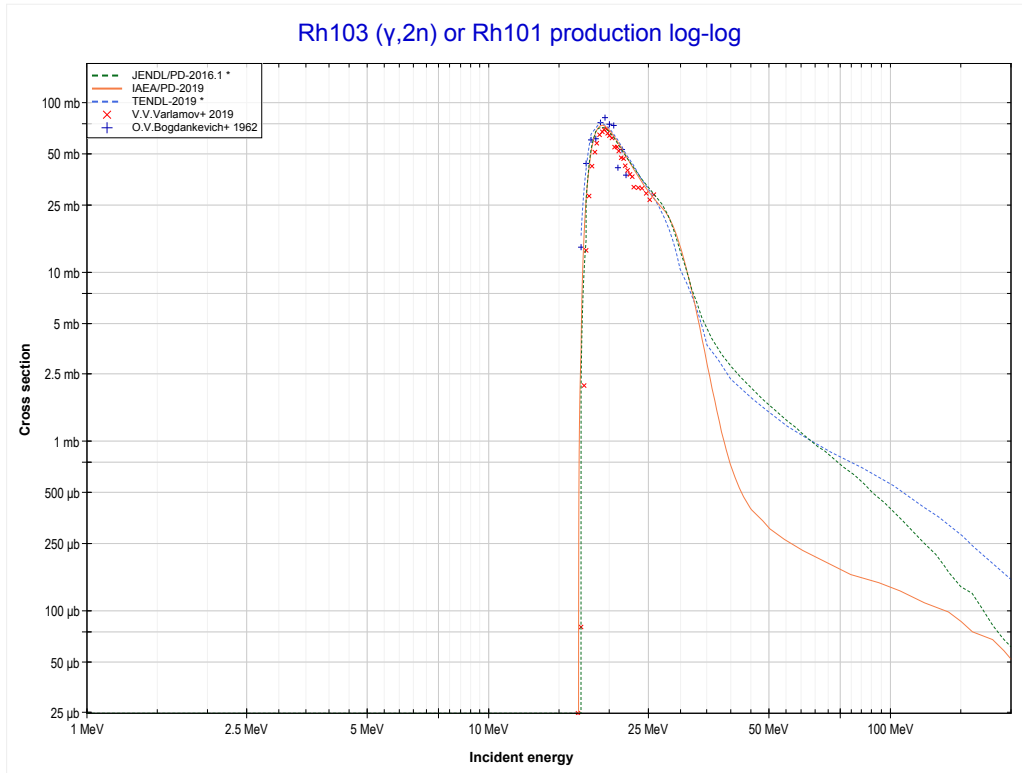
Reaction	Q-Value
Rh103(γ,2n)Rh101	-16762.33 keV

<< 40-Zr-90	45-Rh-103	46-Pd-108 >>
<< MT16 (γ,2n)	MT103 (γ,p) or MT5 (Ru102 production)	46-Pd-105 MT4 (γ,n) >>

Rh103 (γ,p) or Ru102 production log-log

Rh103 (γ,p) or Ru102 production lin-log
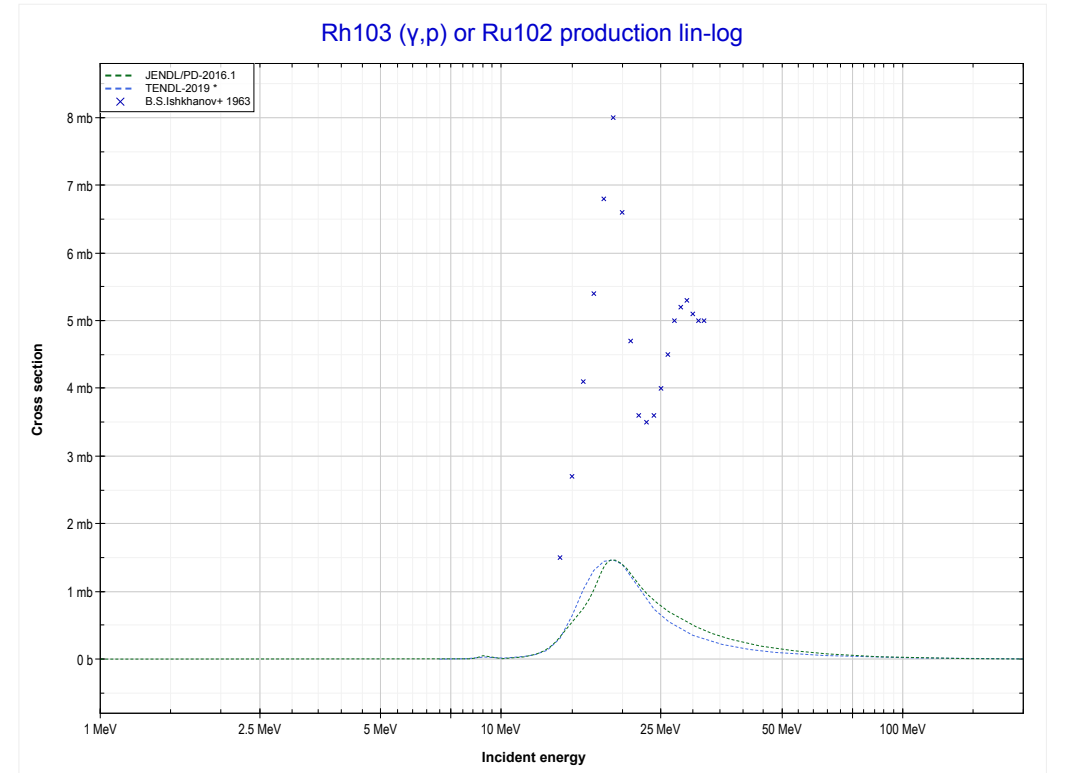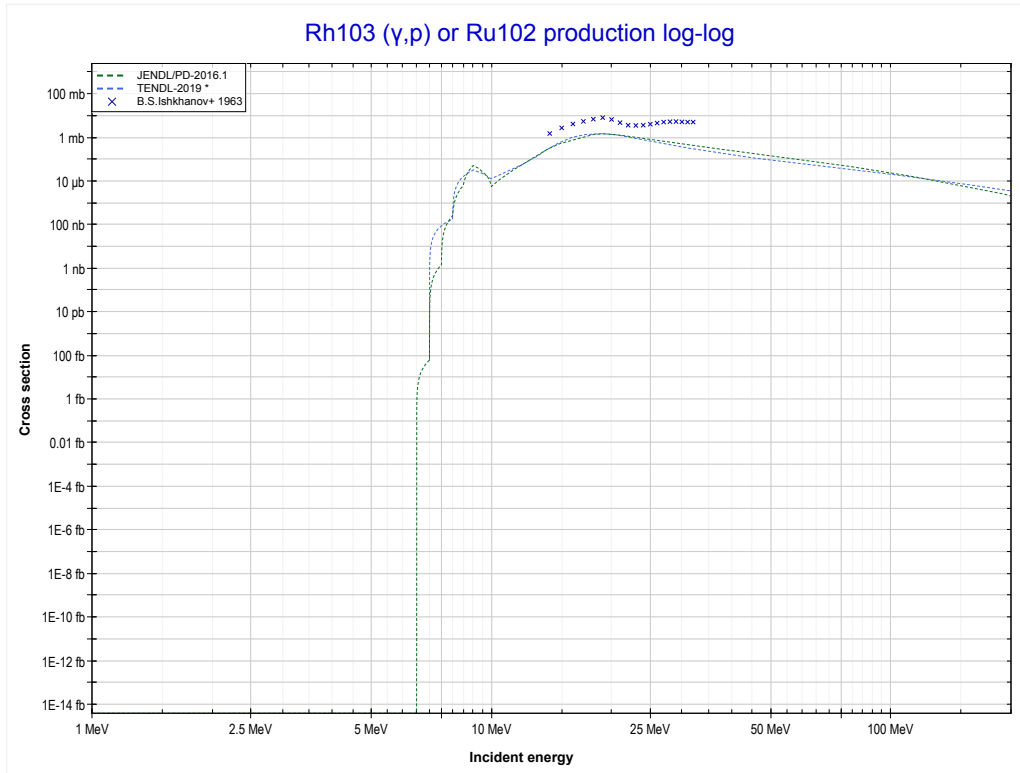
Reaction	Q-Value
Rh103(γ,p)Ru102	-6214.27 keV

<< 42-Mo-100	46-Pd-105	46-Pd-106 >>
<< 45-Rh-103 MT103 (γ,p)	MT4 (γ,n) or MT5 (Pd104 production)	46-Pd-106 MT4 (γ,n) >>

Pd105 (γ,n) or Pd104 production log-log

Pd105 (γ,n) or Pd104 production lin-log
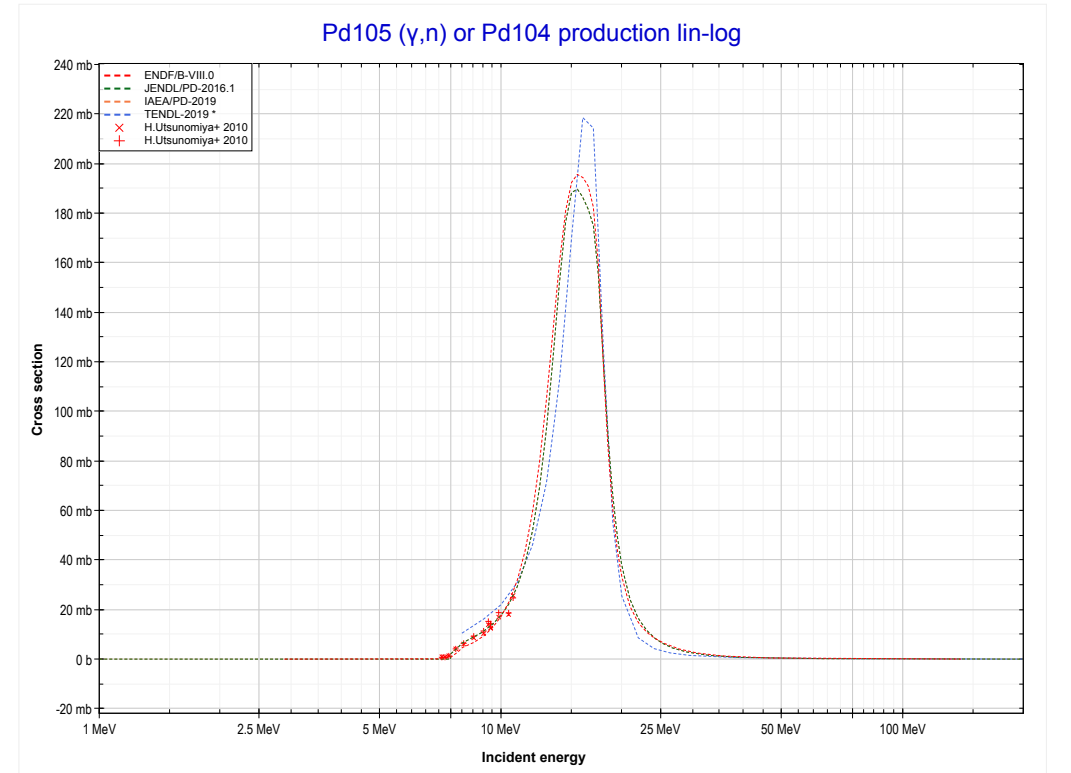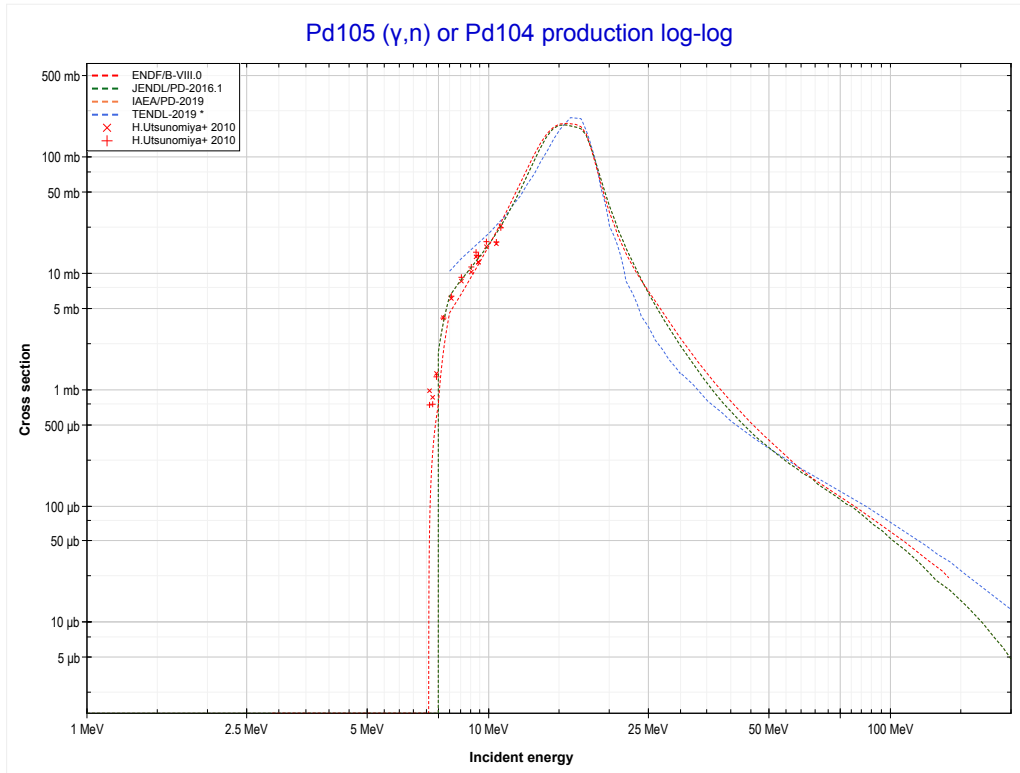
Reaction	Q-Value
Pd105(γ,n)Pd104	-7094.12 keV

Pd106 (γ,n) or Pd105 production log-log

Pd106 (γ,n) or Pd105 production lin-log

Reaction	Q-Value
Pd106(γ,n)Pd105	-9560.92 keV

<< 46-Pd-106	**46-Pd-108**	46-Pd-110 >>
<< 46-Pd-106 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Pd107 production)**	MT103 (γ,p) >>

Pd108 (γ,n) or Pd107 production log-log

Pd108 (γ,n) or Pd107 production lin-log
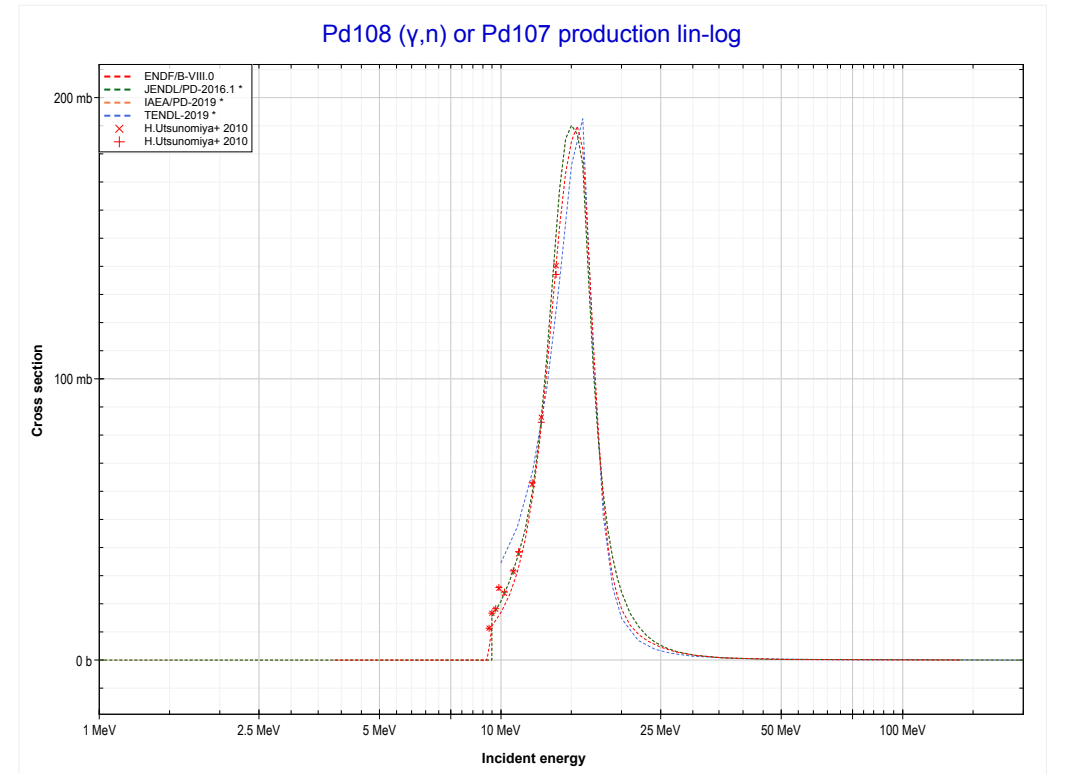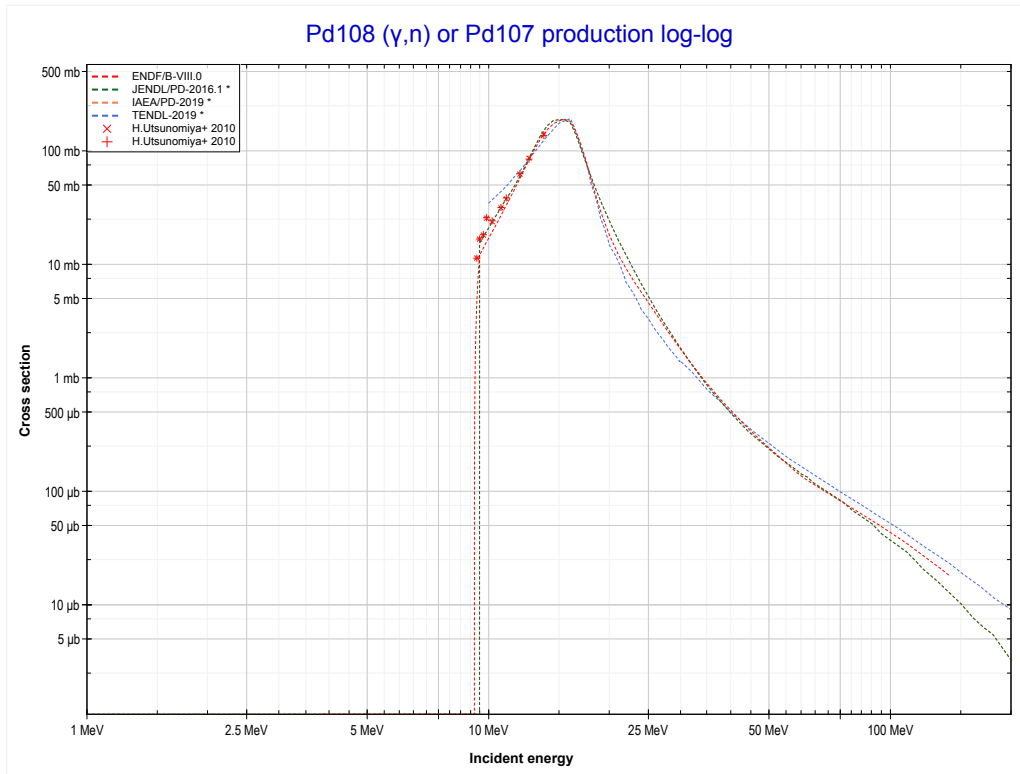
Reaction	Q-Value
Pd108(γ,n)Pd107	-9222.92 keV

<< 45-Rh-103 >>	**46-Pd-108**	50-Sn-120 >>
<< MT4 (γ,n)	**MT103 (γ,p) or MT5 (Rh107 production)**	46-Pd-110 MT4 (γ,n) >>

Pd108 (γ,p) or Rh107 production log-log

Pd108 (γ,p) or Rh107 production lin-log
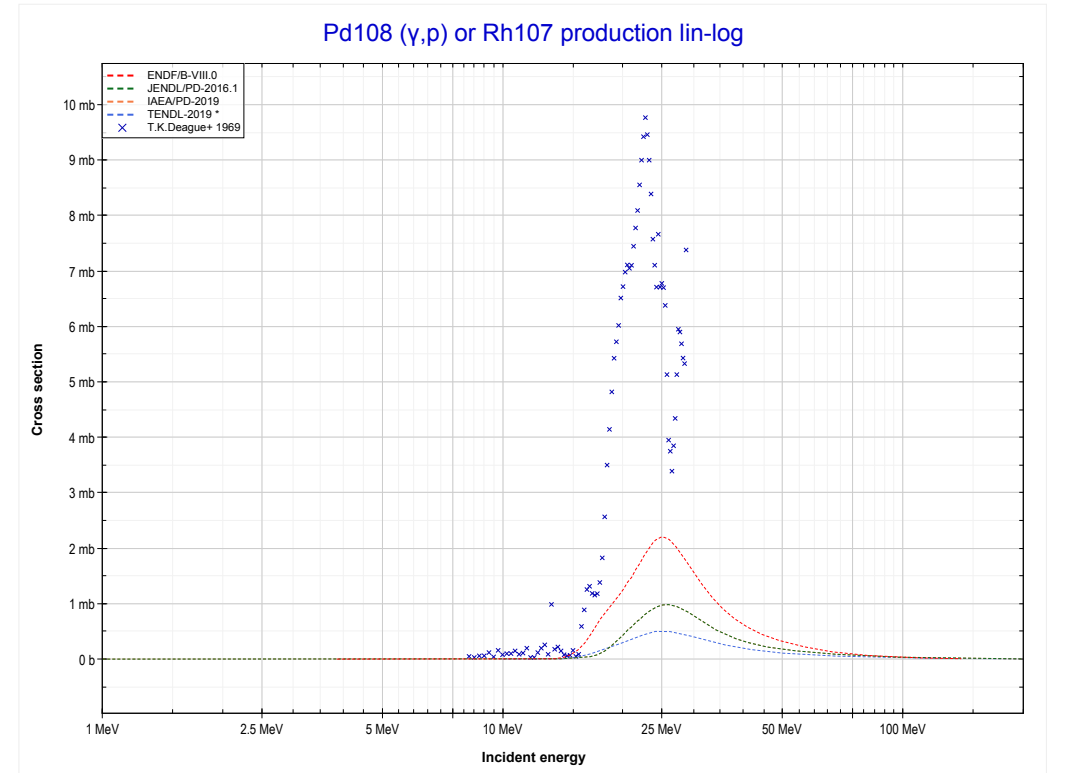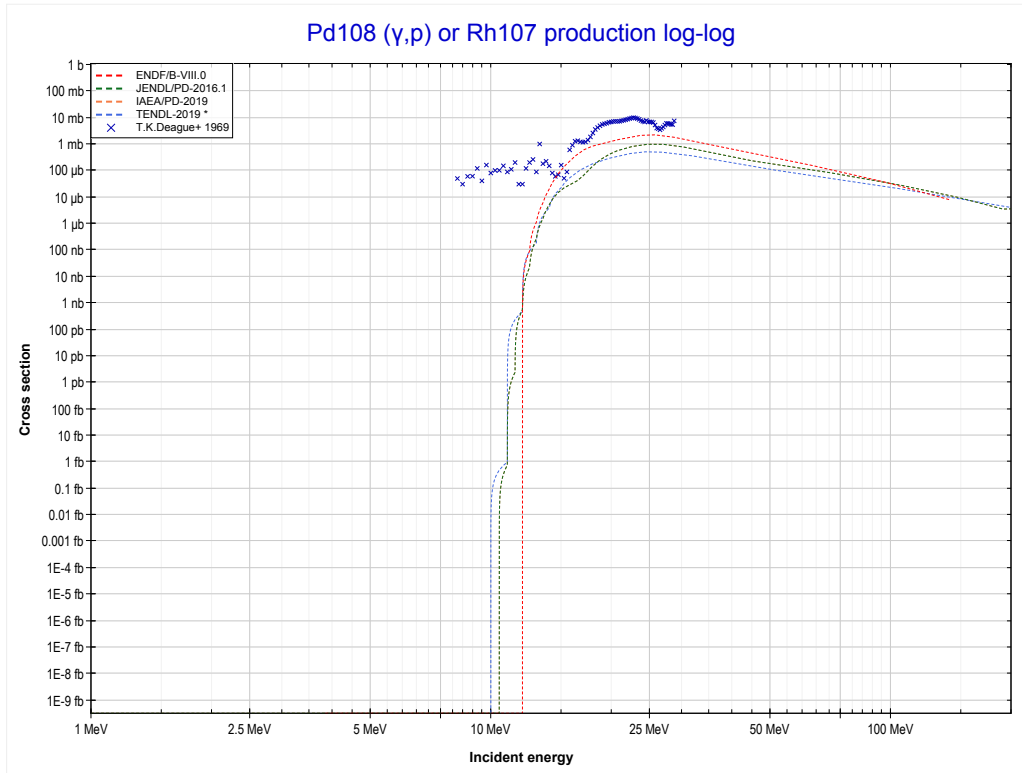
Reaction	Q-Value
Pd108(γ,p)Rh107	-9949.17 keV

<< 46-Pd-108	**46-Pd-110**	47-Ag-107 >>
<< 46-Pd-108 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Pd109 production)**	47-Ag-107 MT4 (γ,n) >>

Pd110 (γ,n) or Pd109 production log-log

Pd110 (γ,n) or Pd109 production lin-log
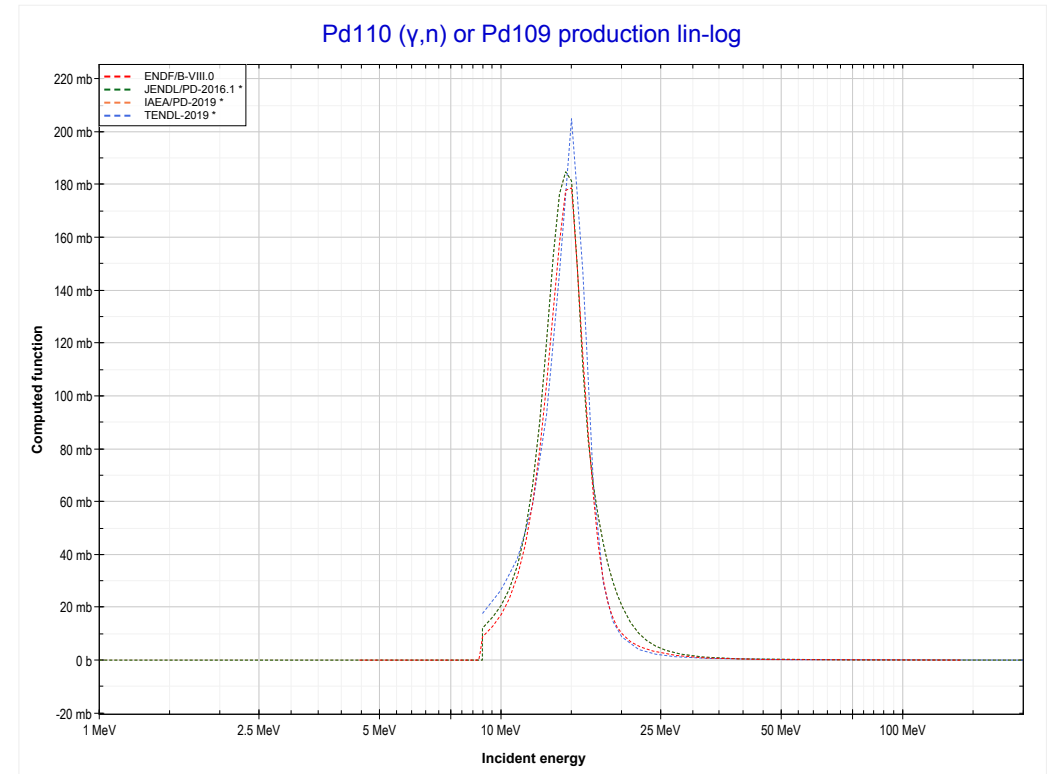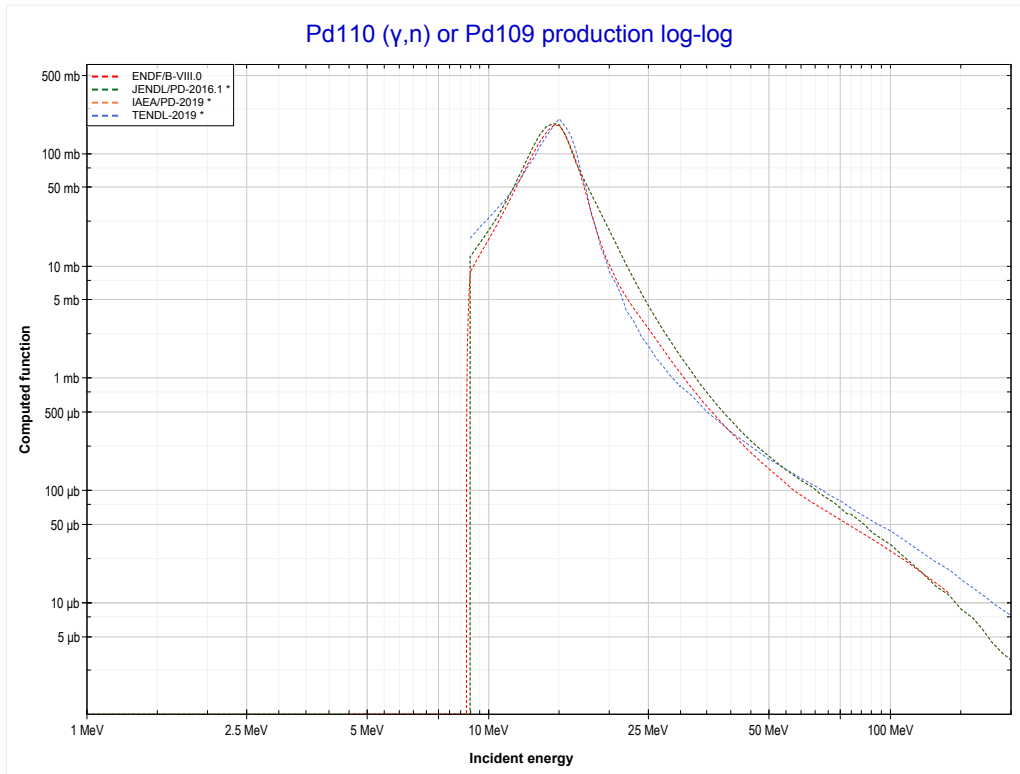
Reaction	Q-Value
Pd110(γ,n)Pd109	-8795.72 keV

<< 46-Pd-110	**47-Ag-107**	47-Ag-109 >>
<< 46-Pd-110 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ag106 production)**	MT16 (γ,2n) >>

Ag107 (γ,n) or Ag106 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1 *
- IAEA/PD-2019 *
- TENDL-2019 *
- N.Mutsuro+ 1959

Ag107 (γ,n) or Ag106 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1 *
- IAEA/PD-2019 *
- TENDL-2019 *
- N.Mutsuro+ 1959
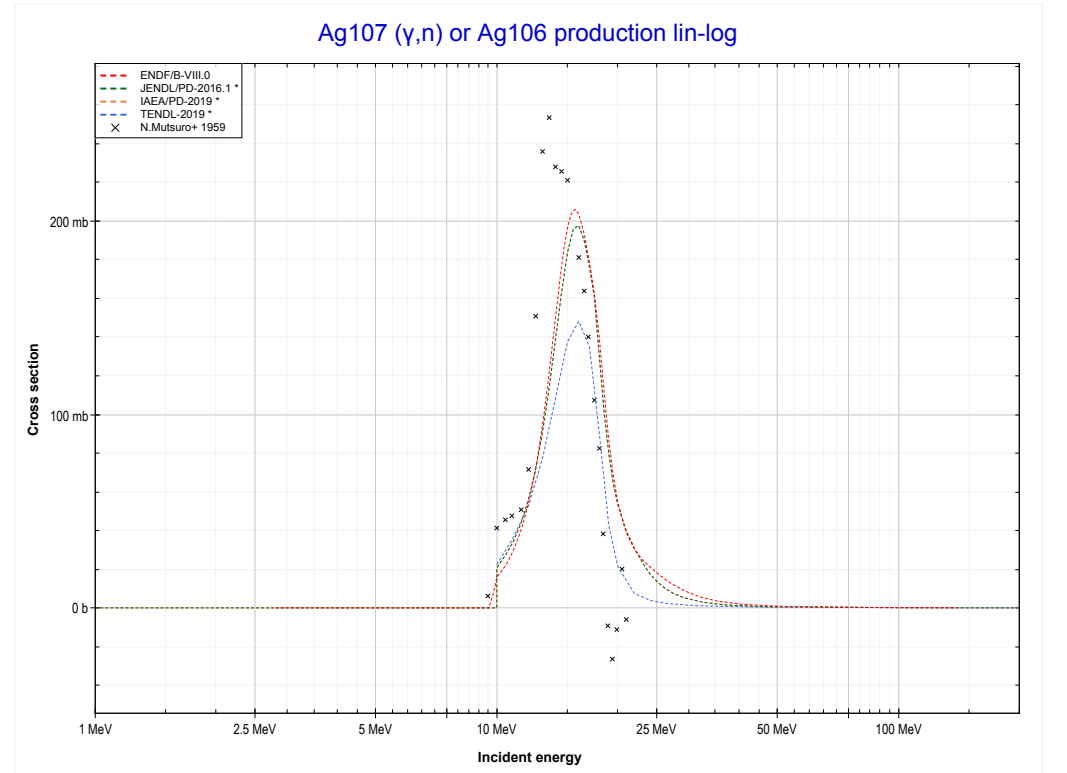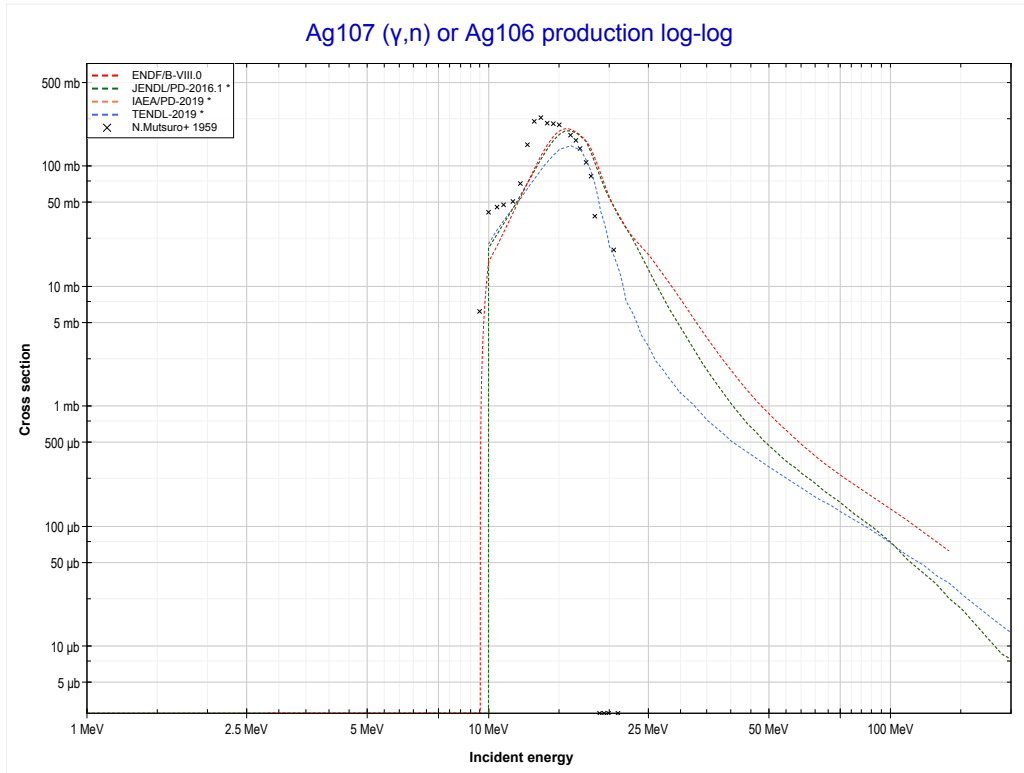
Reaction	Q-Value
Ag107(γ,n)Ag106	-9536.02 keV

<< 45-Rh-103	**47-Ag-107**	49-In-115 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ag105 production)**	47-Ag-109 MT4 (γ,n) >>

Ag107 (γ,2n) or Ag105 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1 *
- IAEA/PD-2019 *
- TENDL-2019 *
- O.V.Bogdankevich+ 1962

Ag107 (γ,2n) or Ag105 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1 *
- IAEA/PD-2019 *
- TENDL-2019 *
- O.V.Bogdankevich+ 1962
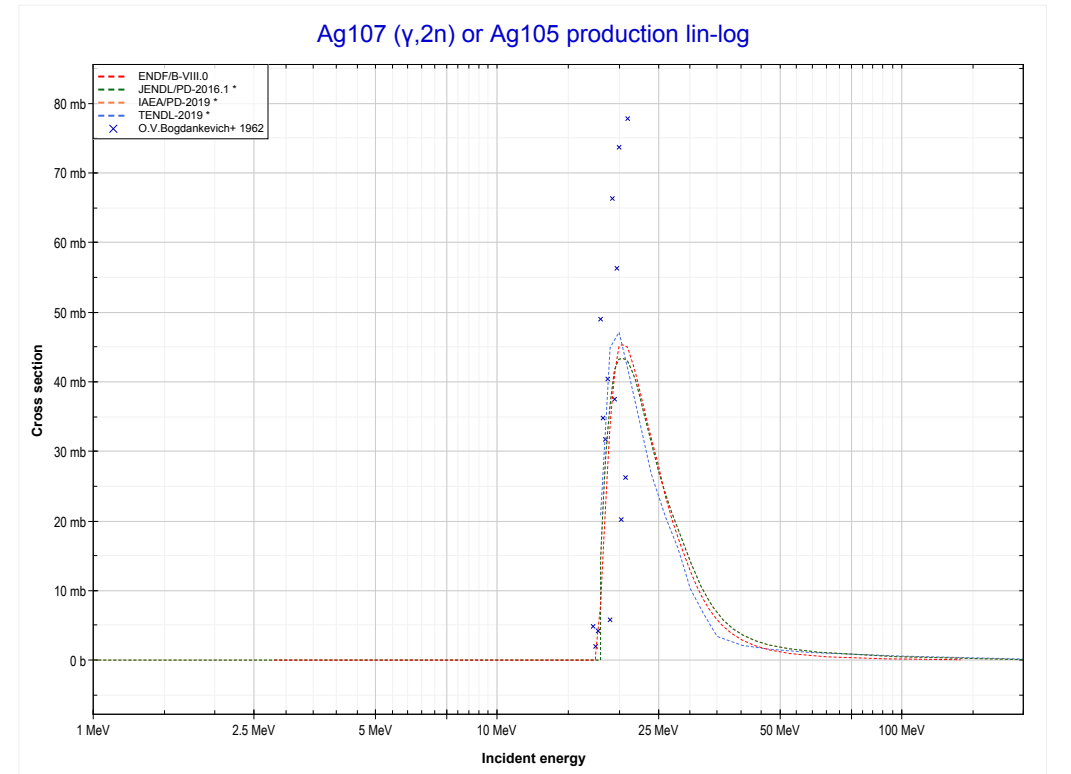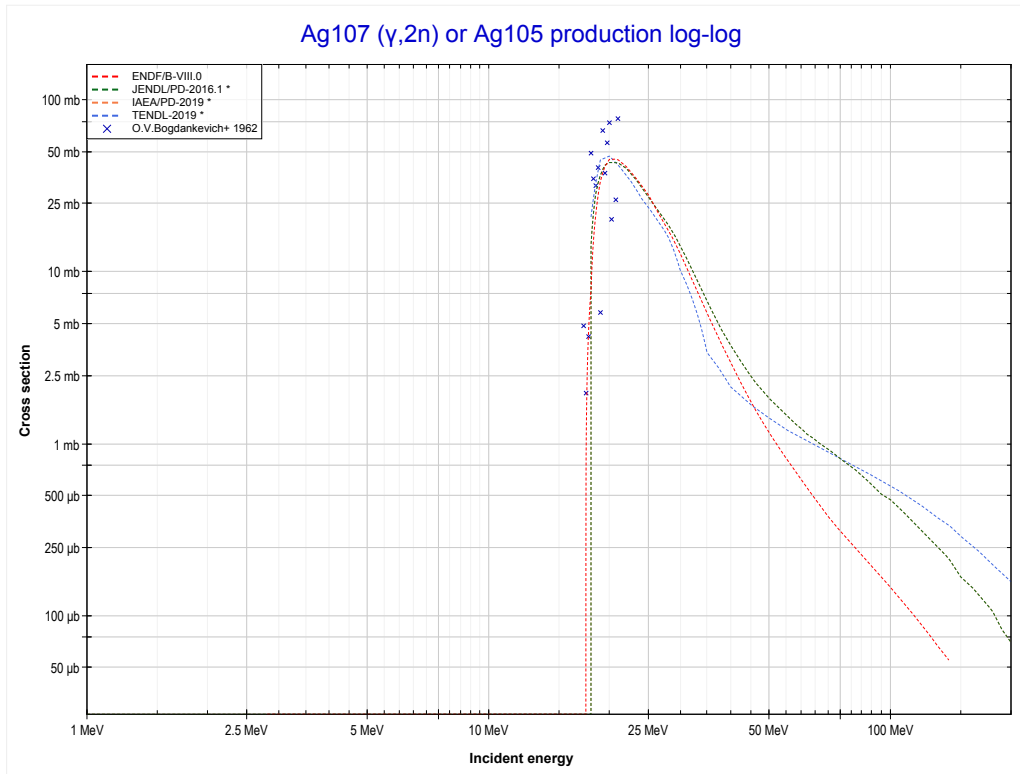
Reaction	Q-Value
Ag107(γ,2n)Ag105	-17478.33 keV

<< 47-Ag-107	**47-Ag-109**	49-In-115 >>
<< 47-Ag-107 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Ag108 production)**	49-In-115 MT4 (γ,n) >>

Ag109 (γ,n) or Ag108 production log-log

Ag109 (γ,n) or Ag108 production lin-log
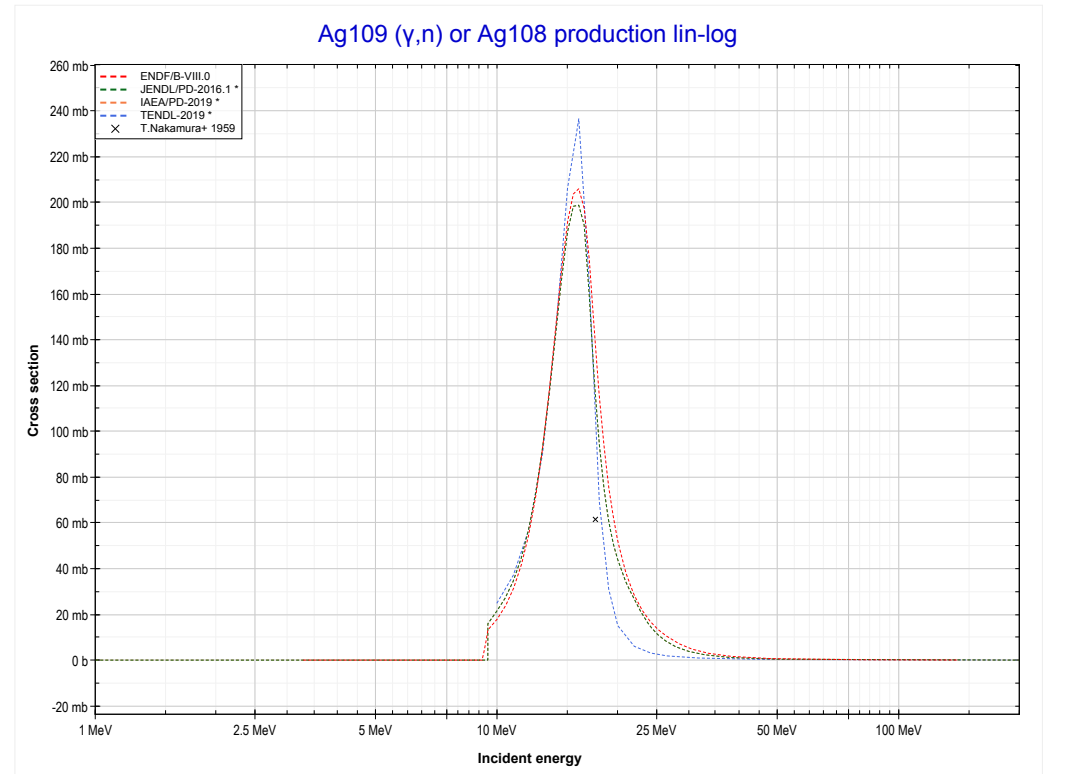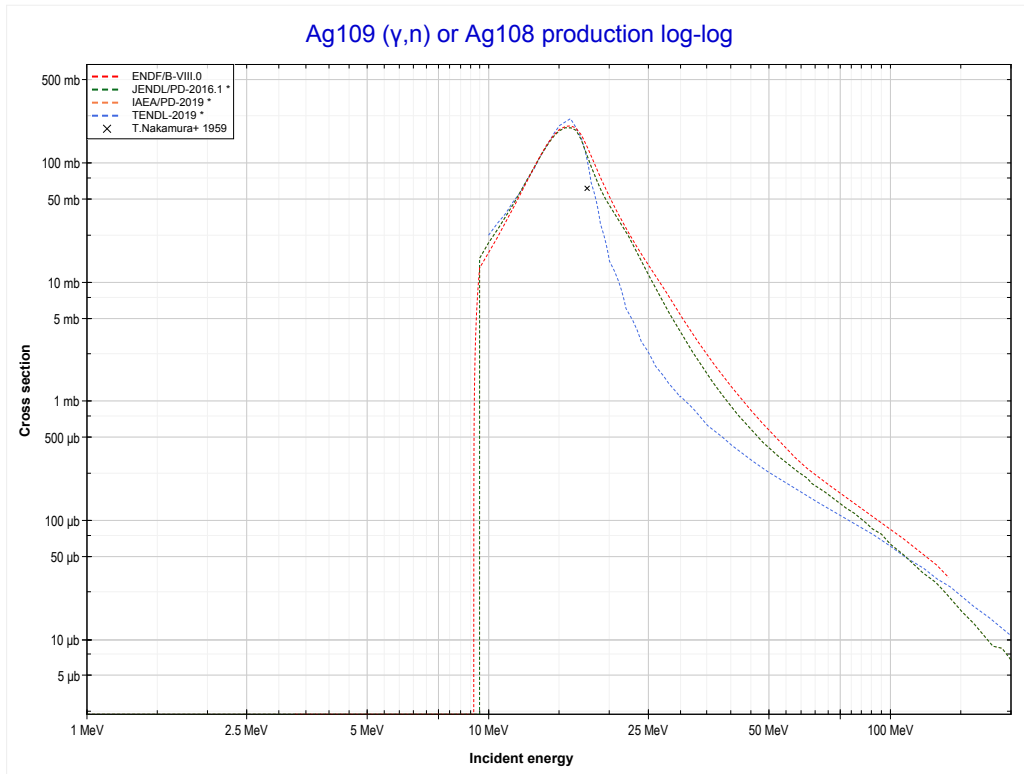
Reaction	Q-Value
Ag109(γ,n)Ag108	-9183.92 keV

<< 47-Ag-109	49-In-115	50-Sn-112 >>
<< 47-Ag-109 MT4 (γ,n)	MT4 (γ,n) or MT5 (In114 production)	MT16 (γ,2n) >>

In115 (γ,n) or In114 production log-log

In115 (γ,n) or In114 production lin-log
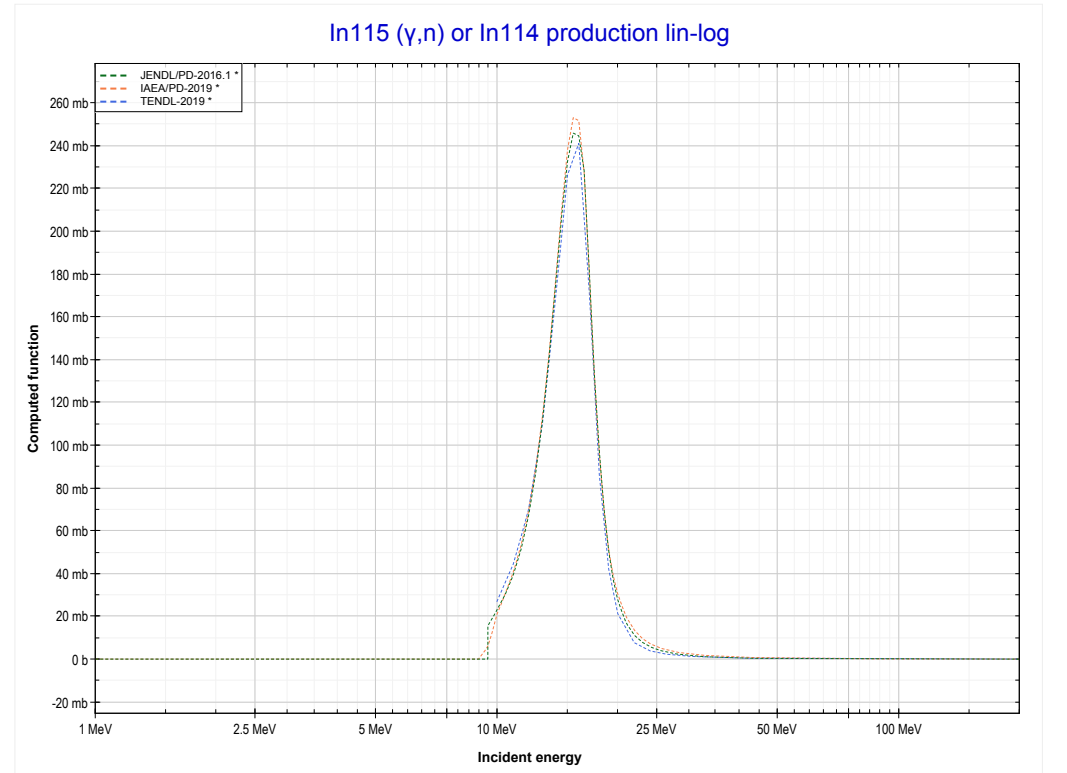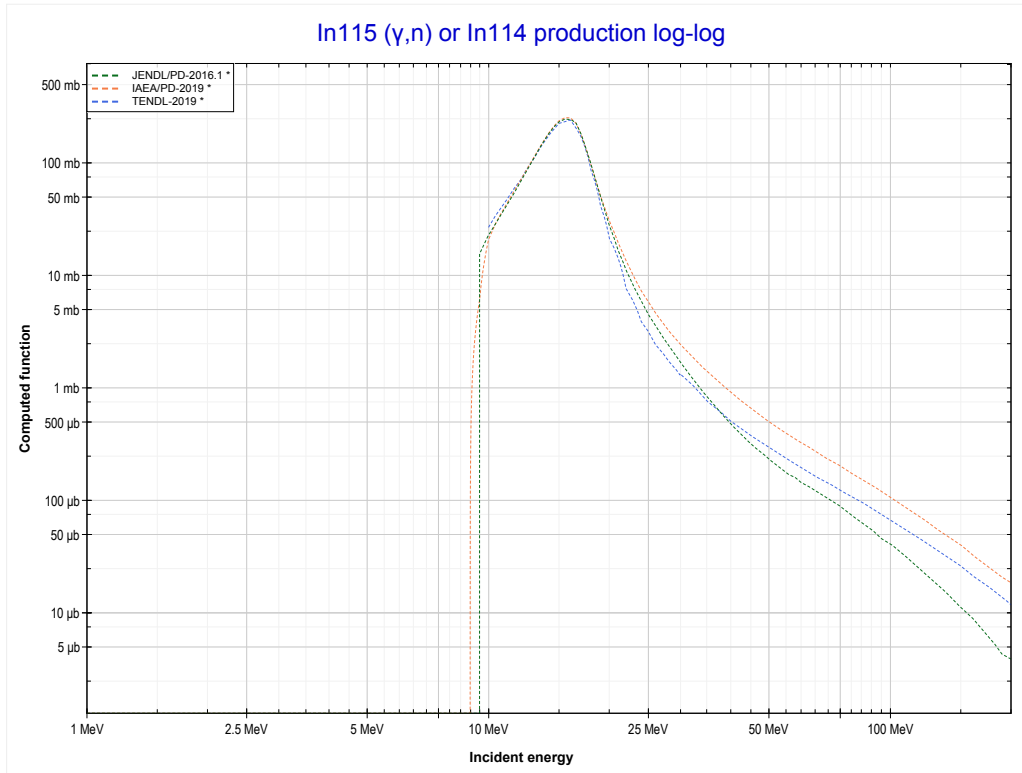
Reaction	Q-Value
In115(γ,n)In114	-9037.86 keV

<< 47-Ag-107	**49-In-115**	50-Sn-112 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (In113 production)**	MT17 (γ,3n) >>

In115 (γ,2n) or In113 production log-log

In115 (γ,2n) or In113 production lin-log
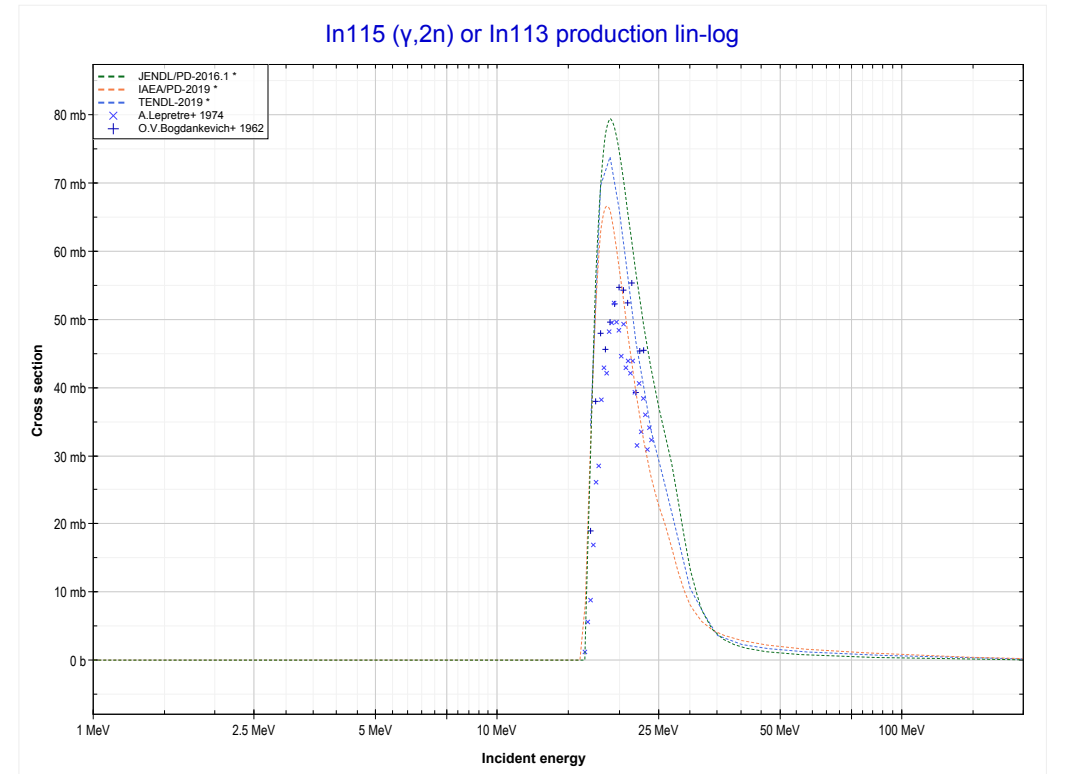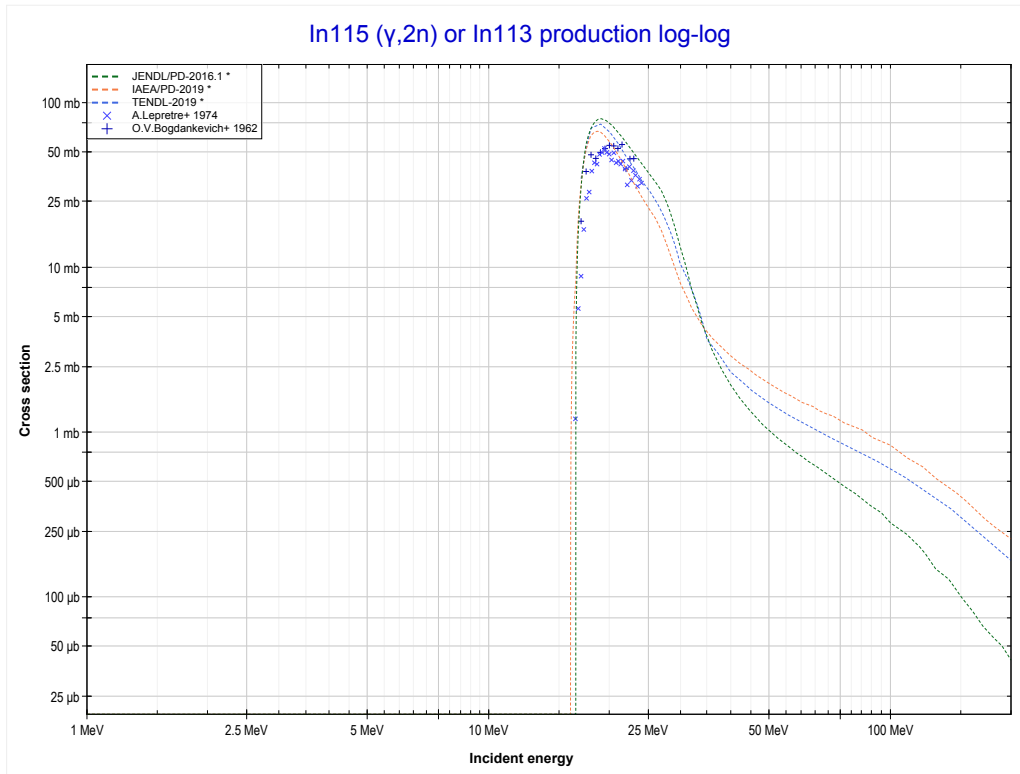
Reaction	Q-Value
In115(γ,2n)In113	-16311.86 keV

<< 42-Mo-100	**49-In-115**	50-Sn-117 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (In112 production)**	50-Sn-112 MT4 (γ,n) >>

In115 (γ,3n) or In112 production log-log

In115 (γ,3n) or In112 production lin-log
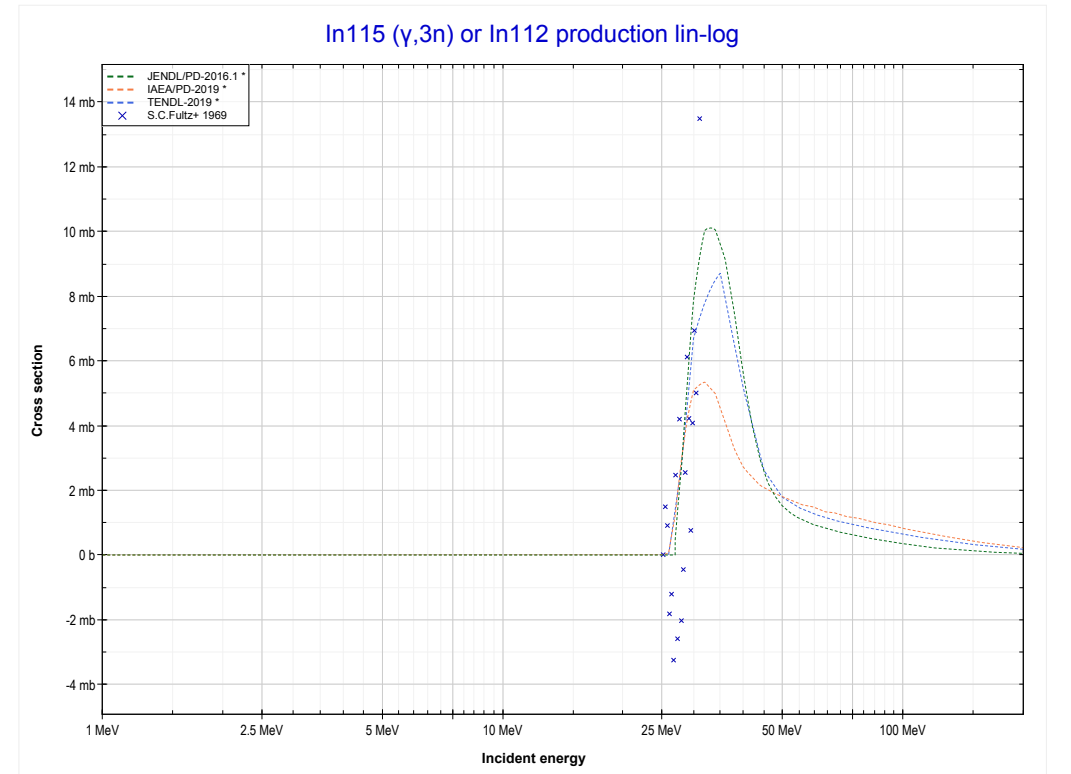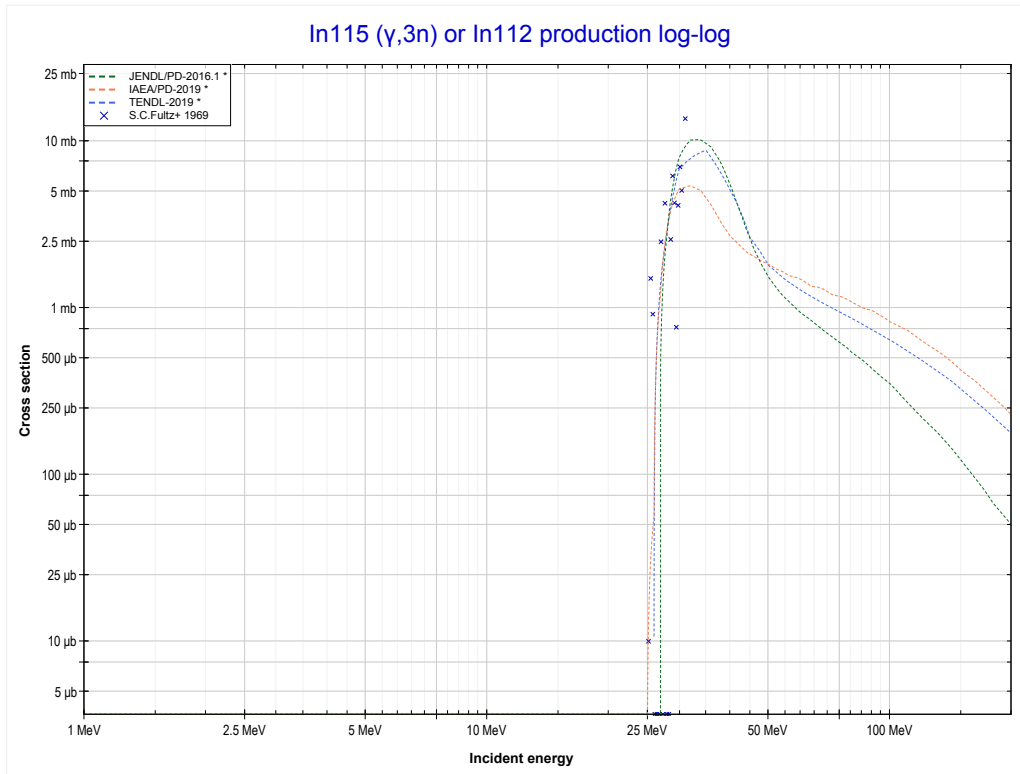
Reaction	Q-Value
In115(γ,3n)In112	-25760.30 keV

<< 49-In-115	**50-Sn-112**	50-Sn-114 >>
<< 49-In-115 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Sn111 production)**	MT16 (γ,2n) >>

Sn112 (γ,n) or Sn111 production log-log

Sn112 (γ,n) or Sn111 production lin-log
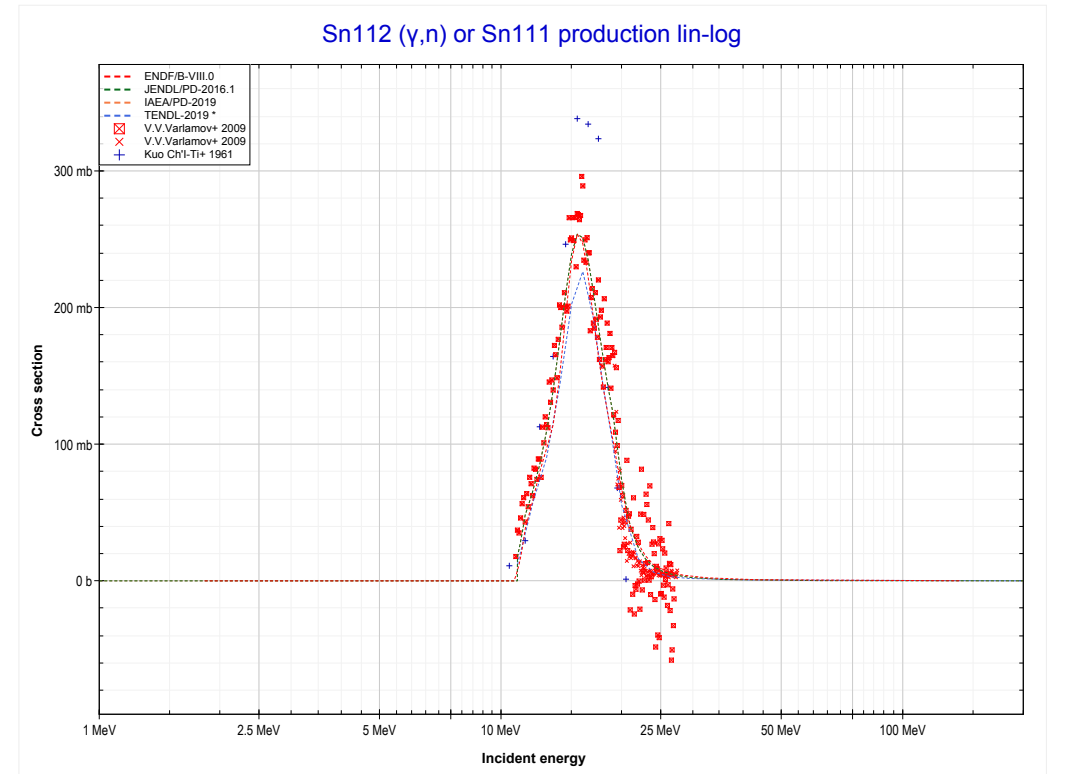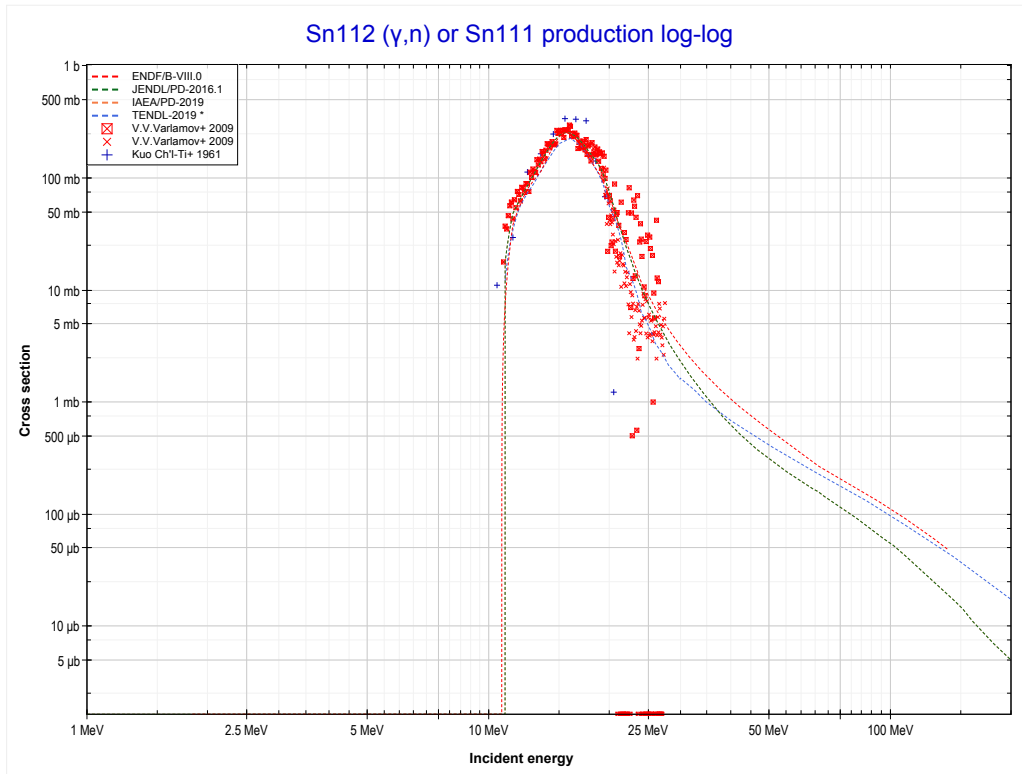
Reaction	Q-Value
Sn112(γ,n)Sn111	-10787.38 keV

<< 49-In-115	**50-Sn-112**	50-Sn-114 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn110 production)**	50-Sn-114 MT4 (γ,n) >>

Sn112 (γ,2n) or Sn110 production log-log

Sn112 (γ,2n) or Sn110 production lin-log
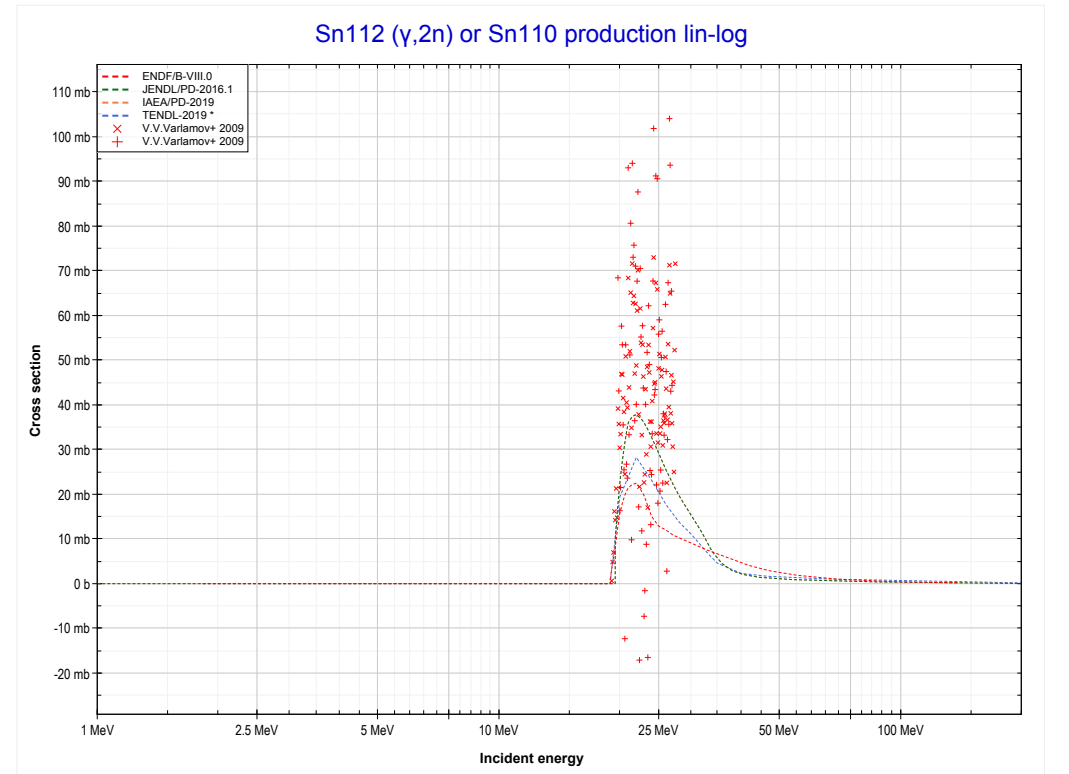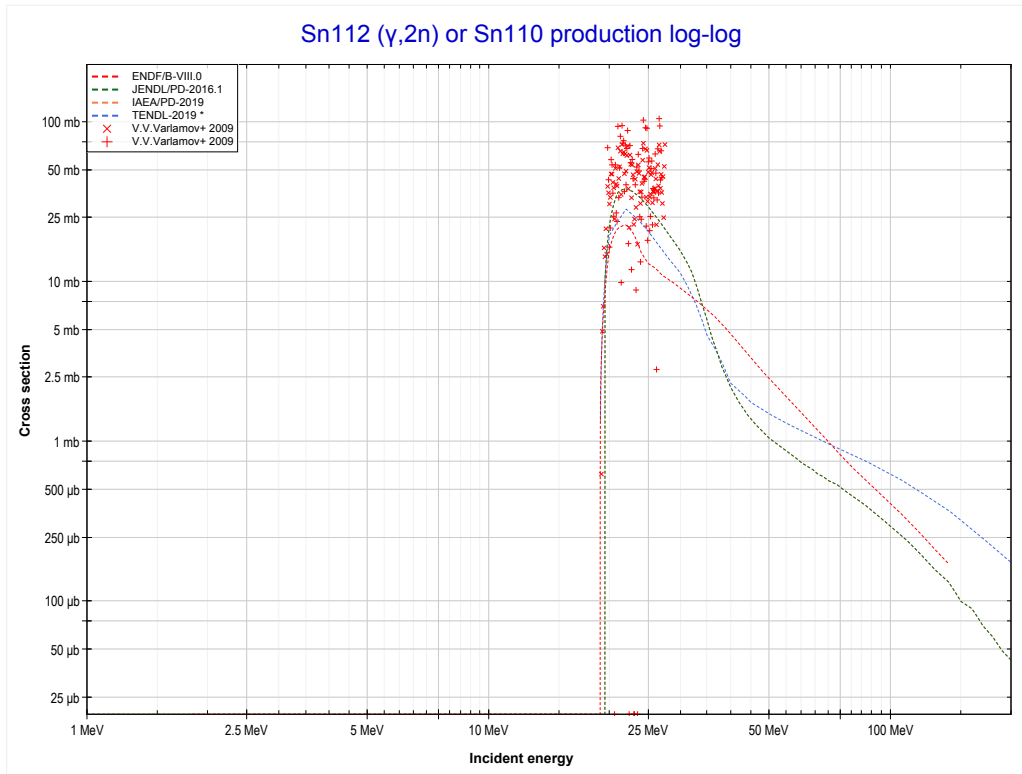
Reaction	Q-Value
Sn112(γ,2n)Sn110	-18955.69 keV

<< 50-Sn-112	**50-Sn-114**	50-Sn-116 >>
<< 50-Sn-112 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sn113 production)**	MT16 (γ,2n) >>

Sn114 (γ,n) or Sn113 production log-log

Sn114 (γ,n) or Sn113 production lin-log
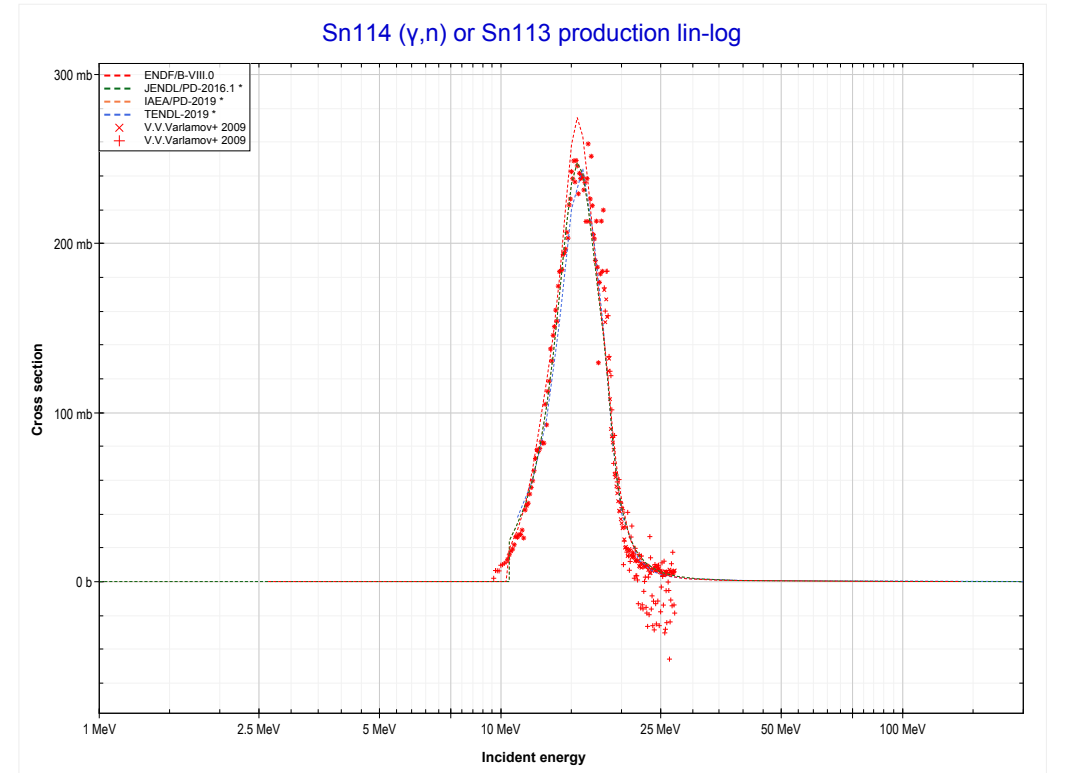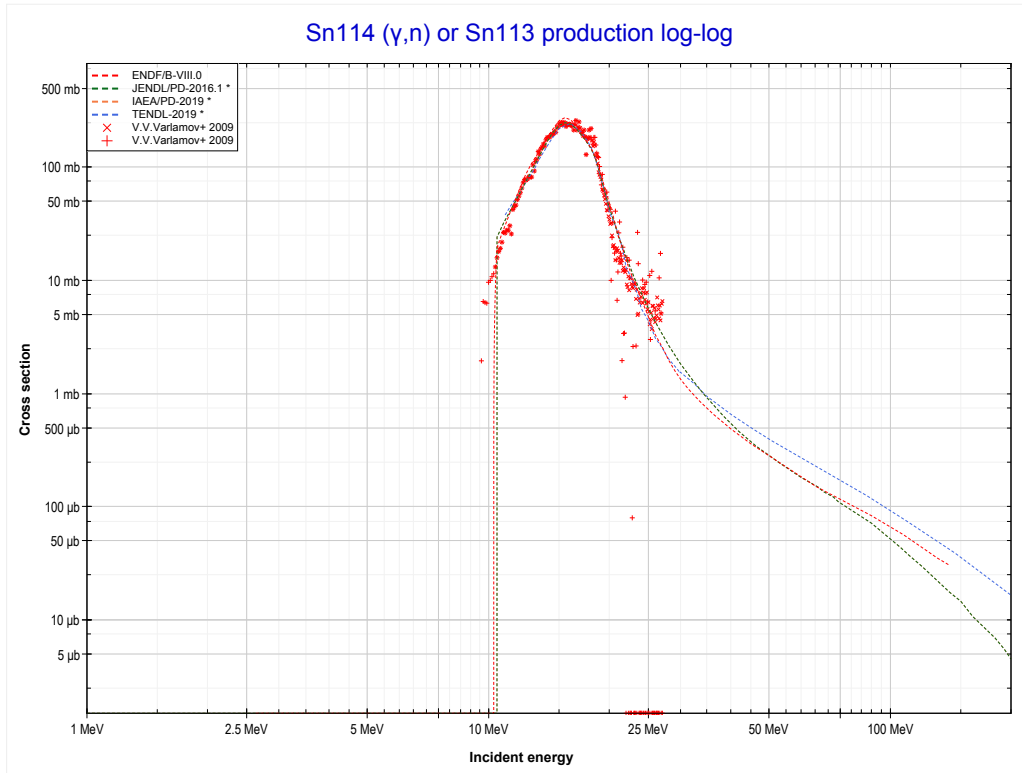
Reaction	Q-Value
Sn114(γ,n)Sn113	-10302.94 keV

<< 50-Sn-112	**50-Sn-114**	50-Sn-116 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn112 production)**	50-Sn-116 MT4 (γ,n) >>

Sn114 (γ,2n) or Sn112 production log-log

Sn114 (γ,2n) or Sn112 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × V.V.Varlamov+ 2009
- + V.V.Varlamov+ 2009
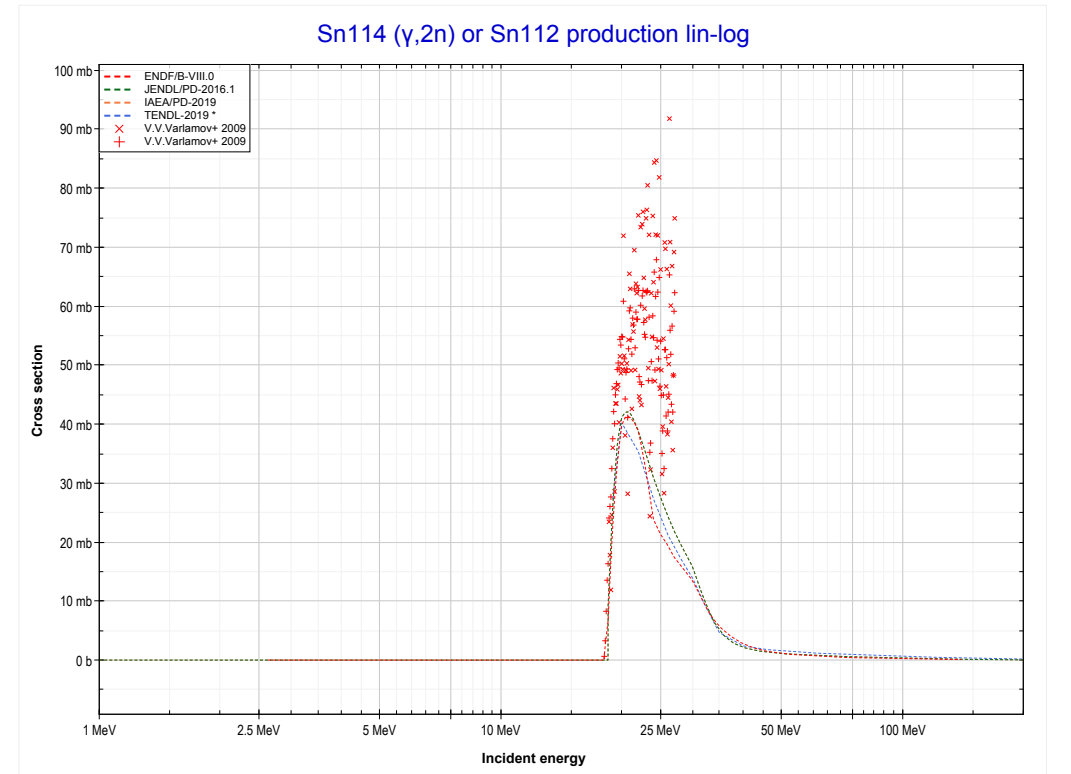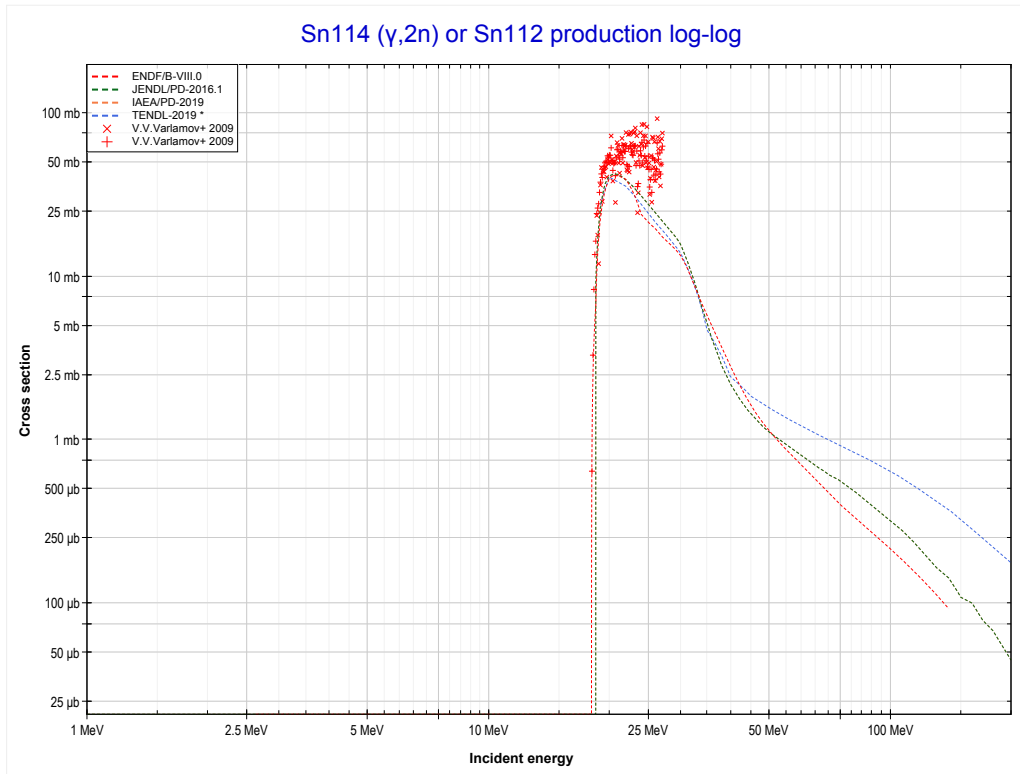
Reaction	Q-Value
Sn114(γ,2n)Sn112	-18047.30 keV

<< 50-Sn-114	**50-Sn-116**	50-Sn-117 >>
<< 50-Sn-114 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sn115 production)**	MT16 (γ,2n) >>

Sn116 (γ,n) or Sn115 production log-log

Sn116 (γ,n) or Sn115 production lin-log
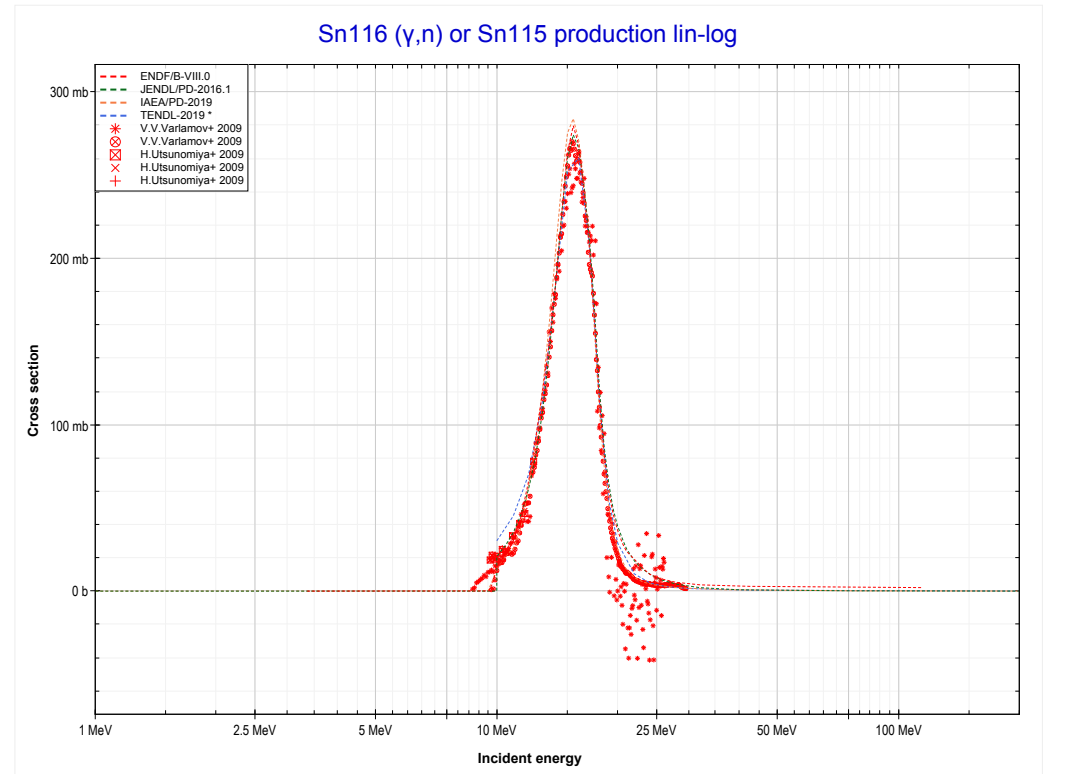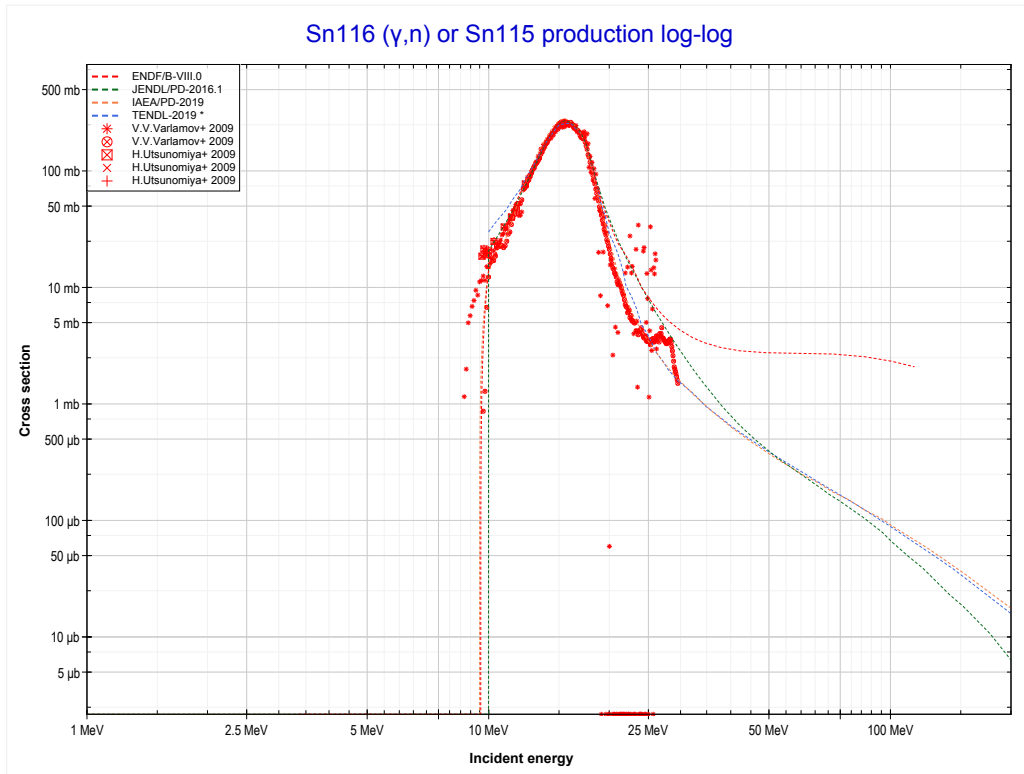
Reaction	Q-Value
Sn116(γ,n)Sn115	-9563.45 keV

<< 50-Sn-114	**50-Sn-116**	50-Sn-117 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn114 production)**	50-Sn-117 MT4 (γ,n) >>

Sn116 (γ,2n) or Sn114 production log-log

Sn116 (γ,2n) or Sn114 production lin-log
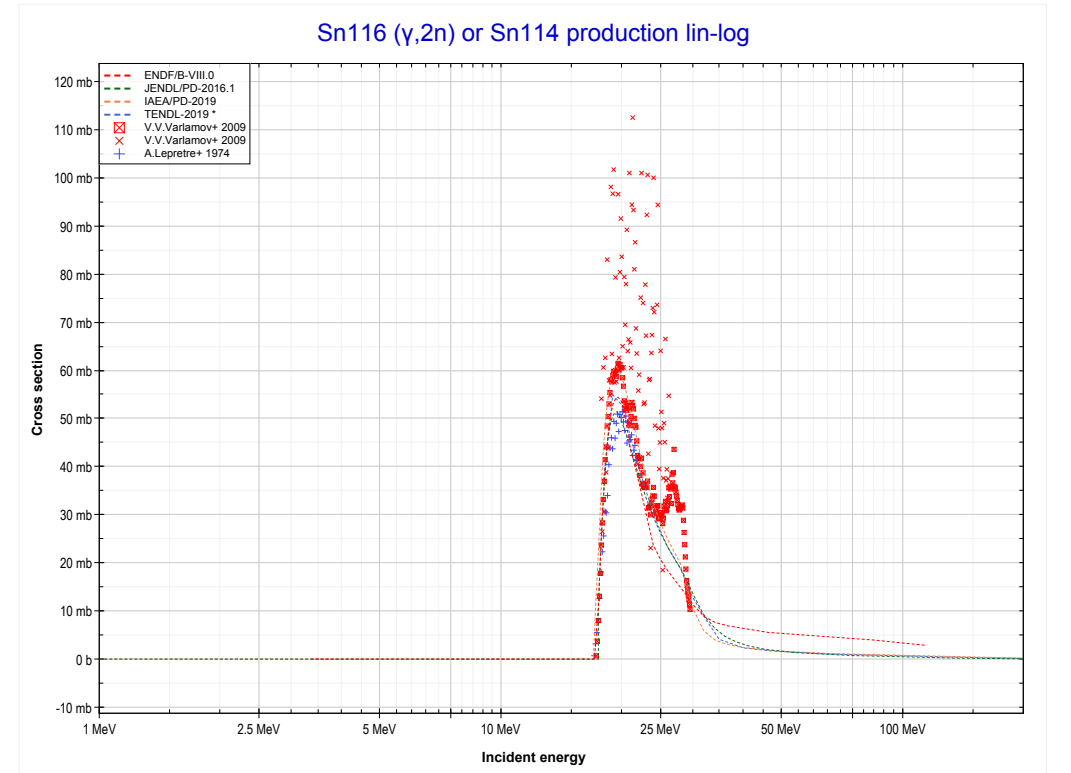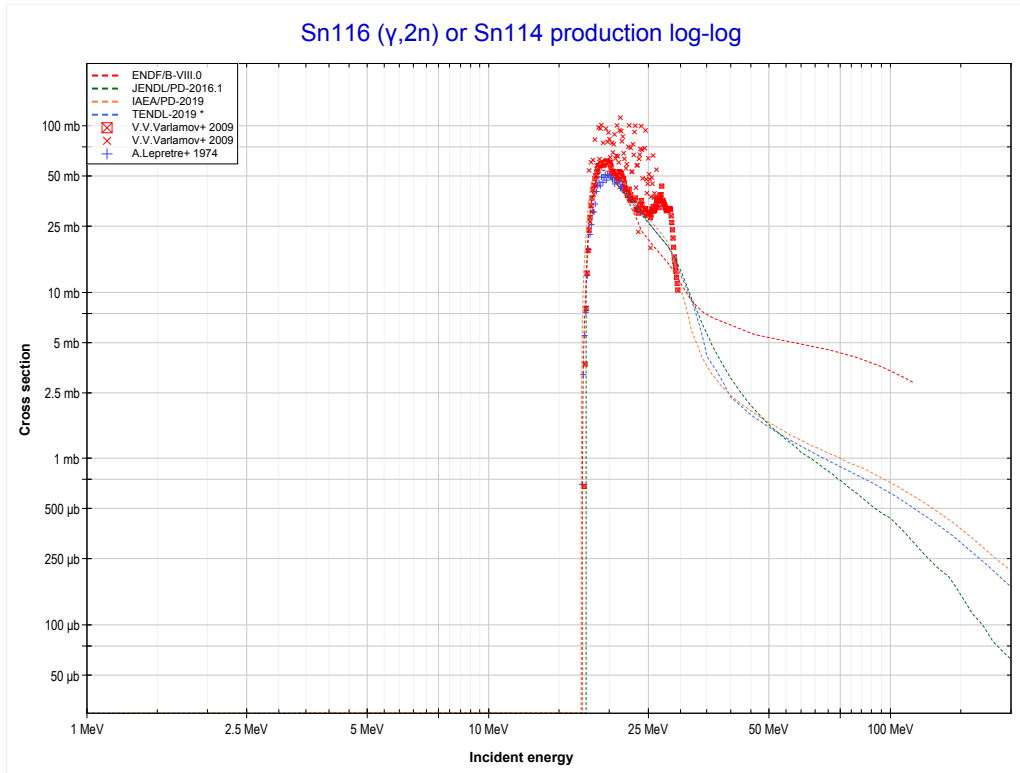
Reaction	Q-Value
Sn116(γ,2n)Sn114	-17108.88 keV

<< 50-Sn-116	**50-Sn-117**	50-Sn-118 >>
<< 50-Sn-116 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sn116 production)**	MT16 (γ,2n) >>

Sn117 (γ,n) or Sn116 production log-log

Sn117 (γ,n) or Sn116 production lin-log
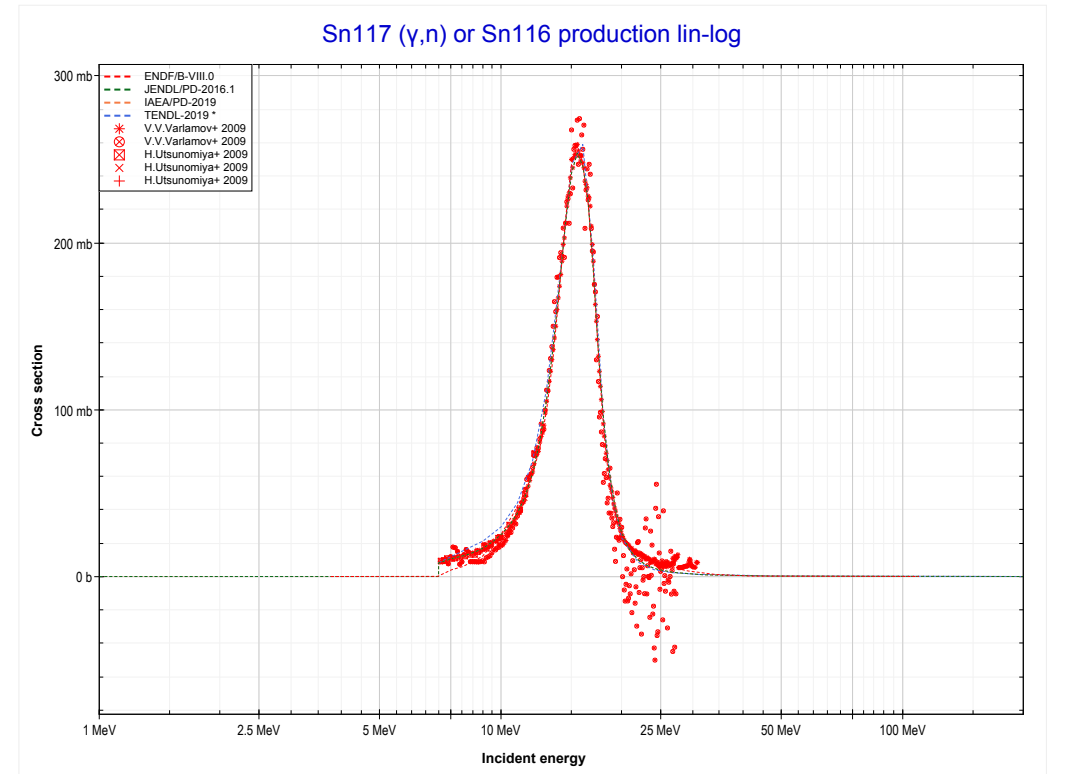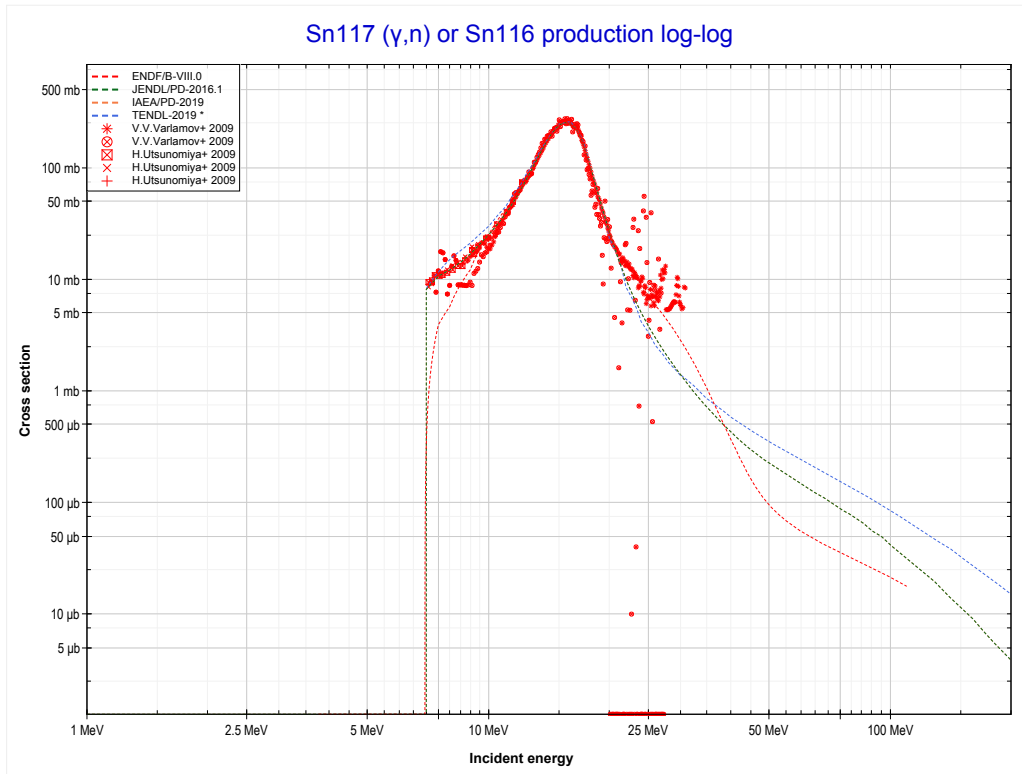
Reaction	Q-Value
Sn117(γ,n)Sn116	-6943.15 keV

<< 50-Sn-116	**50-Sn-117**	50-Sn-118 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn115 production)**	MT17 (γ,3n) >>

Sn117 (γ,2n) or Sn115 production log-log

Sn117 (γ,2n) or Sn115 production lin-log
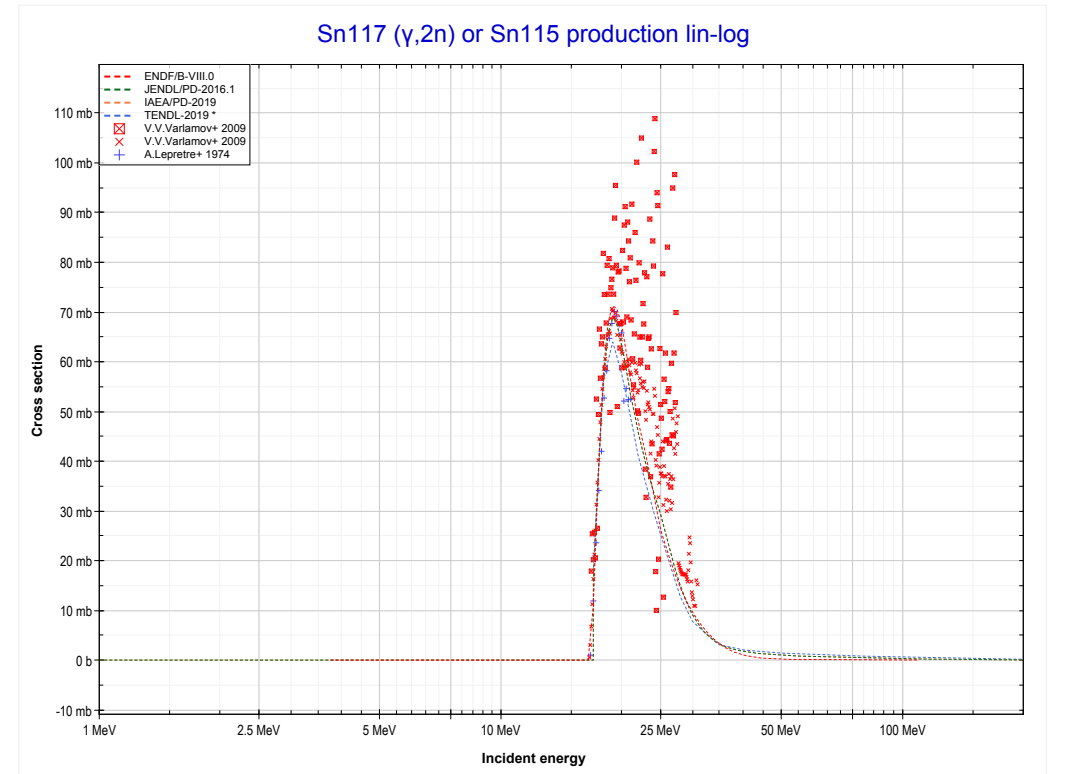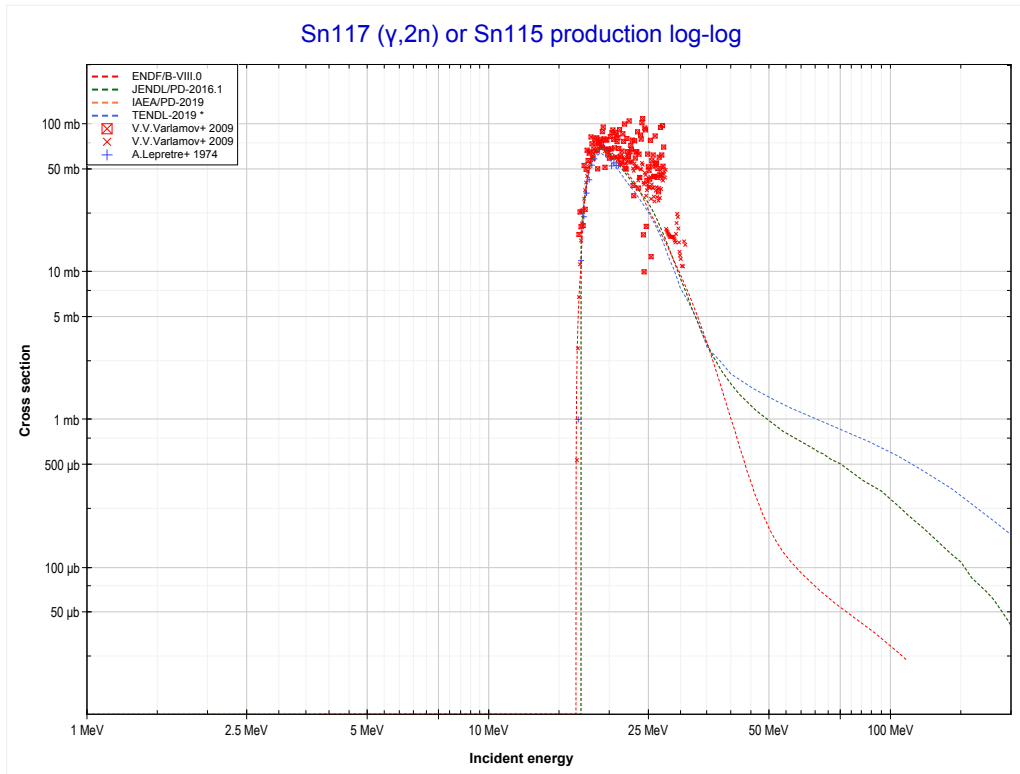
Reaction	Q-Value
Sn117(γ,2n)Sn115	-16506.60 keV

<< 49-In-115	**50-Sn-117**	50-Sn-118 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Sn114 production)**	50-Sn-118 MT4 (γ,n) >>

Sn117 (γ,3n) or Sn114 production log-log

Sn117 (γ,3n) or Sn114 production lin-log

- - - ENDF/B-VIII.0
- - - JENDL/PD-2016.1
- - - IAEA/PD-2019
- - - TENDL-2019 *
- × S.C.Fultz+ 1969
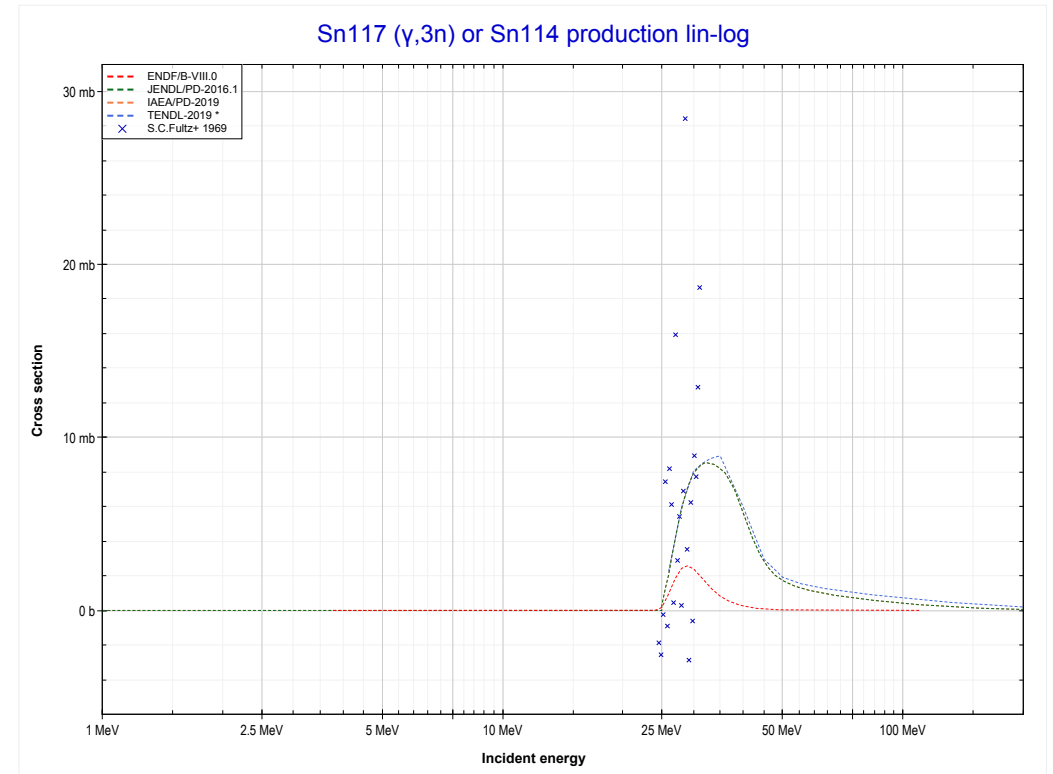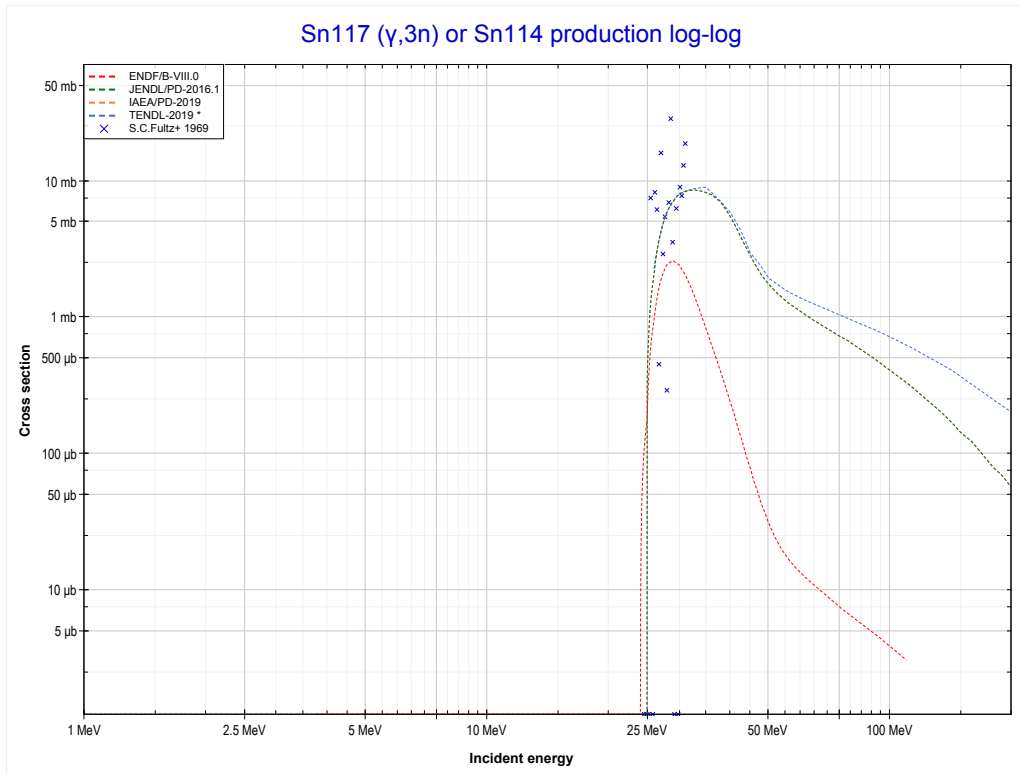
Reaction	Q-Value
Sn117(γ,3n)Sn114	-24052.03 keV

<< 50-Sn-117	**50-Sn-118**	50-Sn-119 >>
<< 50-Sn-117 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Sn117 production)**	MT16 (γ,2n) >>

Sn118 (γ,n) or Sn117 production log-log

Sn118 (γ,n) or Sn117 production lin-log
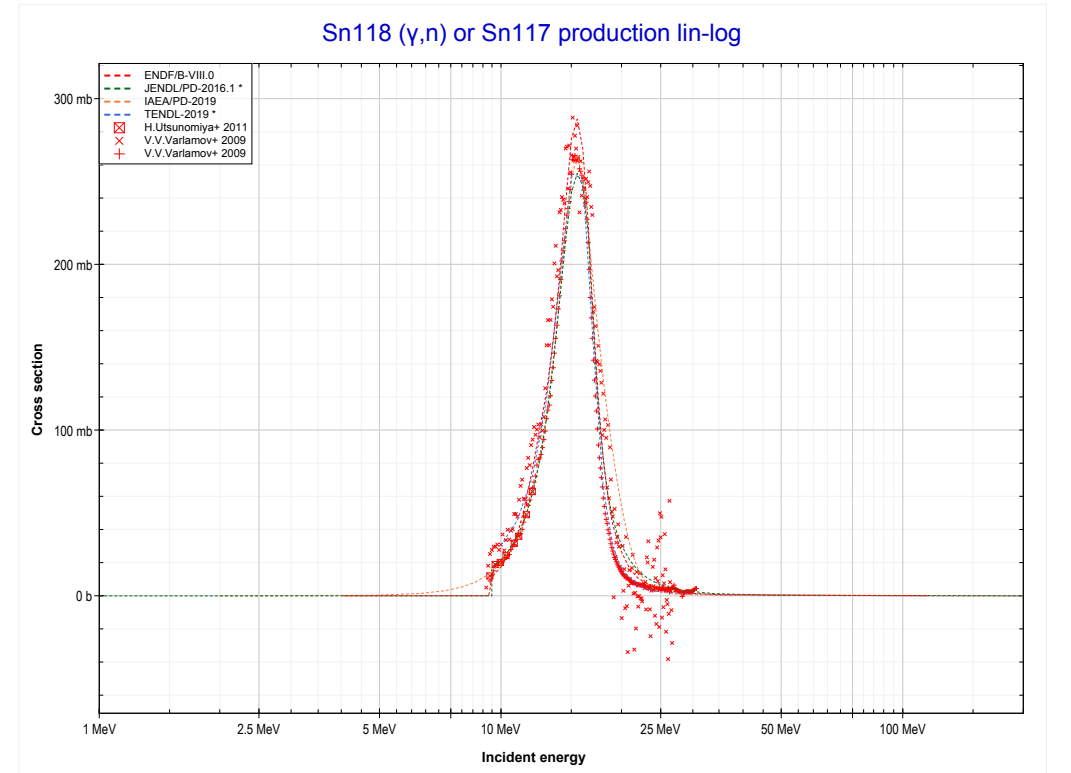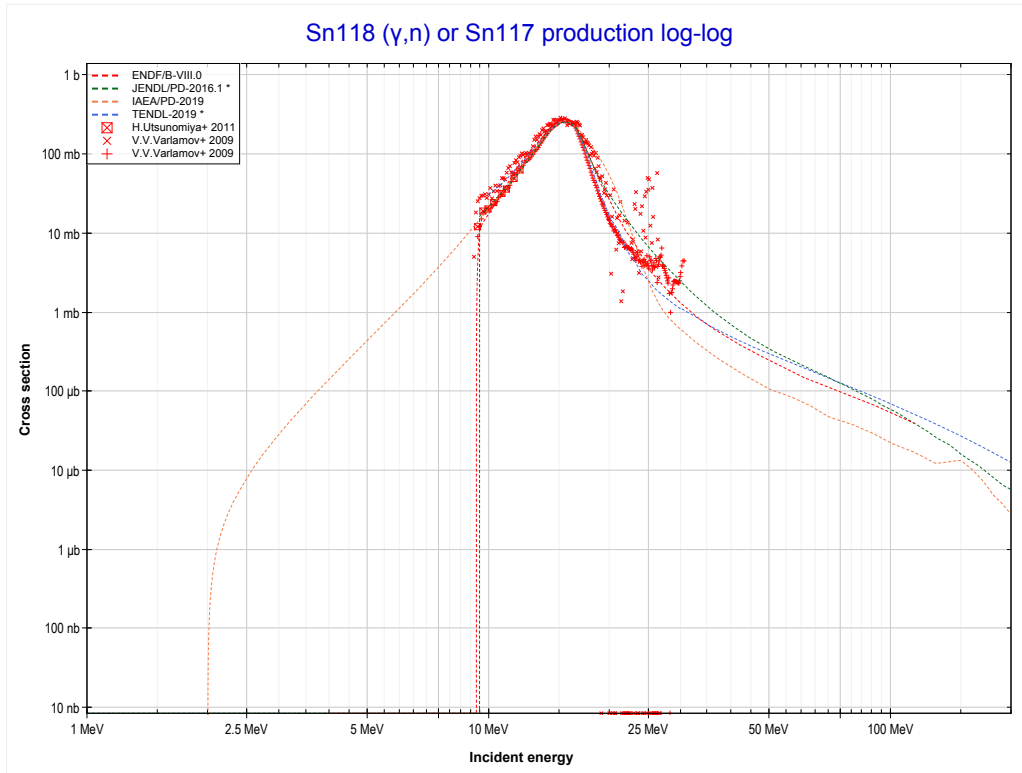
Reaction	Q-Value
Sn118(γ,n)Sn117	-9326.42 keV

<< 50-Sn-117	**50-Sn-118**	50-Sn-119 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn116 production)**	MT17 (γ,3n) >>

Sn118 (γ,2n) or Sn116 production log-log

Sn118 (γ,2n) or Sn116 production lin-log
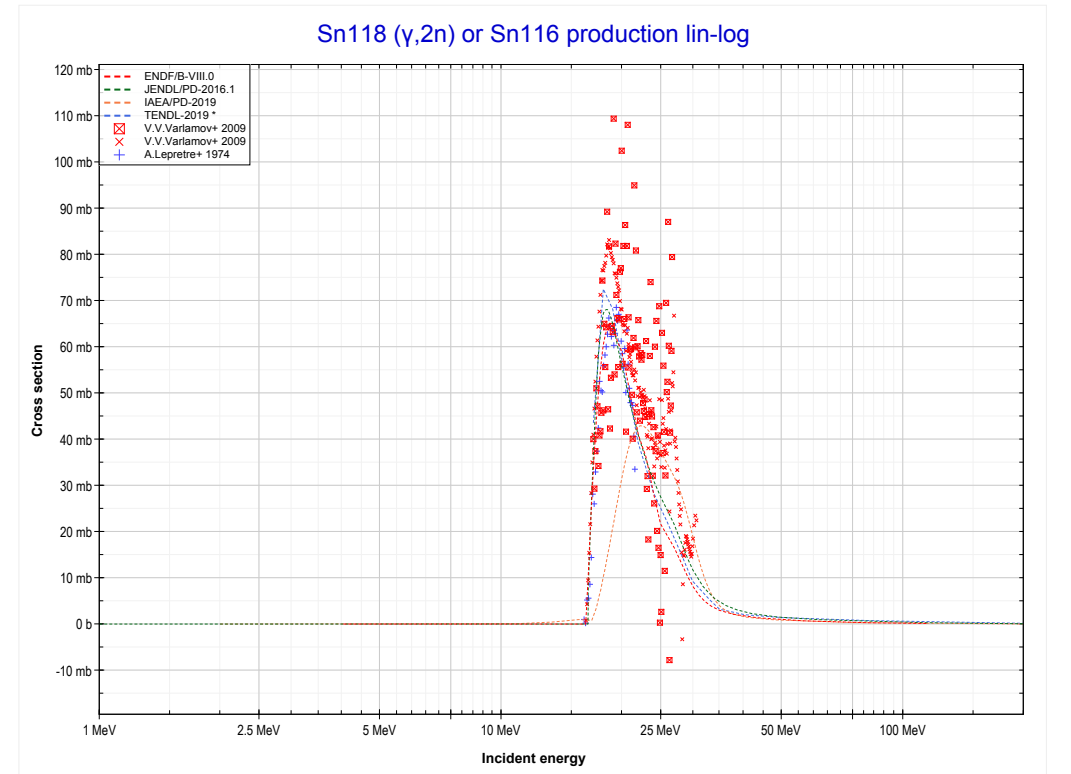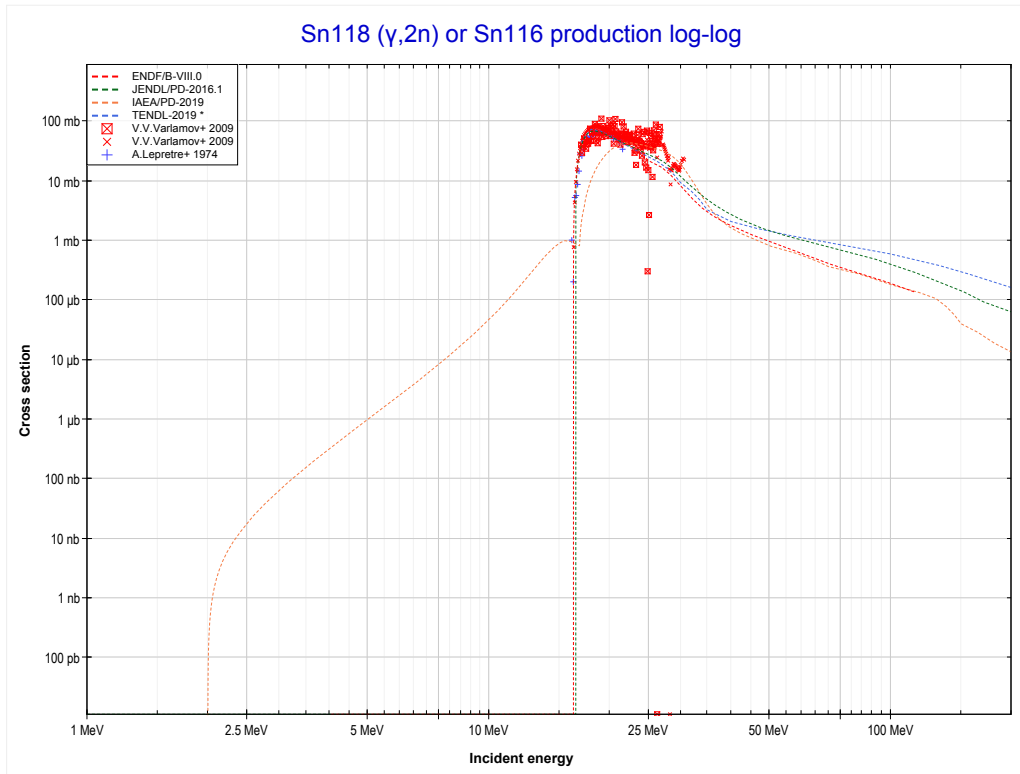
Reaction	Q-Value
Sn118(γ,2n)Sn116	-16269.56 keV

<< 50-Sn-117	**50-Sn-118**	50-Sn-119 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Sn115 production)**	50-Sn-119 MT4 (γ,n) >>

Sn118 (γ,3n) or Sn115 production log-log

Sn118 (γ,3n) or Sn115 production lin-log
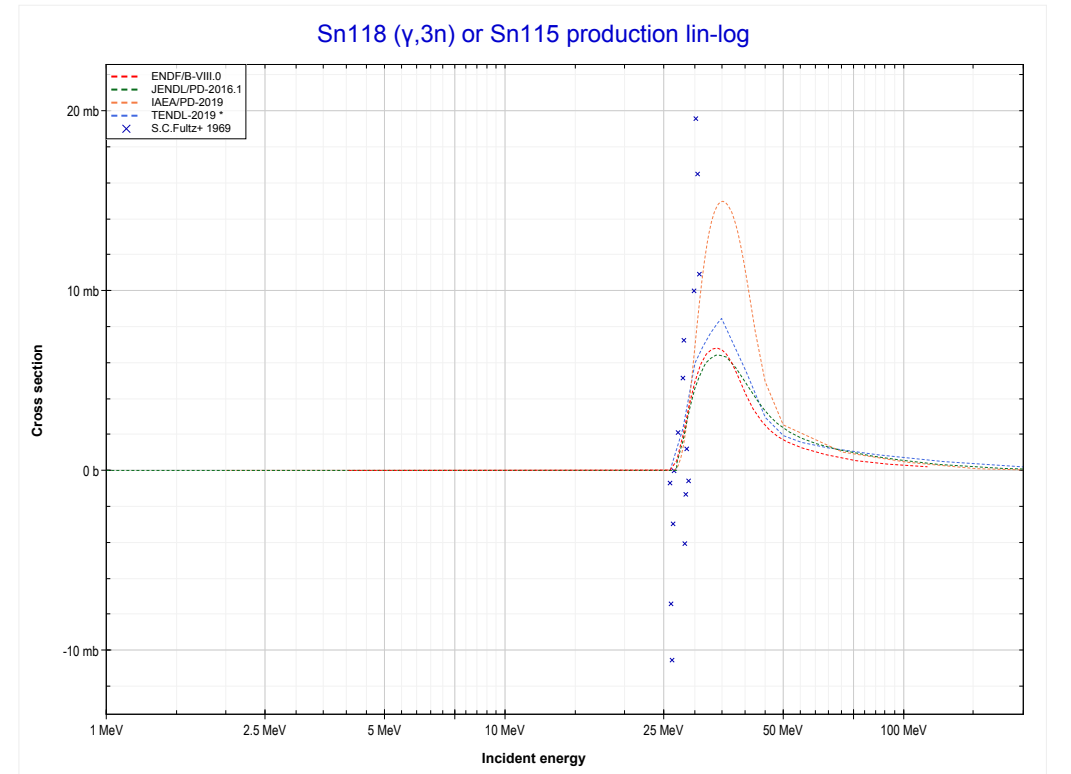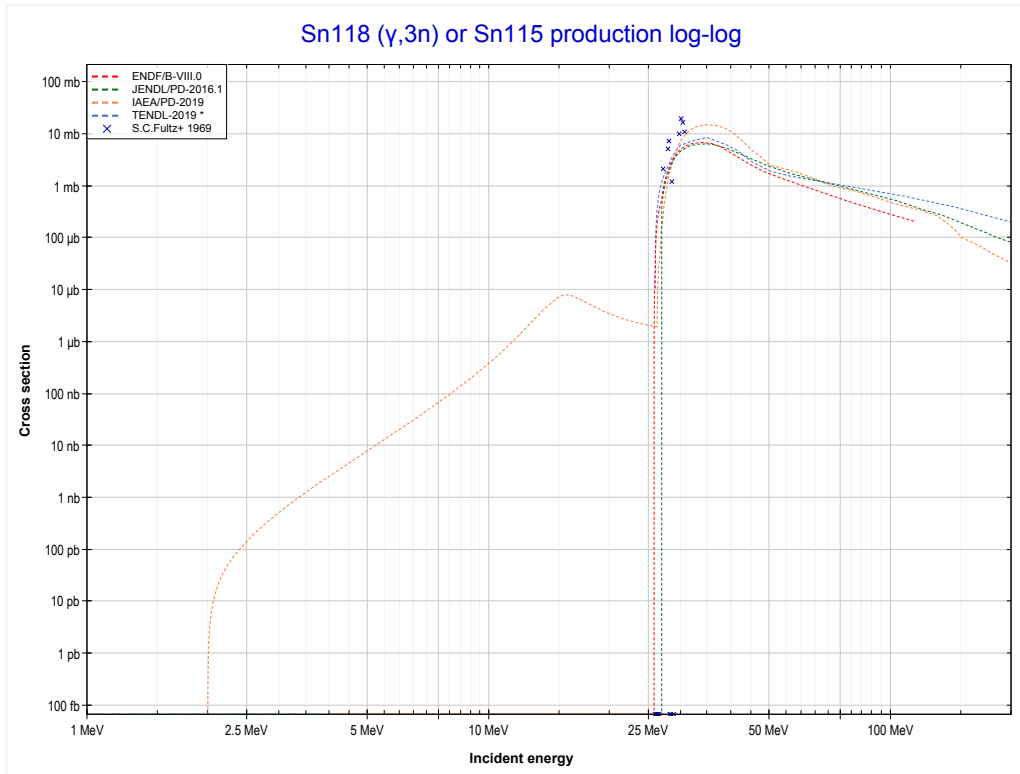
Reaction	Q-Value
Sn118(γ,3n)Sn115	-25833.02 keV

<< 50-Sn-118	**50-Sn-119**	50-Sn-120 >>
<< 50-Sn-118 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Sn118 production)**	MT16 (γ,2n) >>

Sn119 (γ,n) or Sn118 production log-log

Sn119 (γ,n) or Sn118 production lin-log
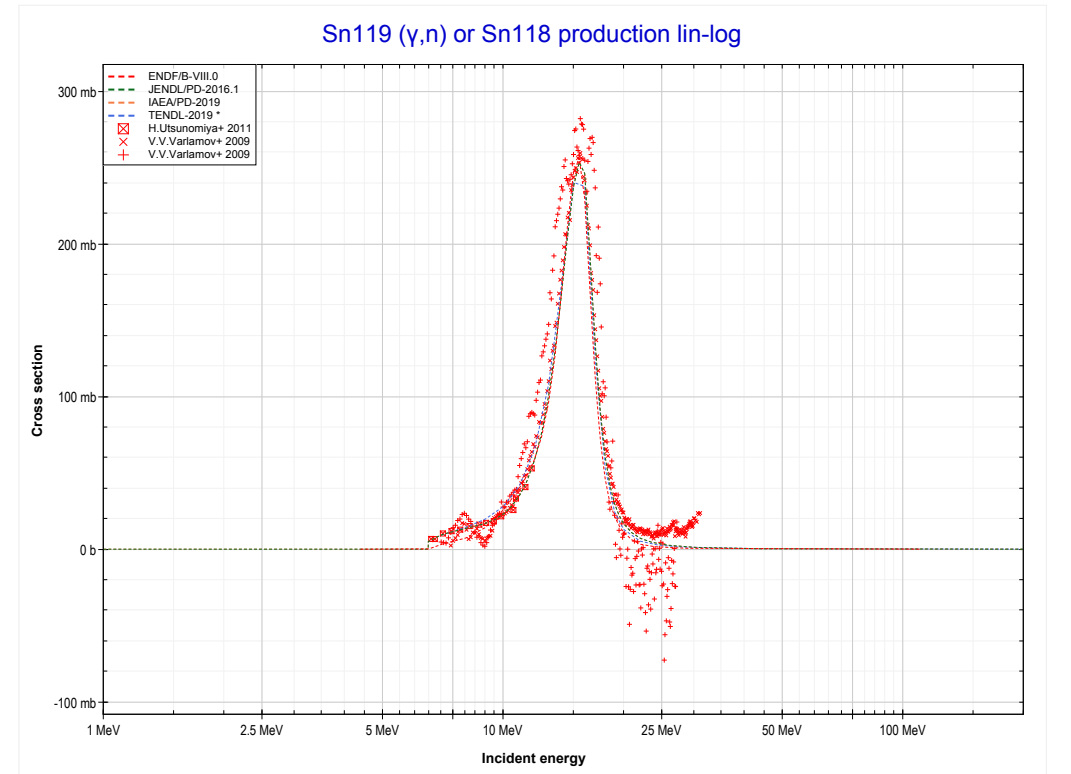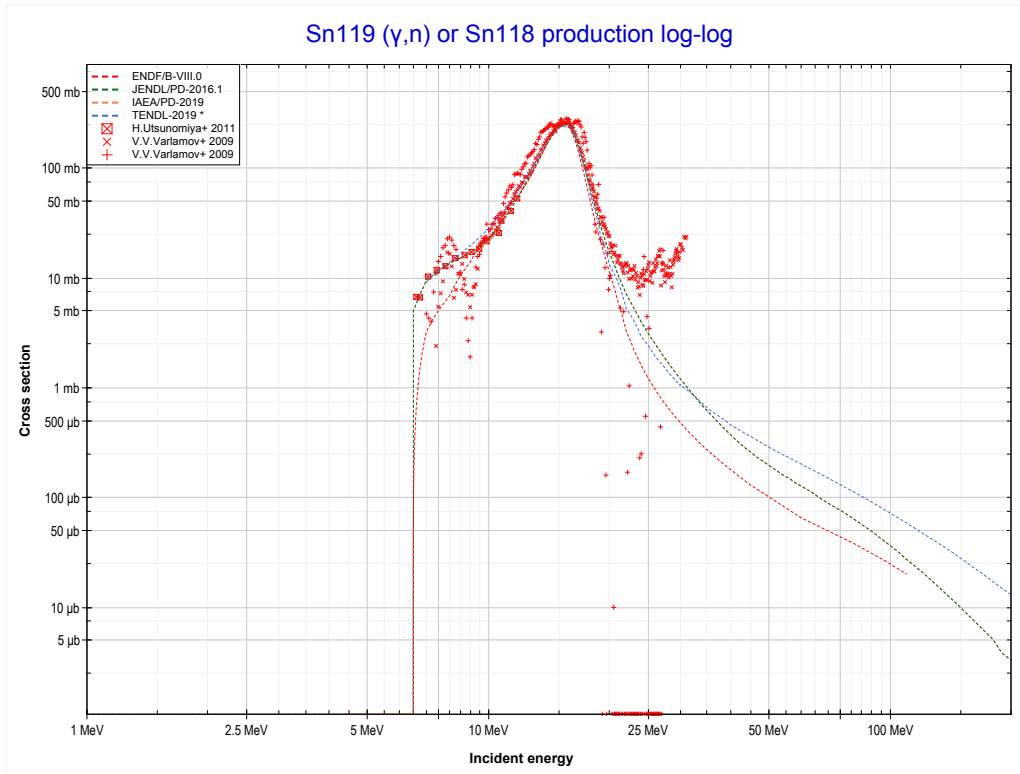
Reaction	Q-Value
Sn119(γ,n)Sn118	-6483.42 keV

<< 50-Sn-118	**50-Sn-119**	50-Sn-120 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn117 production)**	MT17 (γ,3n) >>

Sn119 (γ,2n) or Sn117 production log-log

Sn119 (γ,2n) or Sn117 production lin-log
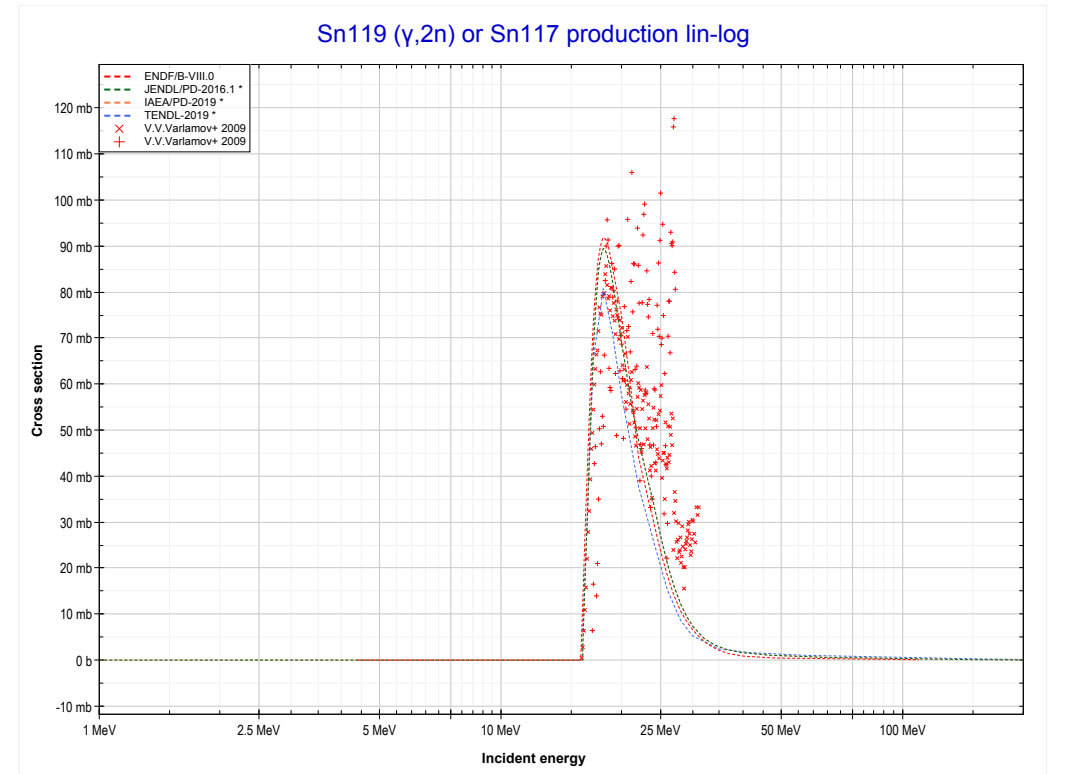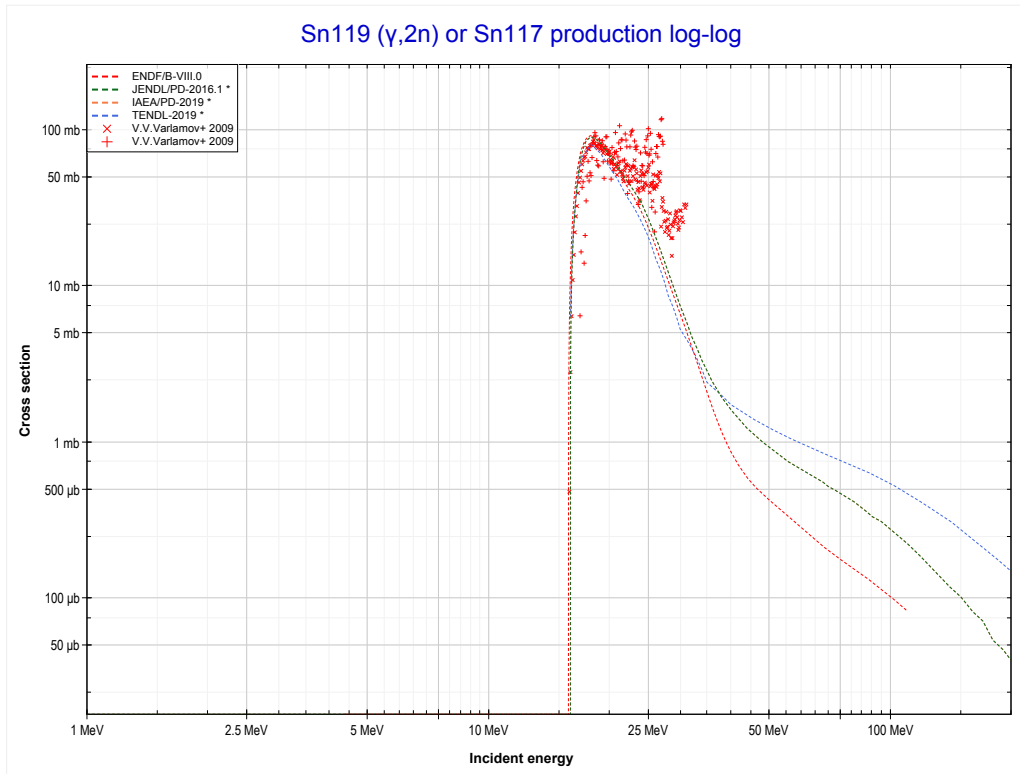
Reaction	Q-Value
Sn119(γ,2n)Sn117	-15809.83 keV

<< 50-Sn-118	**50-Sn-119**	50-Sn-120 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Sn116 production)**	50-Sn-120 MT4 (γ,n) >>

Sn119 (γ,3n) or Sn116 production log-log

Sn119 (γ,3n) or Sn116 production lin-log
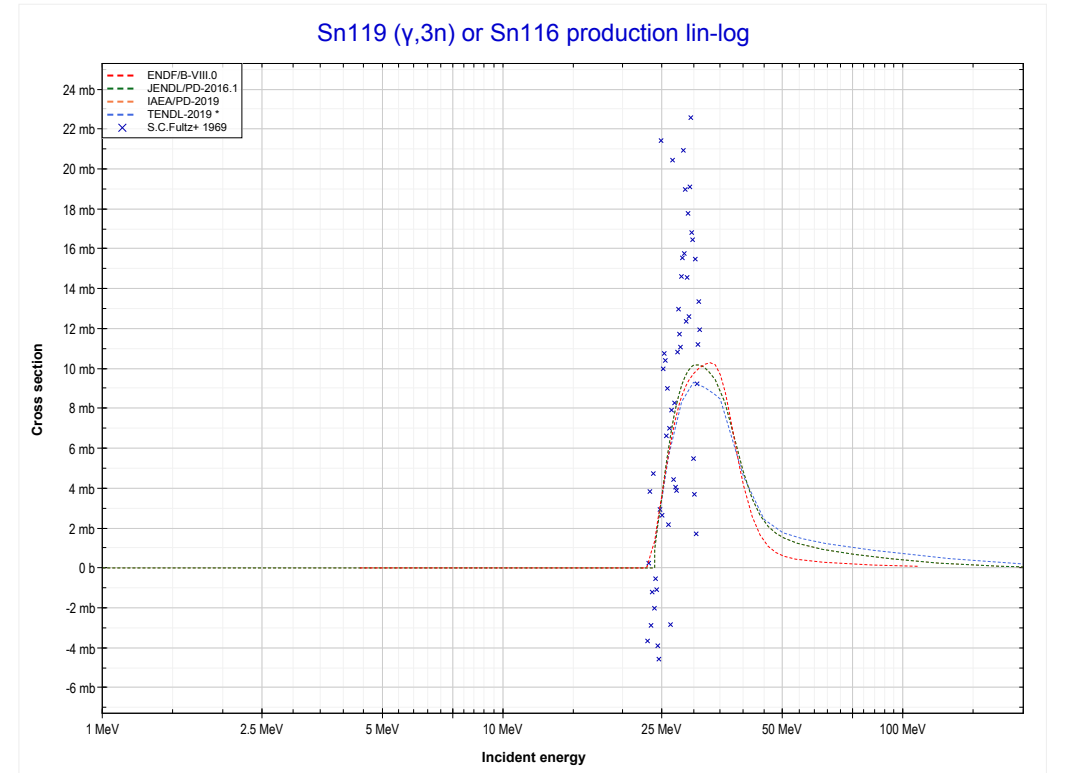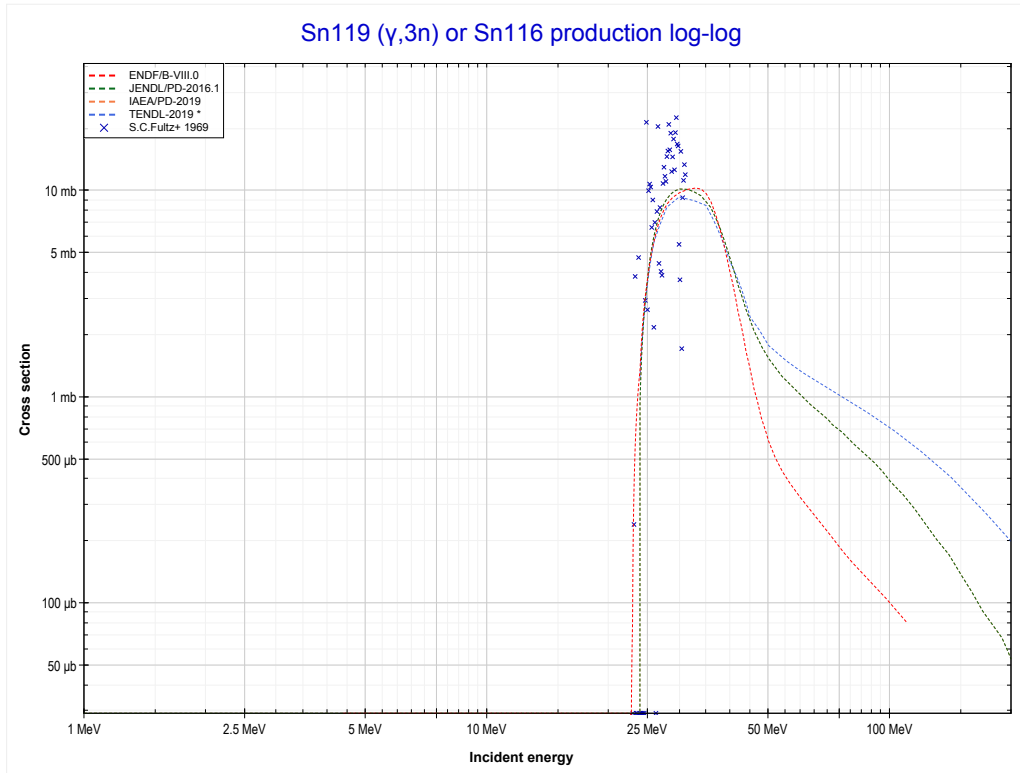
Reaction	Q-Value
Sn119(γ,3n)Sn116	-22752.98 keV

<< 50-Sn-119	**50-Sn-120**	50-Sn-122 >>
<< 50-Sn-119 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Sn119 production)**	MT16 (γ,2n) >>

Sn120 (γ,n) or Sn119 production log-log

Sn120 (γ,n) or Sn119 production lin-log
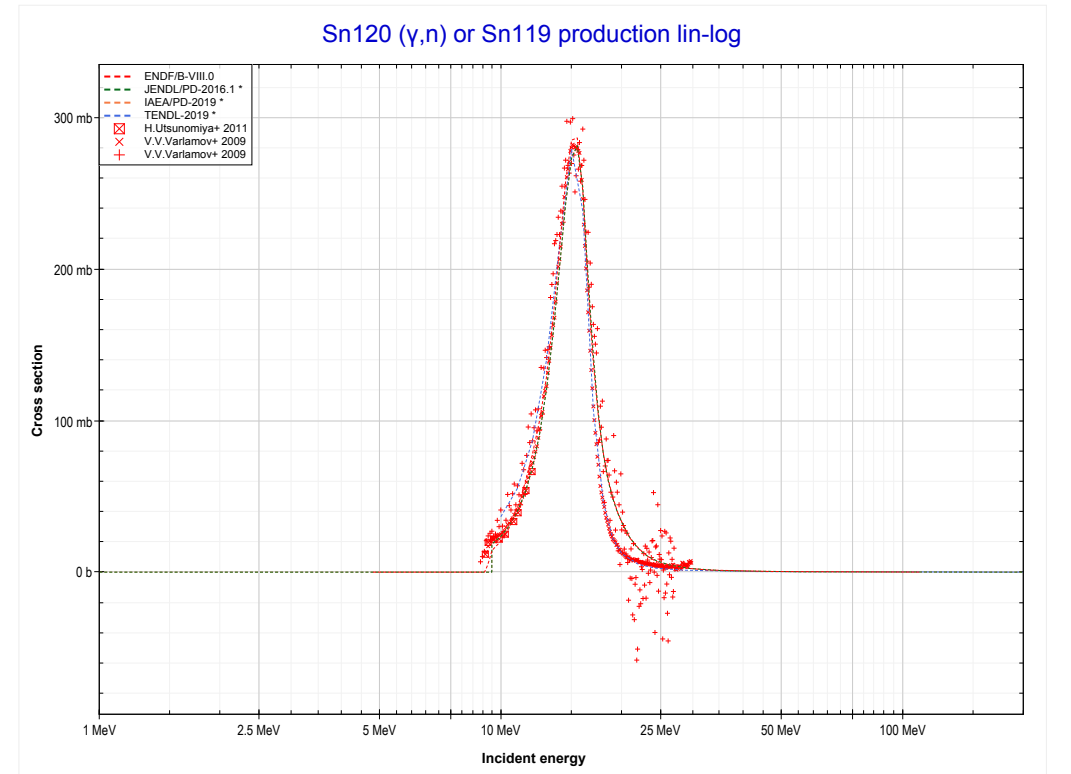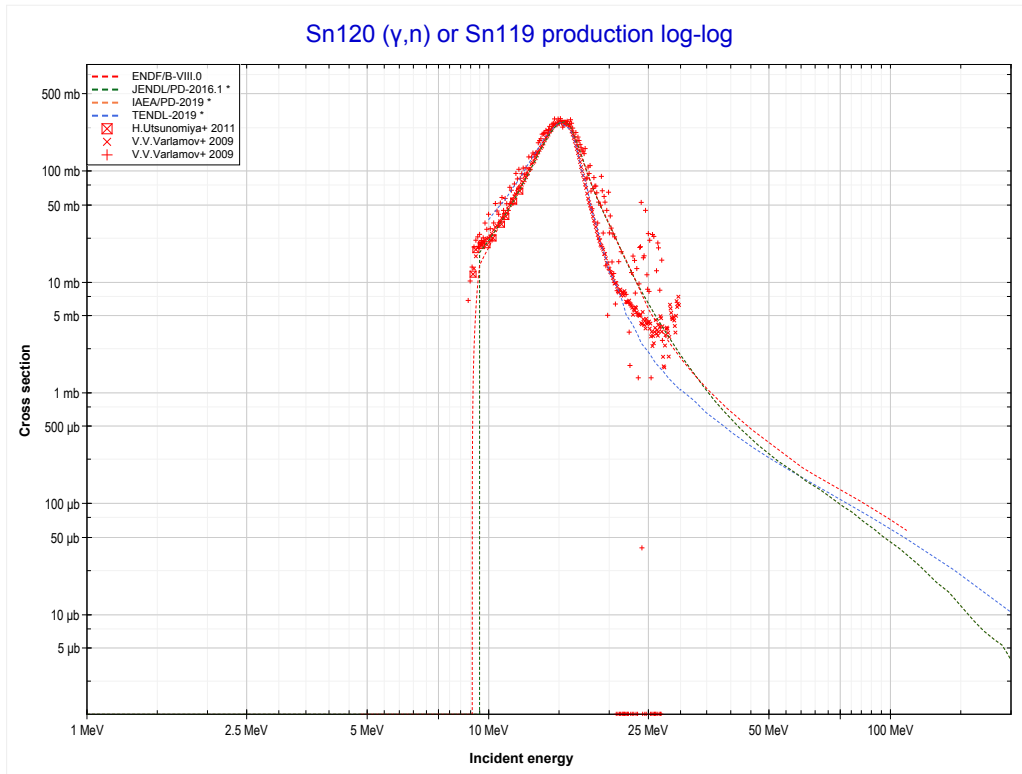
Reaction	Q-Value
Sn120(γ,n)Sn119	-9104.72 keV

<< 50-Sn-119	**50-Sn-120**	50-Sn-122 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn118 production)**	MT17 (γ,3n) >>

Sn120 (γ,2n) or Sn118 production log-log

Sn120 (γ,2n) or Sn118 production lin-log
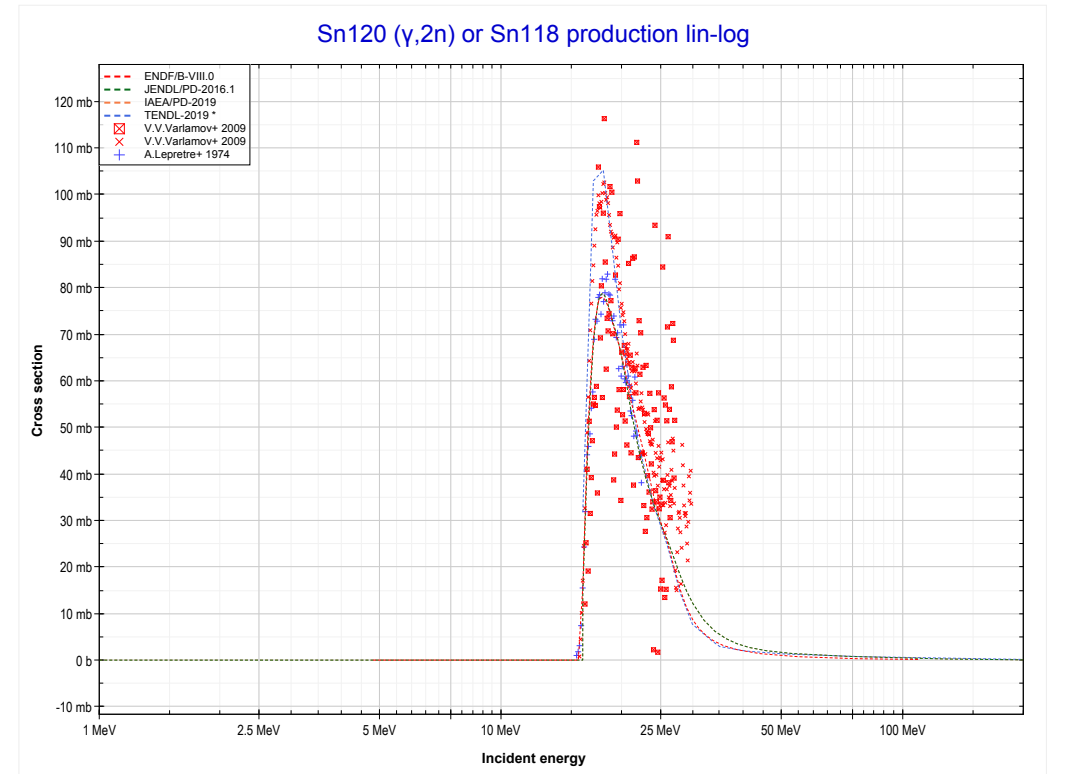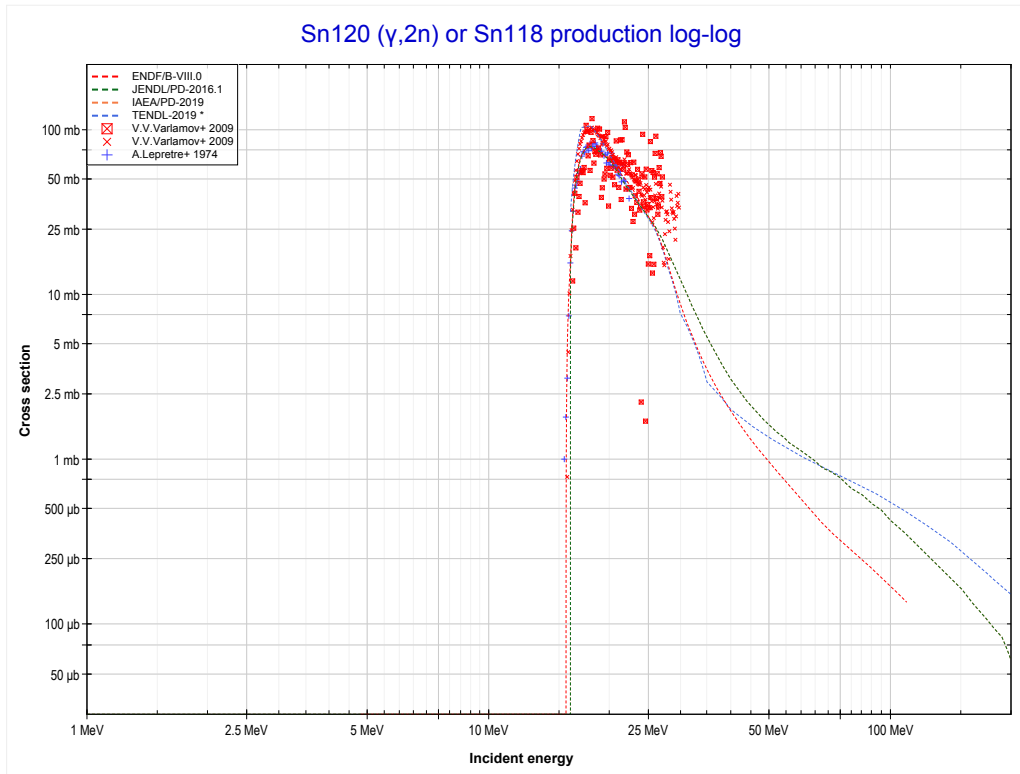
Reaction	Q-Value
Sn120(γ,2n)Sn118	-15588.13 keV

<< 50-Sn-119	**50-Sn-120**	50-Sn-124 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Sn117 production)**	MT103 (γ,p) >>

Sn120 (γ,3n) or Sn117 production log-log

Sn120 (γ,3n) or Sn117 production lin-log
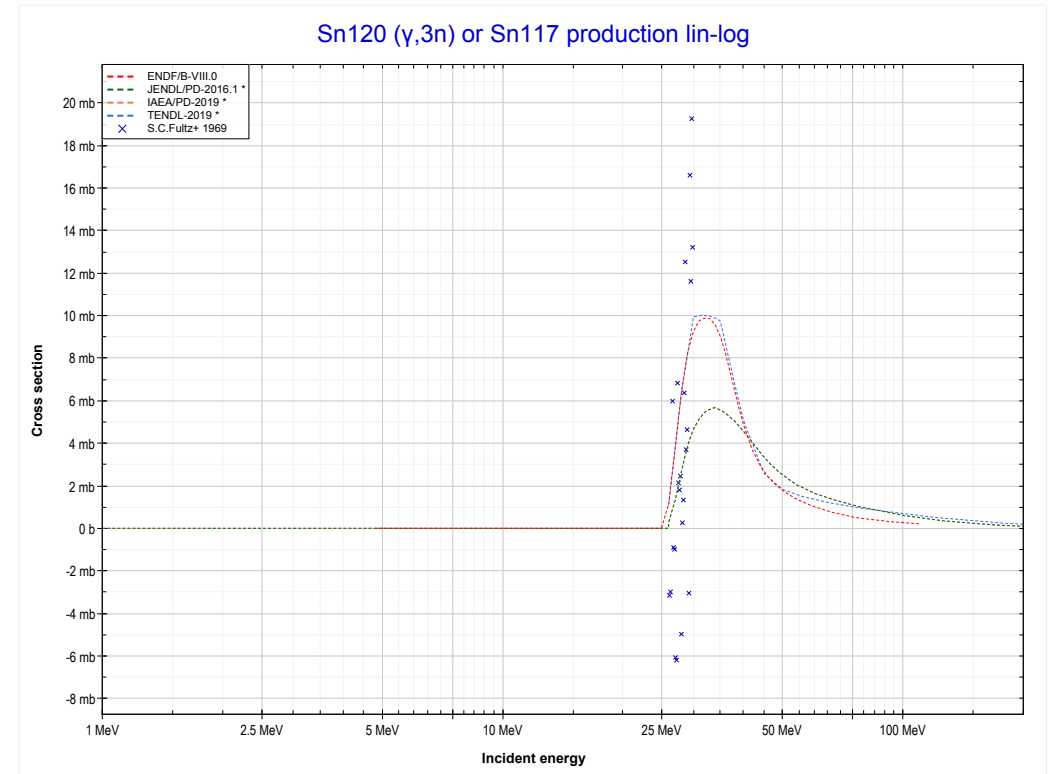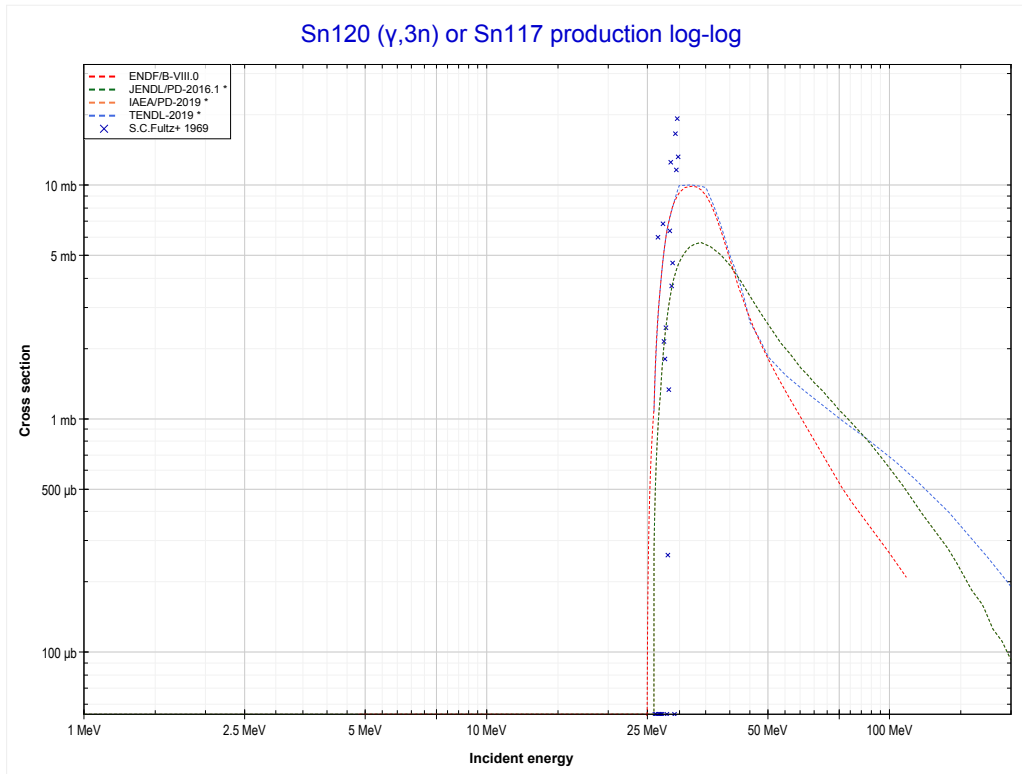
Reaction	Q-Value
Sn120(γ,3n)Sn117	-24914.55 keV

<< 46-Pd-108	**50-Sn-120**	64-Gd-160 >>
<< MT17 (γ,3n)	**MT103 (γ,p) or MT5 (In119 production)**	50-Sn-122 MT4 (γ,n) >>

Sn120 (γ,p) or In119 production log-log

Sn120 (γ,p) or In119 production lin-log
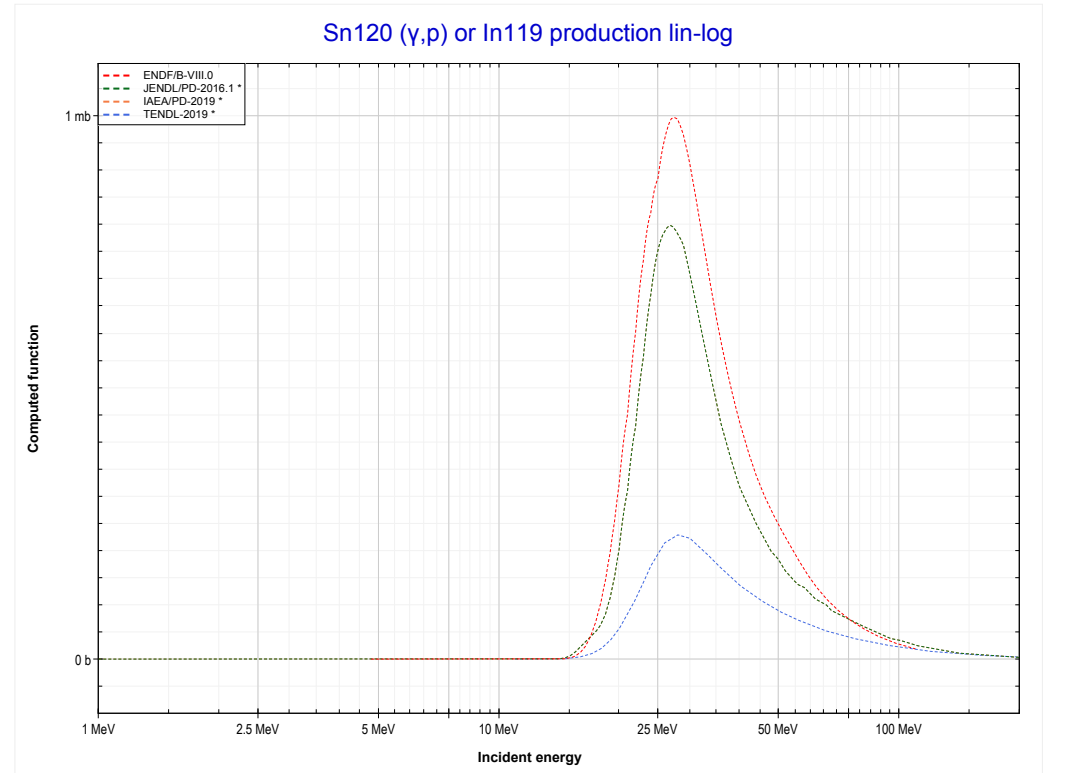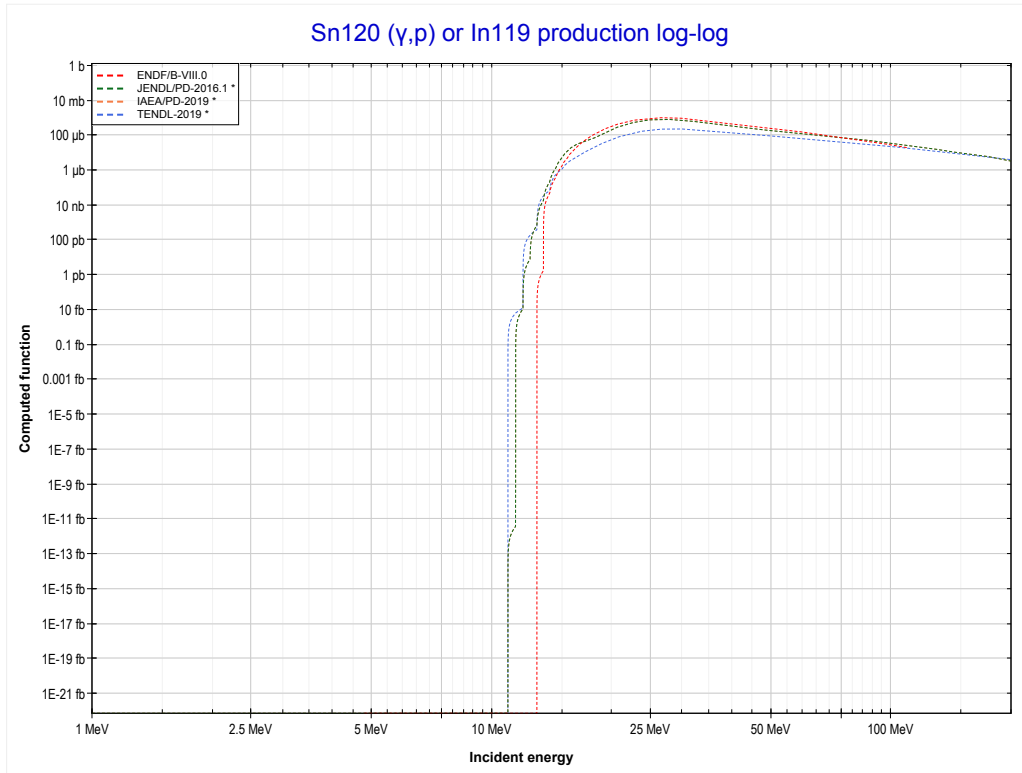
Reaction	Q-Value
Sn120(γ,p)In119	-10688.37 keV

<< 50-Sn-120	**50-Sn-122**	50-Sn-124 >>
<< 50-Sn-120 MT103 (γ,p)	**MT4 (γ,n) or MT5 (Sn121 production)**	MT16 (γ,2n) >>

Sn122 (γ,n) or Sn121 production log-log

Sn122 (γ,n) or Sn121 production lin-log
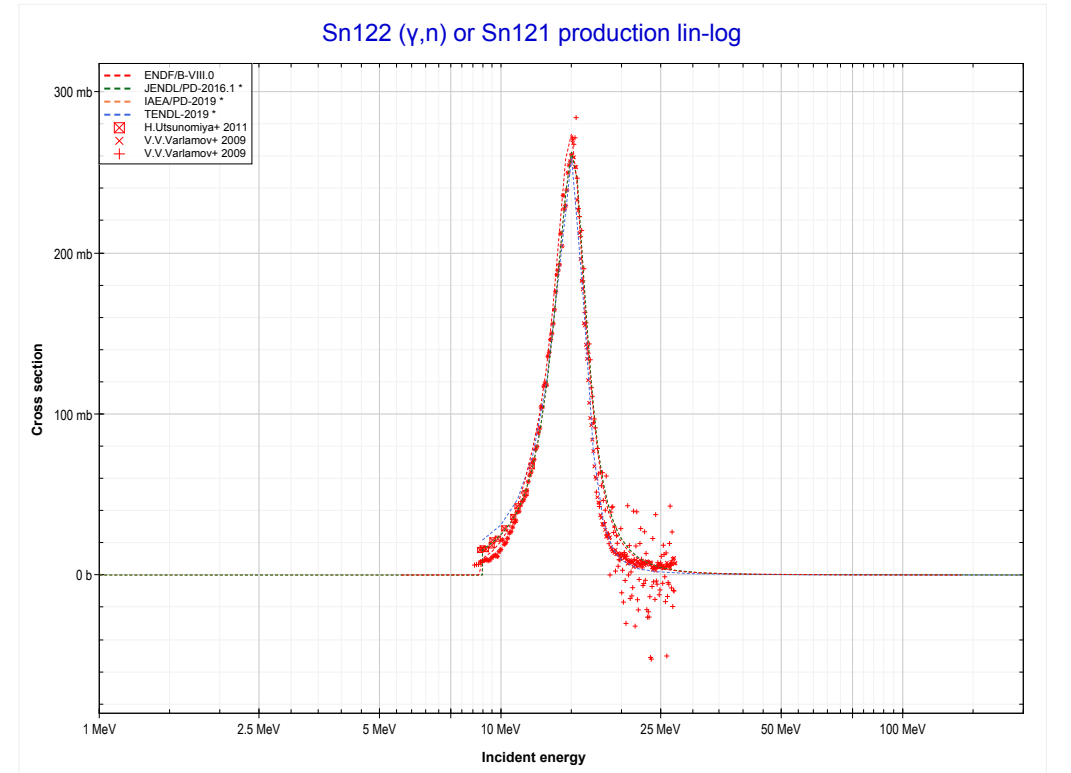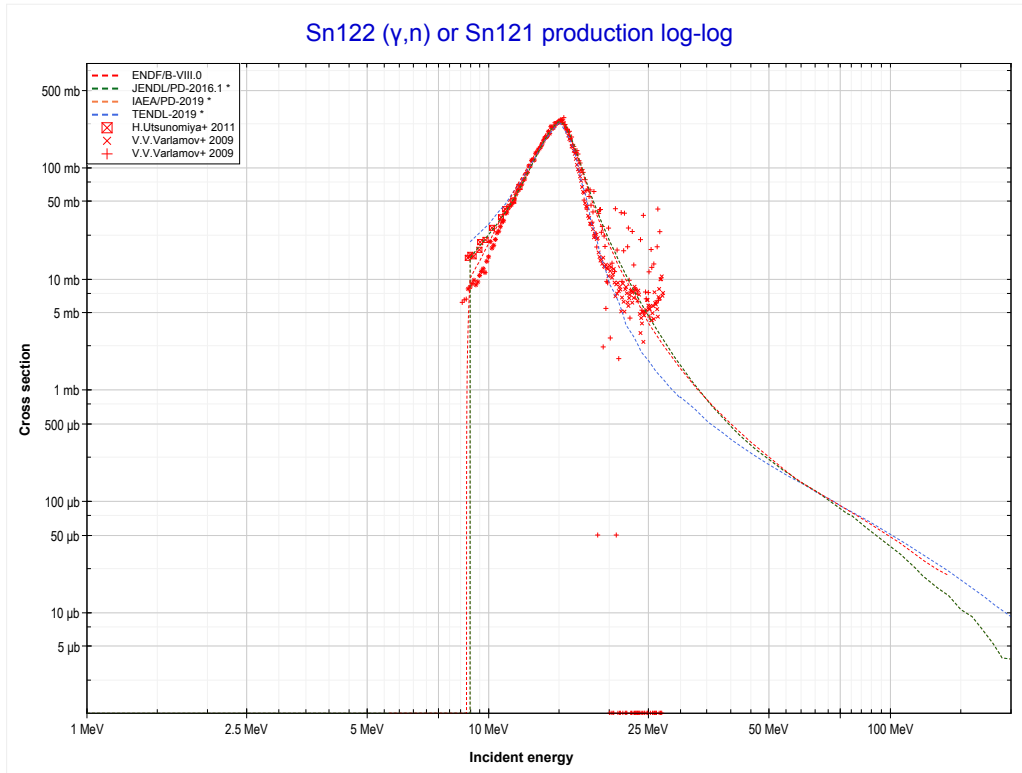
Reaction	Q-Value
Sn122(γ,n)Sn121	-8815.32 keV

<< 50-Sn-120	**50-Sn-122**	50-Sn-124 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn120 production)**	50-Sn-124 MT4 (γ,n) >>

Sn122 (γ,2n) or Sn120 production log-log

Sn122 (γ,2n) or Sn120 production lin-log
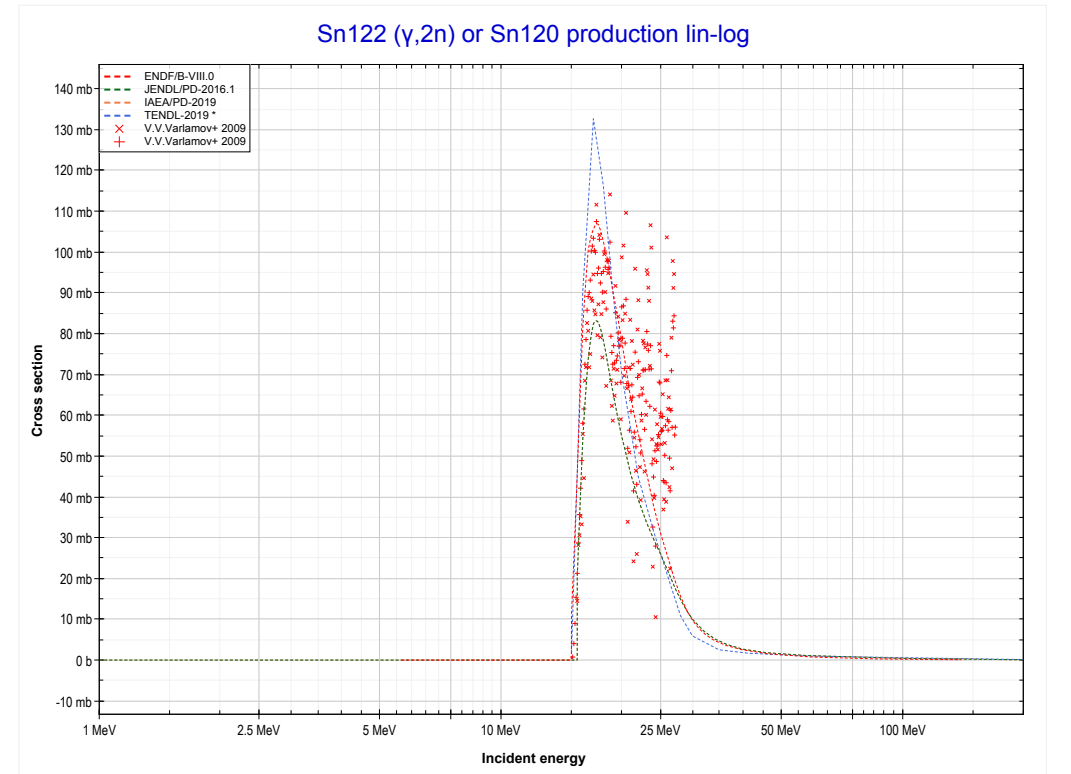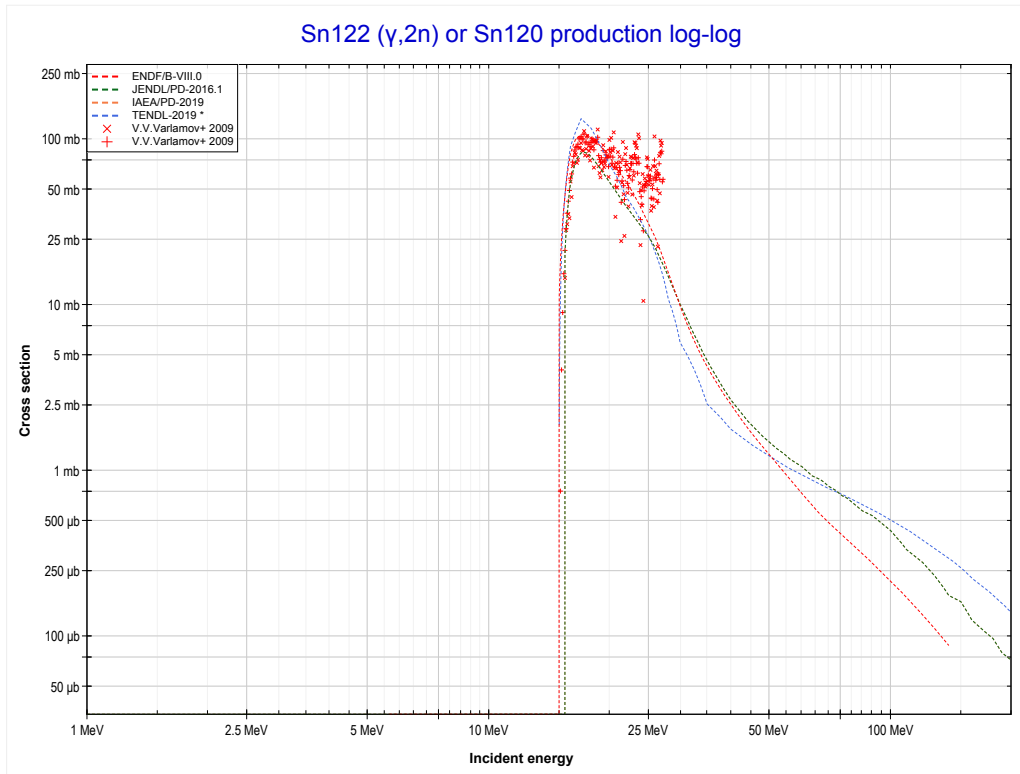
Reaction	Q-Value
Sn122(γ,2n)Sn120	-14985.53 keV

<< 50-Sn-122	**50-Sn-124**	51-Sb-121 >>
<< 50-Sn-122 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sn123 production)**	MT16 (γ,2n) >>

Sn124 (γ,n) or Sn123 production log-log

Sn124 (γ,n) or Sn123 production lin-log
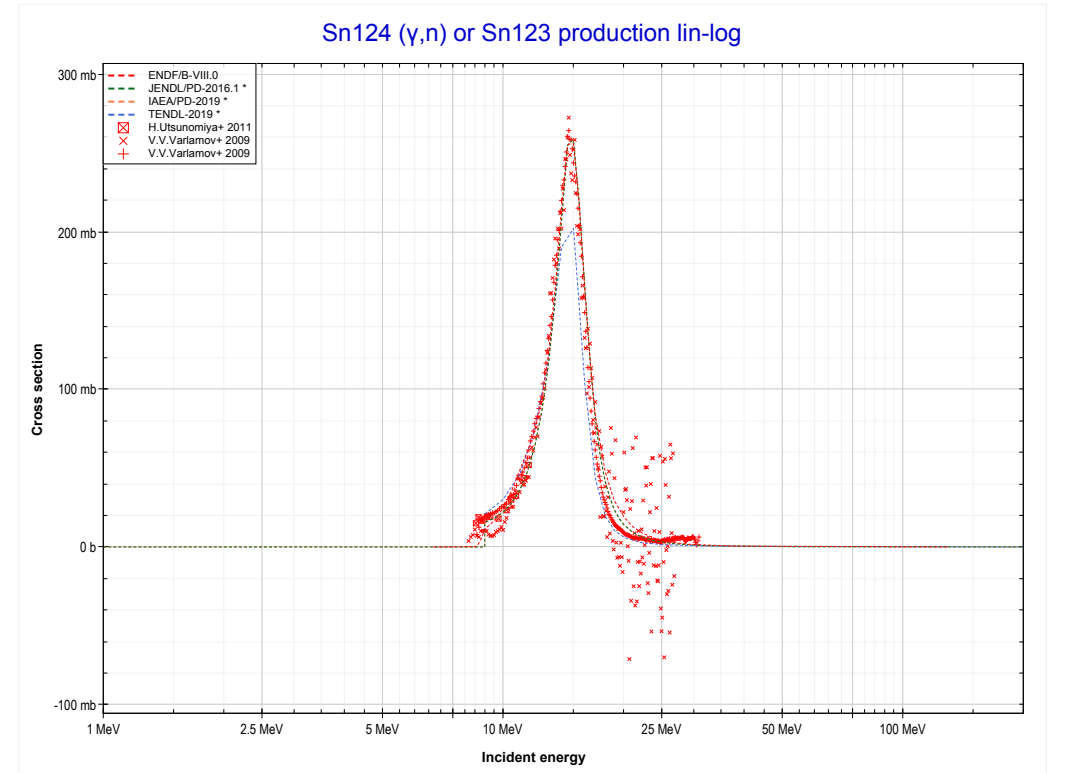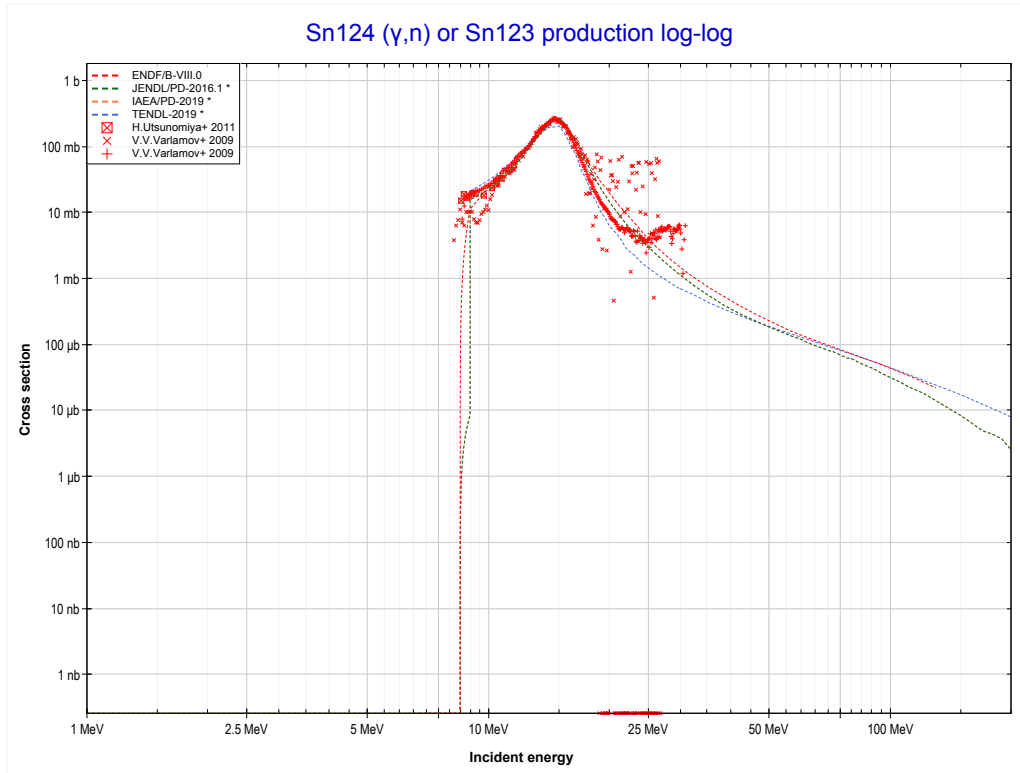
Reaction	Q-Value
Sn124(γ,n)Sn123	-8489.32 keV

<< 50-Sn-122	**50-Sn-124**	53-I-127 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sn122 production)**	MT17 (γ,3n) >>

Sn124 (γ,2n) or Sn122 production log-log

Sn124 (γ,2n) or Sn122 production lin-log
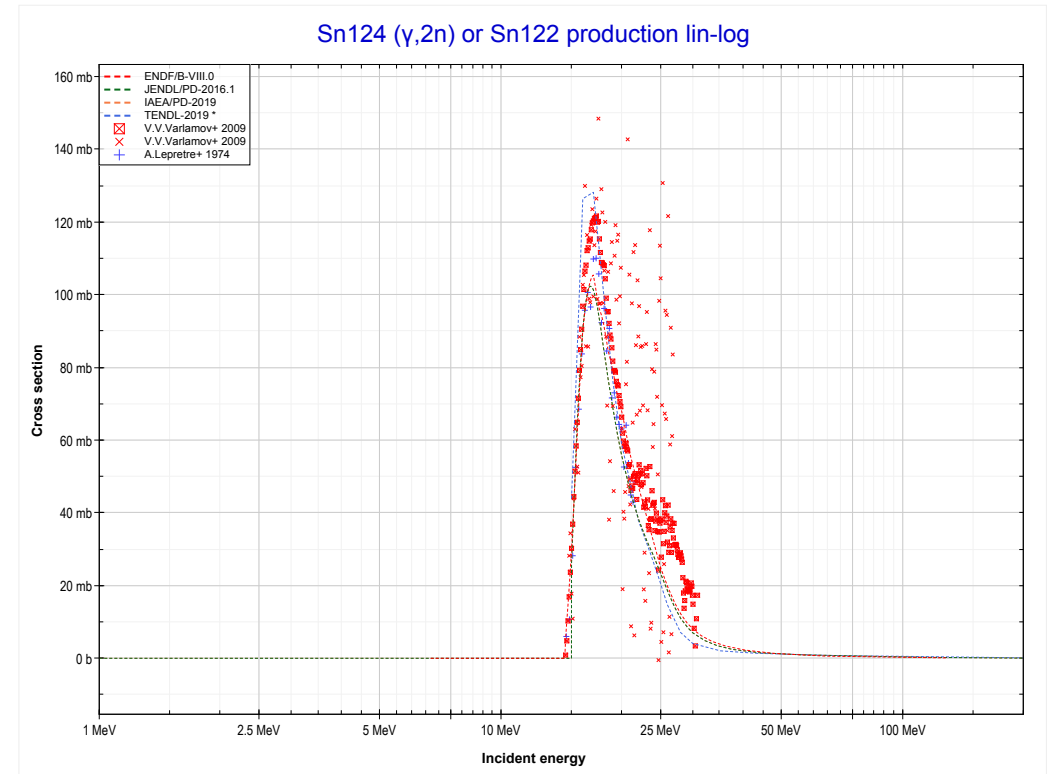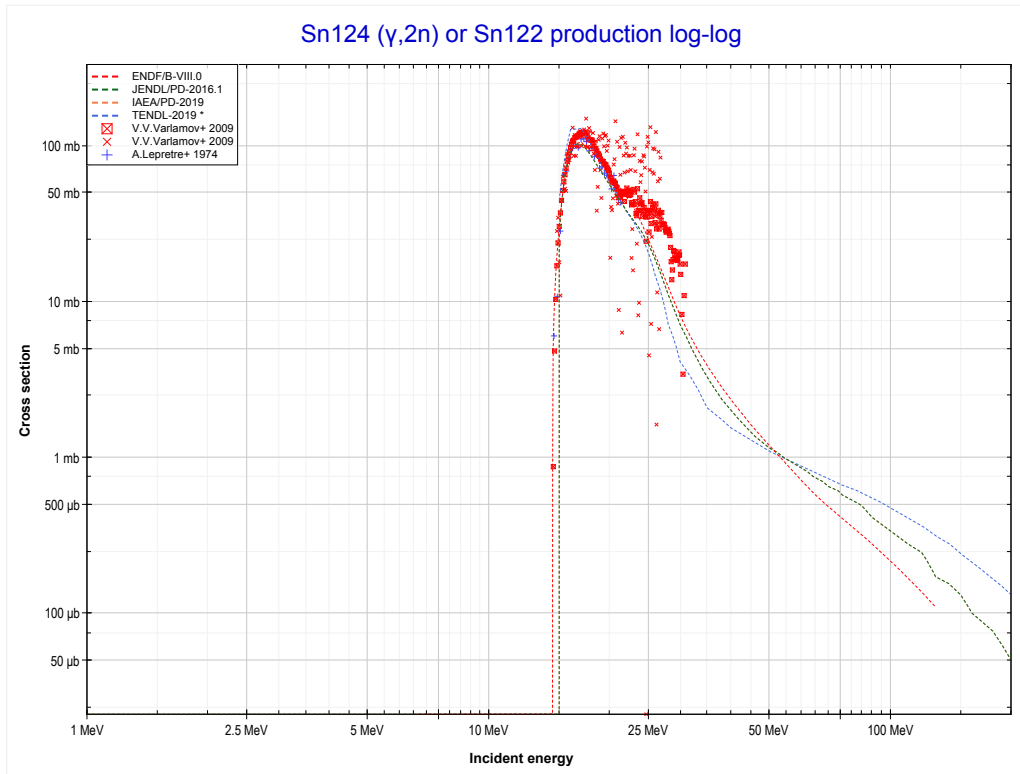
Reaction	Q-Value
Sn124(γ,2n)Sn122	-14435.53 keV

<< 50-Sn-120 >>	**50-Sn-124**	53-I-127 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Sn121 production)**	51-Sb-121 MT4 (γ,n) >>

Sn124 (γ,3n) or Sn121 production log-log

Sn124 (γ,3n) or Sn121 production lin-log
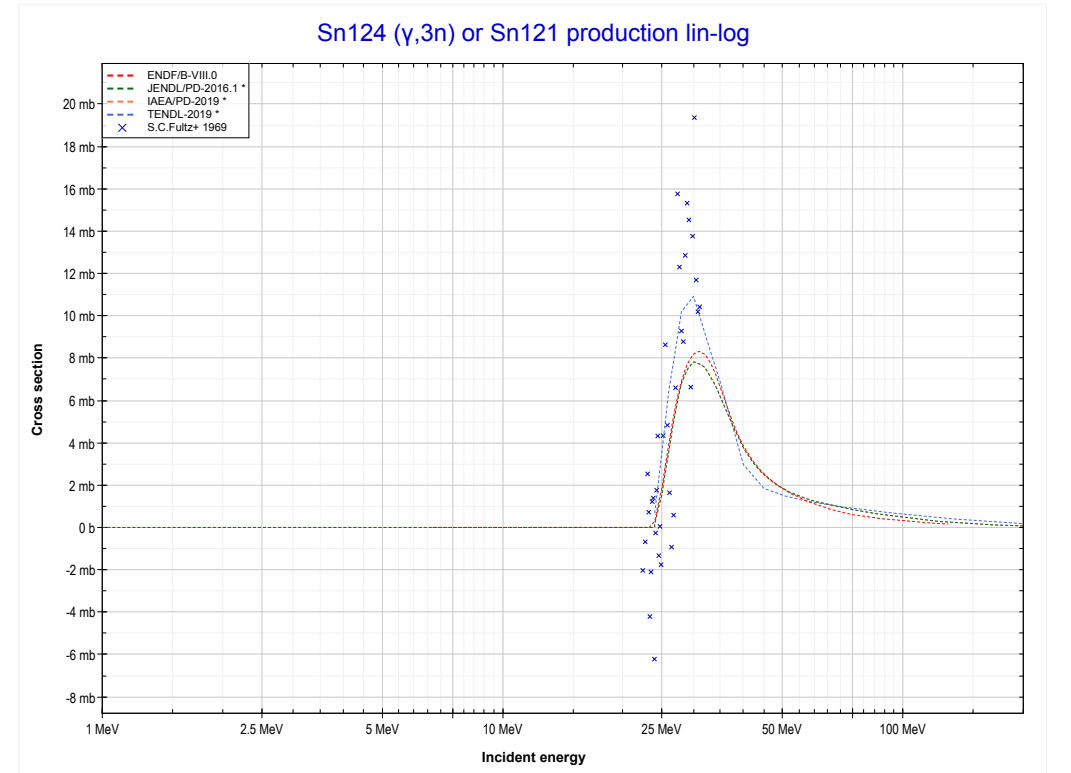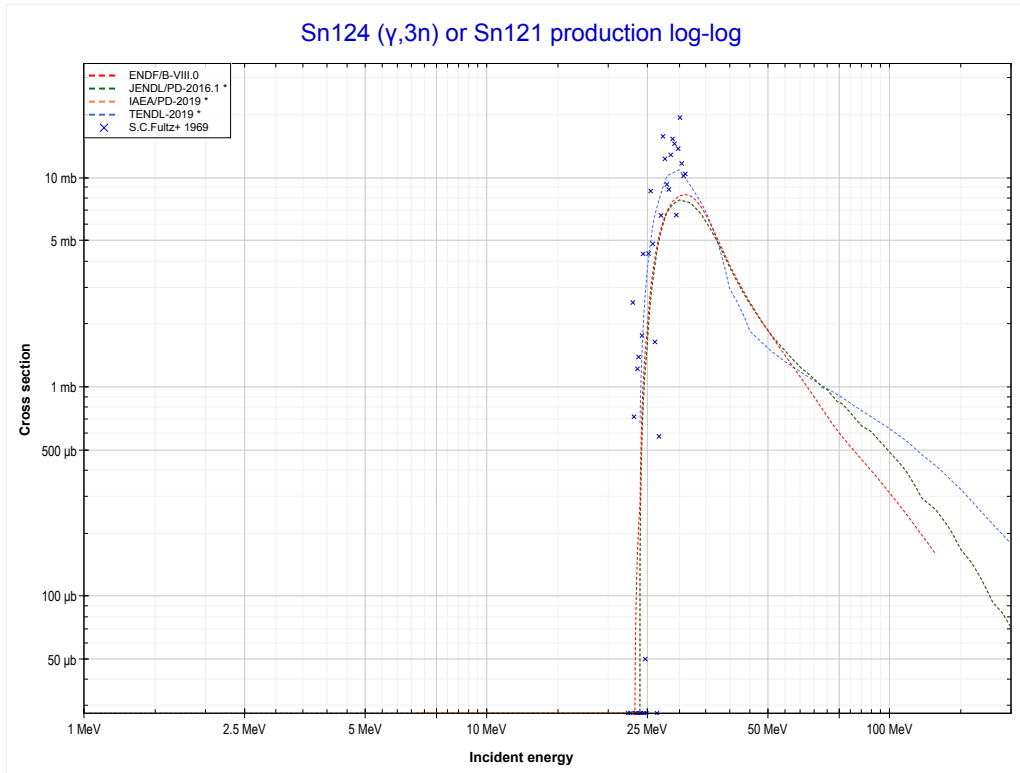
Reaction	Q-Value
Sn124(γ,3n)Sn121	-23250.85 keV

<< 50-Sn-124	**51-Sb-121**	51-Sb-123 >>
<< 50-Sn-124 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Sb120 production)**	51-Sb-123 MT4 (γ,n) >>

Sb121 (γ,n) or Sb120 production log-log

Sb121 (γ,n) or Sb120 production lin-log
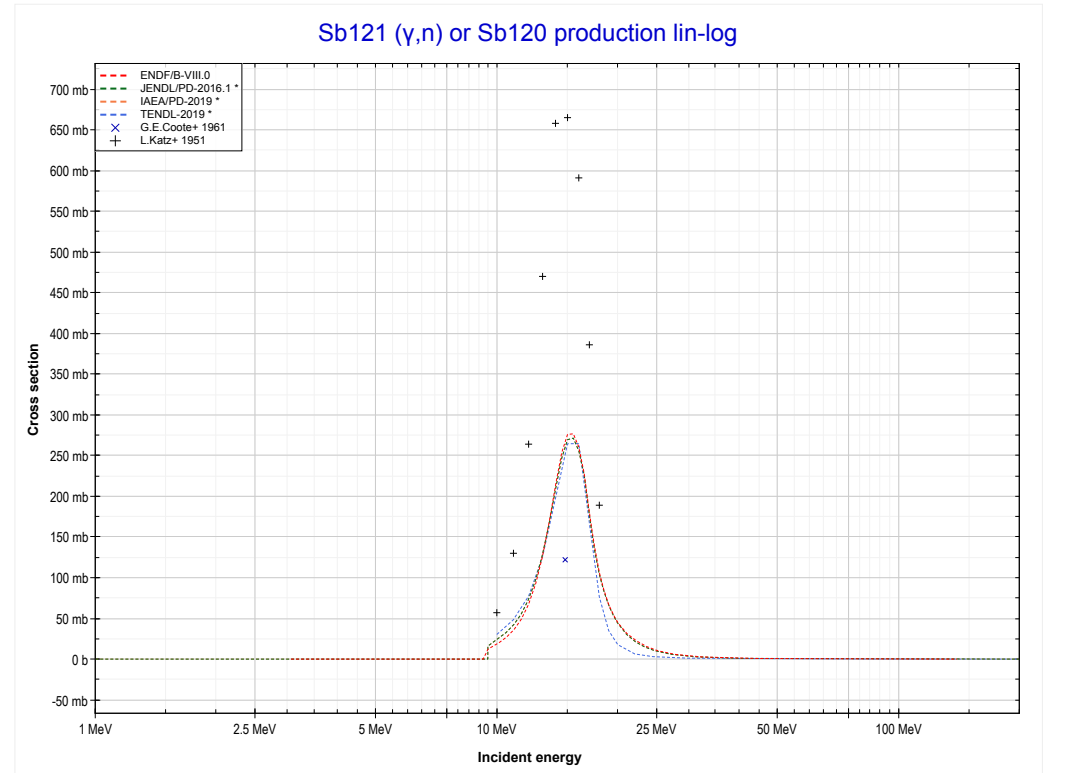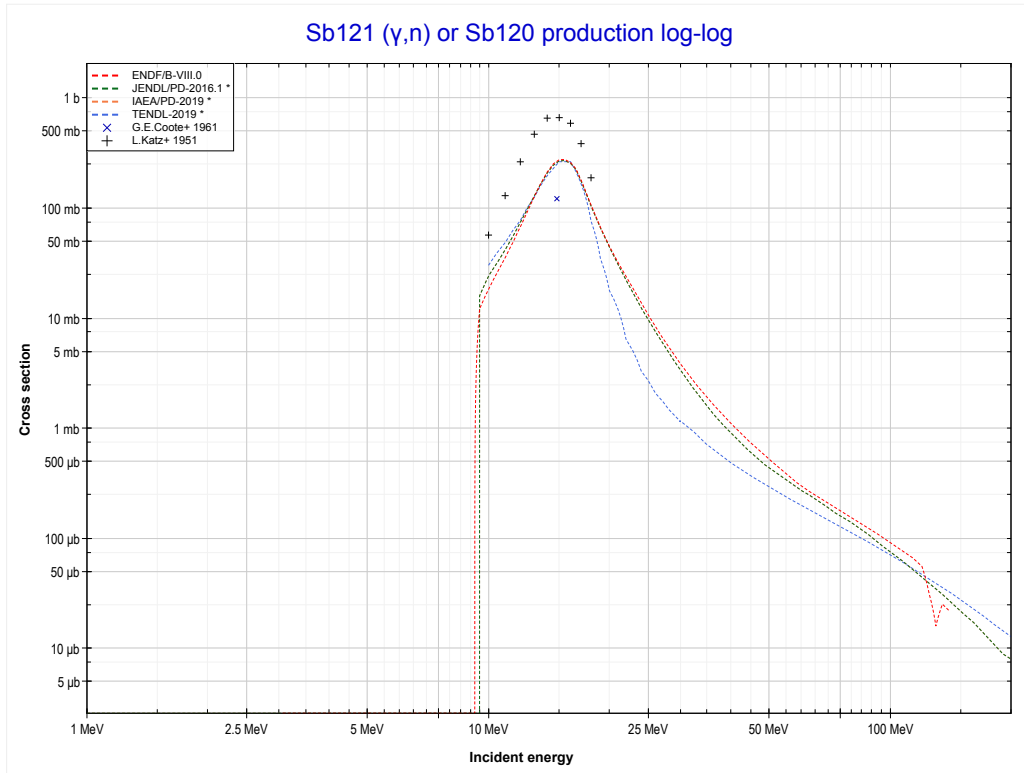
Reaction	Q-Value
Sb121(γ,n)Sb120	-9253.62 keV

<< 51-Sb-121	**51-Sb-123**	53-I-129 >>
<< 51-Sb-121 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Sb122 production)**	53-I-127 MT16 (γ,2n) >>

Sb123 (γ,n) or Sb122 production log-log

Sb123 (γ,n) or Sb122 production lin-log
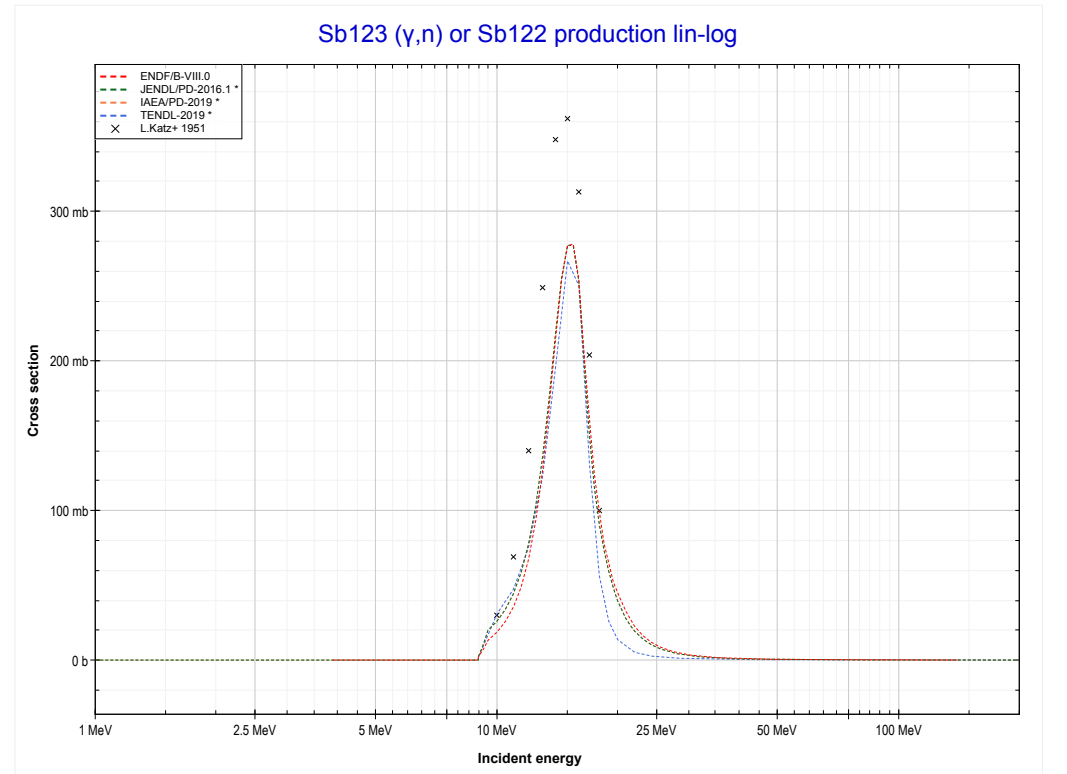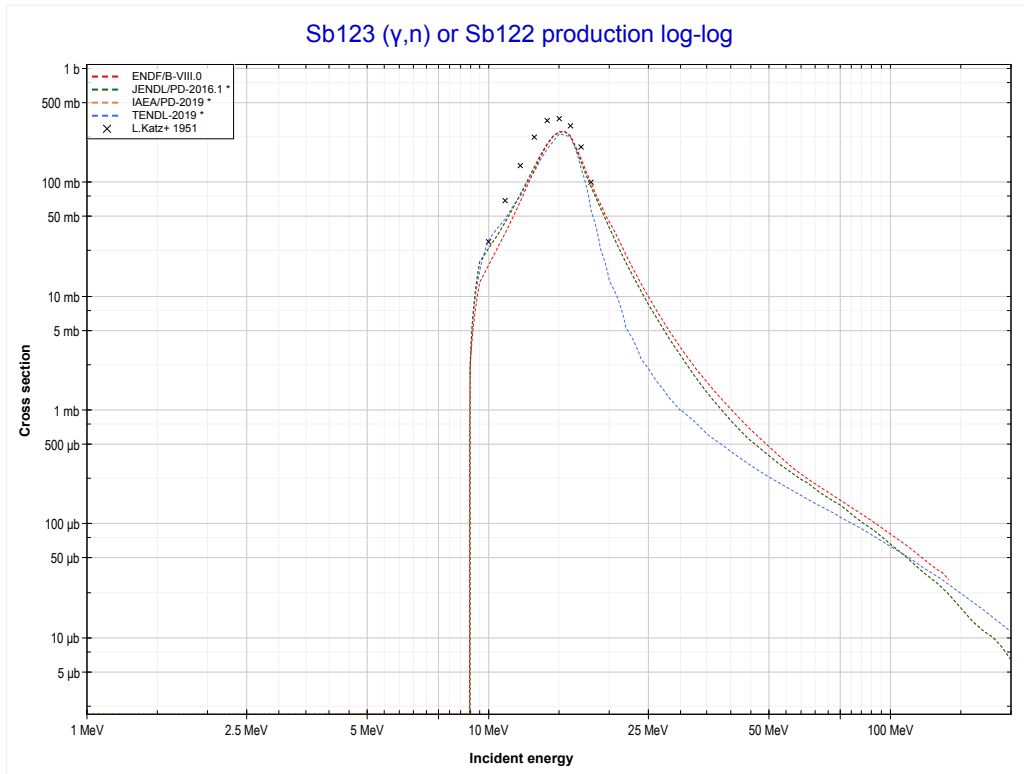
Reaction	Q-Value
Sb123(γ,n)Sb122	-8960.02 keV

<< 50-Sn-124	53-I-127	54-Xe-129 >>
<< 51-Sb-123 MT4 (γ,n)	MT16 (γ,2n) or MT5 (I125 production)	MT17 (γ,3n) >>

I127 (γ,2n) or I125 production log-log

I127 (γ,2n) or I125 production lin-log
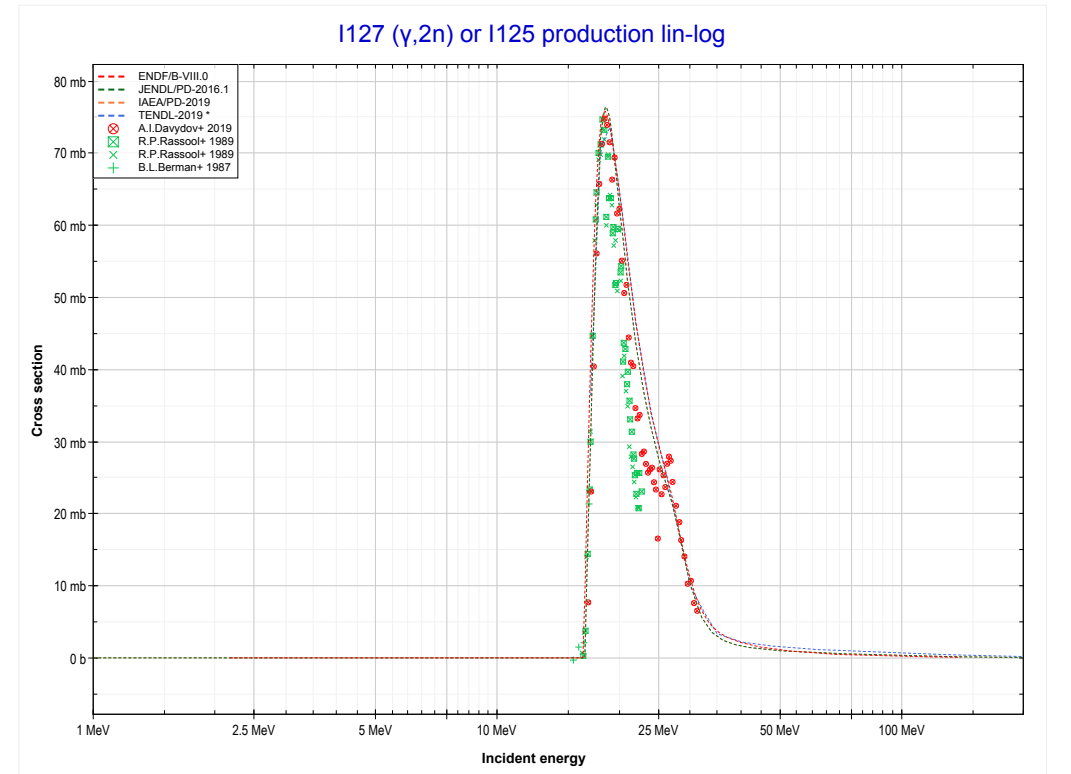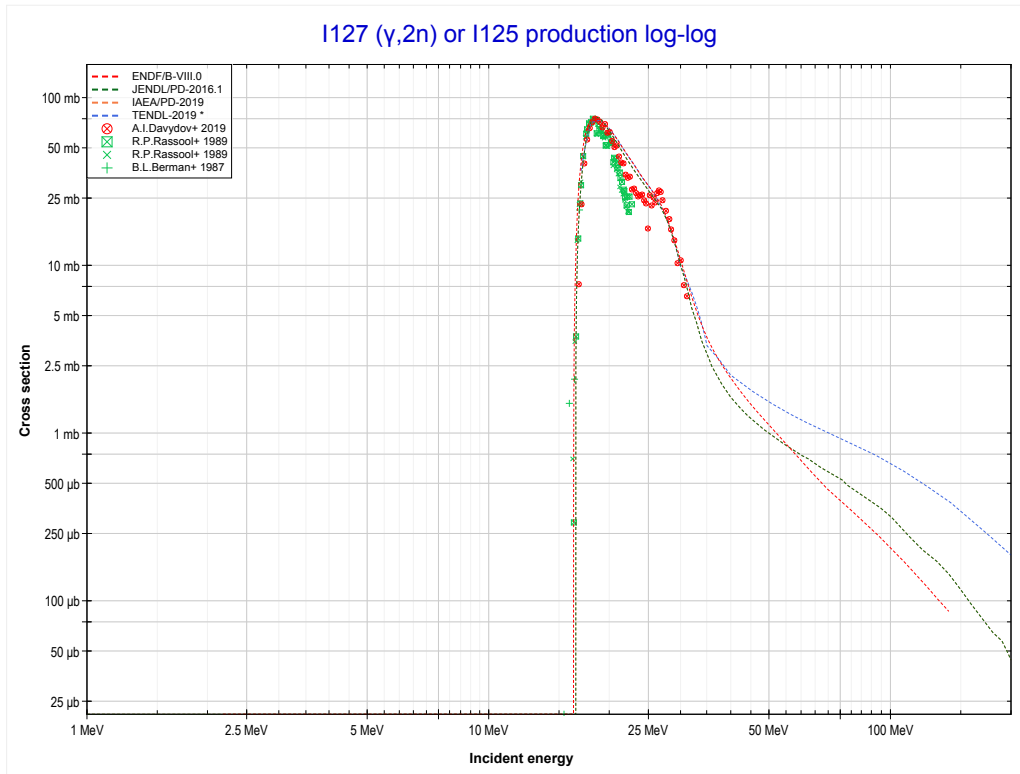
Reaction	Q-Value
I127(γ,2n)I125	-16289.43 keV

<< 50-Sn-124	**53-I-127**	54-Xe-129 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (I124 production)**	53-I-129 MT4 (γ,n) >>

I127 (γ,3n) or I124 production log-log

I127 (γ,3n) or I124 production lin-log
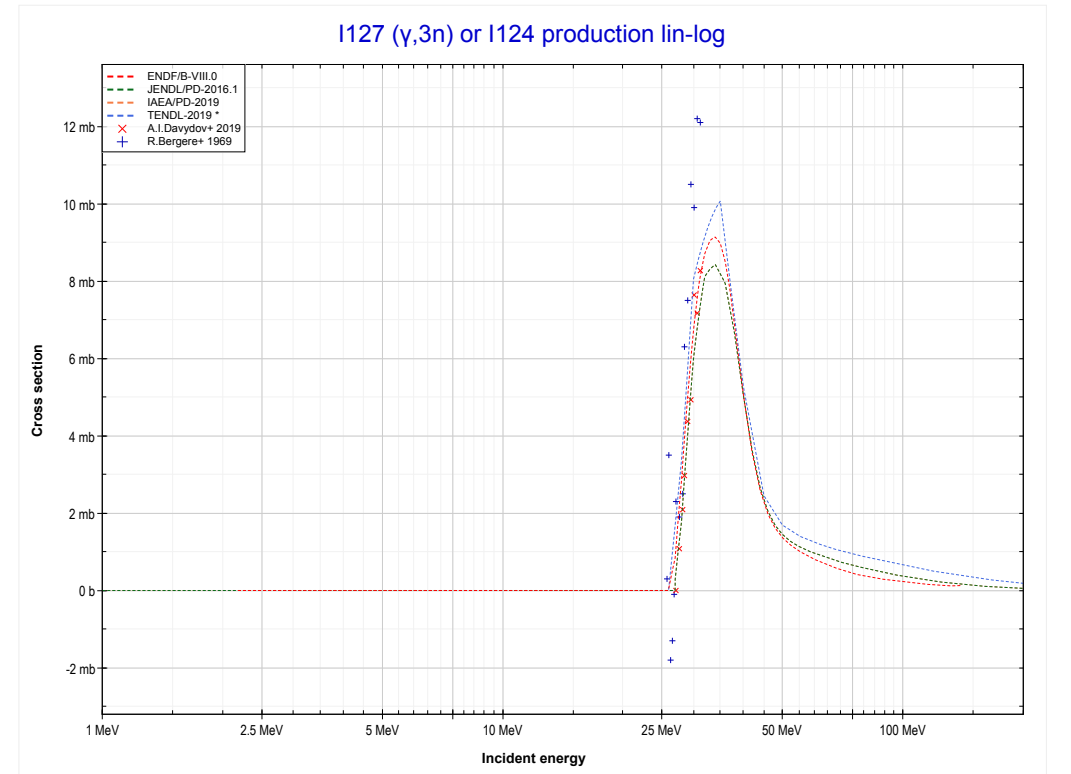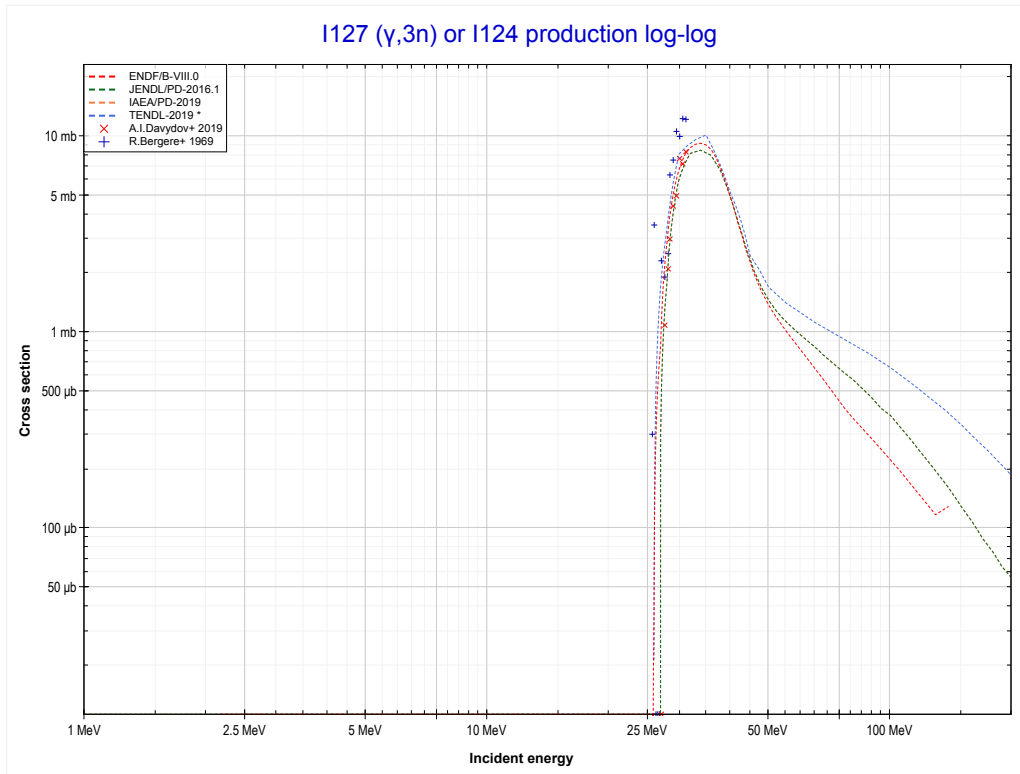
Reaction	Q-Value
I127(γ,3n)I124	-25832.25 keV

<< 51-Sb-123 >>	53-I-129	56-Ba-130 >>
<< 53-I-127 MT17 (γ,3n)	MT4 (γ,n) or MT5 (I128 production)	54-Xe-129 MT16 (γ,2n) >>

I129 (γ,n) or I128 production log-log

I129 (γ,n) or I128 production lin-log
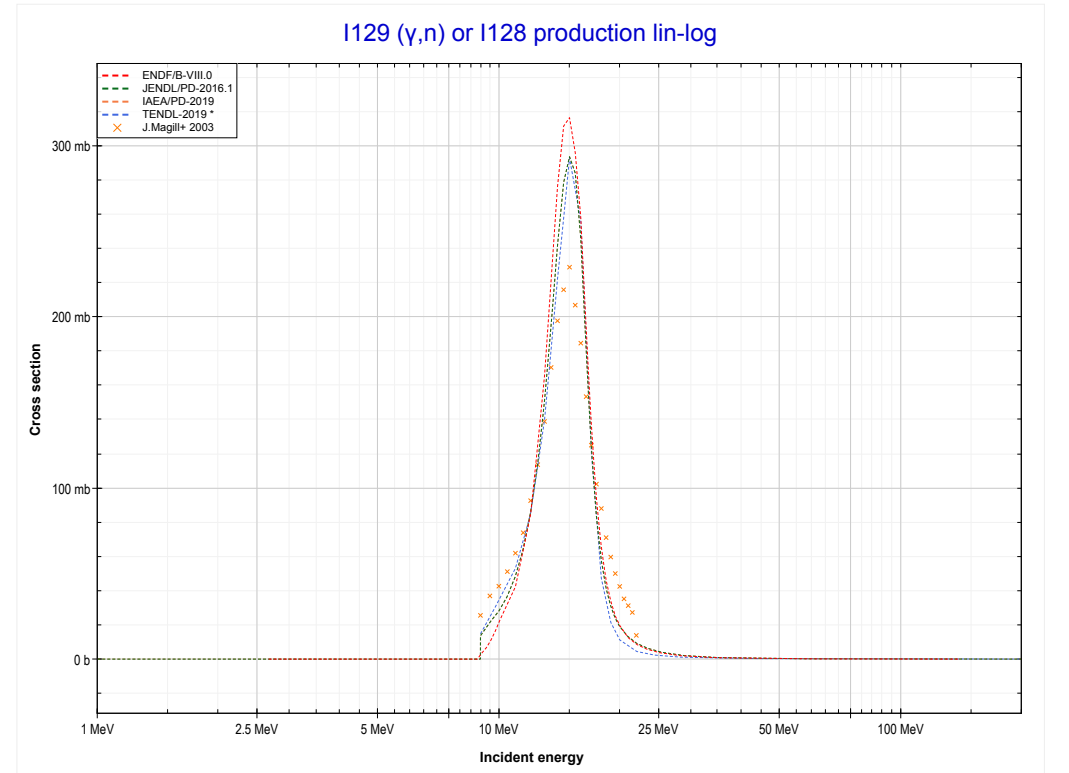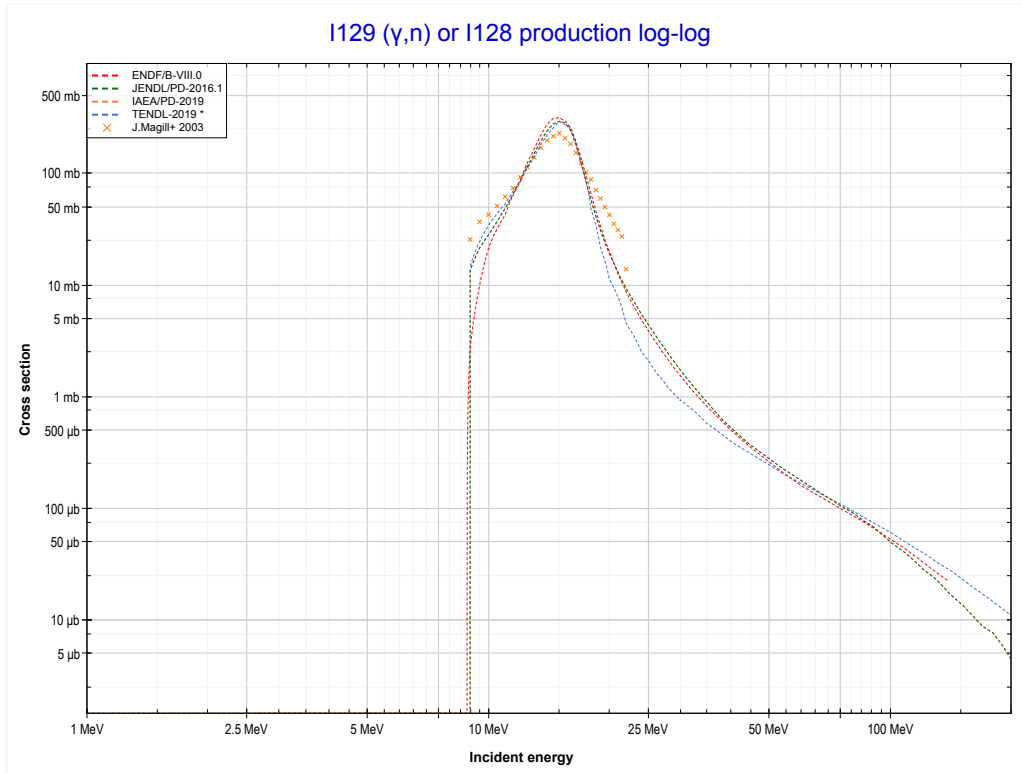
Reaction	Q-Value
I129(γ,n)I128	-8839.32 keV

<< 53-I-127	**54-Xe-129**	57-La-139 >>
<< 53-I-129 MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Xe127 production)**	MT17 (γ,3n) >>

Xe129 (γ,2n) or Xe127 production log-log

Xe129 (γ,2n) or Xe127 production lin-log
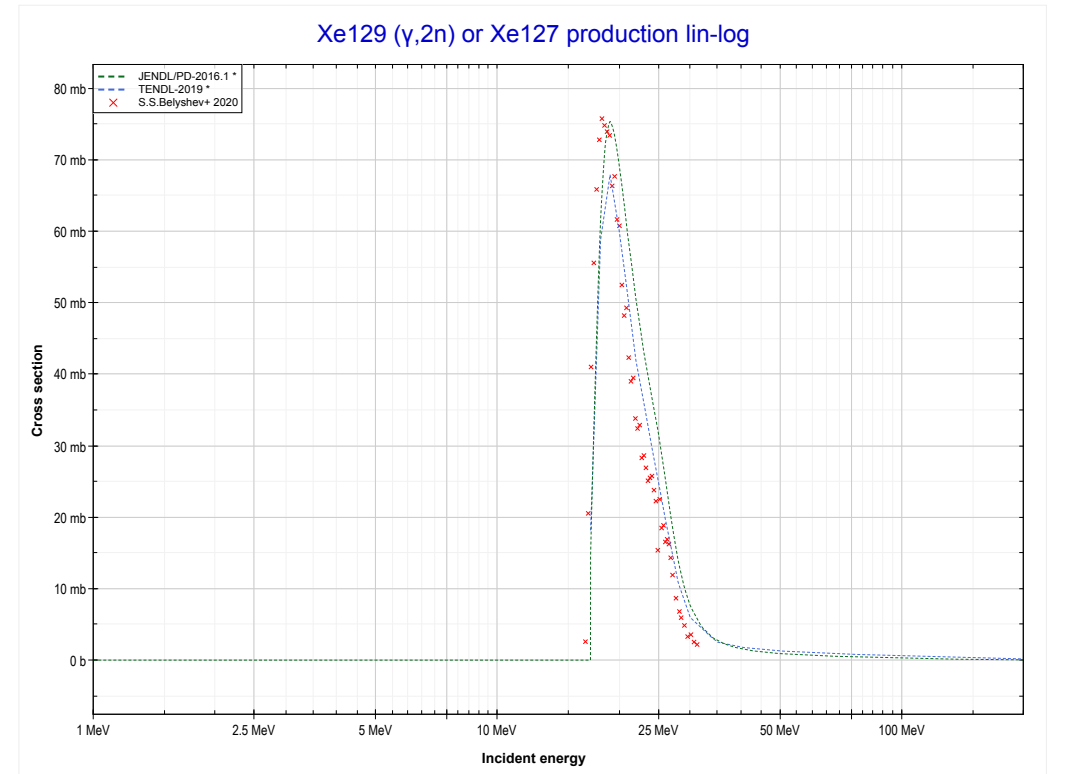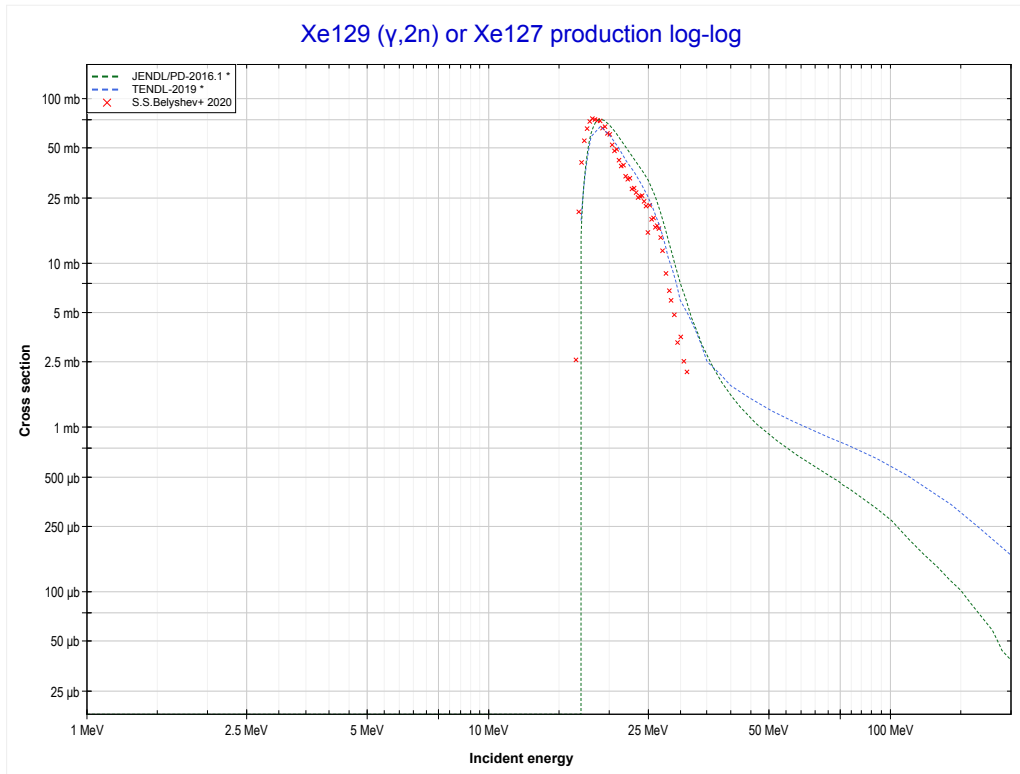
Reaction	Q-Value
Xe129(γ,2n)Xe127	-16516.69 keV

<< 53-I-127	**54-Xe-129**	55-Cs-133 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Xe126 production)**	55-Cs-133 MT17 (γ,3n) >>
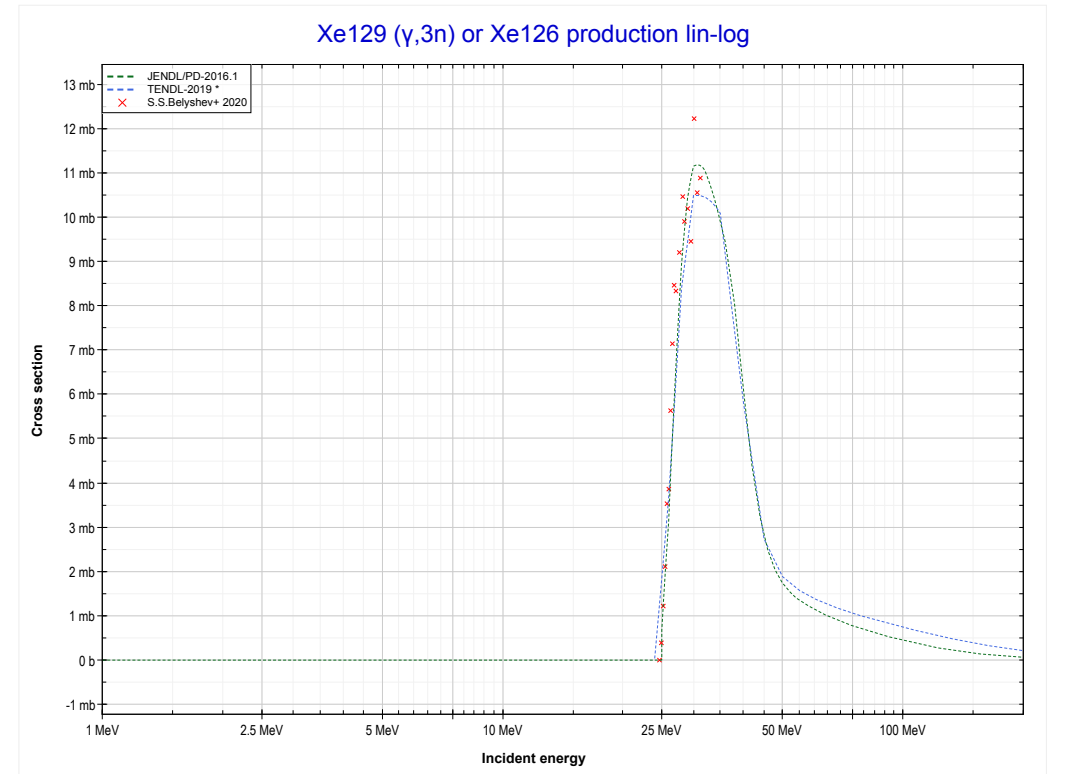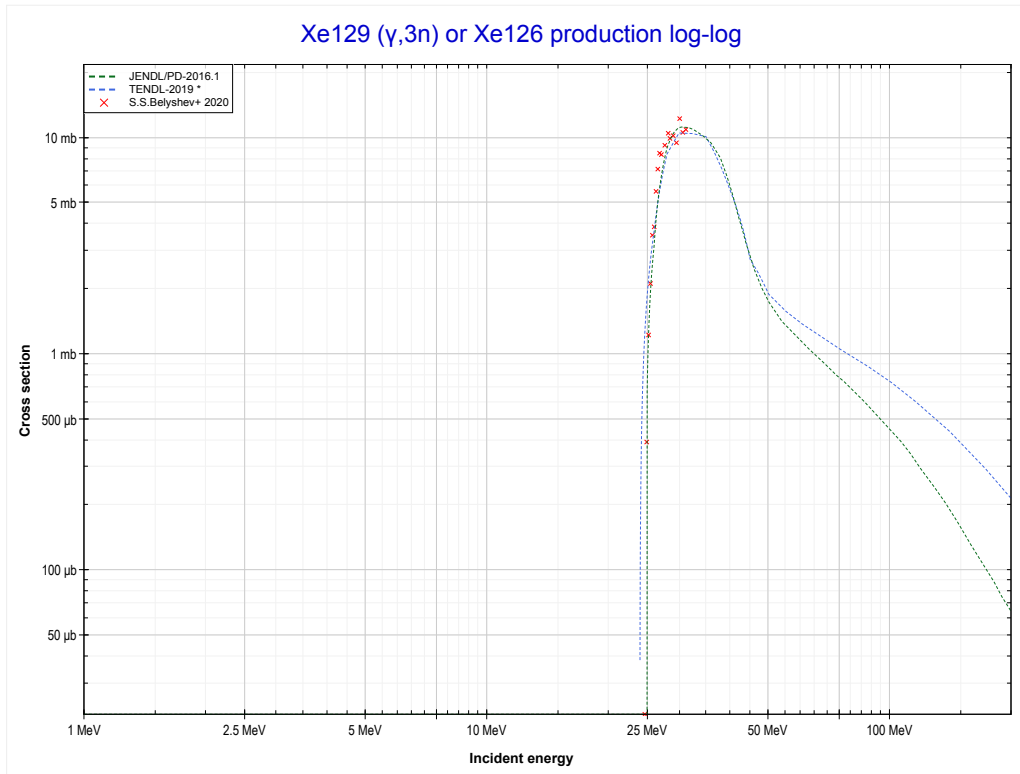
Reaction	Q-Value
Xe129(γ,3n)Xe126	-23763.01 keV

<< 54-Xe-129	**55-Cs-133**	56-Ba-138 >>
<< 54-Xe-129 MT17 (γ,3n)	**MT17 (γ,3n) or MT5 (Cs130 production)**	56-Ba-130 MT4 (γ,n) >>

Cs133 (γ,3n) or Cs130 production log-log

Cs133 (γ,3n) or Cs130 production lin-log
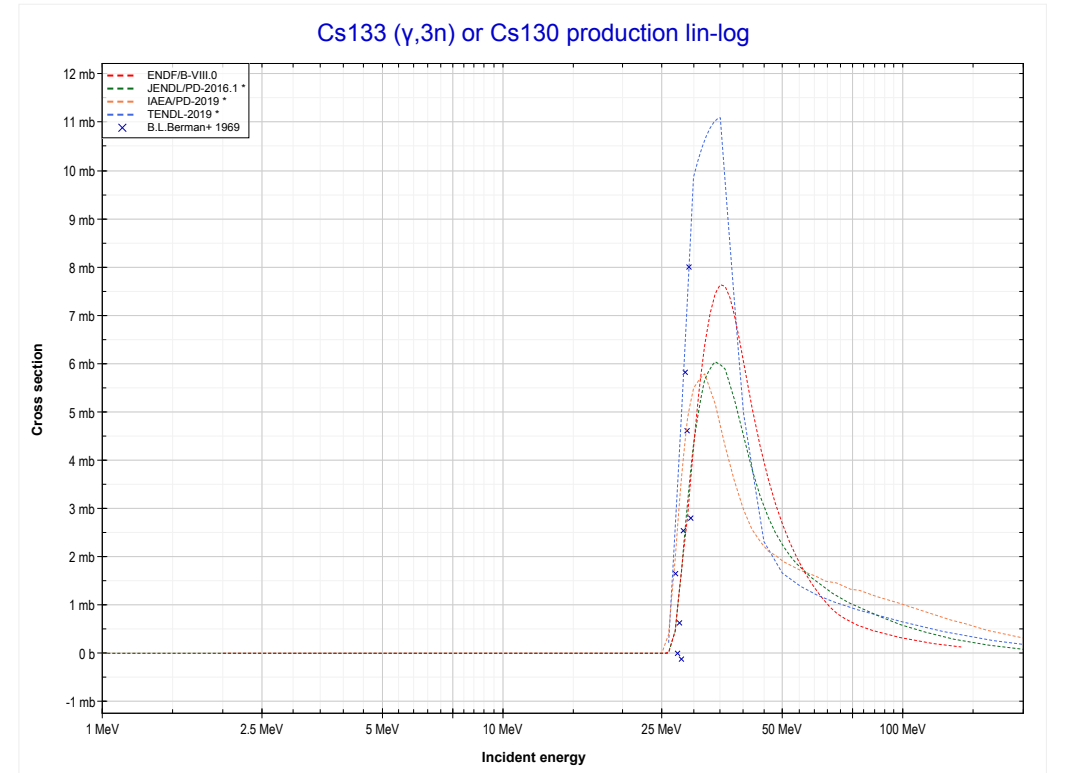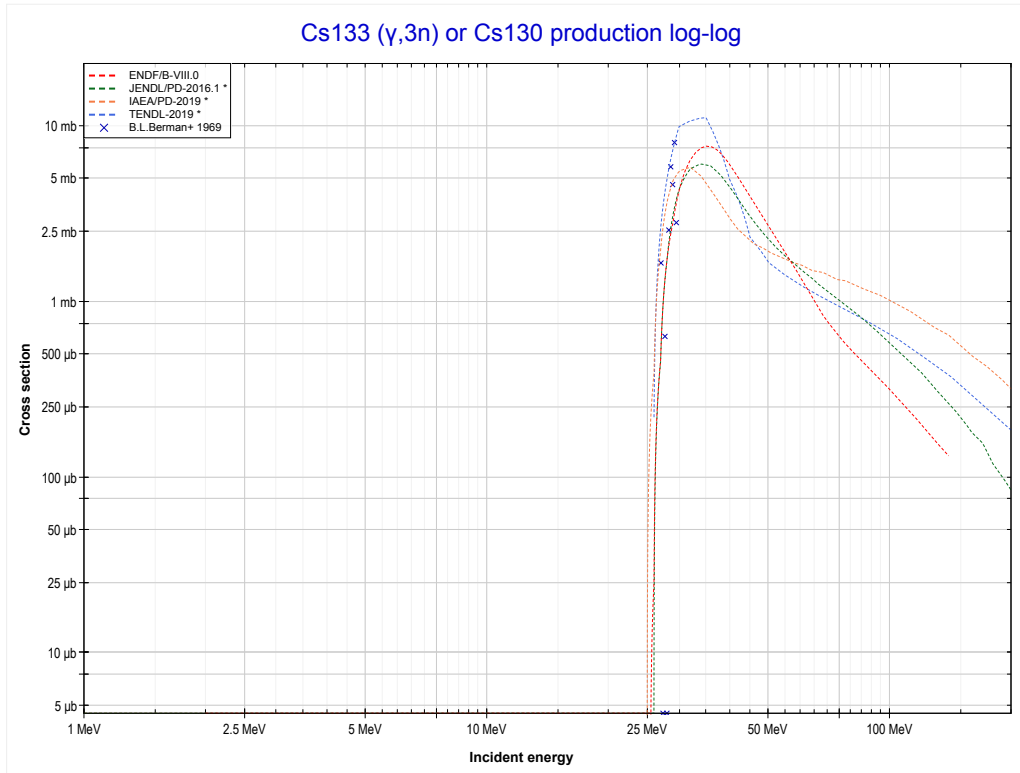
Reaction	Q-Value
Cs133(γ,3n)Cs130	-25384.88 keV

<< 53-I-129	**56-Ba-130**	56-Ba-132 >>
<< 55-Cs-133 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Ba129 production)**	56-Ba-132 MT4 (γ,n) >>

Ba130 (γ,n) or Ba129 production log-log

Ba130 (γ,n) or Ba129 production lin-log
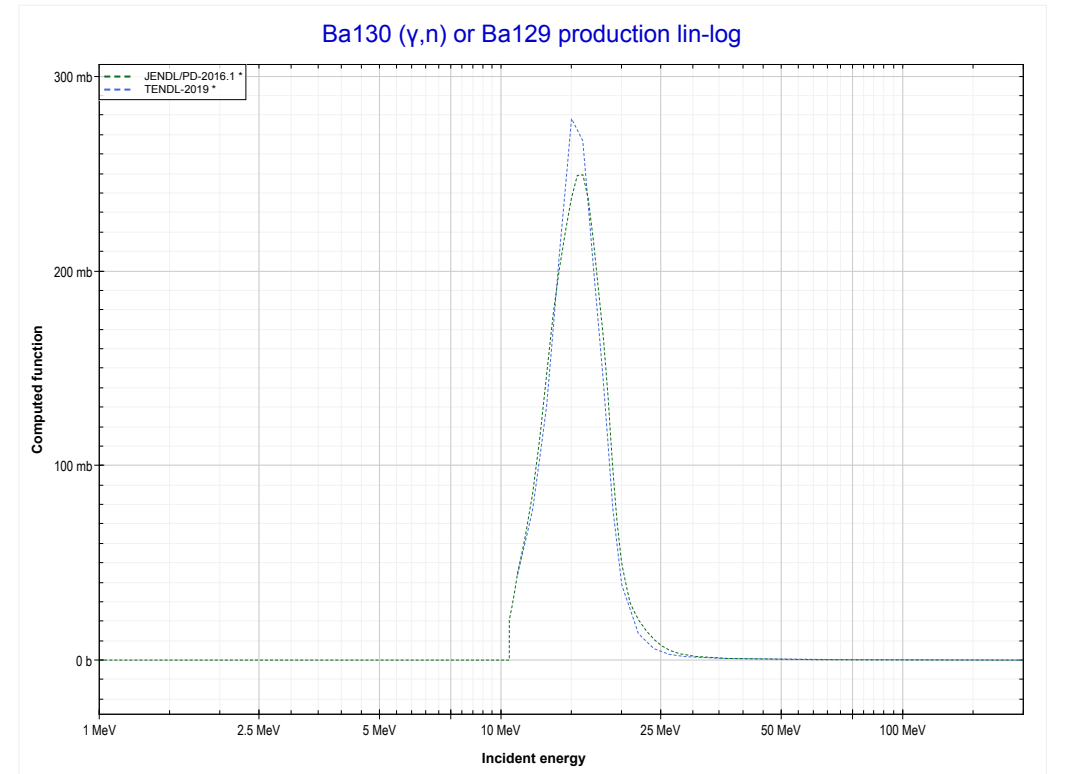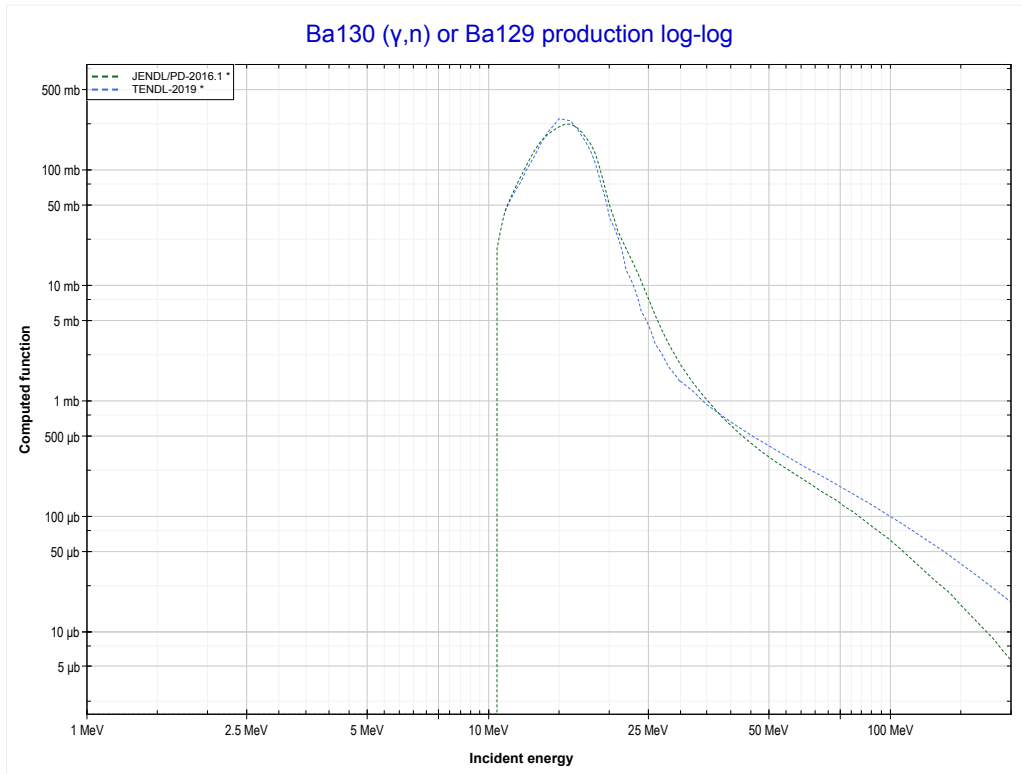
Reaction	Q-Value
Ba130(γ,n)Ba129	-10269.82 keV

<< 56-Ba-130	56-Ba-132	56-Ba-134 >>
<< 56-Ba-130 MT4 (γ,n)	MT4 (γ,n) or MT5 (Ba131 production)	56-Ba-134 MT4 (γ,n) >>

Ba132 (γ,n) or Ba131 production log-log

Ba132 (γ,n) or Ba131 production lin-log
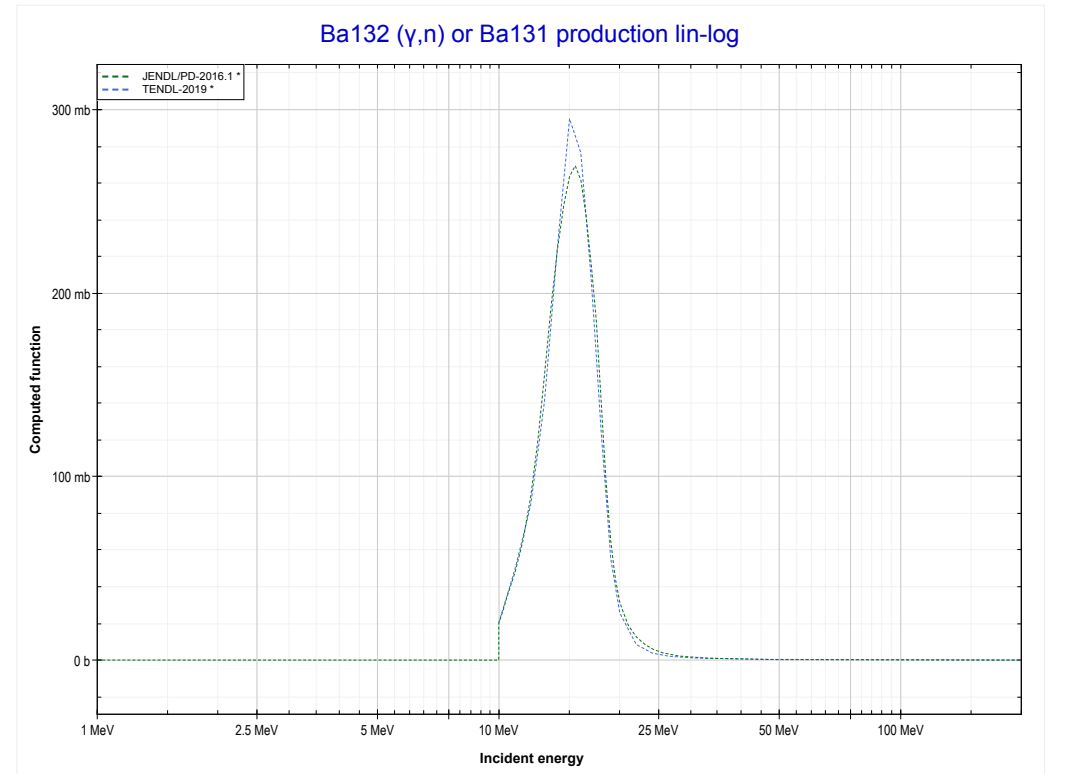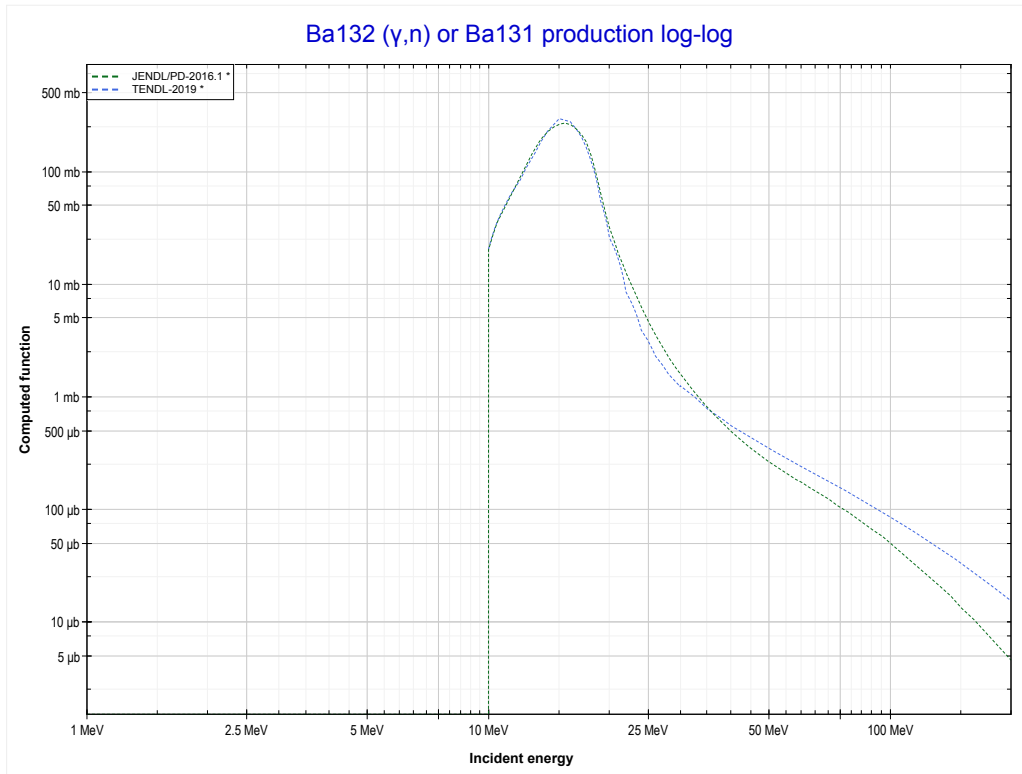
Reaction	Q-Value
Ba132(γ,n)Ba131	-9822.62 keV

<< 56-Ba-132	**56-Ba-134**	56-Ba-136 >>
<< 56-Ba-132 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ba133 production)**	56-Ba-136 MT4 (γ,n) >>

Ba134 (γ,n) or Ba133 production log-log

Ba134 (γ,n) or Ba133 production lin-log
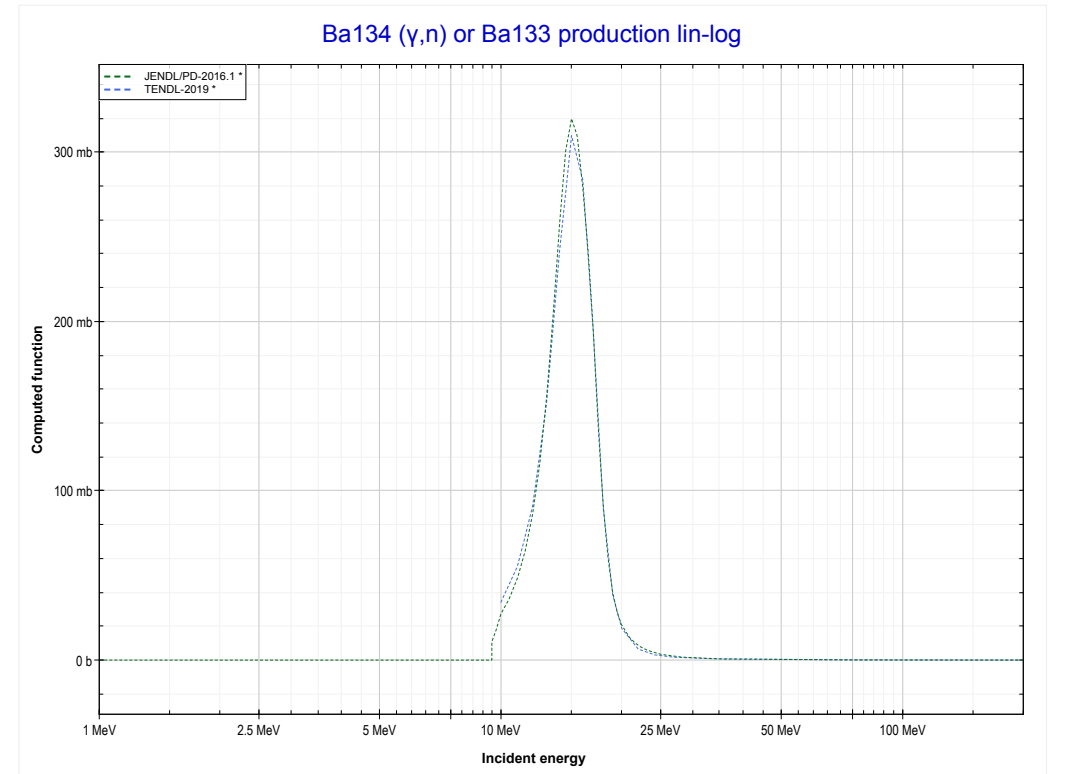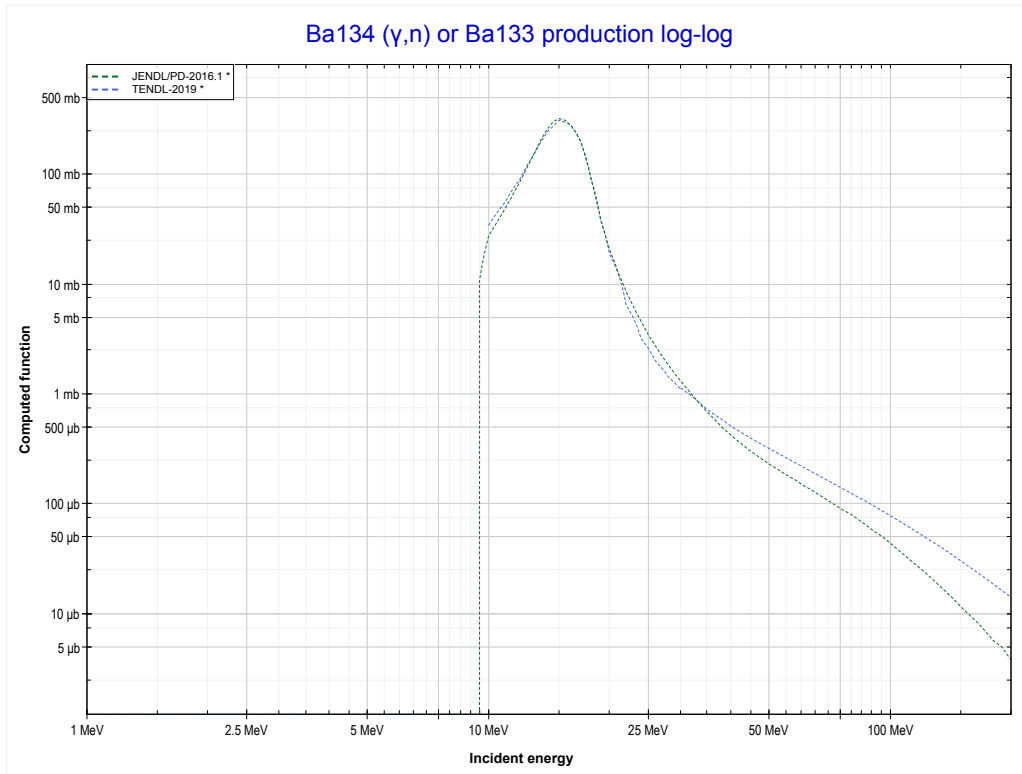
Reaction	Q-Value
Ba134(γ,n)Ba133	-9467.62 keV

<< 56-Ba-134	**56-Ba-136**	56-Ba-138 >>
<< 56-Ba-134 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ba135 production)**	56-Ba-138 MT4 (γ,n) >>

Ba136 (γ,n) or Ba135 production log-log

Ba136 (γ,n) or Ba135 production lin-log
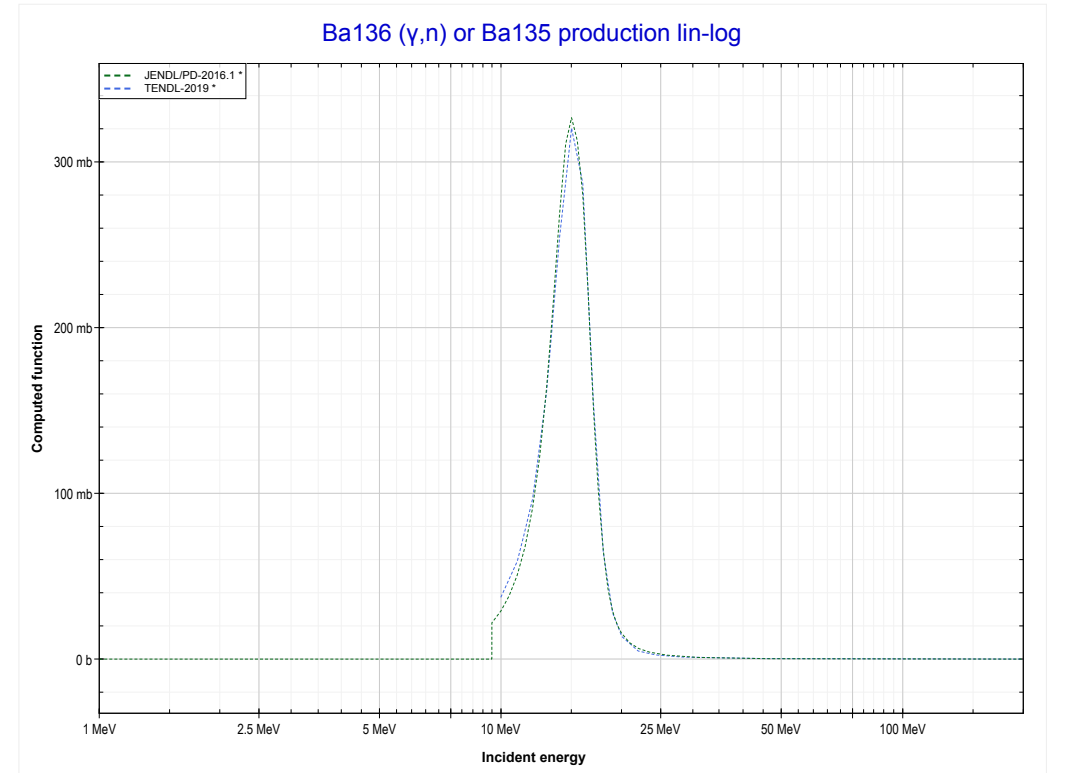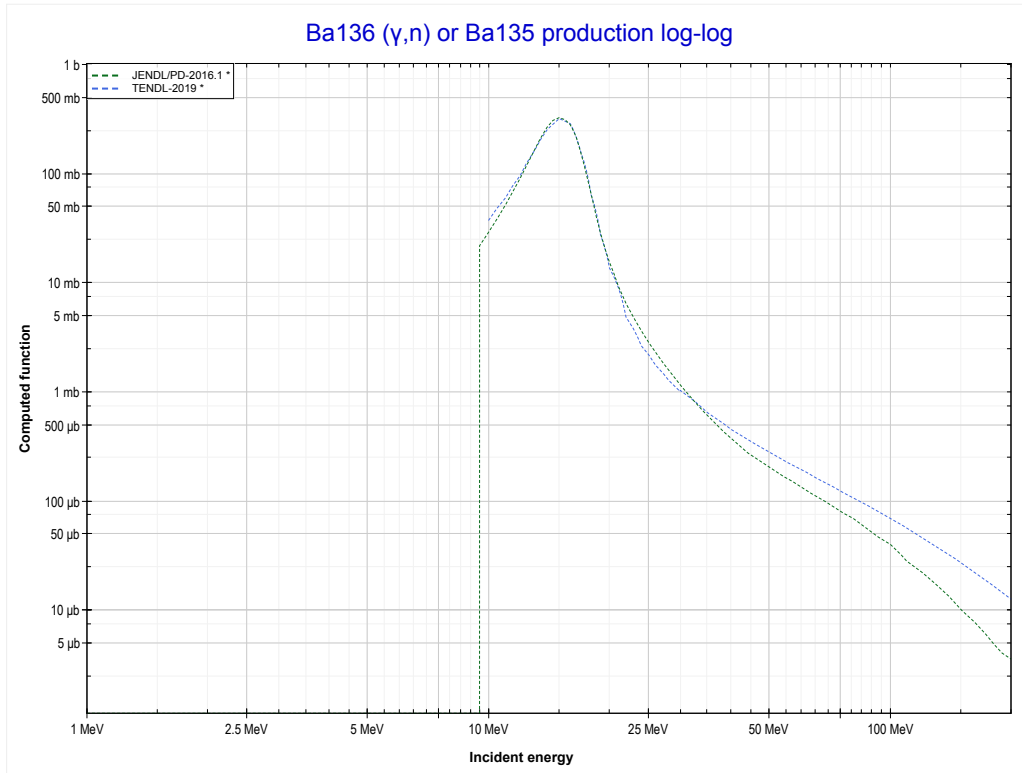
Reaction	Q-Value
Ba136(γ,n)Ba135	-9107.72 keV

<< 56-Ba-136	**56-Ba-138**	57-La-139 >>
<< 56-Ba-136 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Ba137 production)**	MT17 (γ,3n) >>

Ba138 (γ,n) or Ba137 production log-log

Ba138 (γ,n) or Ba137 production lin-log

Legend
JENDL/PD-2016.1 *
IAEA/PD-2019 *
TENDL-2019 *
S.N.Beljaev+ 1991
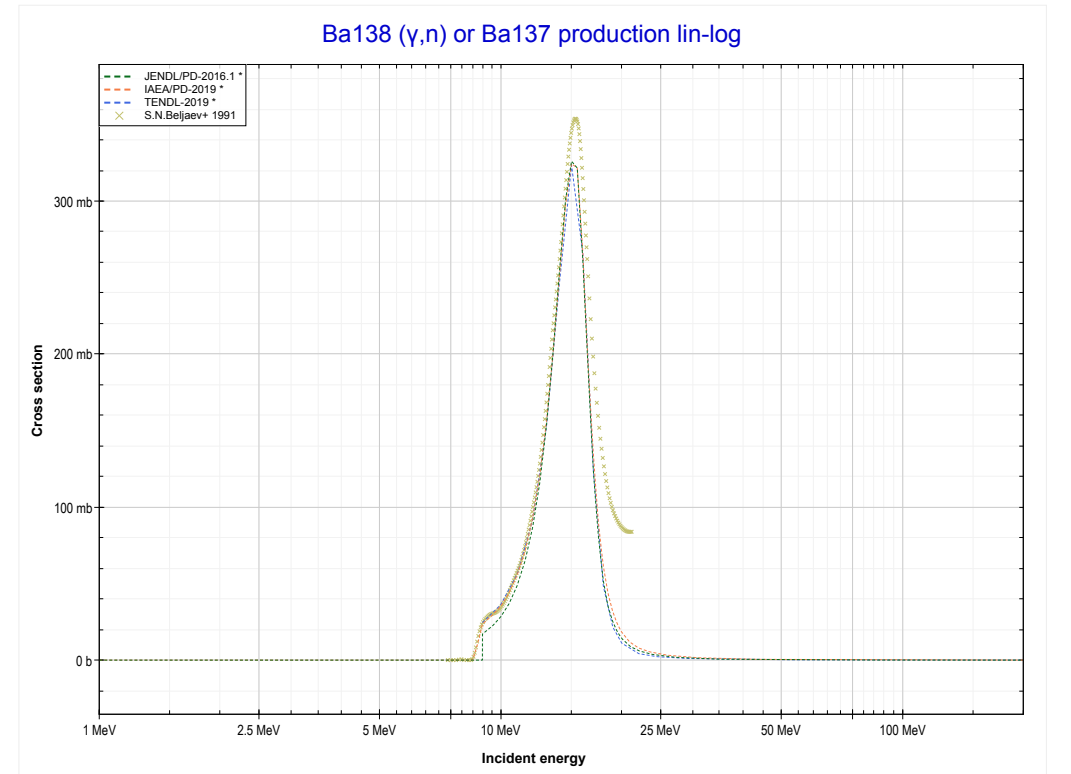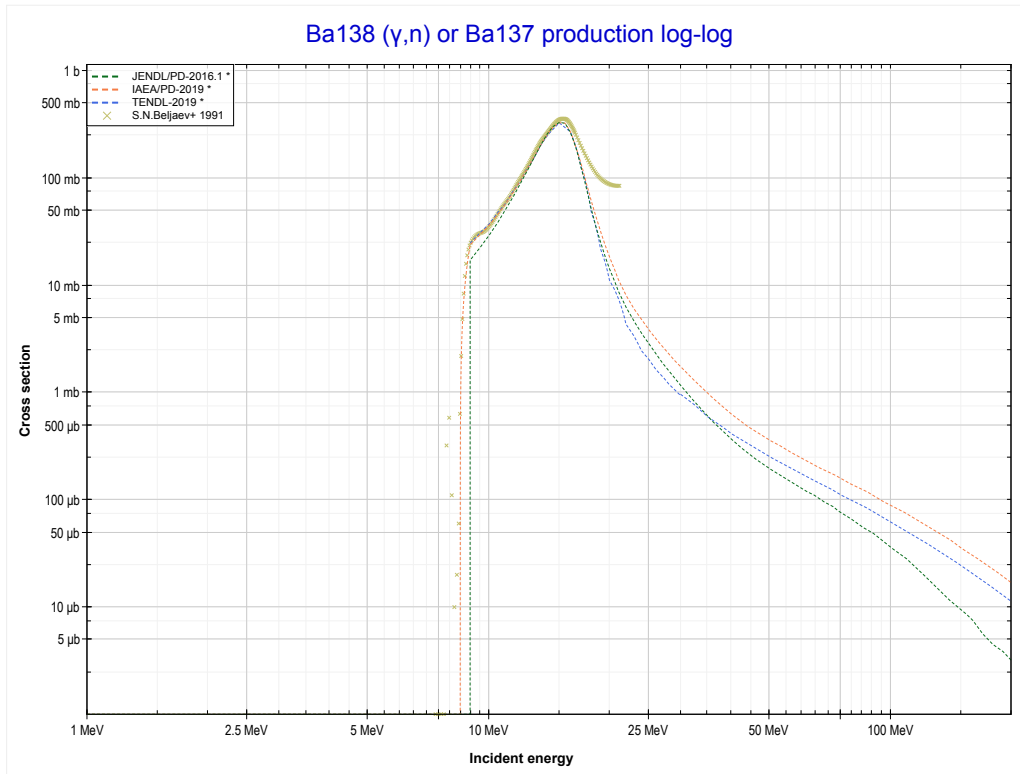
Reaction	Q-Value
Ba138(γ,n)Ba137	-8611.72 keV

<< 55-Cs-133	**56-Ba-138**	57-La-139 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Ba135 production)**	57-La-139 MT4 (γ,n) >>

Ba138 (γ,3n) or Ba135 production log-log

Ba138 (γ,3n) or Ba135 production lin-log
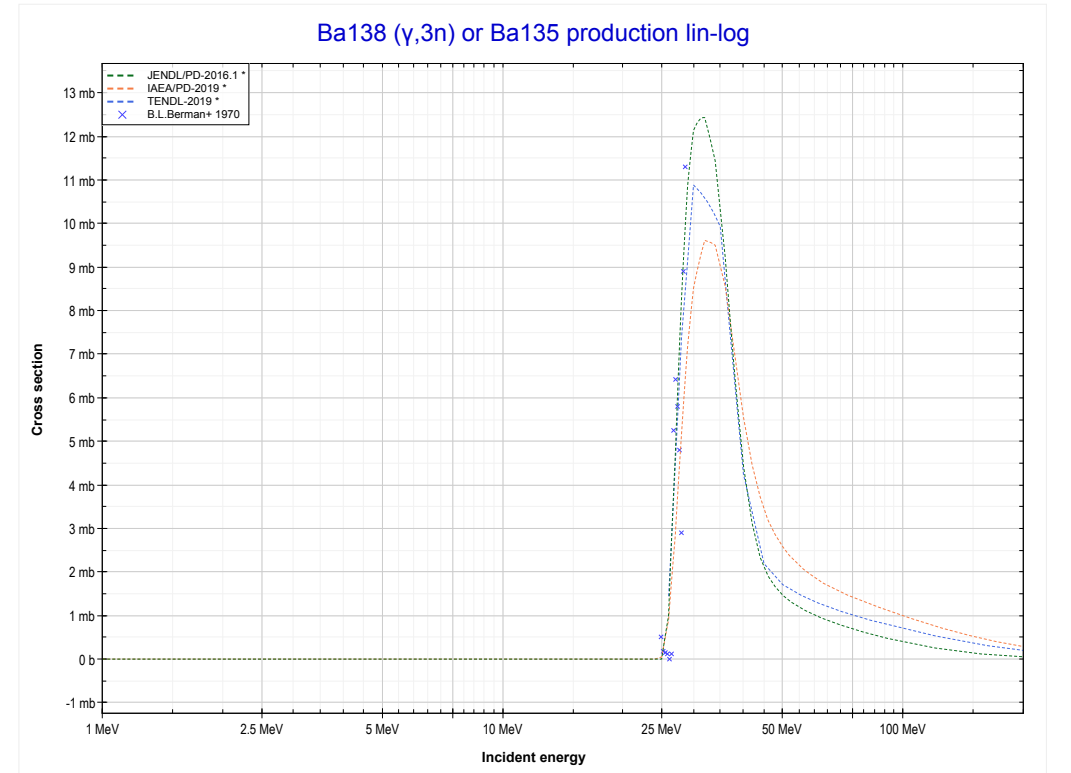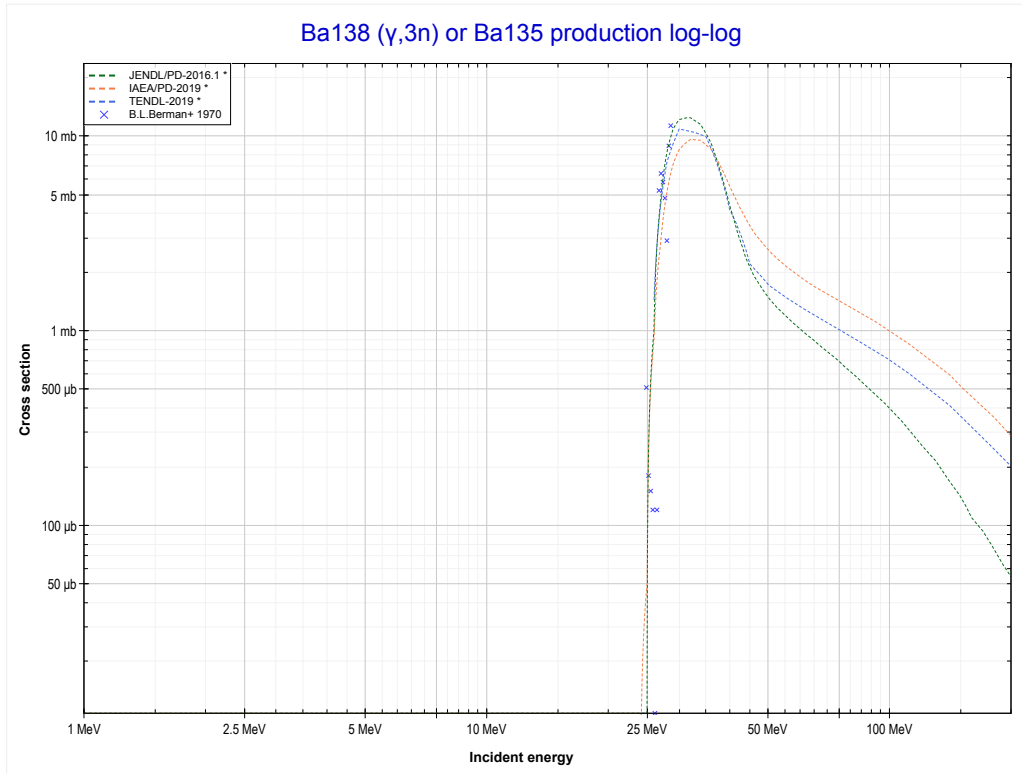
Reaction	Q-Value
Ba138(γ,3n)Ba135	-24625.05 keV

<< 56-Ba-138	57-La-139	58-Ce-140 >>
<< 56-Ba-138 MT17 (γ,3n)	MT4 (γ,n) or MT5 (La138 production)	MT16 (γ,2n) >>

La139 (γ,n) or La138 production log-log

La139 (γ,n) or La138 production lin-log
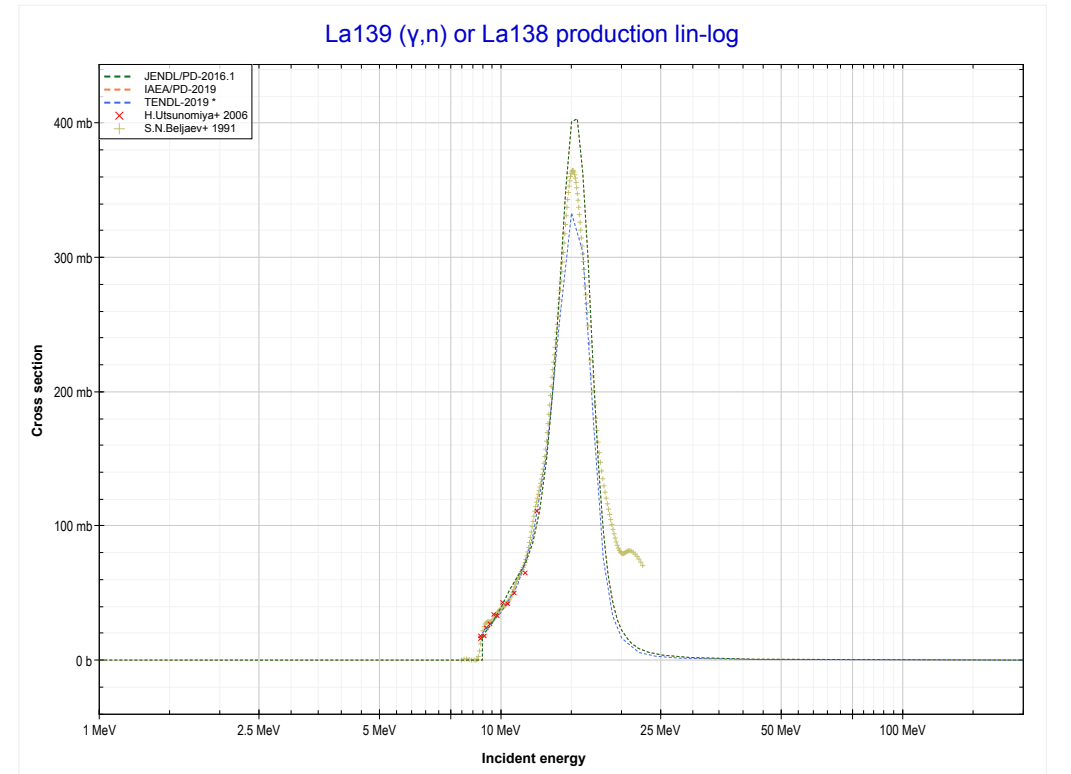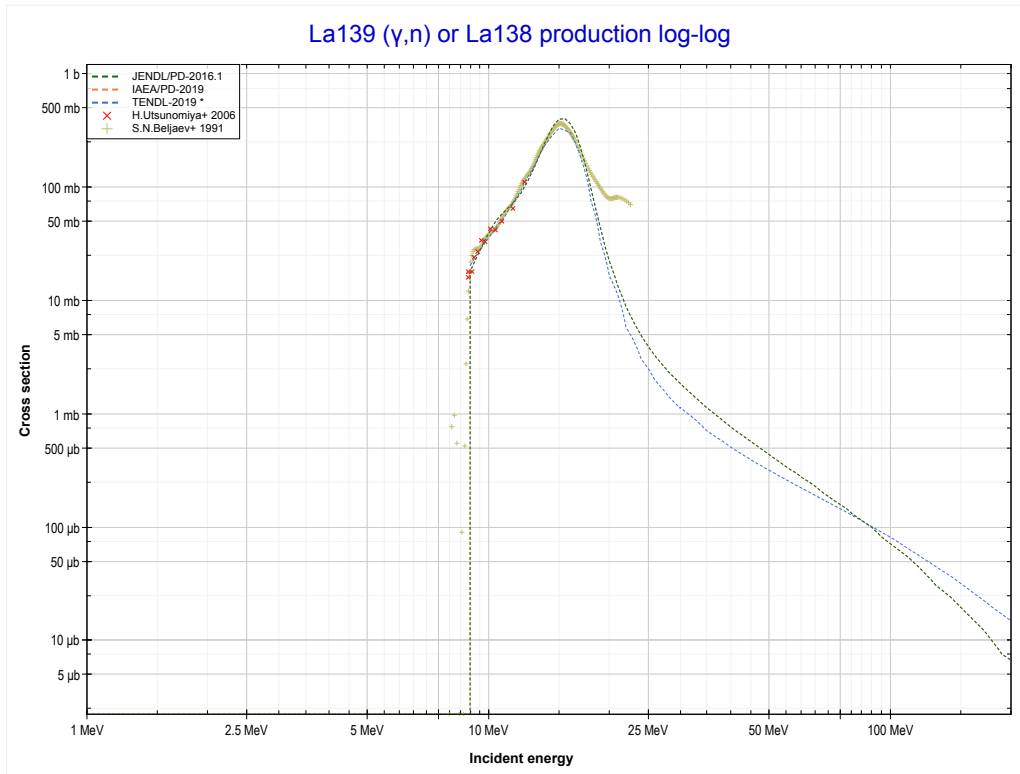
Reaction	Q-Value
La139(γ,n)La138	-8778.52 keV

<< 54-Xe-129	57-La-139	58-Ce-140 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (La137 production)	MT17 (γ,3n) >>

La139 (γ,2n) or La137 production log-log

La139 (γ,2n) or La137 production lin-log
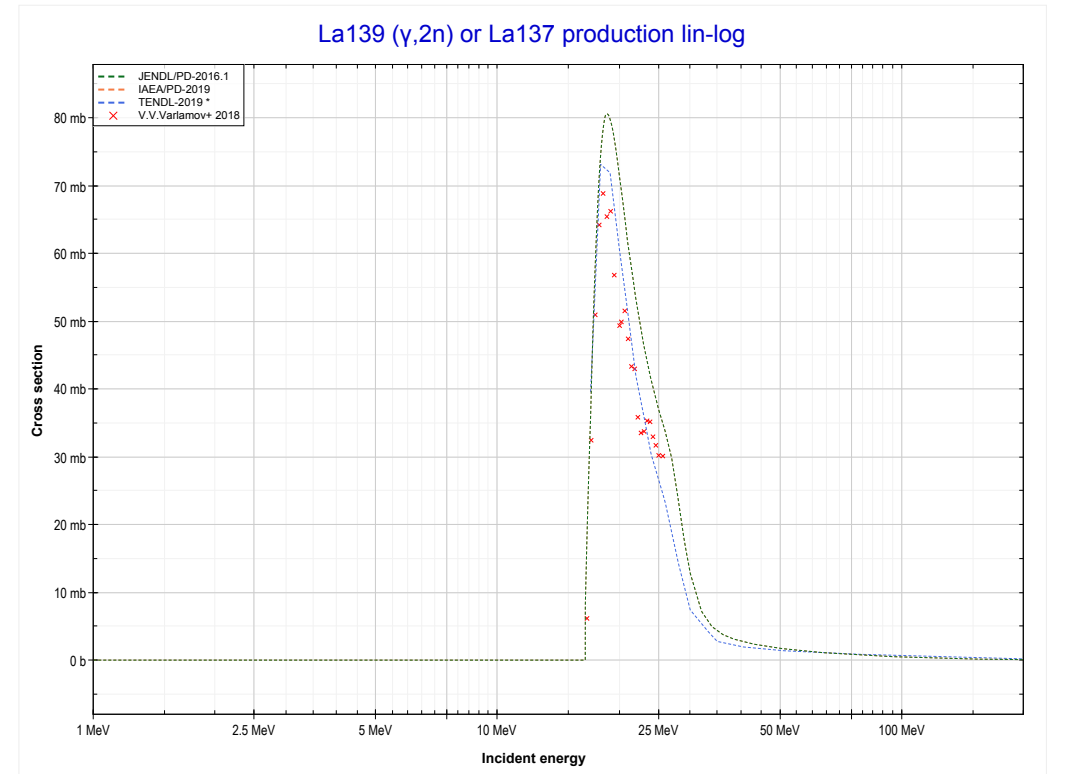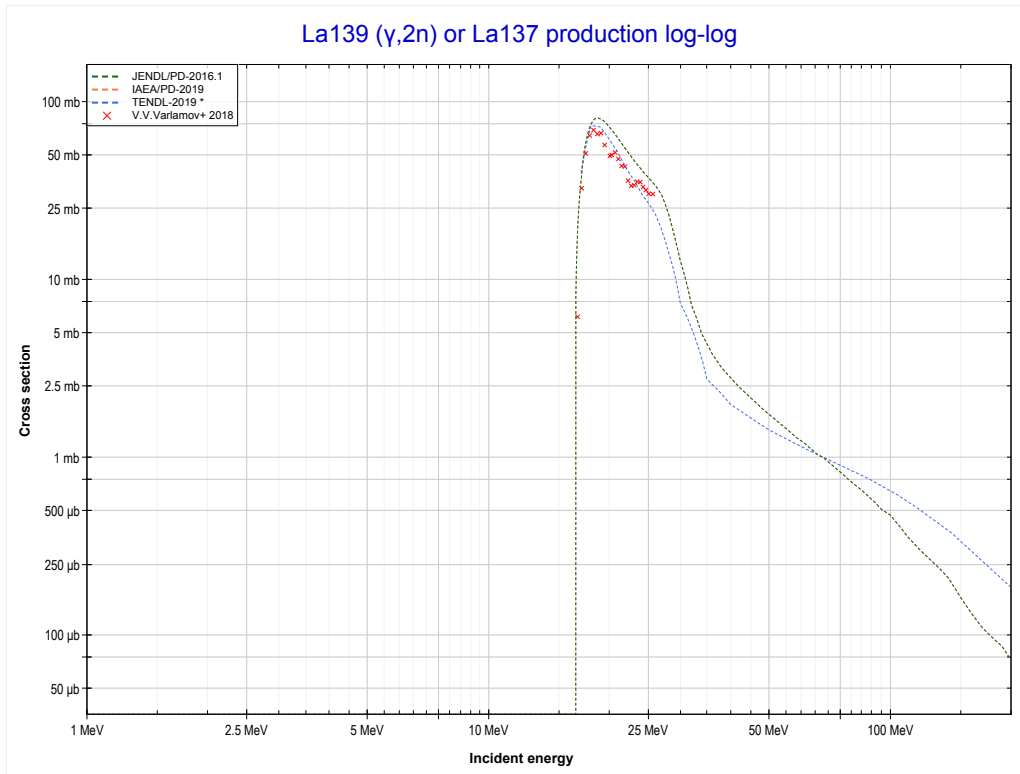
Reaction	Q-Value
La139(γ,2n)La137	-16228.13 keV

<< 56-Ba-138	57-La-139	59-Pr-141 >>
<< MT16 (γ,2n)	MT17 (γ,3n) or MT5 (La136 production)	58-Ce-140 MT4 (γ,n) >>

La139 (γ,3n) or La136 production log-log

La139 (γ,3n) or La136 production lin-log
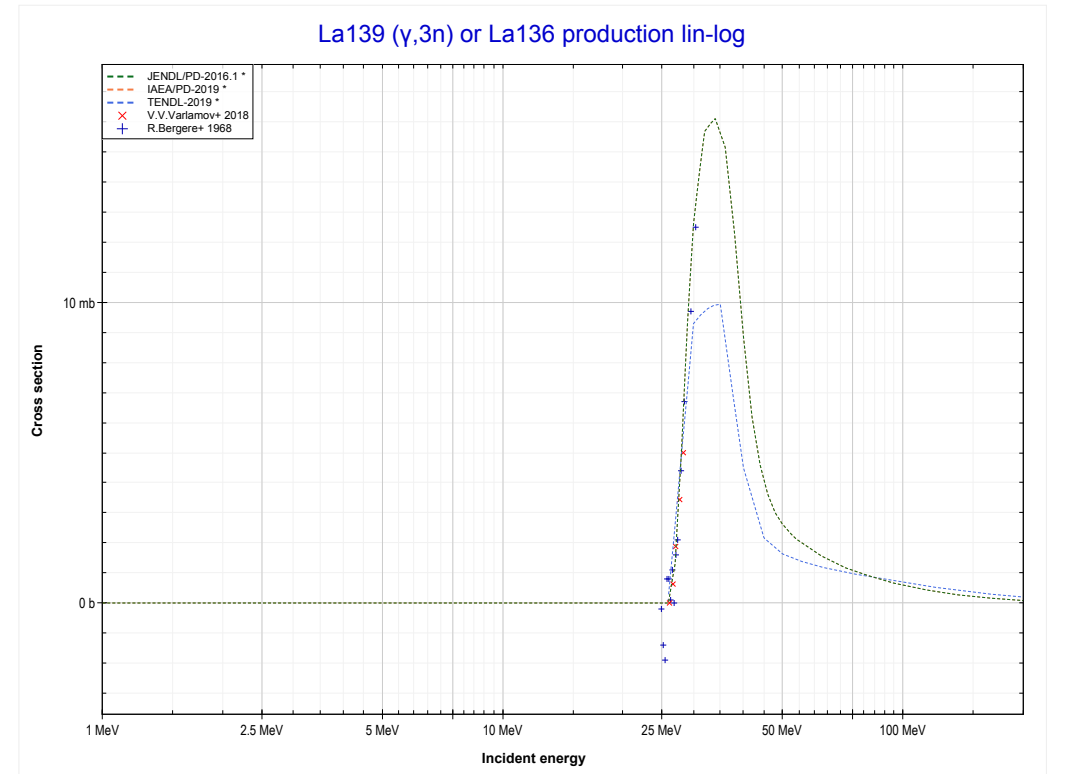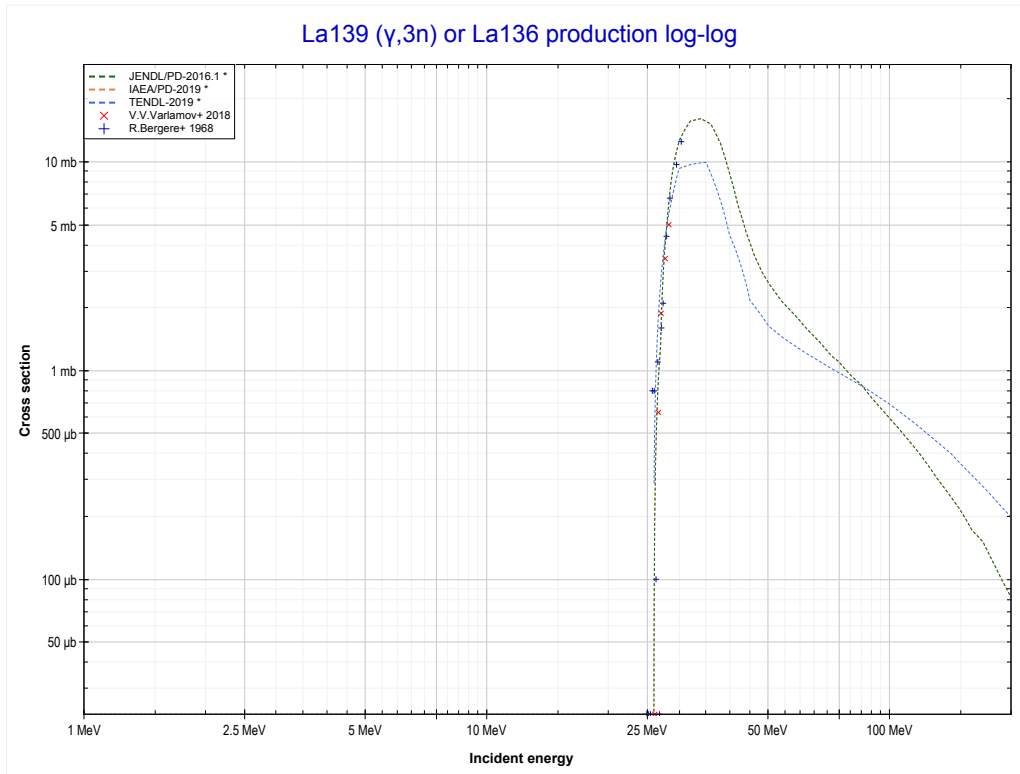
Reaction	Q-Value
La139(γ,3n)La136	-25400.15 keV

<< 57-La-139	**58-Ce-140**	58-Ce-142 >>
<< 57-La-139 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Ce139 production)**	MT16 (γ,2n) >>

Ce140 (γ,n) or Ce139 production log-log

Ce140 (γ,n) or Ce139 production lin-log
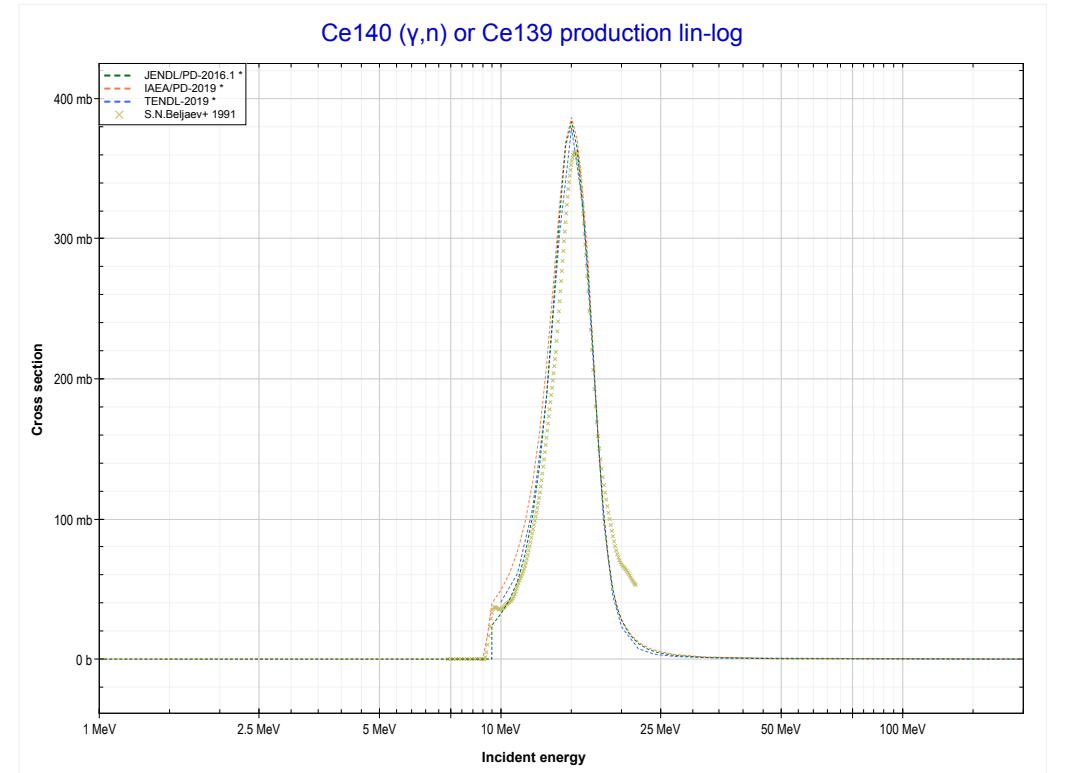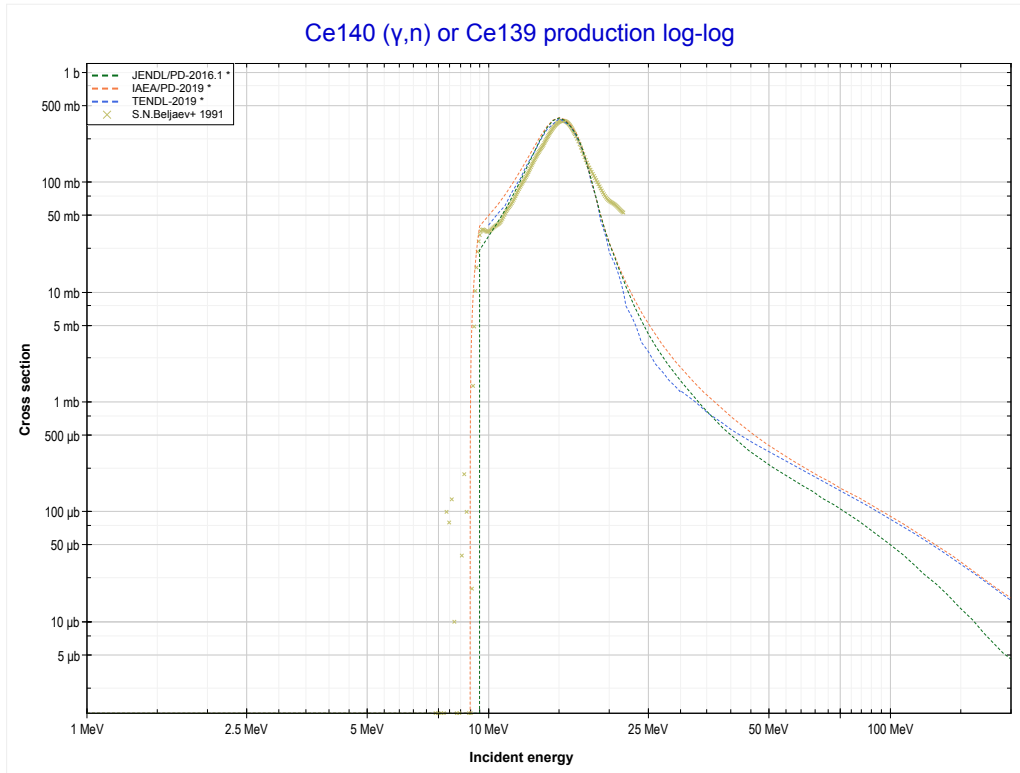
Reaction	Q-Value
Ce140(γ,n)Ce139	-9199.42 keV

<< 57-La-139	**58-Ce-140**	58-Ce-142 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ce138 production)**	58-Ce-142 MT4 (γ,n) >>

Ce140 (γ,2n) or Ce138 production log-log

Ce140 (γ,2n) or Ce138 production lin-log
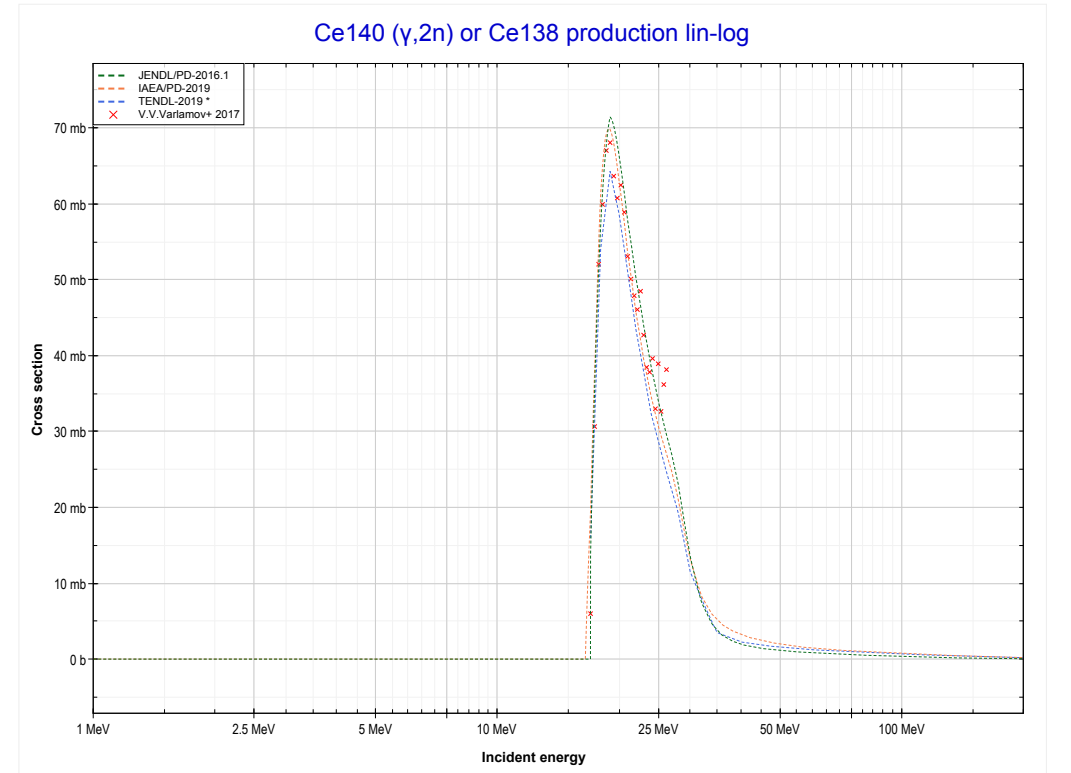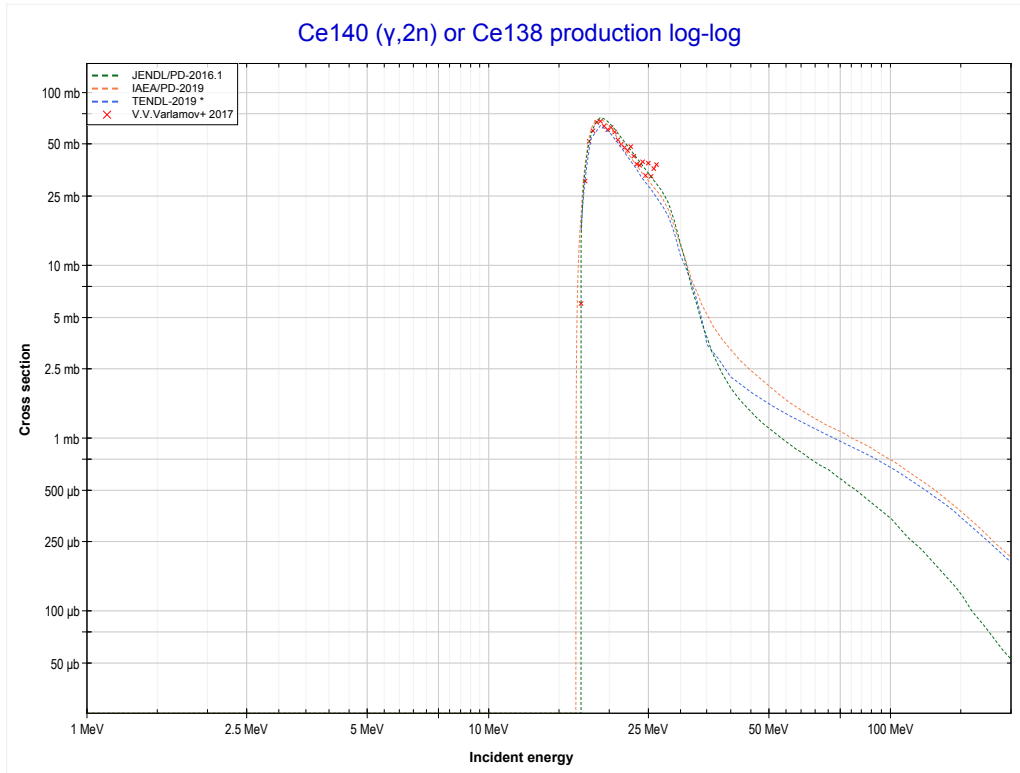
Reaction	Q-Value
Ce140(γ,2n)Ce138	-16647.73 keV

<< 58-Ce-140	**58-Ce-142**	59-Pr-141 >>
<< 58-Ce-140 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Ce141 production)**	MT16 (γ,2n) >>

Ce142 (γ,n) or Ce141 production log-log

Ce142 (γ,n) or Ce141 production lin-log
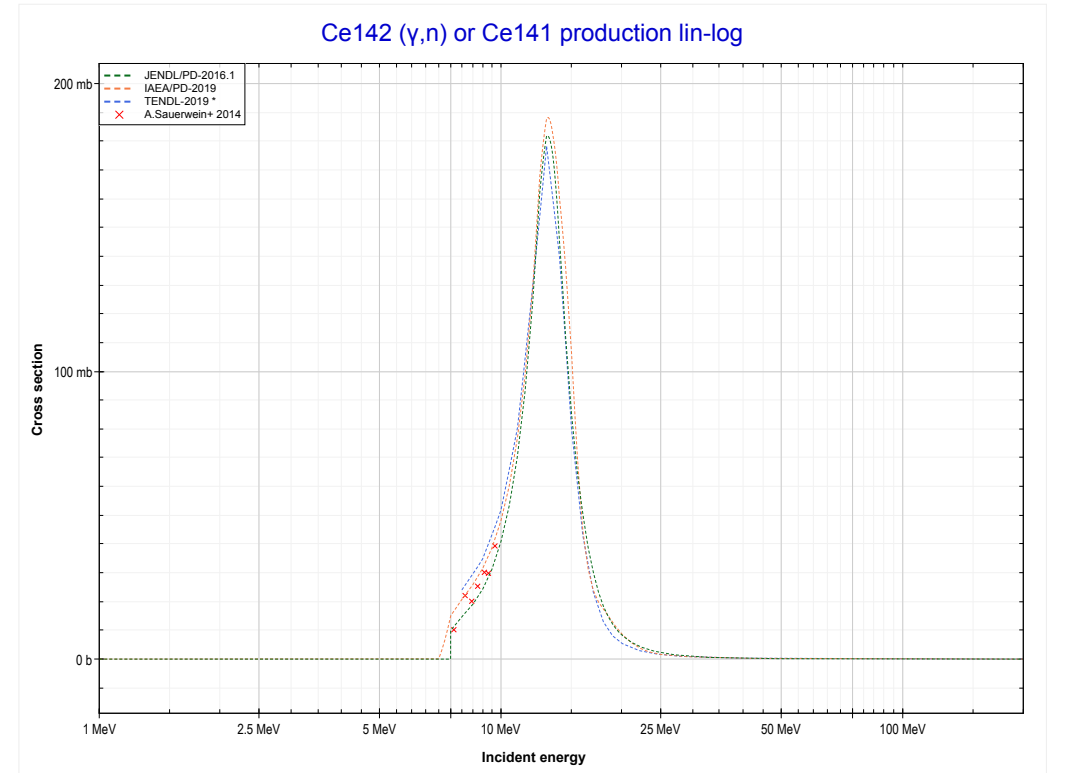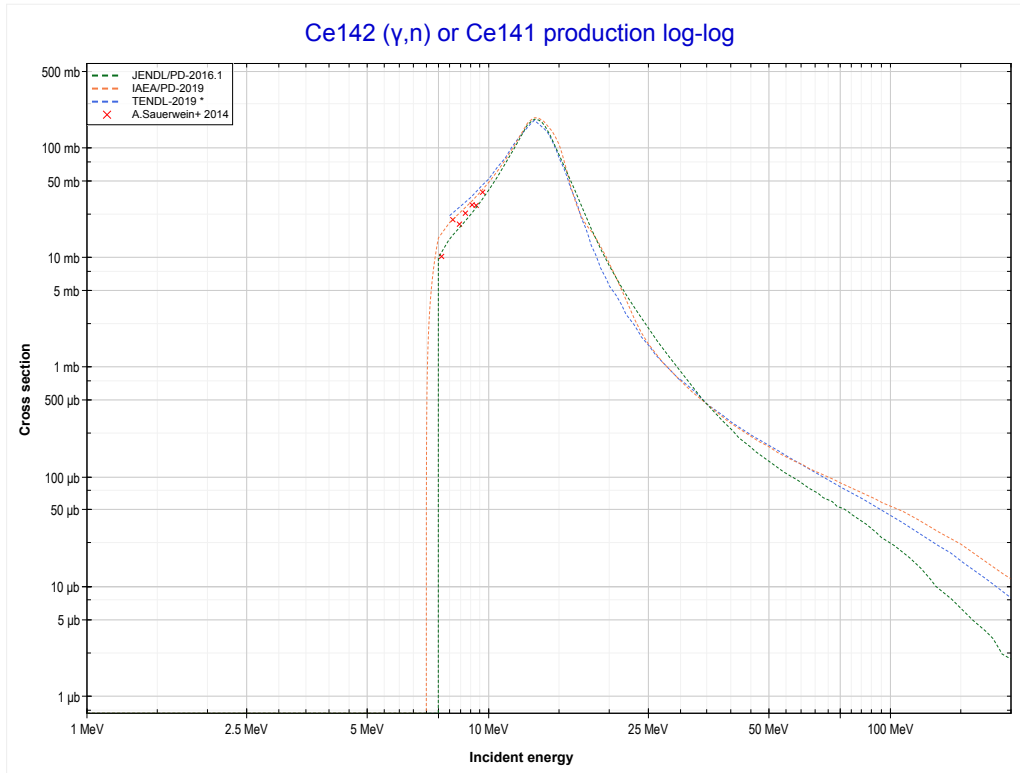
Reaction	Q-Value
Ce142(γ,n)Ce141	-7171.62 keV

<< 58-Ce-140	**58-Ce-142**	60-Nd-142 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ce140 production)**	59-Pr-141 MT4 (γ,n) >>

Ce142 (γ,2n) or Ce140 production log-log

Ce142 (γ,2n) or Ce140 production lin-log
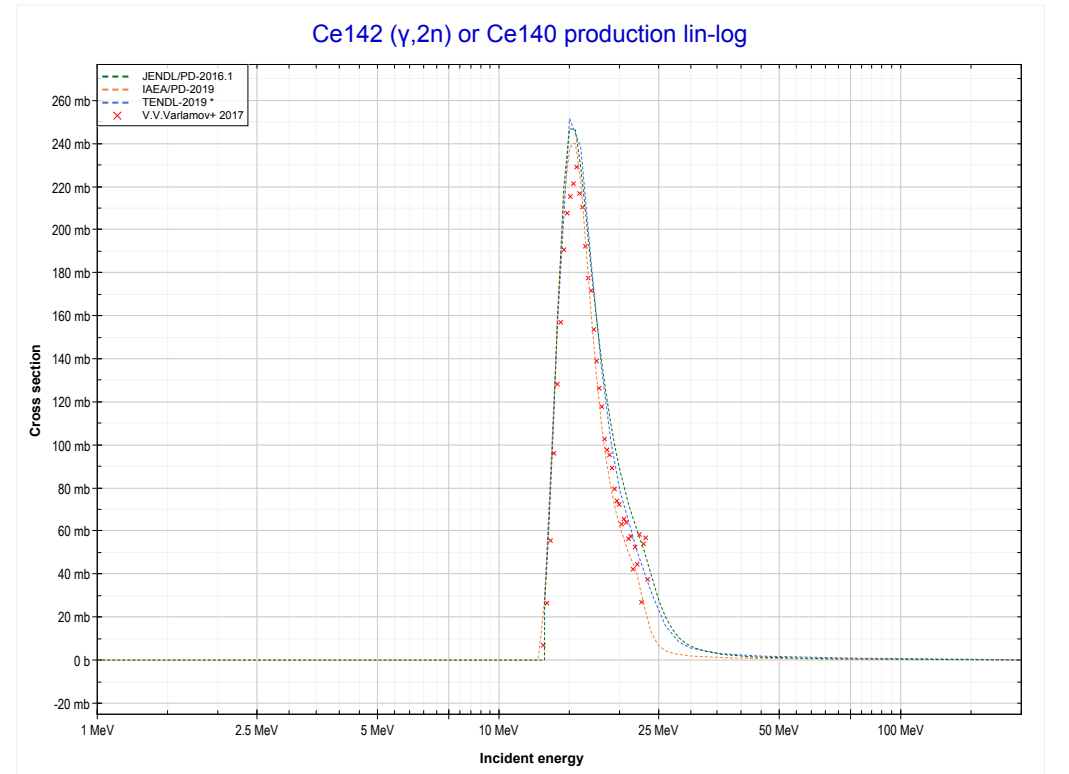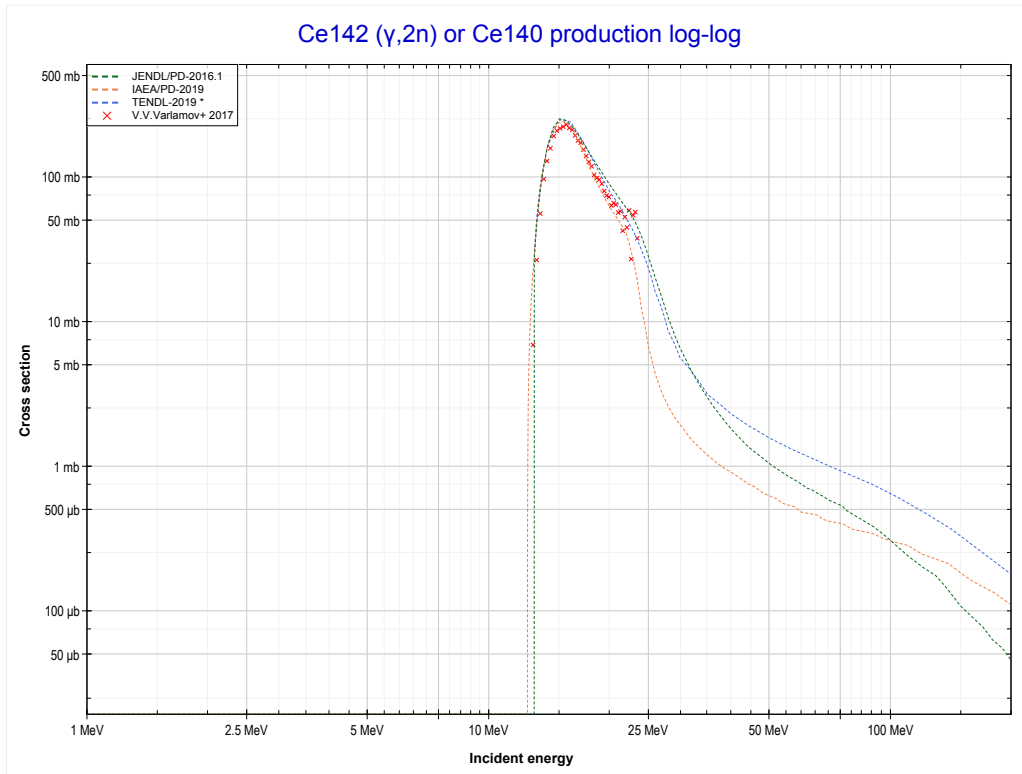
Reaction	Q-Value
Ce142(γ,2n)Ce140	-12599.73 keV

<< 58-Ce-142	**59-Pr-141**	60-Nd-142 >>
<< 58-Ce-142 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Pr140 production)**	MT17 (γ,3n) >>

Pr141 (γ,n) or Pr140 production log-log

Pr141 (γ,n) or Pr140 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- H.Utsunomiya+ 2006
- S.N.Beljaev+ 1991
- R.E.Sund+ 1970
- B.C.Cook+ 1966
- B.C.Cook+ 1966
- W.E.Del Bianco+ 1962
- G.E.Coote+ 1961
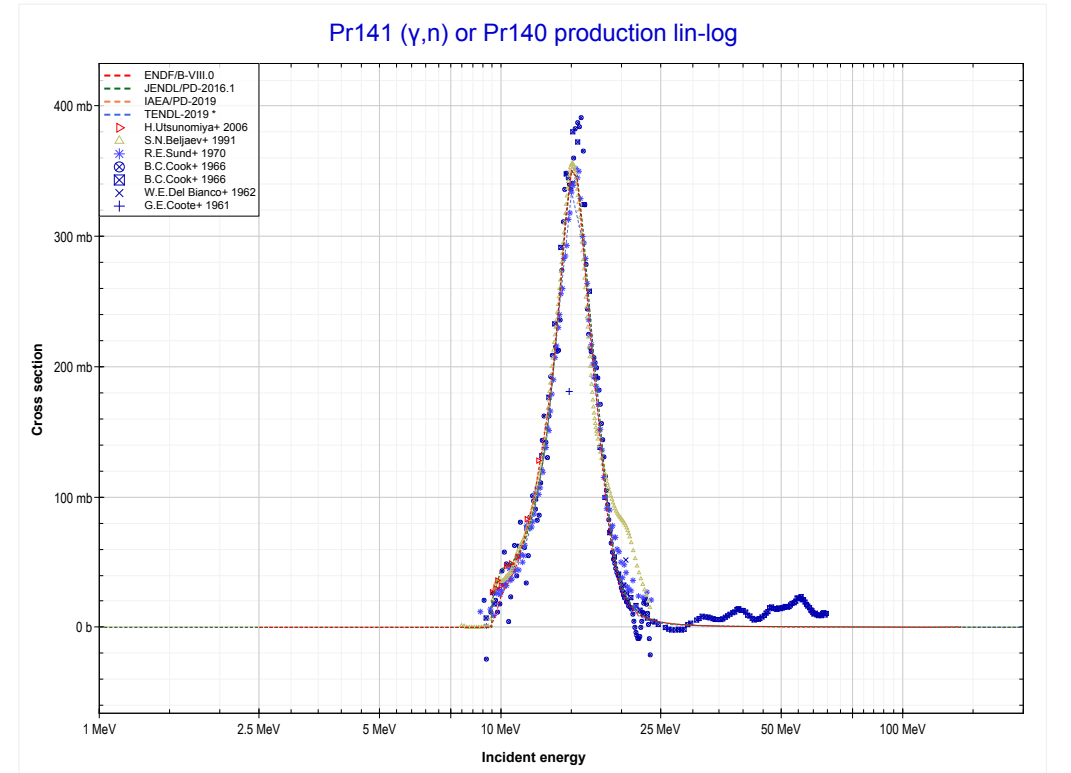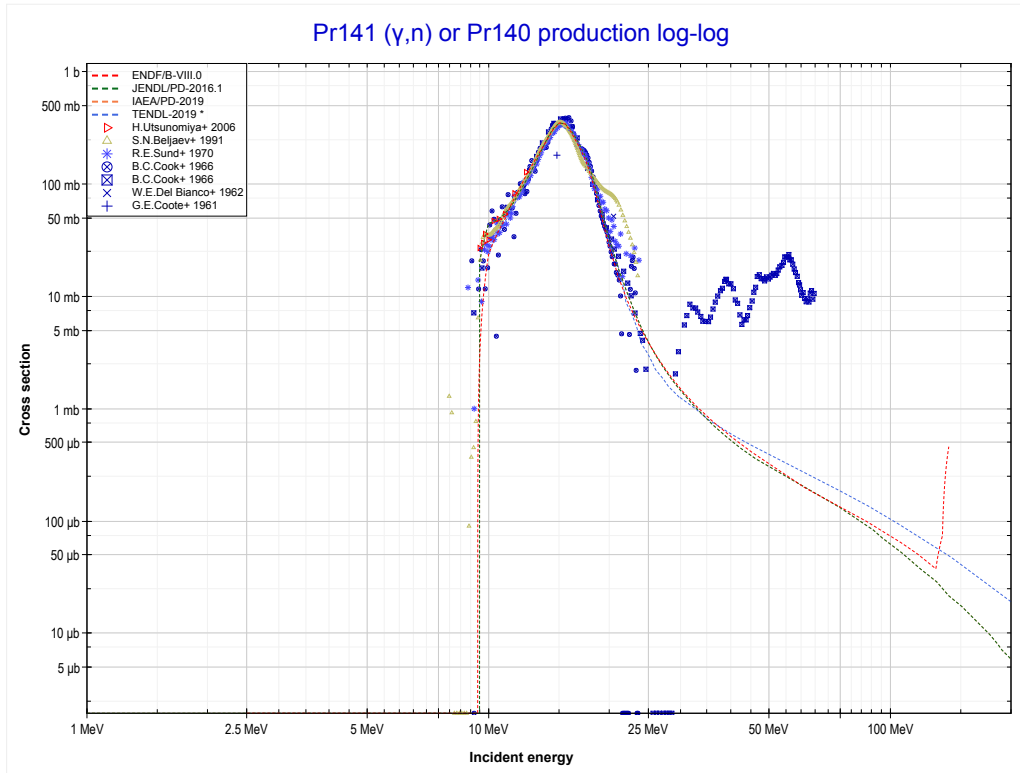
Reaction	Q-Value
Pr141(γ,n)Pr140	-9398.92 keV

<< 57-La-139	**59-Pr-141**	63-Eu-153 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Pr138 production)**	60-Nd-142 MT4 (γ,n) >>

Pr141 (γ,3n) or Pr138 production log-log

Pr141 (γ,3n) or Pr138 production lin-log
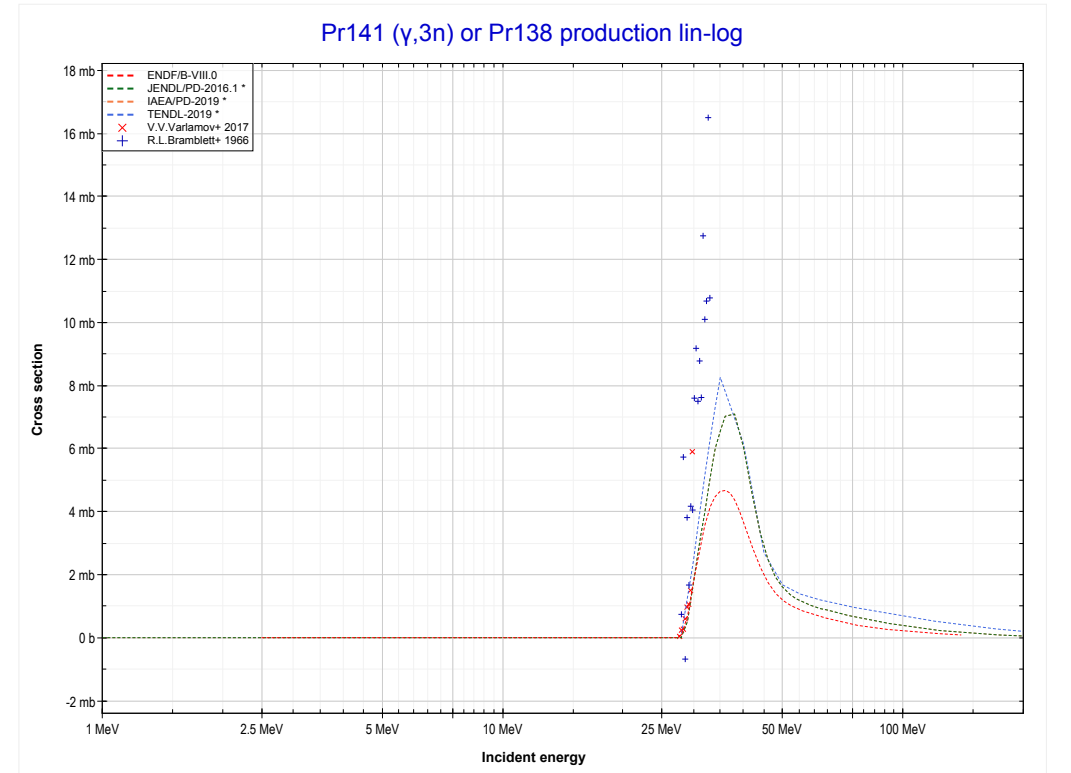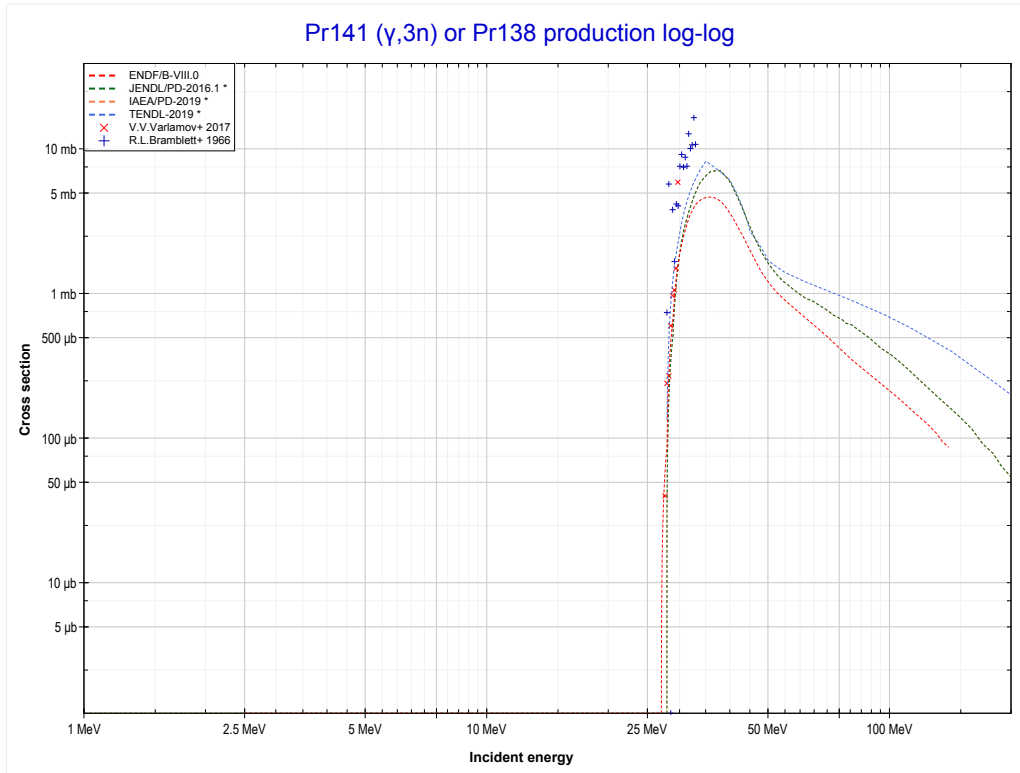
Reaction	Q-Value
Pr141(γ,3n)Pr138	-27095.55 keV

<< 59-Pr-141	**60-Nd-142**	60-Nd-143 >>
<< 59-Pr-141 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Nd141 production)**	MT16 (γ,2n) >>

Nd142 (γ,n) or Nd141 production log-log

Nd142 (γ,n) or Nd141 production lin-log
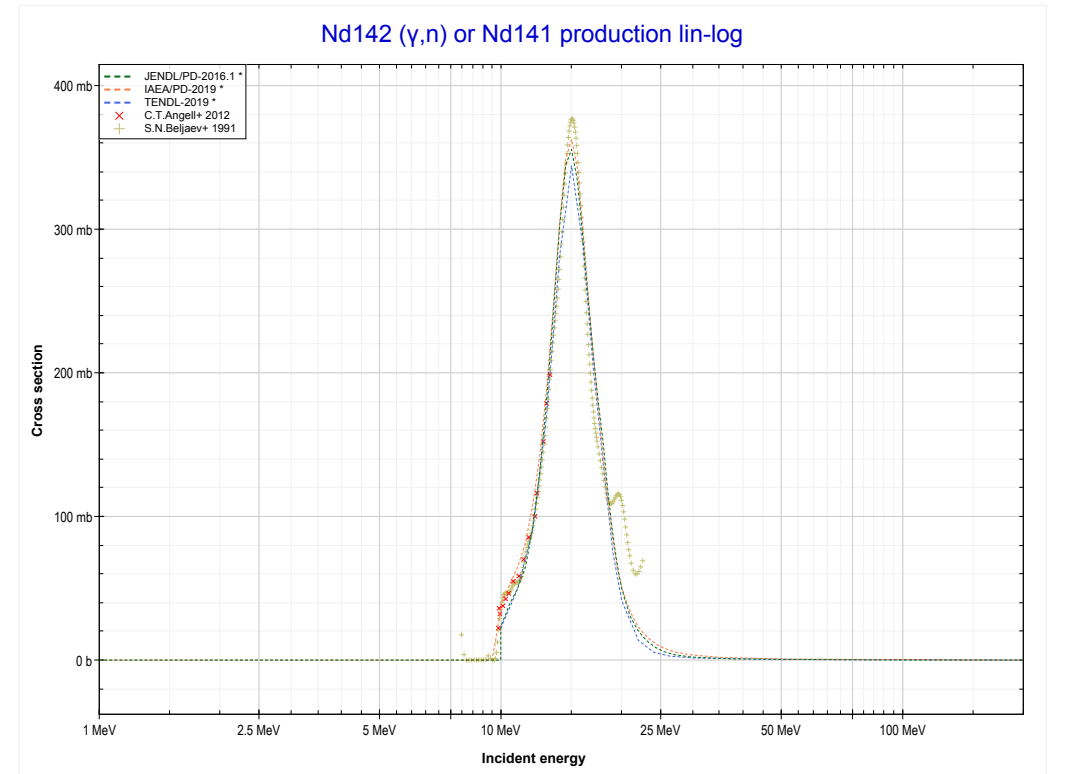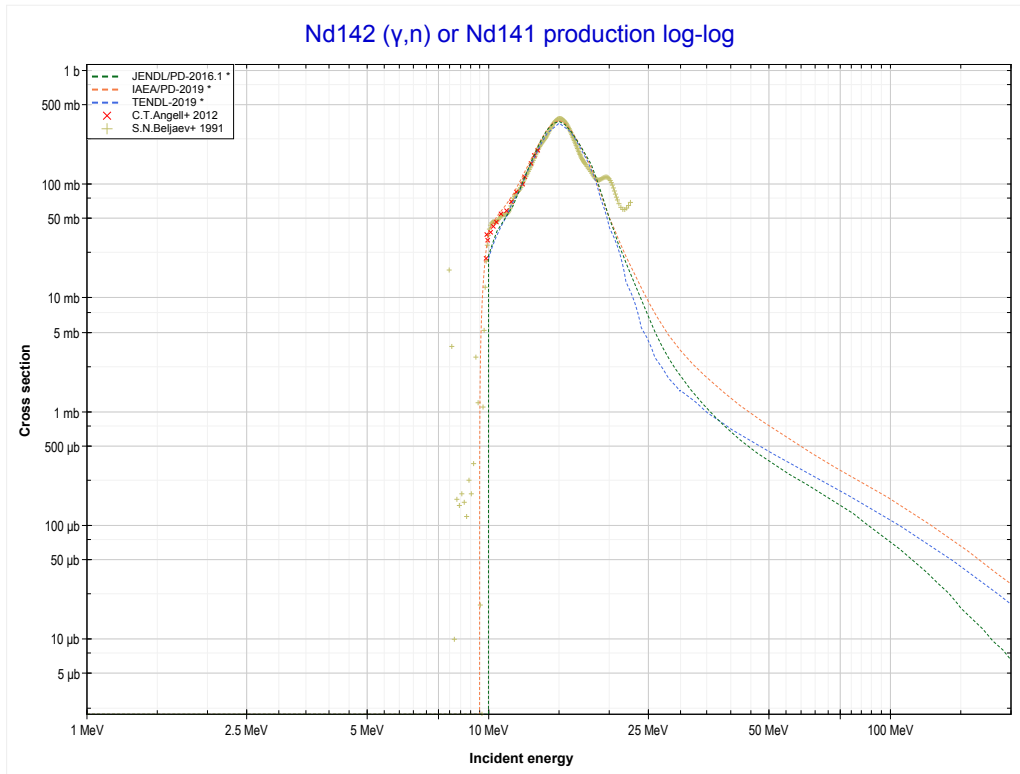
Reaction	Q-Value
Nd142(γ,n)Nd141	-9828.32 keV

<< 58-Ce-142	60-Nd-142	60-Nd-143 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Nd140 production)	60-Nd-143 MT4 (γ,n) >>

Nd142 (γ,2n) or Nd140 production log-log

Nd142 (γ,2n) or Nd140 production lin-log
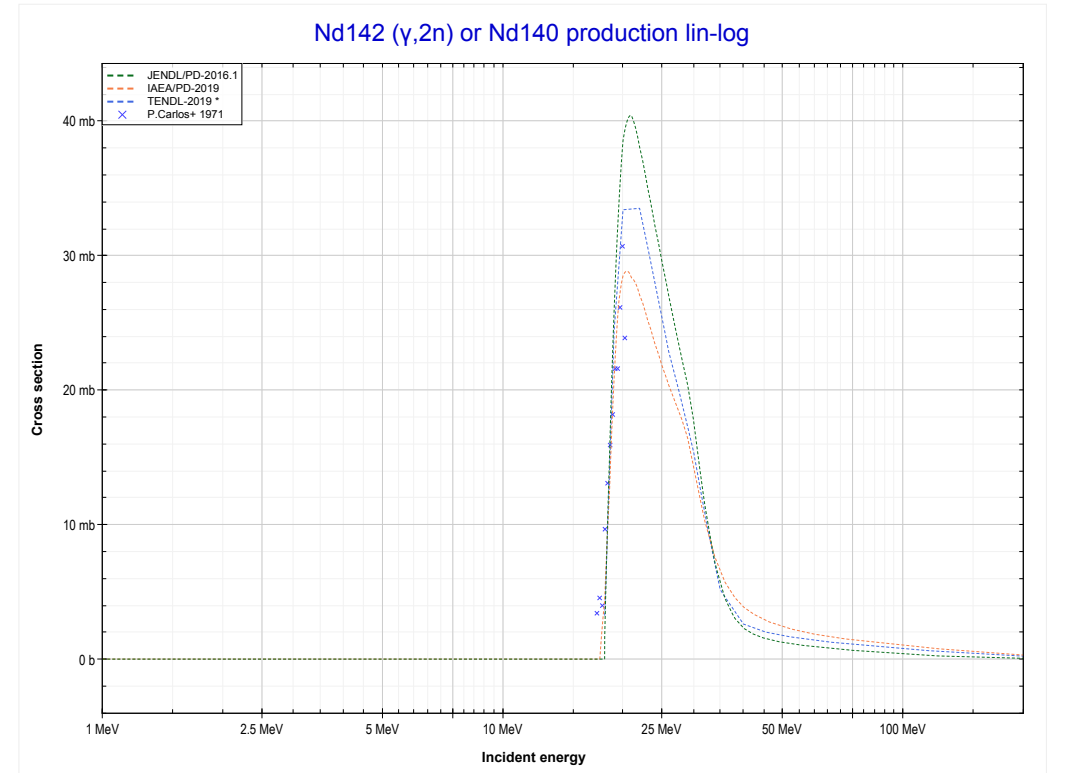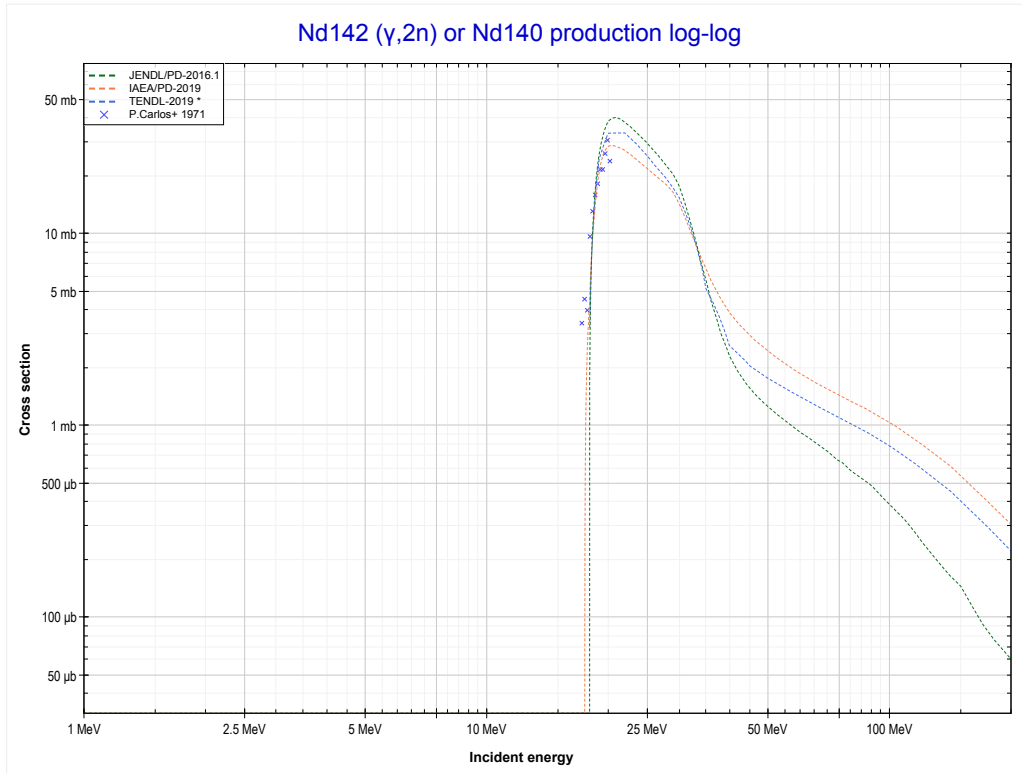
Reaction	Q-Value
Nd142(γ,2n)Nd140	-17833.63 keV

<< 60-Nd-142	**60-Nd-143**	60-Nd-144 >>
<< 60-Nd-142 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Nd142 production)**	MT16 (γ,2n) >>

Nd143 (γ,n) or Nd142 production log-log

Nd143 (γ,n) or Nd142 production lin-log
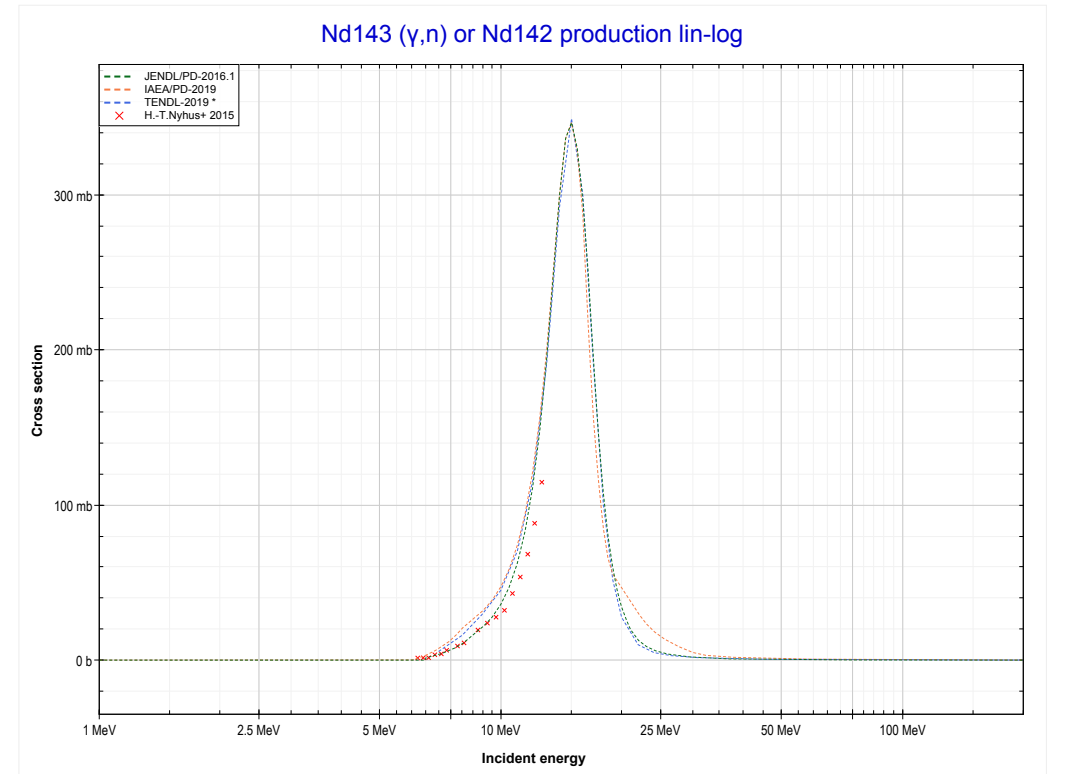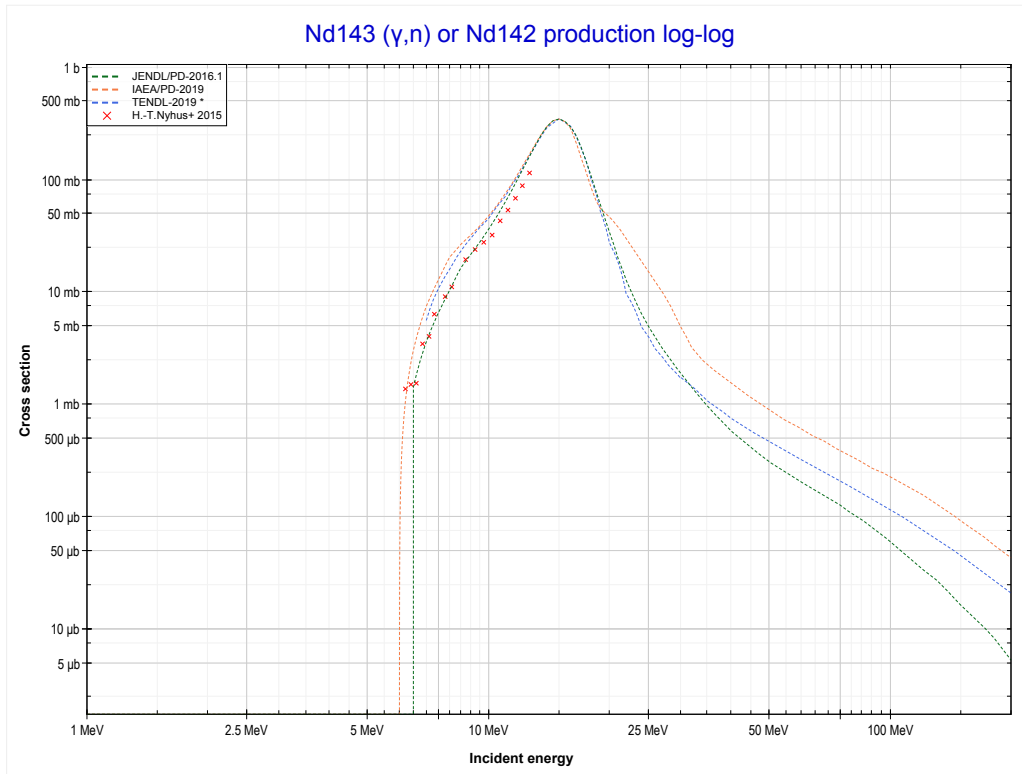
Reaction	Q-Value
Nd143(γ,n)Nd142	-6123.52 keV

<< 60-Nd-142	**60-Nd-143**	60-Nd-144 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Nd141 production)**	60-Nd-144 MT4 (γ,n) >>

Nd143 (γ,2n) or Nd141 production log-log

Nd143 (γ,2n) or Nd141 production lin-log
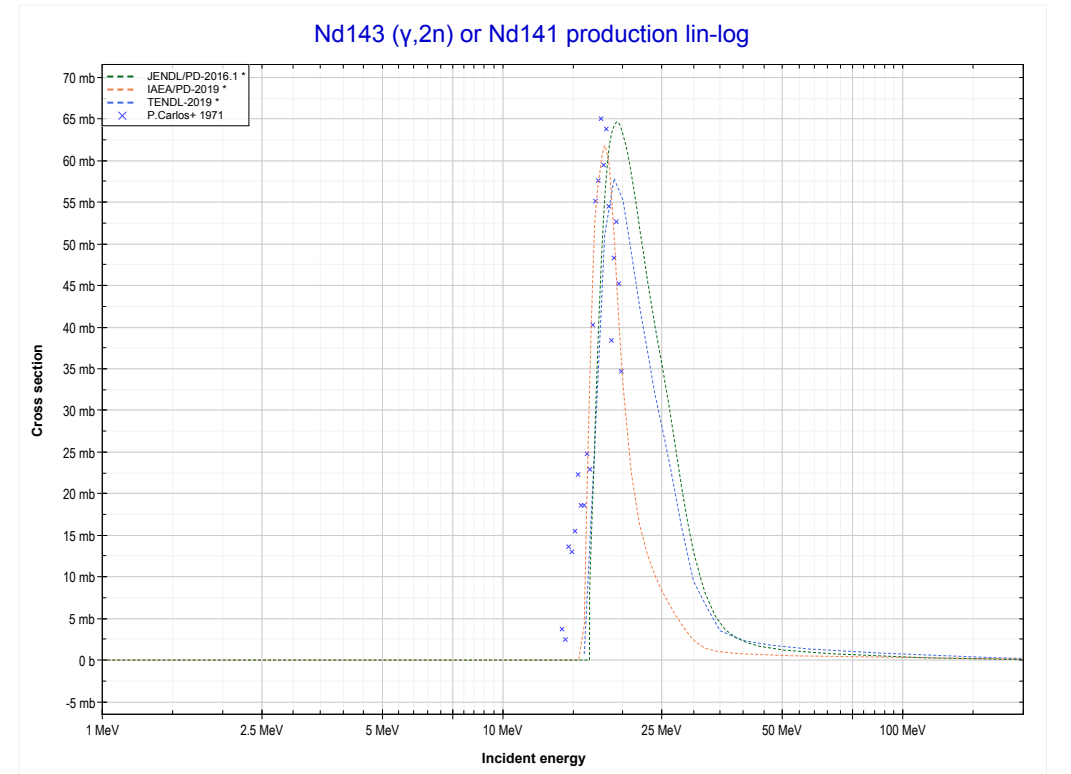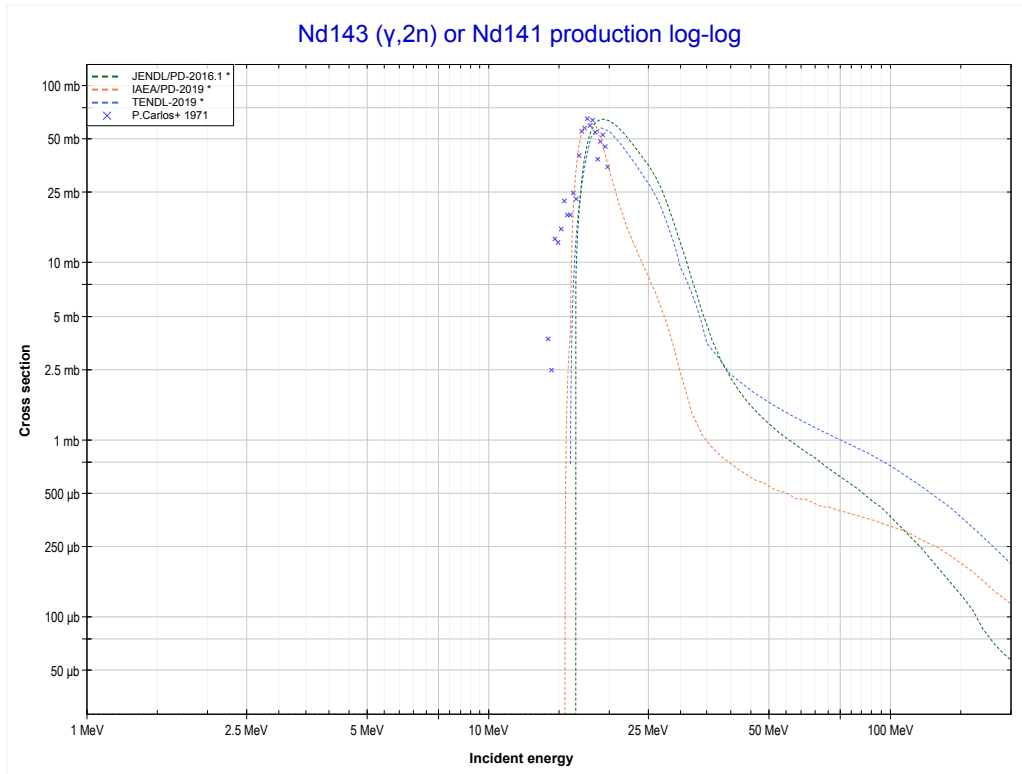
Reaction	Q-Value
Nd143(γ,2n)Nd141	-15951.83 keV

<< 60-Nd-143	60-Nd-144	60-Nd-145 >>
<< 60-Nd-143 MT16 (γ,2n)	MT4 (γ,n) or MT5 (Nd143 production)	MT16 (γ,2n) >>

Nd144 (γ,n) or Nd143 production log-log

Nd144 (γ,n) or Nd143 production lin-log
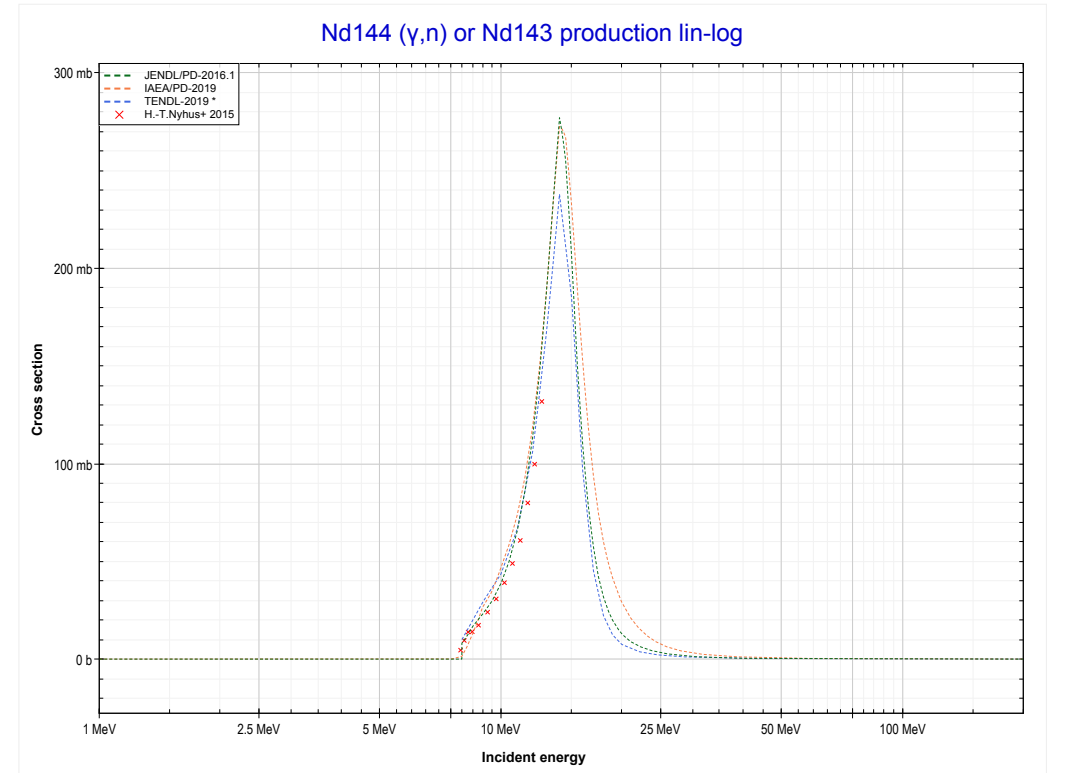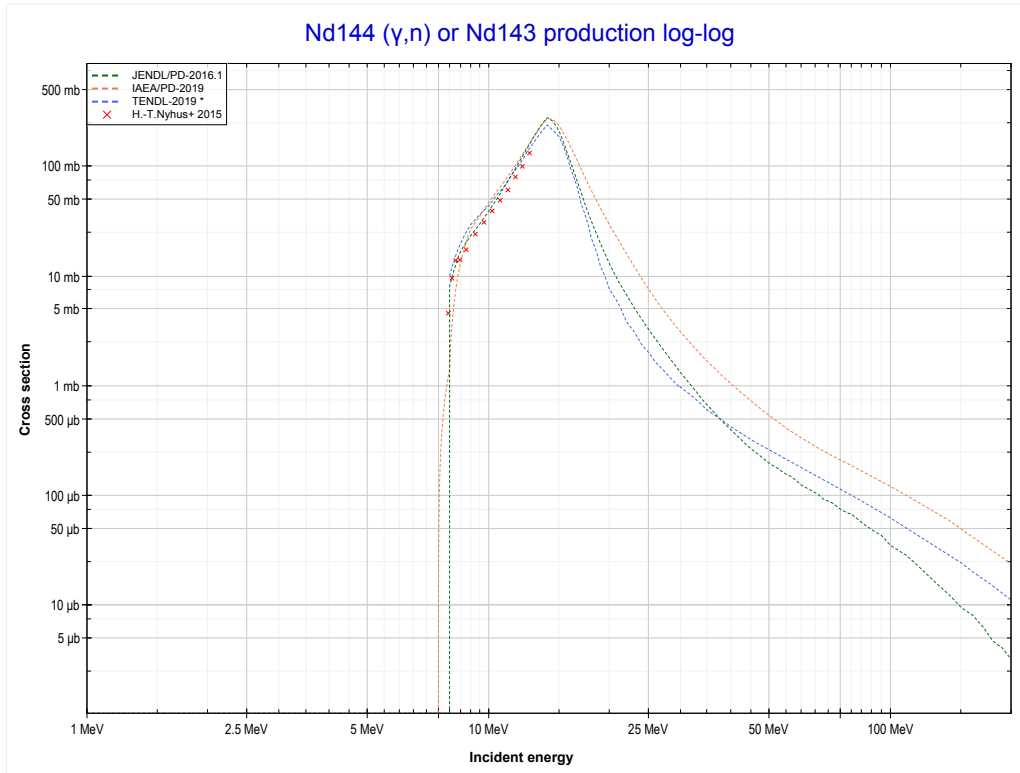
Reaction	Q-Value
Nd144(γ,n)Nd143	-7817.12 keV

<< 60-Nd-143	**60-Nd-144**	60-Nd-145 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Nd142 production)**	60-Nd-145 MT4 (γ,n) >>

Nd144 (γ,2n) or Nd142 production log-log

Nd144 (γ,2n) or Nd142 production lin-log
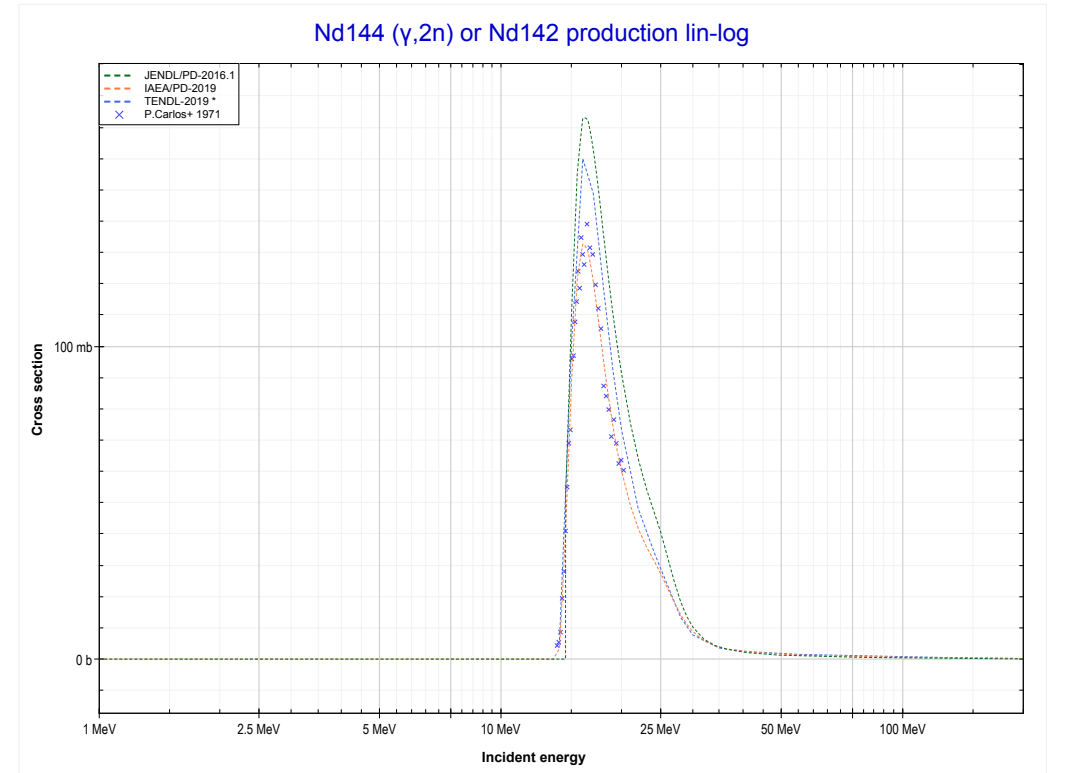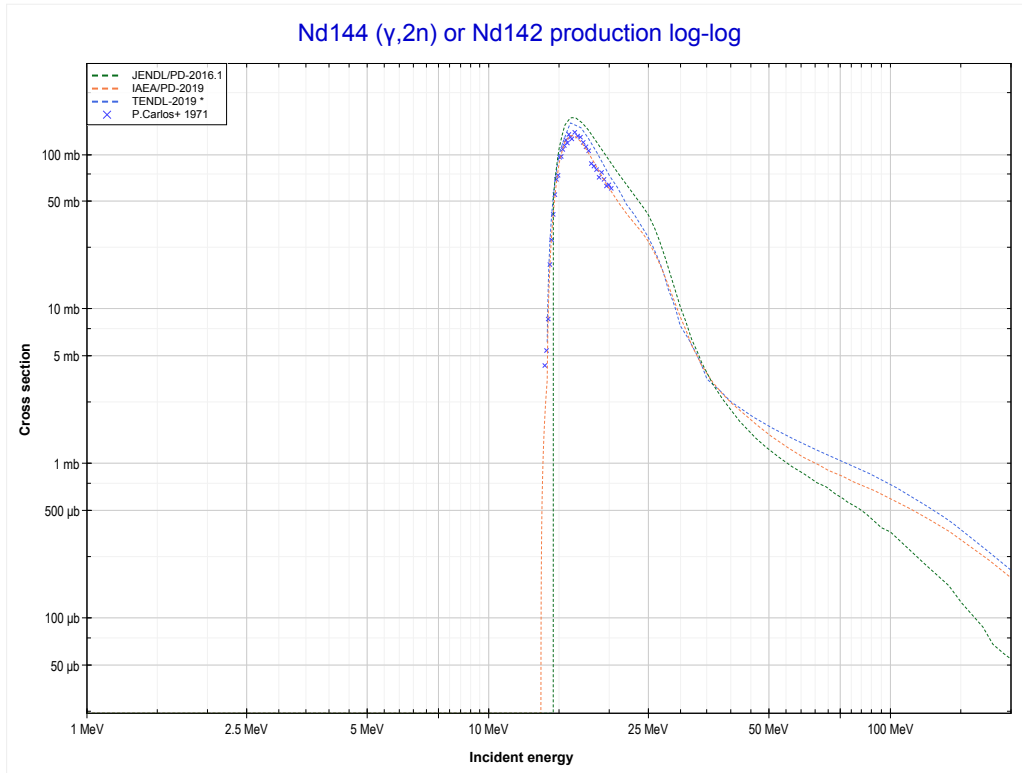
Reaction	Q-Value
Nd144(γ,2n)Nd142	-13940.63 keV

<< 60-Nd-144	**60-Nd-145**	60-Nd-146 >>
<< 60-Nd-144 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Nd144 production)**	MT16 (γ,2n) >>

Nd145 (γ,n) or Nd144 production log-log

Nd145 (γ,n) or Nd144 production lin-log
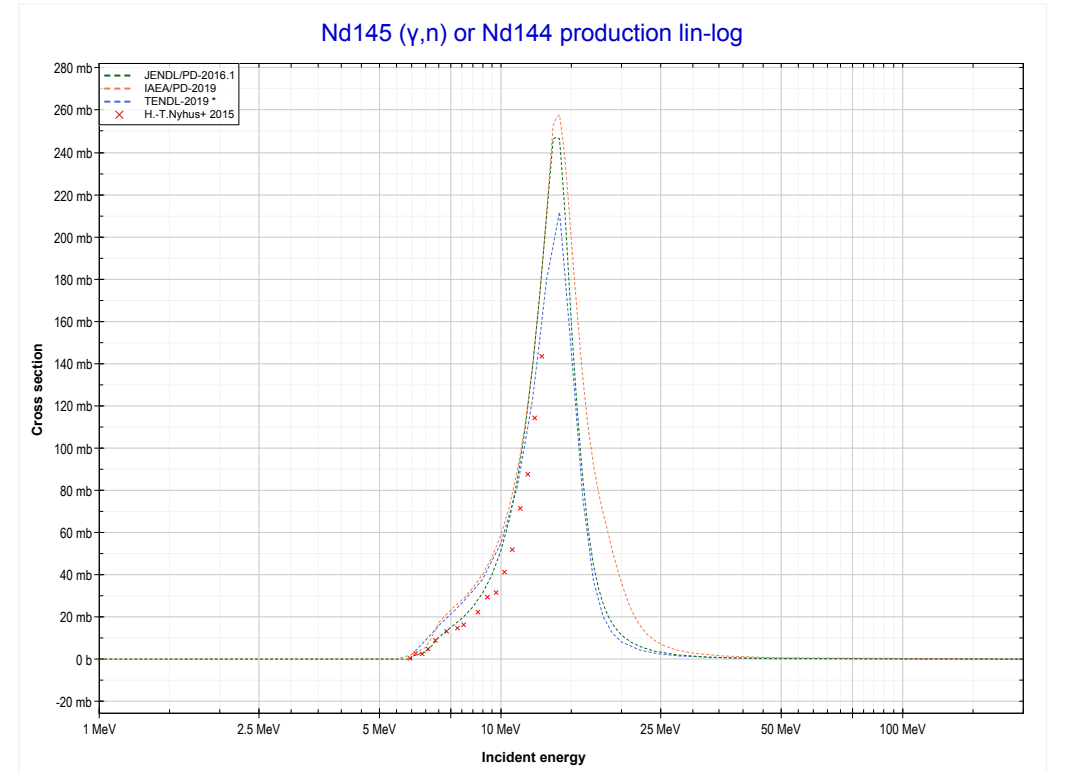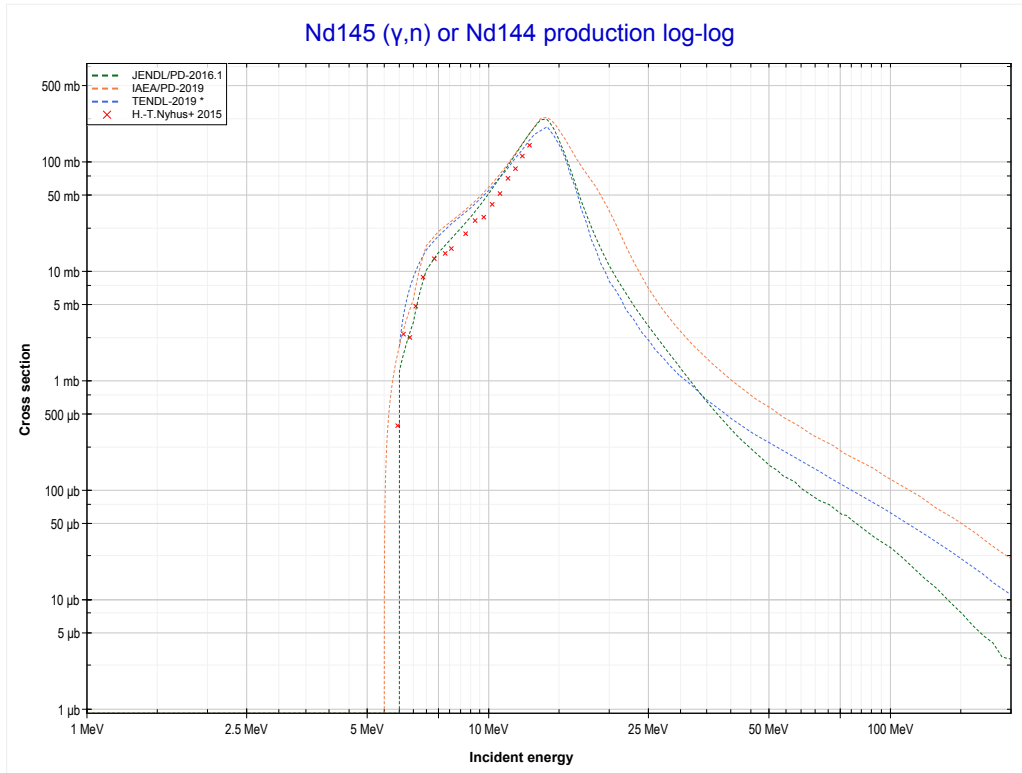
Reaction	Q-Value
Nd145(γ,n)Nd144	-5755.32 keV

<< 60-Nd-144	**60-Nd-145**	60-Nd-146 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Nd143 production)**	60-Nd-146 MT4 (γ,n) >>

Nd145 (γ,2n) or Nd143 production log-log

Nd145 (γ,2n) or Nd143 production lin-log
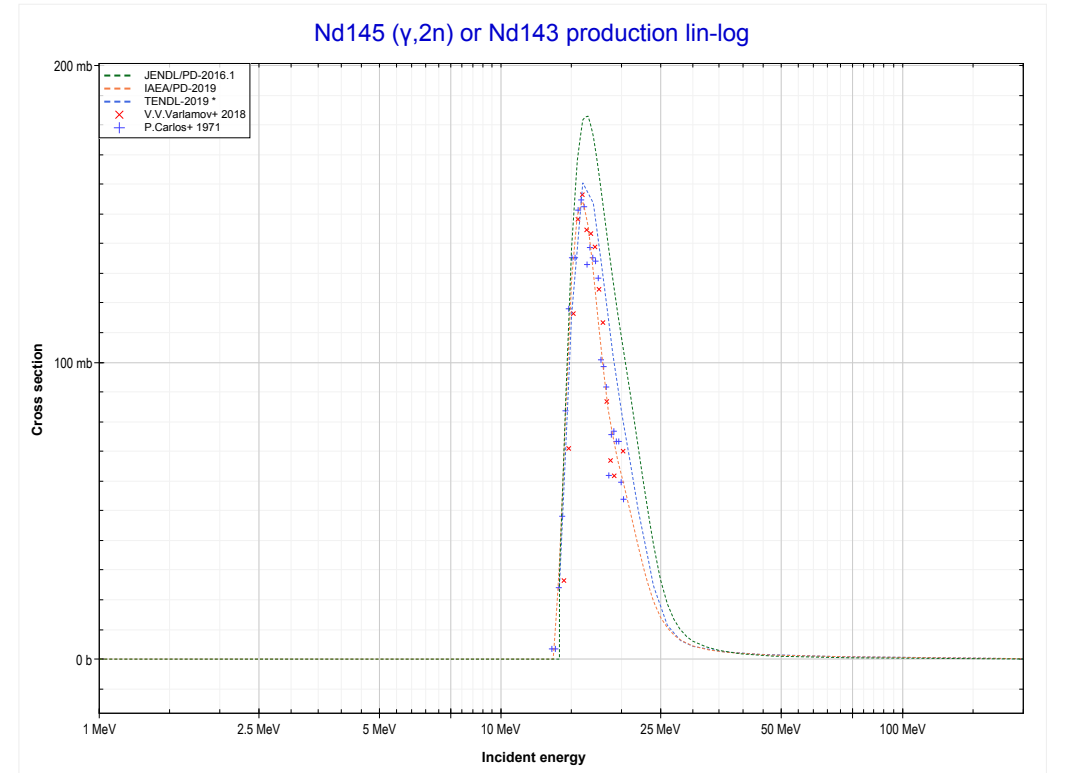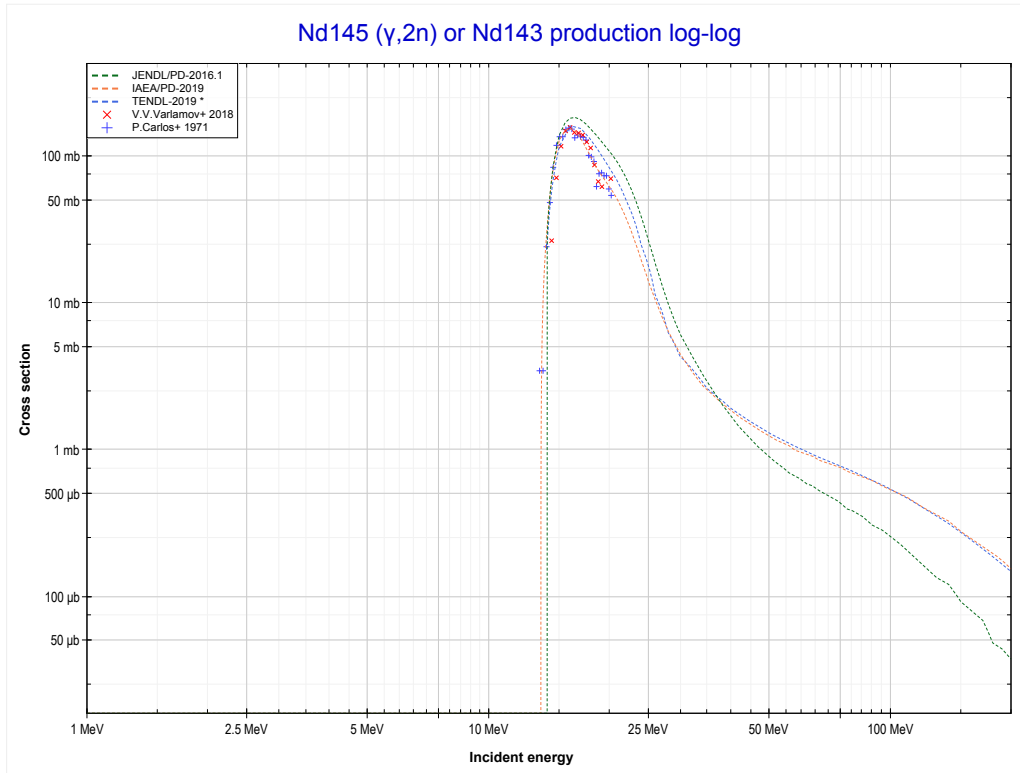
Reaction	Q-Value
Nd145(γ,2n)Nd143	-13572.43 keV

<< 60-Nd-145	60-Nd-146	60-Nd-148 >>
<< 60-Nd-145 MT16 (γ,2n)	MT4 (γ,n) or MT5 (Nd145 production)	MT16 (γ,2n) >>

Nd146 (γ,n) or Nd145 production log-log

Nd146 (γ,n) or Nd145 production lin-log
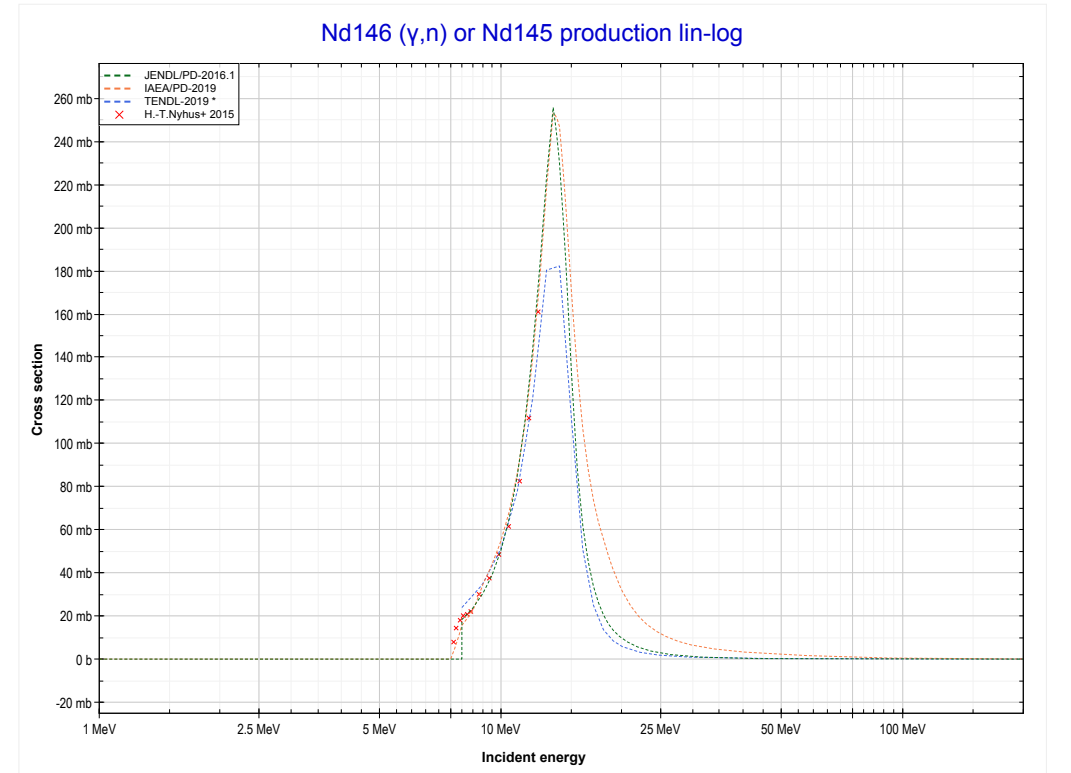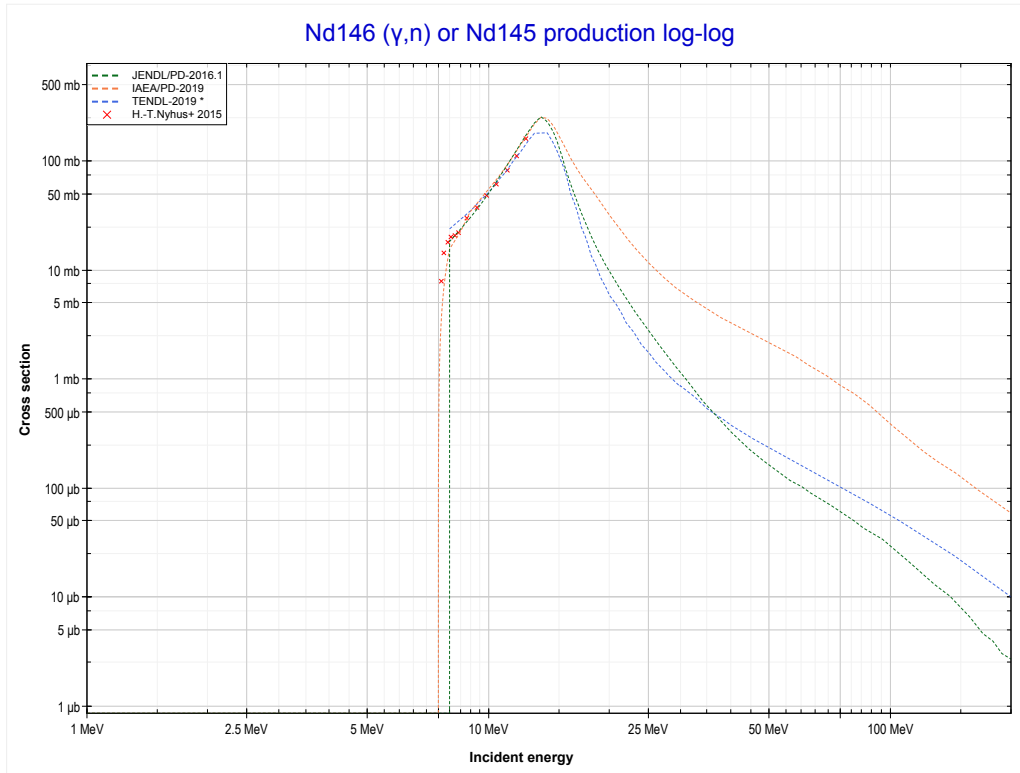
Reaction	Q-Value
Nd146(γ,n)Nd145	-7565.22 keV

<< 60-Nd-145	**60-Nd-146**	60-Nd-148 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Nd144 production)**	60-Nd-148 MT4 (γ,n) >>

Nd146 (γ,2n) or Nd144 production log-log

Nd146 (γ,2n) or Nd144 production lin-log
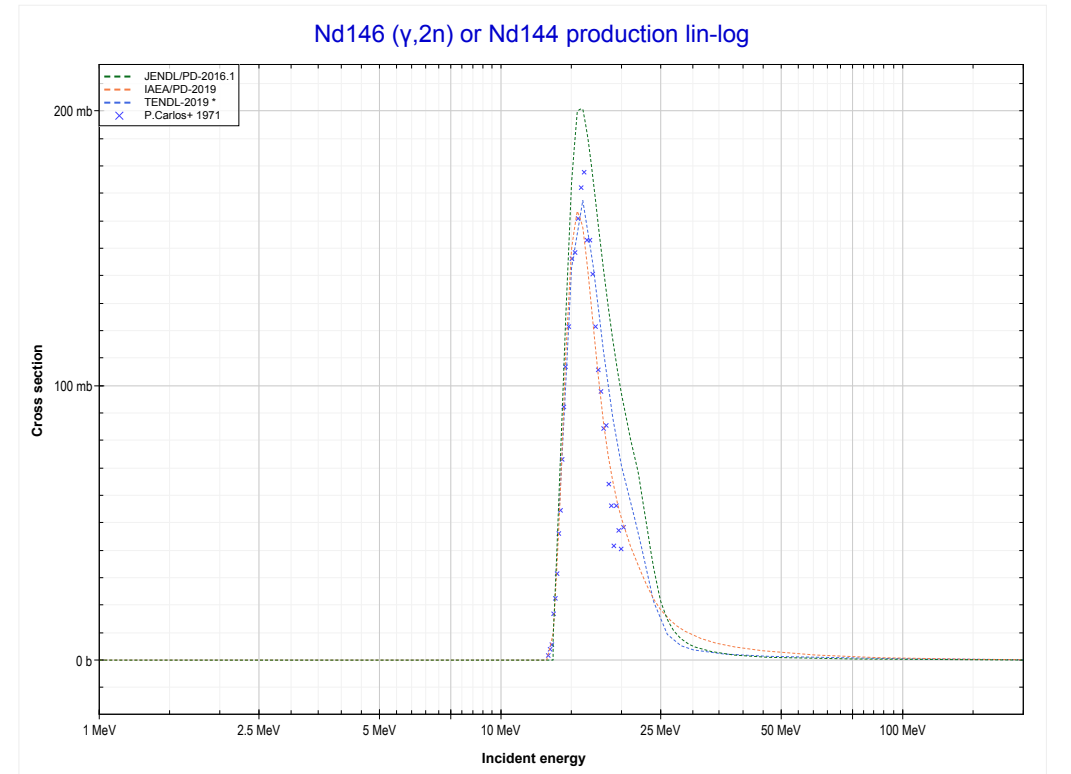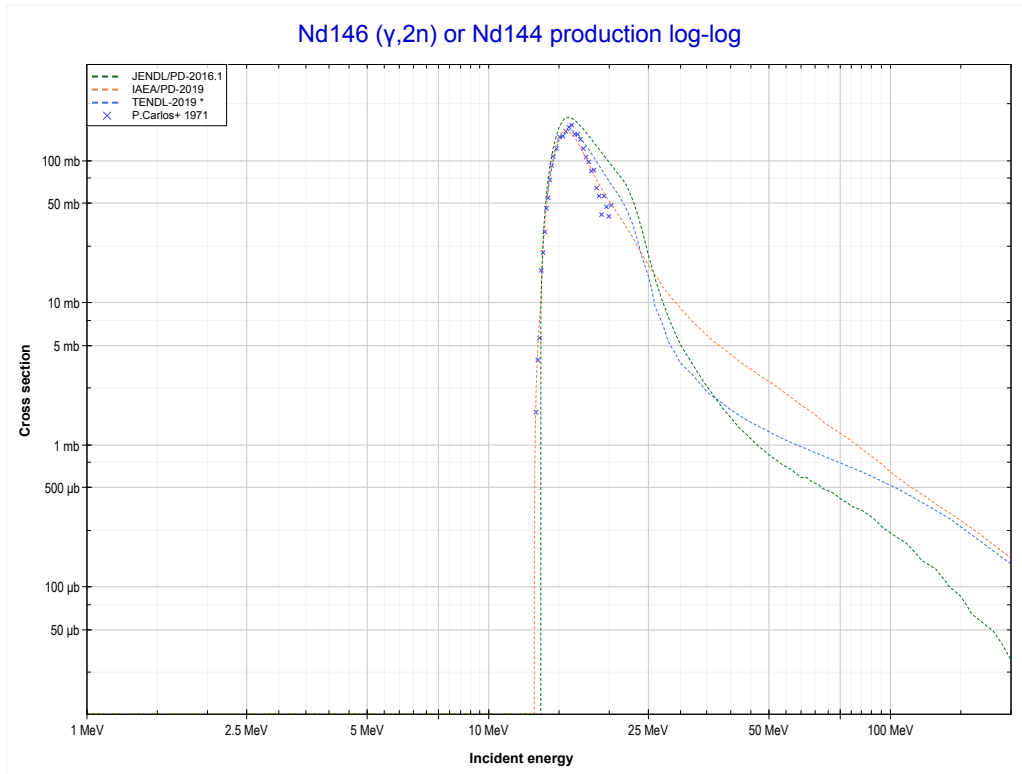
Reaction	Q-Value
Nd146(γ,2n)Nd144	-13320.53 keV

<< 60-Nd-146	**60-Nd-148**	62-Sm-144 >>
<< 60-Nd-146 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Nd147 production)**	MT16 (γ,2n) >>

Nd148 (γ,n) or Nd147 production log-log

Nd148 (γ,n) or Nd147 production lin-log
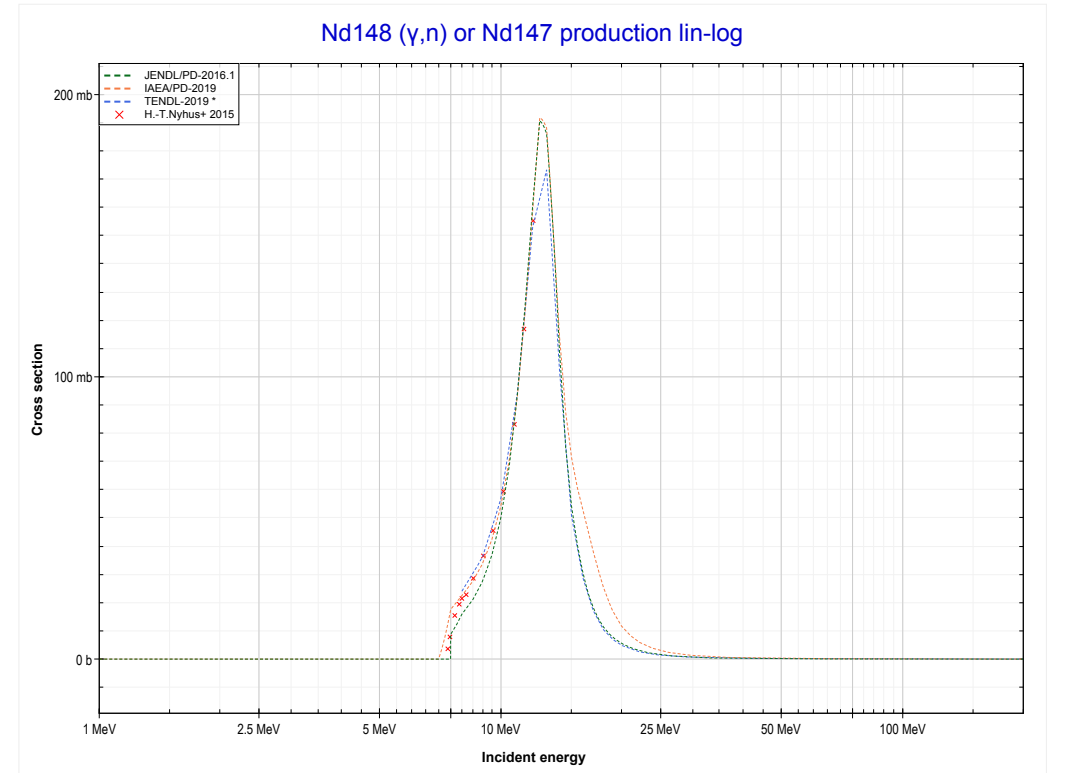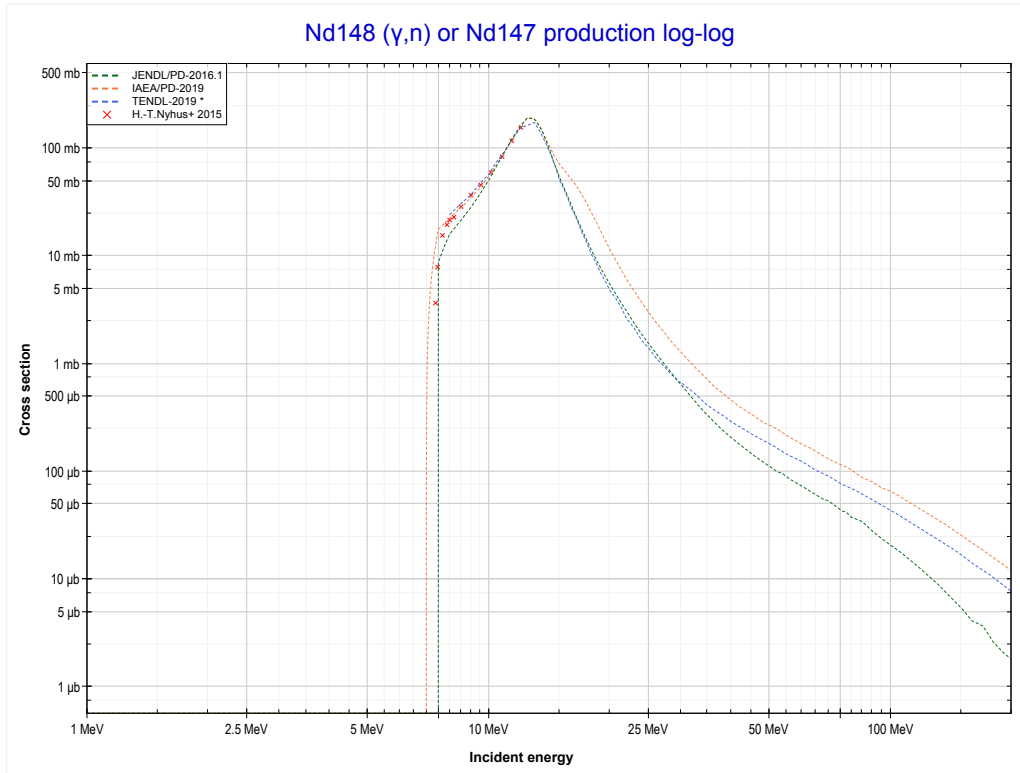
Reaction	Q-Value
Nd148(γ,n)Nd147	-7332.62 keV

<< 60-Nd-146	**60-Nd-148**	60-Nd-150 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Nd146 production)**	60-Nd-150 MT16 (γ,2n) >>

Nd148 (γ,2n) or Nd146 production log-log

Nd148 (γ,2n) or Nd146 production lin-log
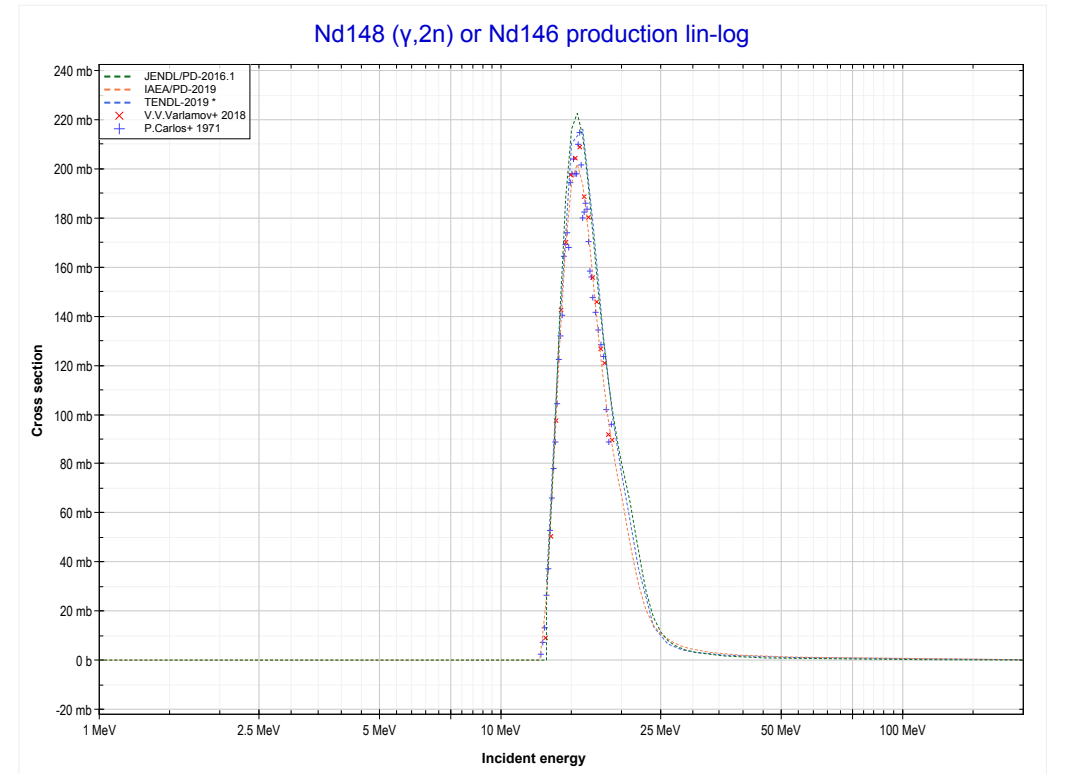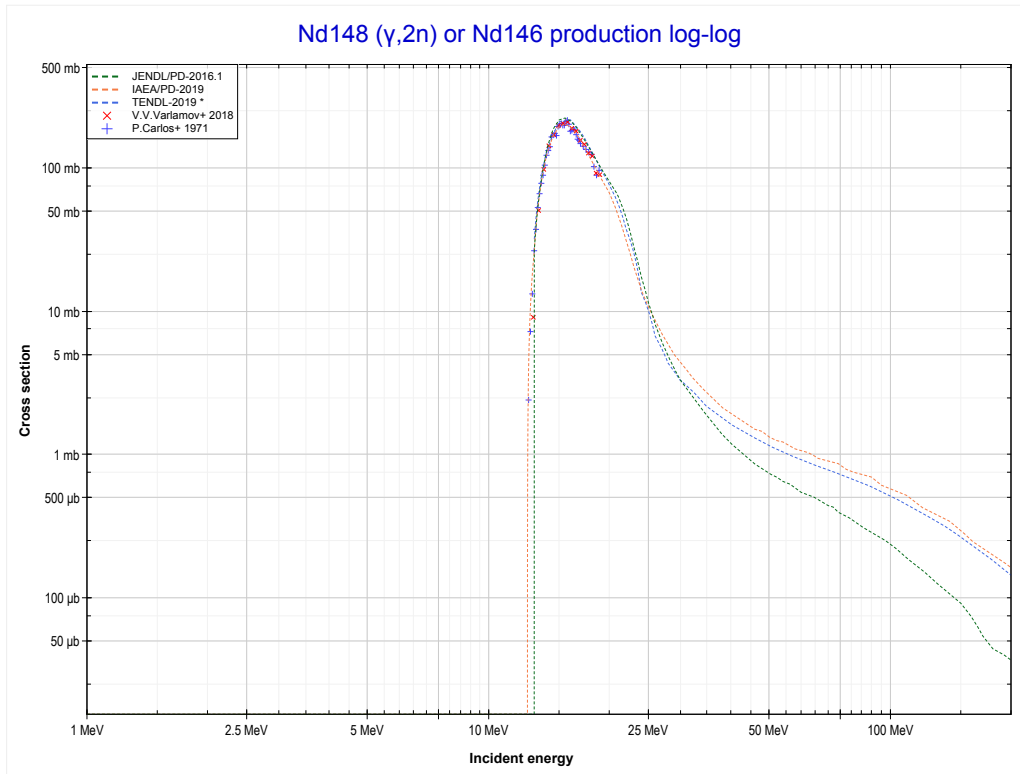
Reaction	Q-Value
Nd148(γ,2n)Nd146	-12624.73 keV

<< 60-Nd-148	60-Nd-150	62-Sm-144 >>
<< 60-Nd-148 MT16 (γ,2n)	MT16 (γ,2n) or MT5 (Nd148 production)	62-Sm-144 MT4 (γ,n) >>

Nd150 (γ,2n) or Nd148 production log-log

Nd150 (γ,2n) or Nd148 production lin-log
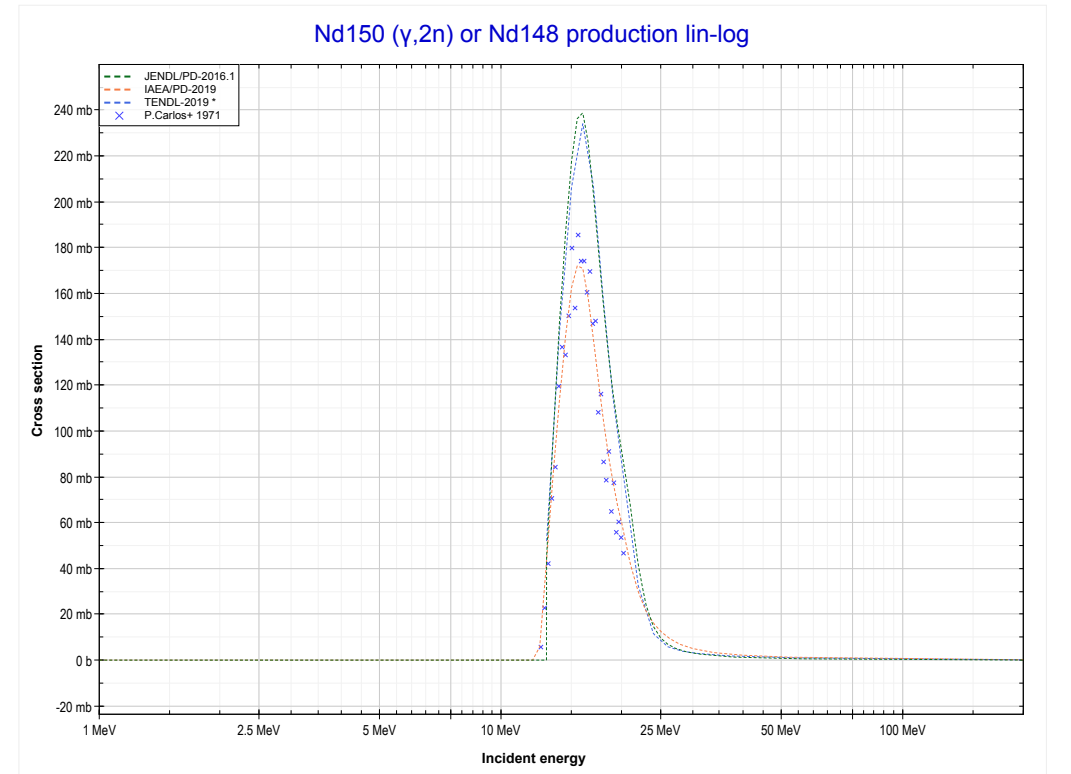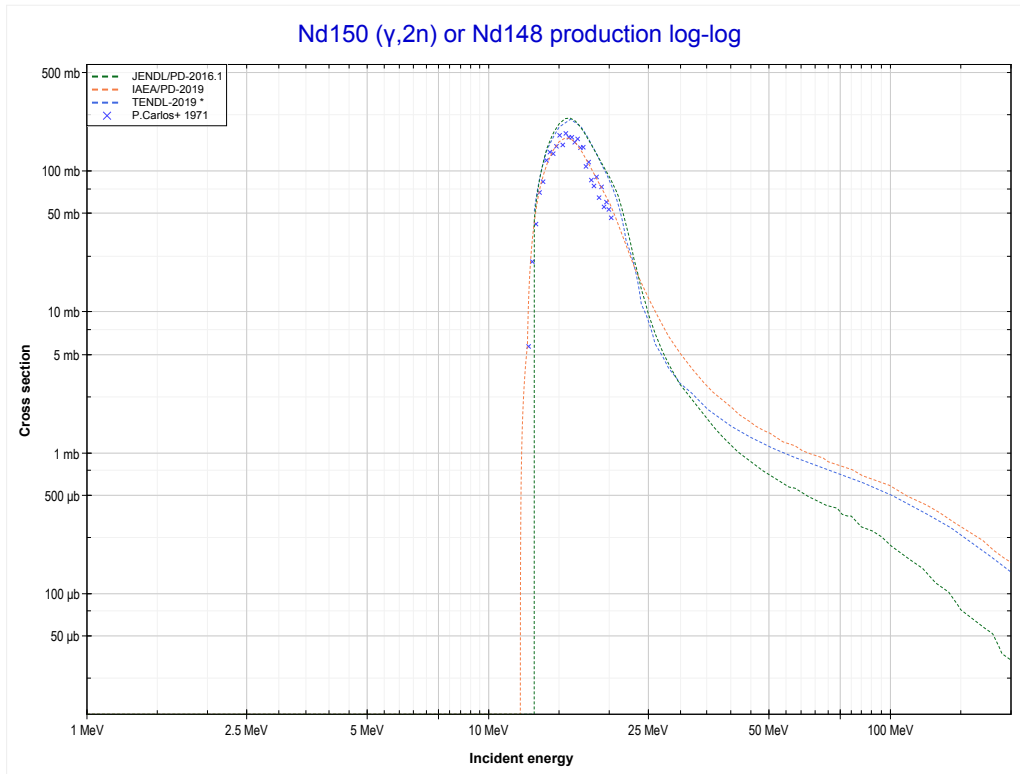
Reaction	Q-Value
Nd150(γ,2n)Nd148	-12414.43 keV

<< 60-Nd-148	**62-Sm-144**	62-Sm-147 >>
<< 60-Nd-150 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sm143 production)**	MT16 (γ,2n) >>

Sm144 (γ,n) or Sm143 production log-log

Sm144 (γ,n) or Sm143 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1 *
- IAEA/PD-2019 *
- TENDL-2019 *
- × D.M.Filipescu+ 2014
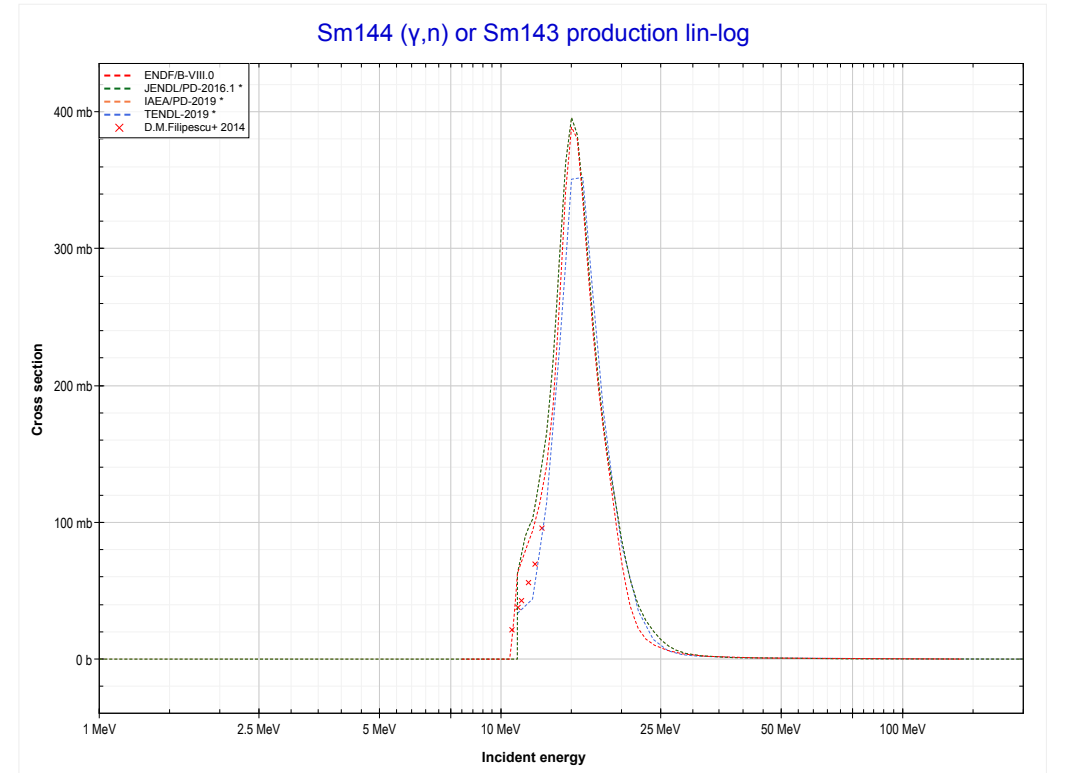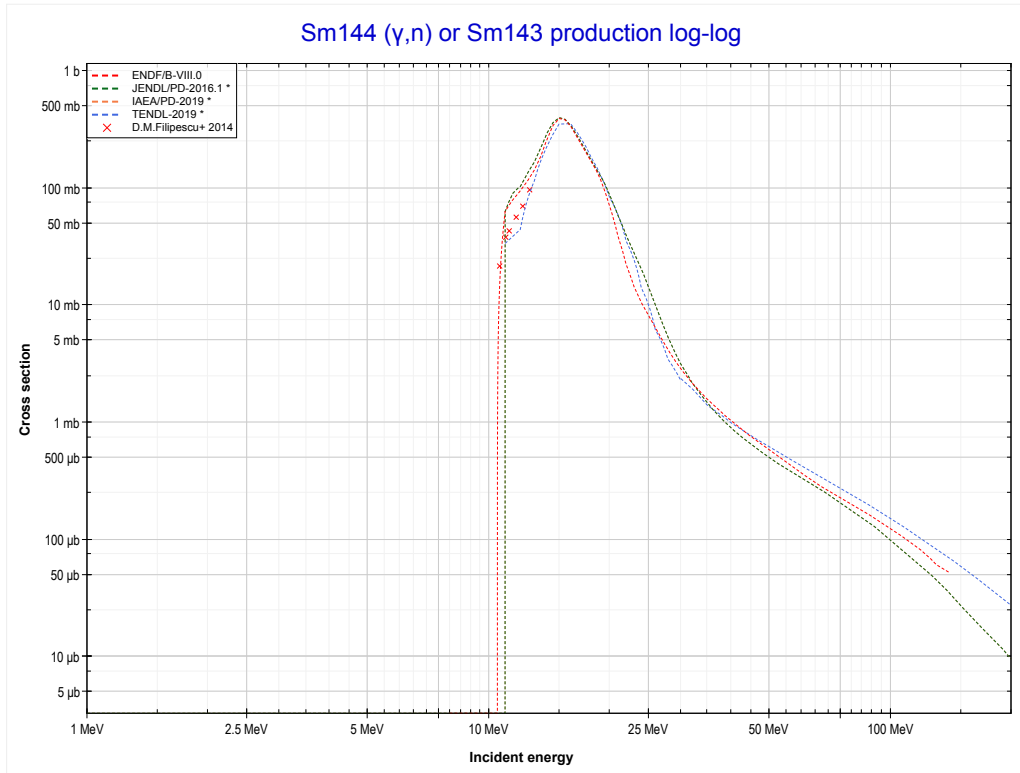
Reaction	Q-Value
Sm144(γ,n)Sm143	-10519.62 keV

<< 60-Nd-150	62-Sm-144	62-Sm-148 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Sm142 production)	62-Sm-147 MT4 (γ,n) >>

Sm144 (γ,2n) or Sm142 production log-log

Sm144 (γ,2n) or Sm142 production lin-log
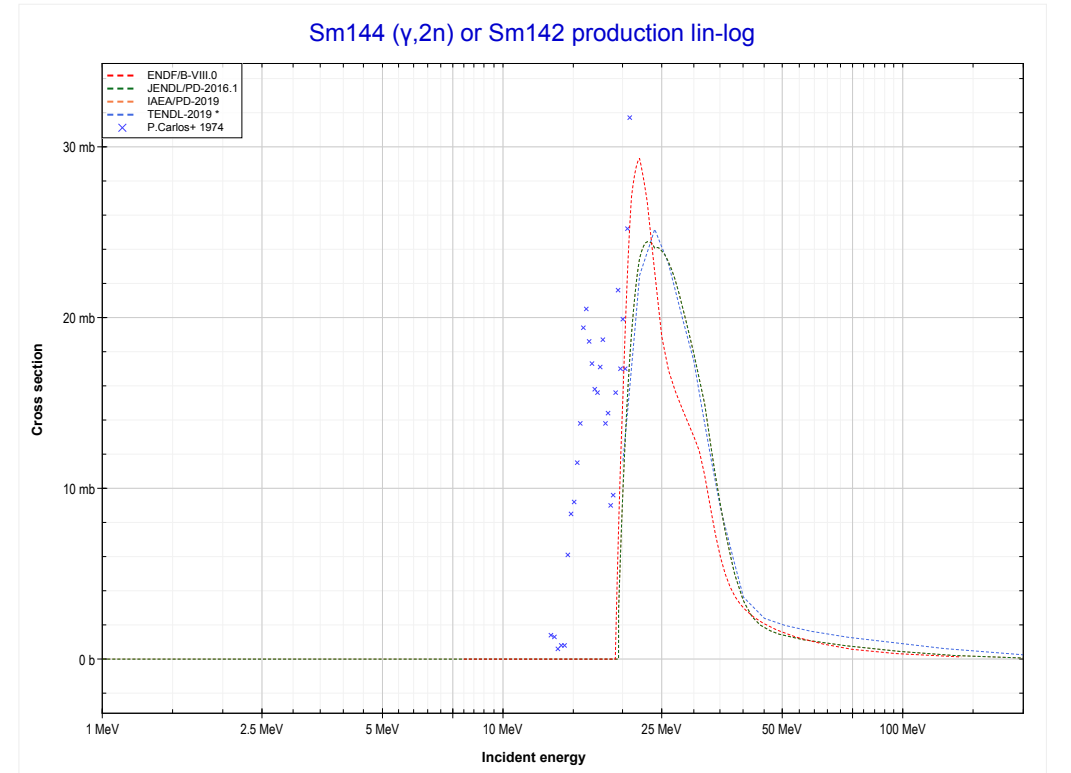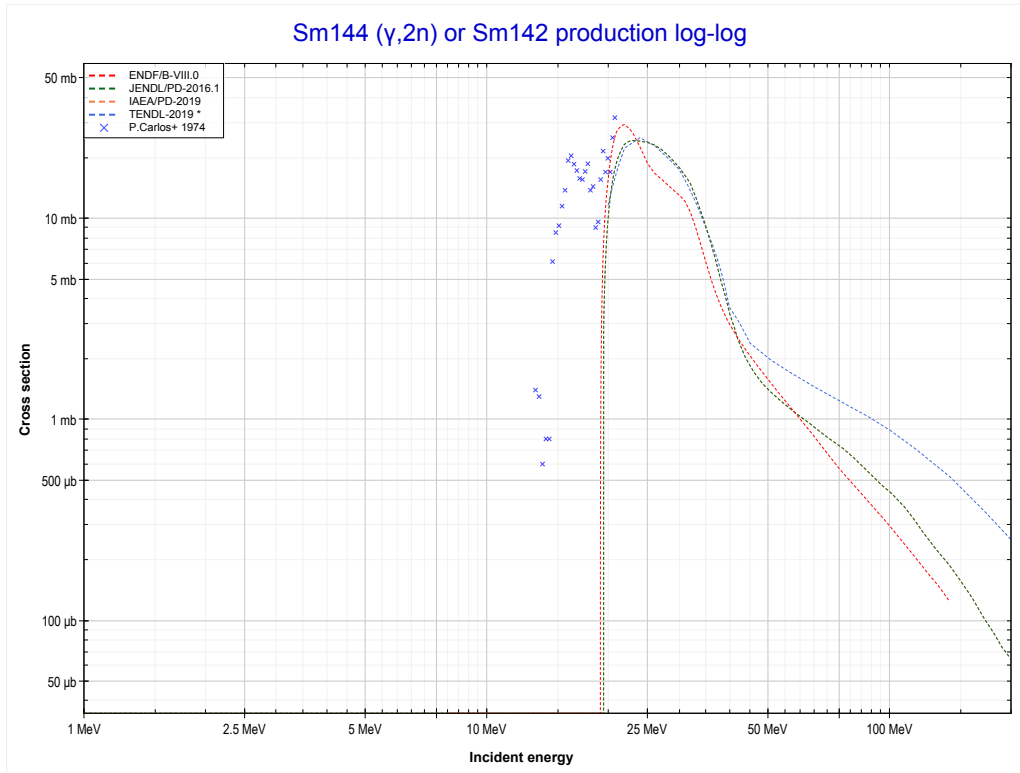
Reaction	Q-Value
Sm144(γ,2n)Sm142	-19122.13 keV

<< 62-Sm-144	62-Sm-147	62-Sm-148 >>
<< 62-Sm-144 MT16 (γ,2n)	MT4 (γ,n) or MT5 (Sm146 production)	62-Sm-148 MT4 (γ,n) >>

Sm147 (γ,n) or Sm146 production log-log

Sm147 (γ,n) or Sm146 production lin-log
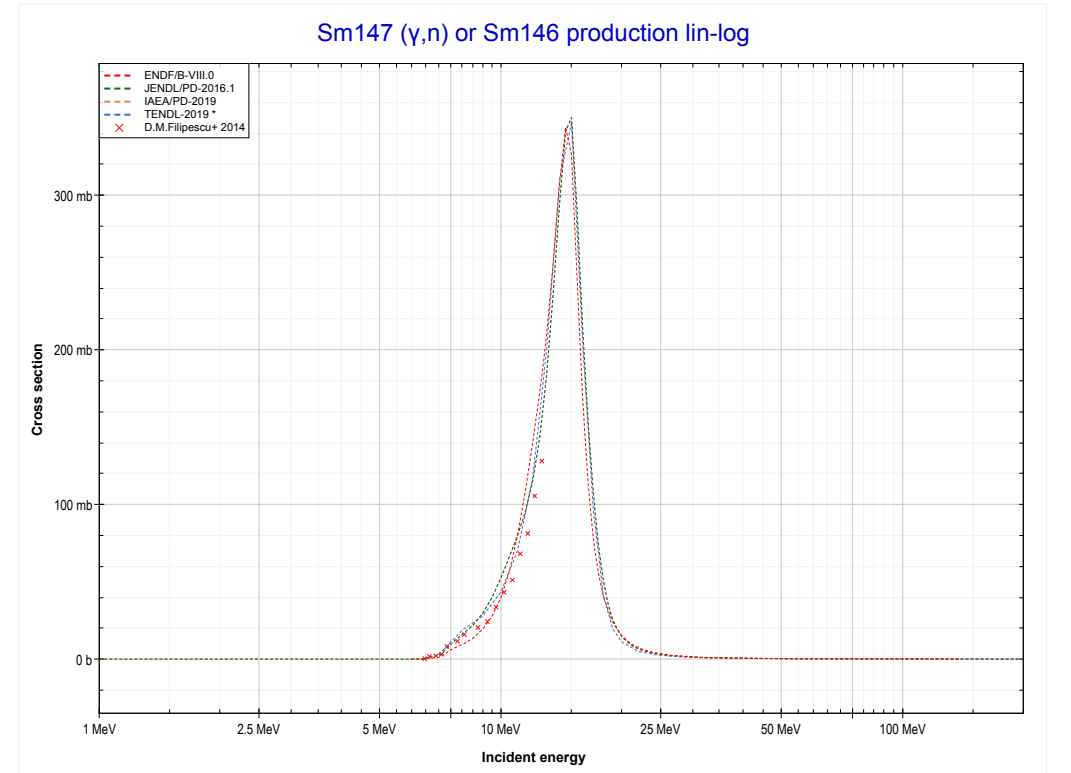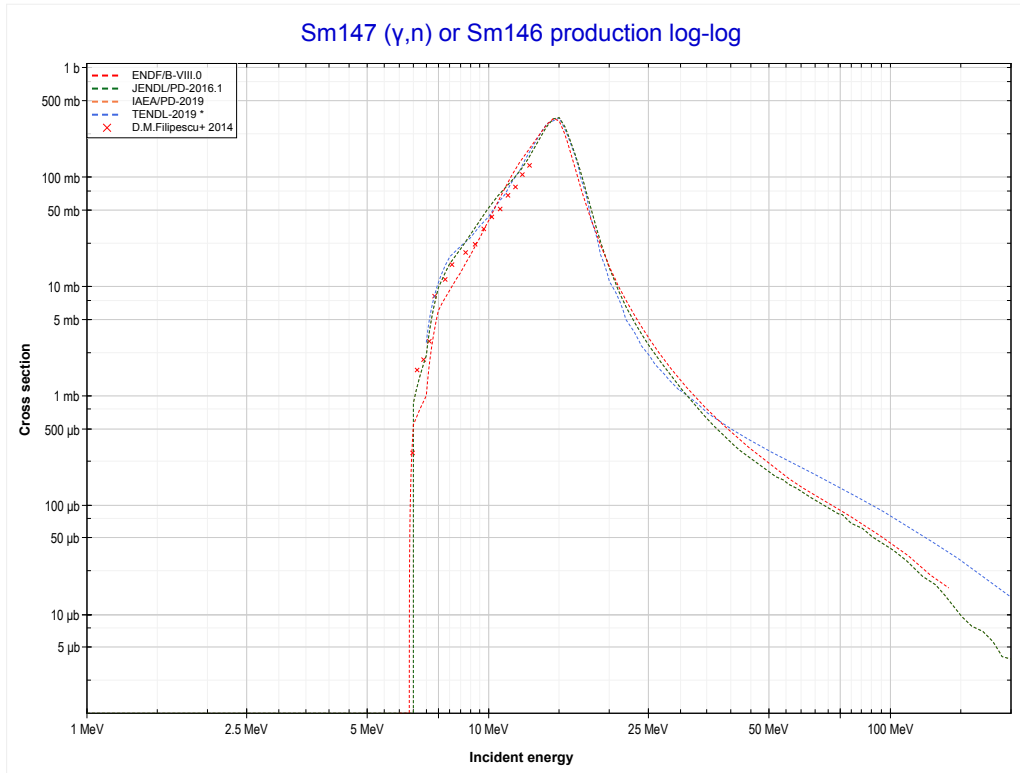
Reaction	Q-Value
Sm147(γ,n)Sm146	-6341.72 keV

<< 62-Sm-147	**62-Sm-148**	62-Sm-149 >>
<< 62-Sm-147 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Sm147 production)**	MT16 (γ,2n) >>

Sm148 (γ,n) or Sm147 production log-log

Sm148 (γ,n) or Sm147 production lin-log
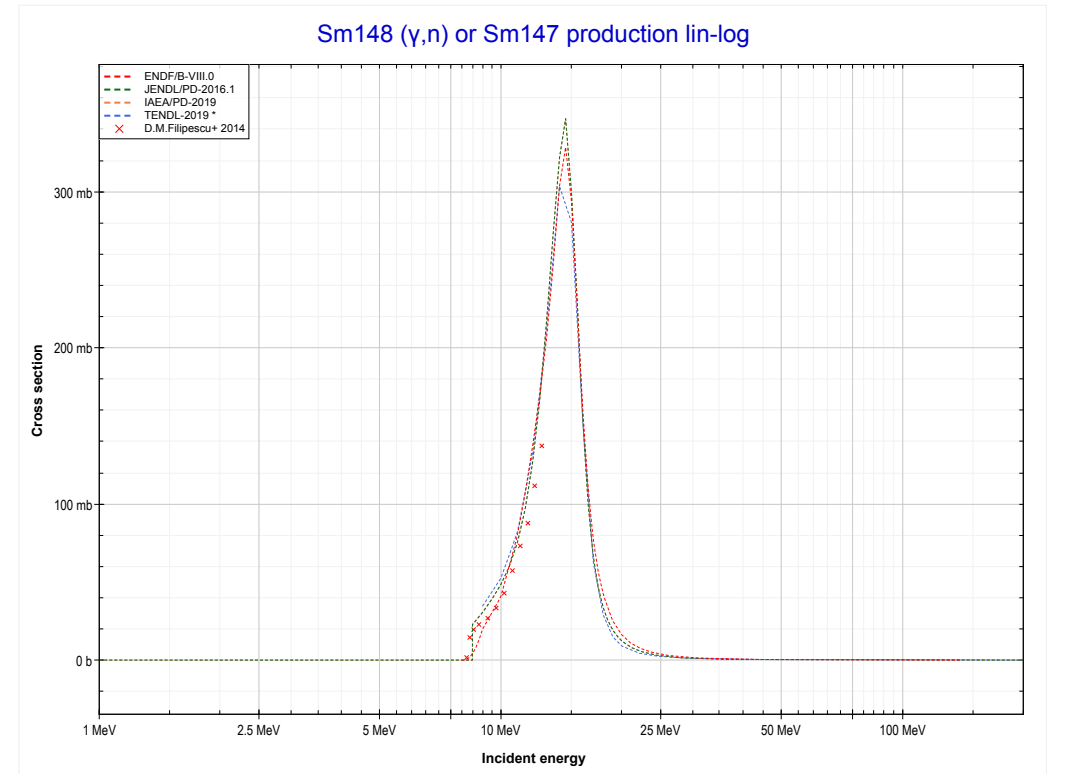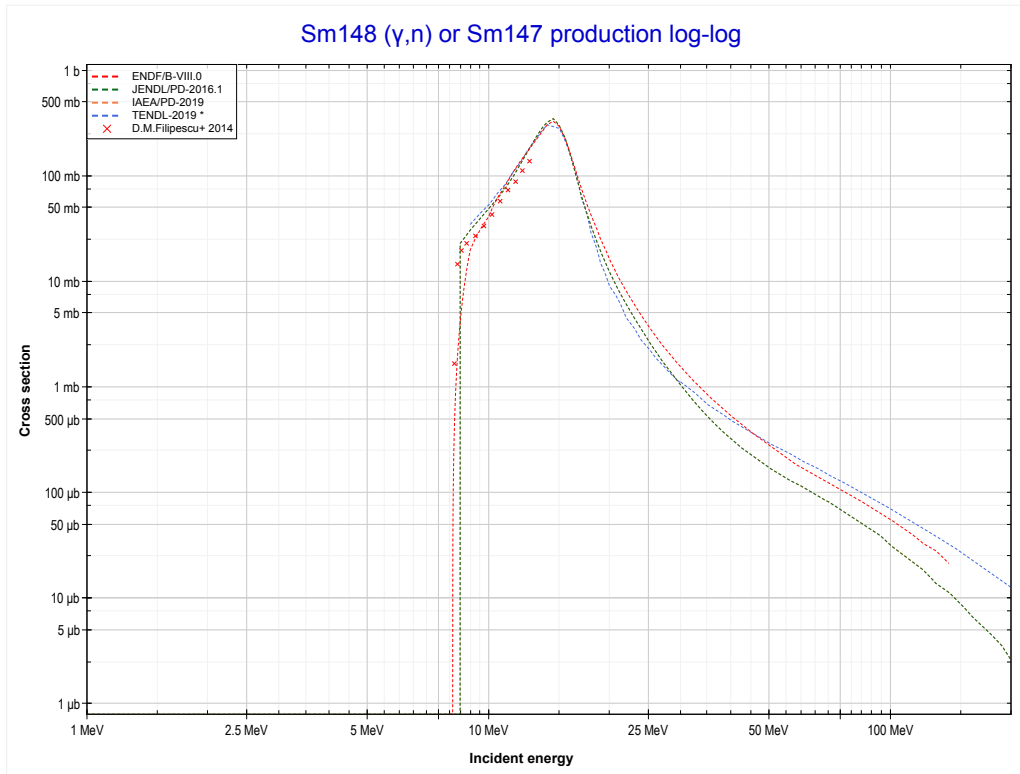
Reaction	Q-Value
Sm148(γ,n)Sm147	-8141.22 keV

<< 62-Sm-144	**62-Sm-148**	62-Sm-150 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sm146 production)**	62-Sm-149 MT4 (γ,n) >>

Sm148 (γ,2n) or Sm146 production log-log

Sm148 (γ,2n) or Sm146 production lin-log
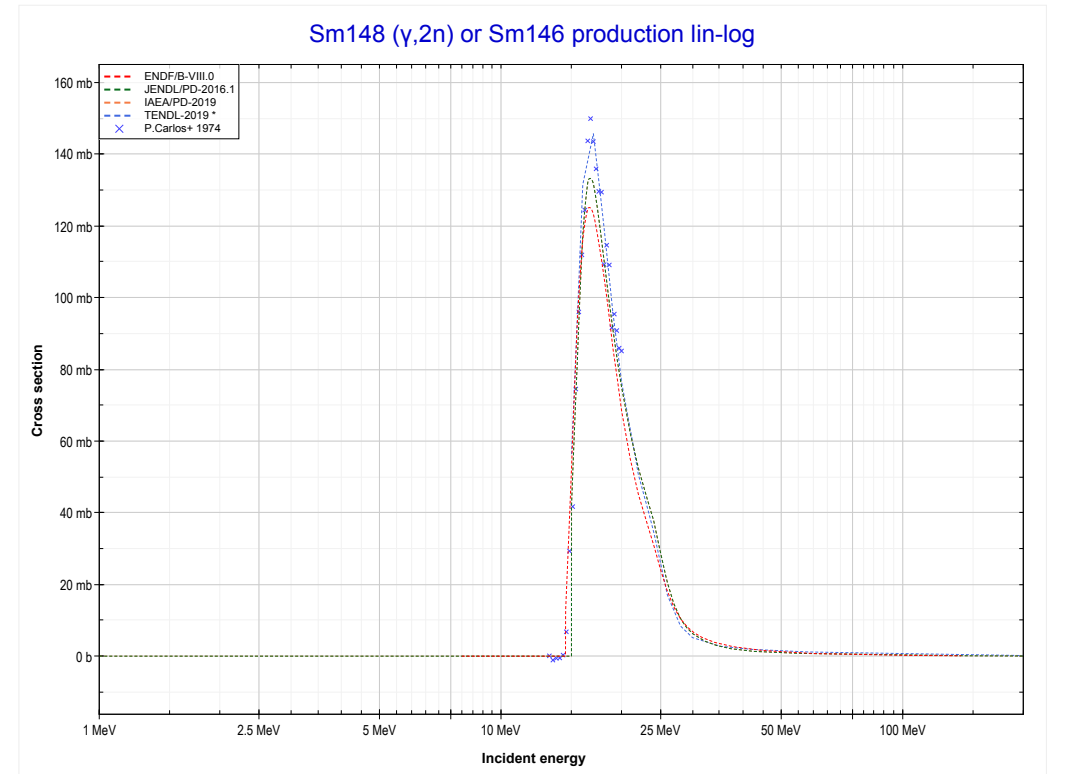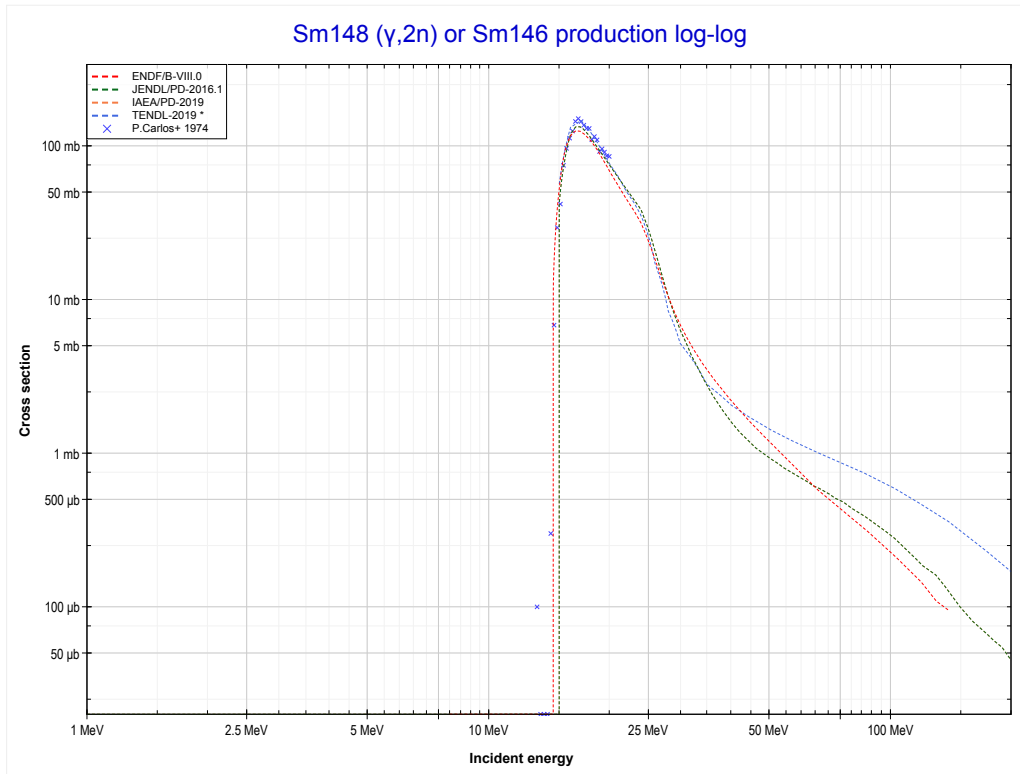
Reaction	Q-Value
Sm148(γ,2n)Sm146	-14482.93 keV

<< 62-Sm-148	**62-Sm-149**	62-Sm-150 >>
<< 62-Sm-148 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sm148 production)**	62-Sm-150 MT4 (γ,n) >>

Sm149 (γ,n) or Sm148 production log-log

Sm149 (γ,n) or Sm148 production lin-log

Legend for both plots:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × D.M.Filipescu+ 2014
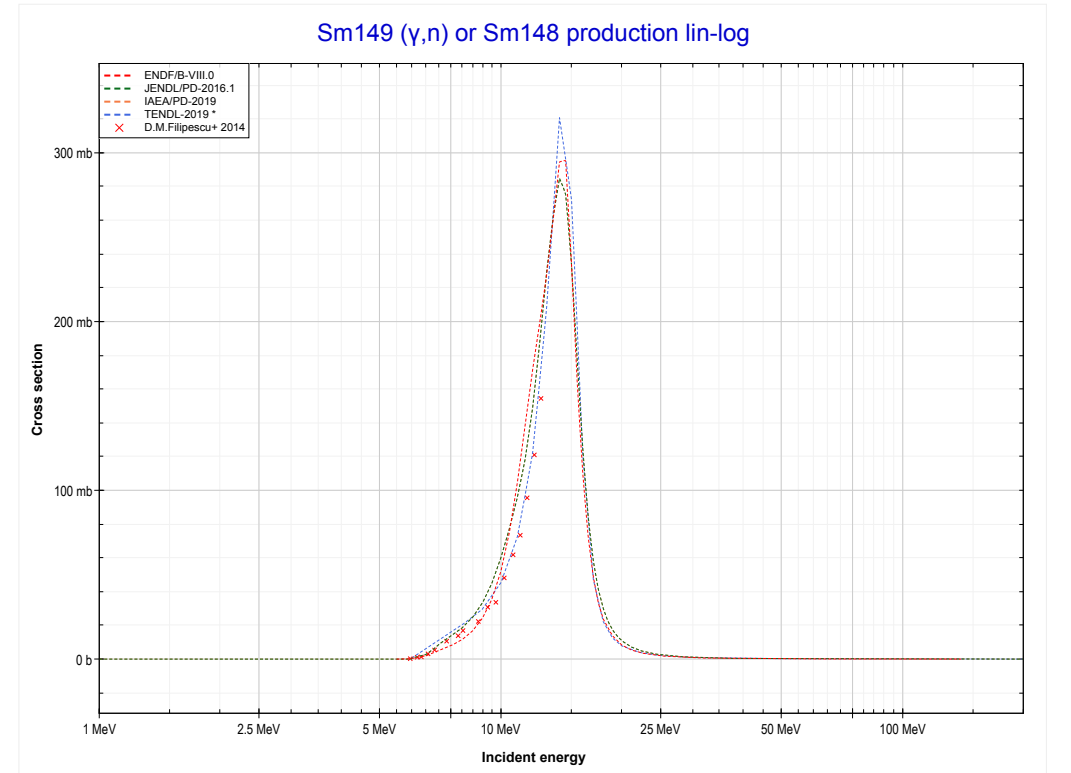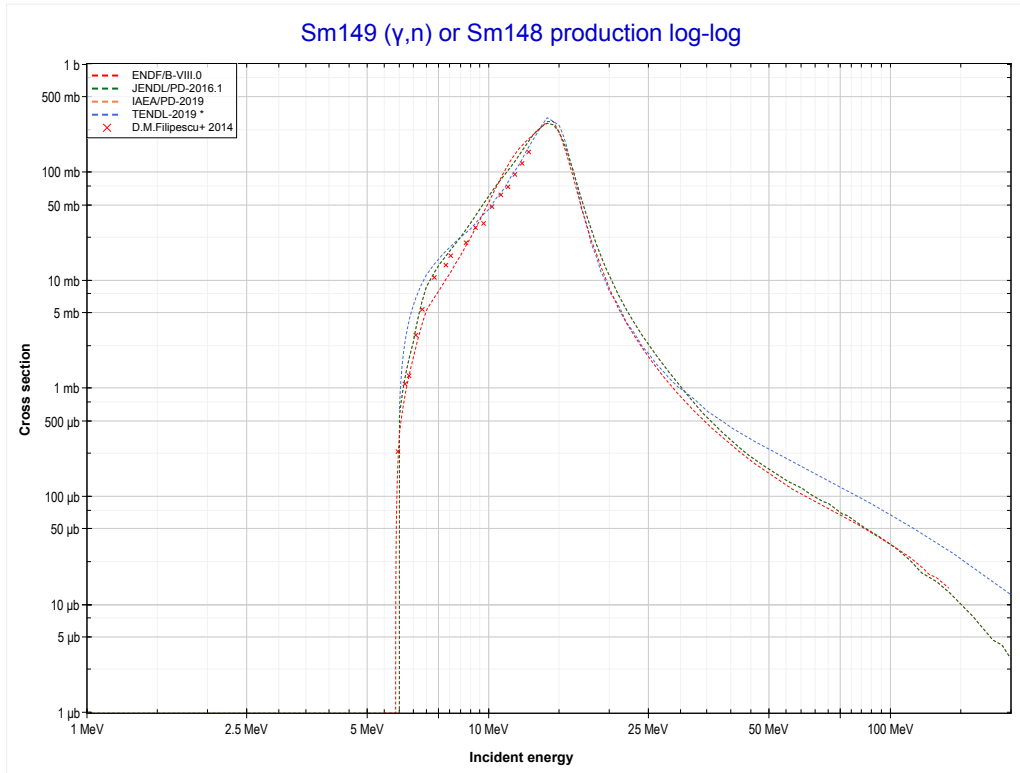
Reaction	Q-Value
Sm149(γ,n)Sm148	-5870.72 keV

<< 62-Sm-149	62-Sm-150	62-Sm-152 >>
<< 62-Sm-149 MT4 (γ,n)	MT4 (γ,n) or MT5 (Sm149 production)	MT16 (γ,2n) >>

Sm150 (γ,n) or Sm149 production log-log

Sm150 (γ,n) or Sm149 production lin-log
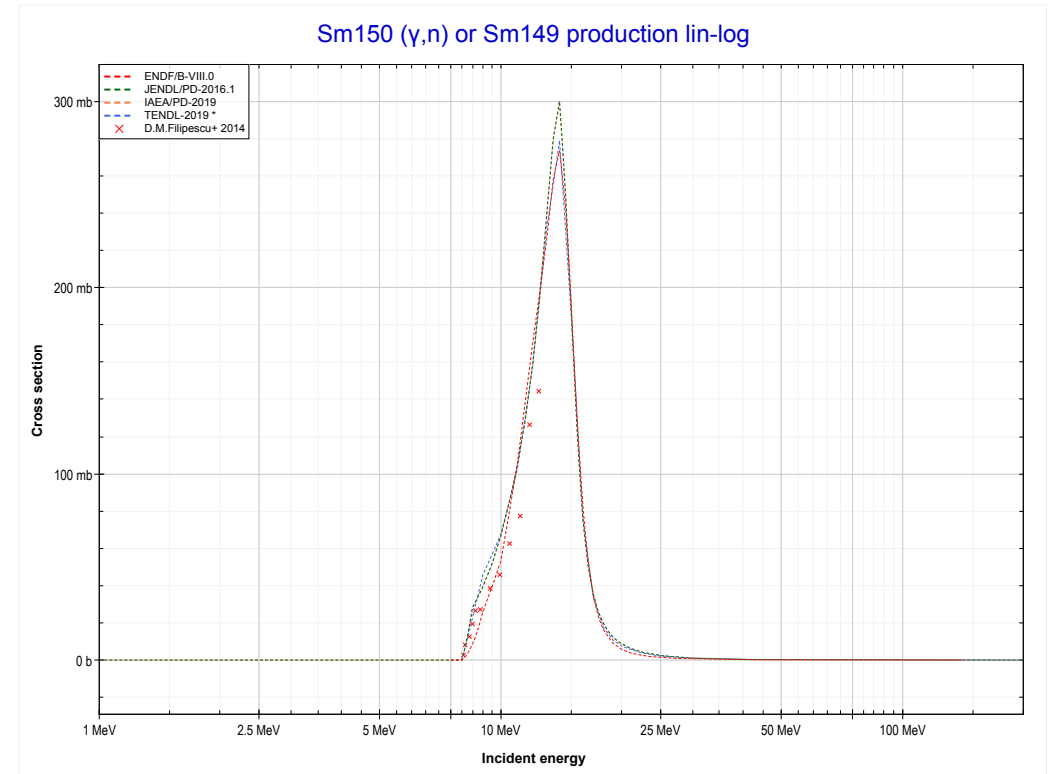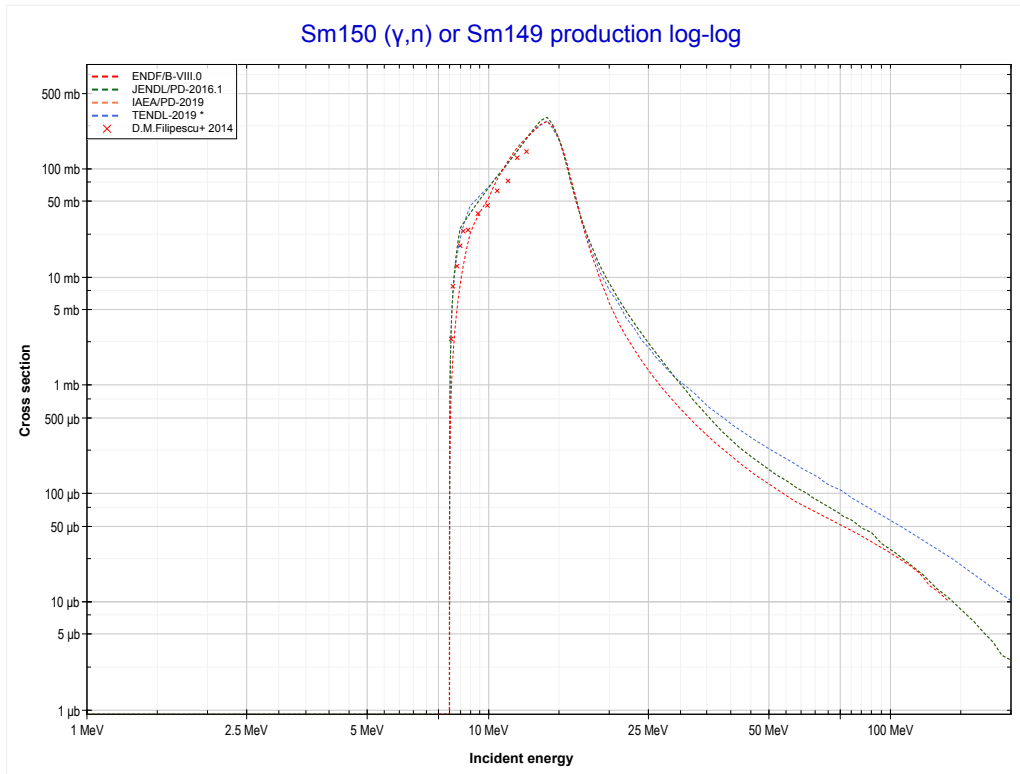
Reaction	Q-Value
Sm150(γ,n)Sm149	-7986.72 keV

<< 62-Sm-148	62-Sm-150	62-Sm-152 >>
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Sm148 production)	62-Sm-152 MT4 (γ,n) >>

Sm150 (γ,2n) or Sm148 production log-log

Sm150 (γ,2n) or Sm148 production lin-log
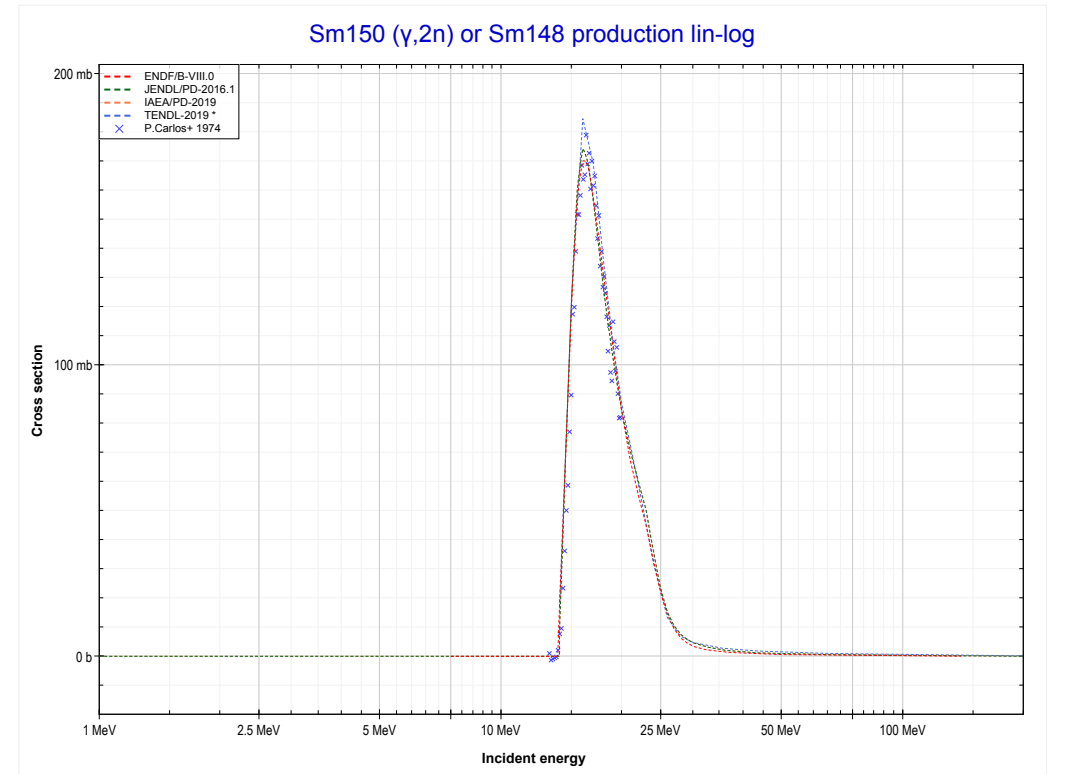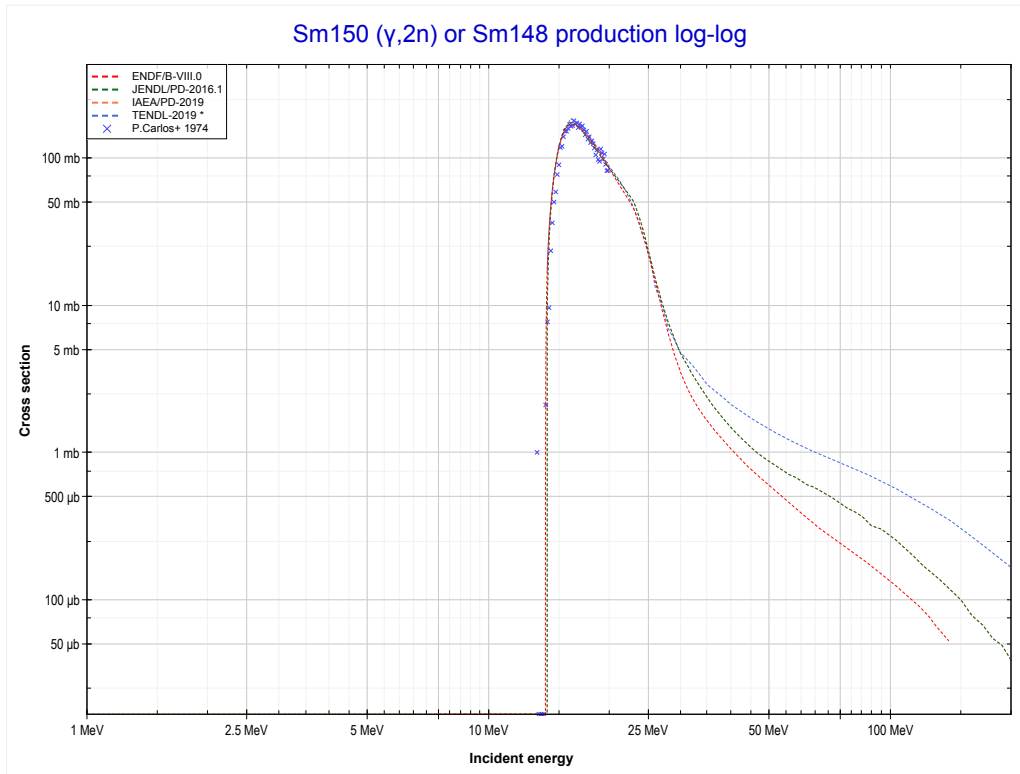
Reaction	Q-Value
Sm150(γ,2n)Sm148	-13857.43 keV

<< 62-Sm-150	**62-Sm-152**	62-Sm-154 >>
<< 62-Sm-150 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sm151 production)**	MT16 (γ,2n) >>

Sm152 (γ,n) or Sm151 production log-log

Sm152 (γ,n) or Sm151 production lin-log
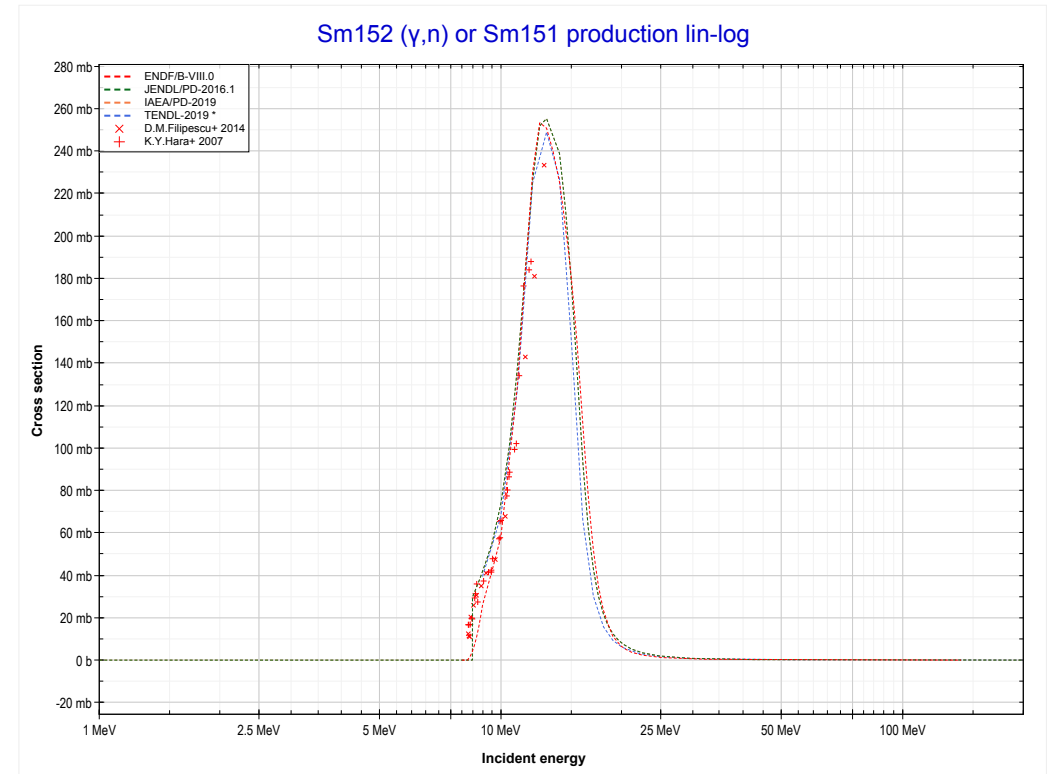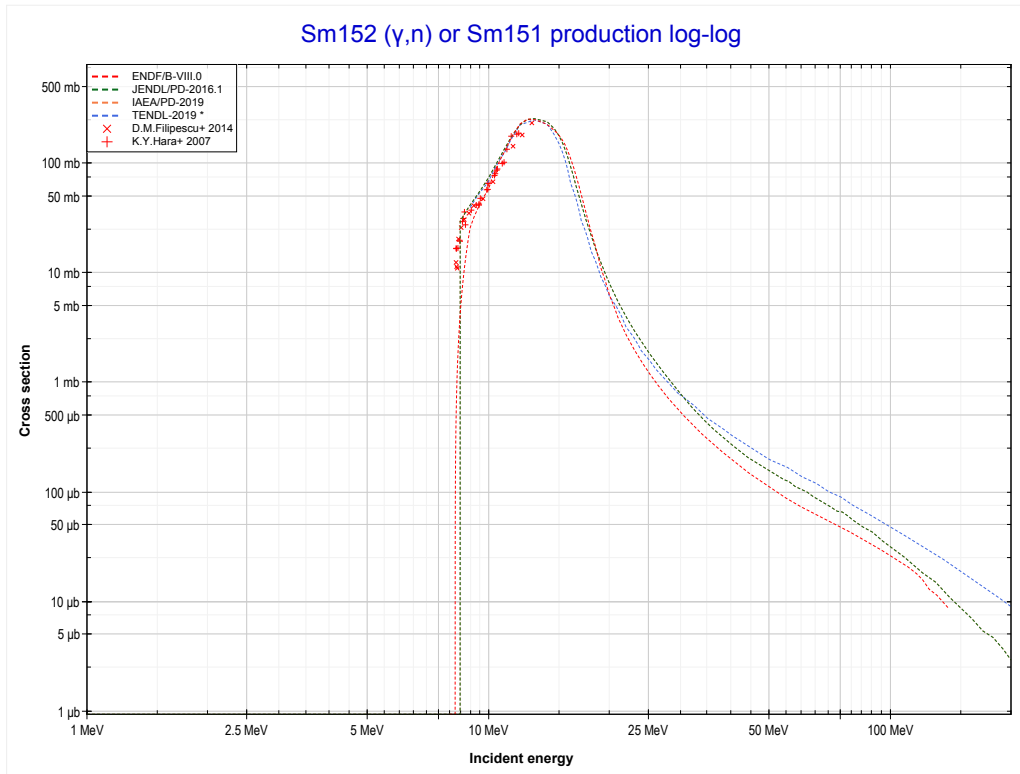
Reaction	Q-Value
Sm152(γ,n)Sm151	-8257.62 keV

<< 62-Sm-150	**62-Sm-152**	62-Sm-154 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sm150 production)**	62-Sm-154 MT4 (γ,n) >>

Sm152 (γ,2n) or Sm150 production log-log

Sm152 (γ,2n) or Sm150 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × P.Carlos+ 1974
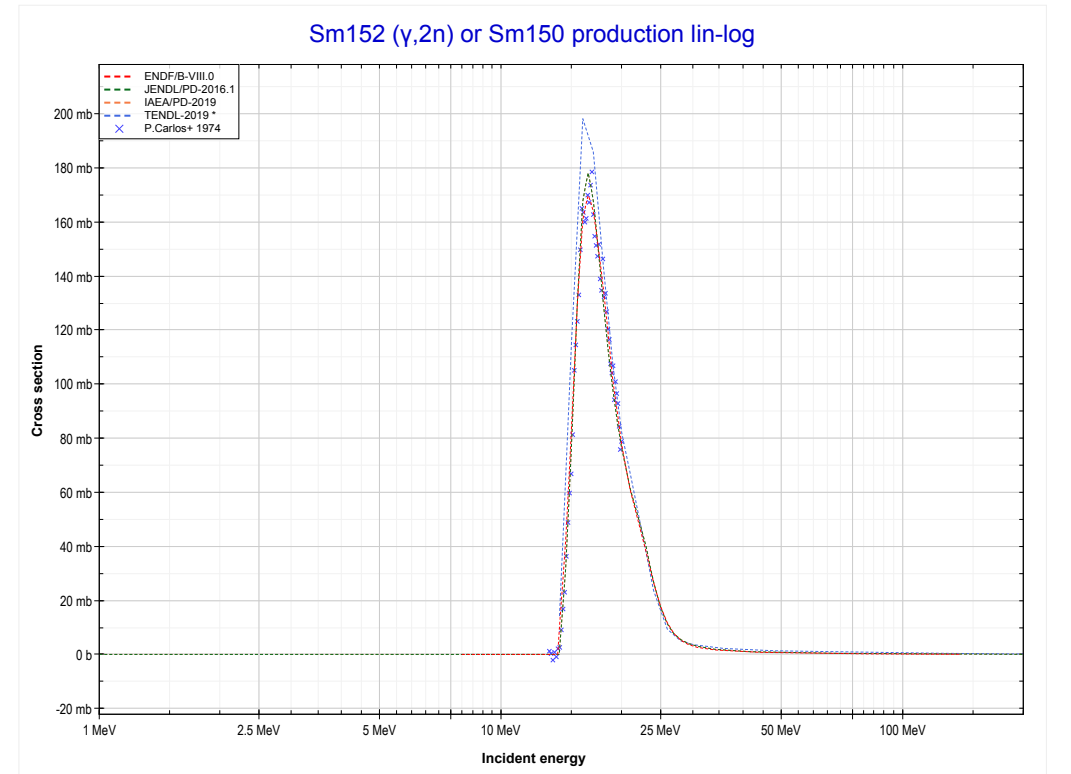
Reaction	Q-Value
Sm152(γ,2n)Sm150	-13854.13 keV

<< 62-Sm-152	**62-Sm-154**	63-Eu-153 >>
<< 62-Sm-152 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Sm153 production)**	MT16 (γ,2n) >>

Sm154 (γ,n) or Sm153 production log-log

Sm154 (γ,n) or Sm153 production lin-log
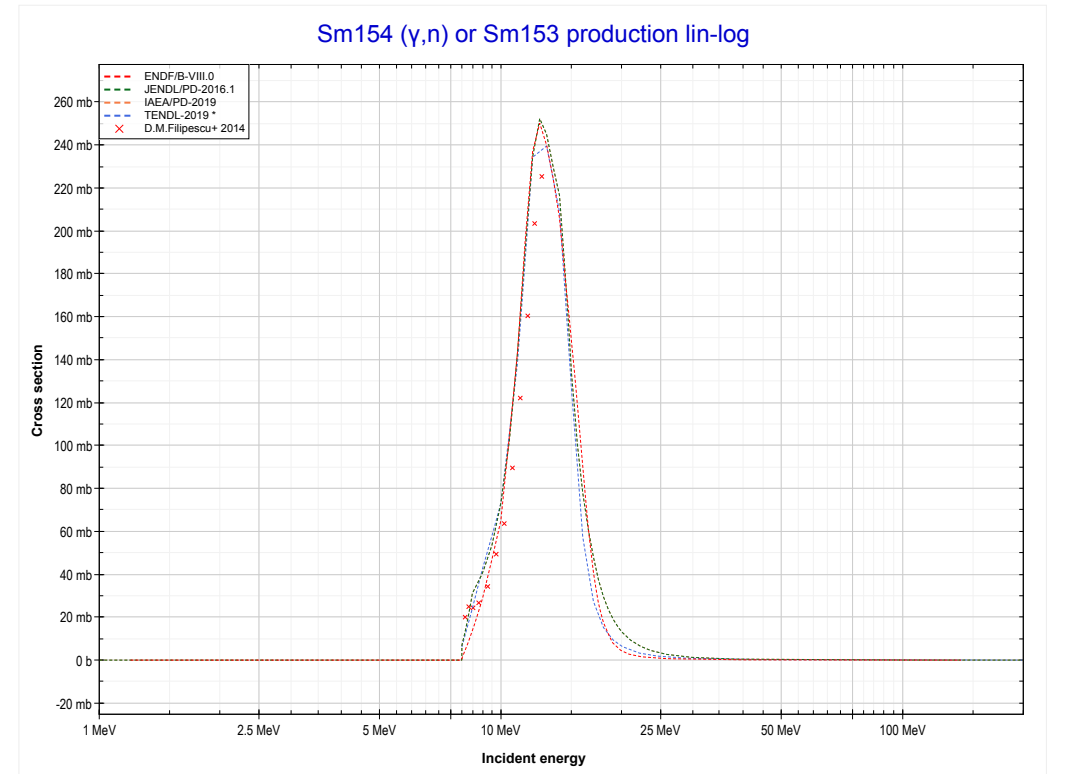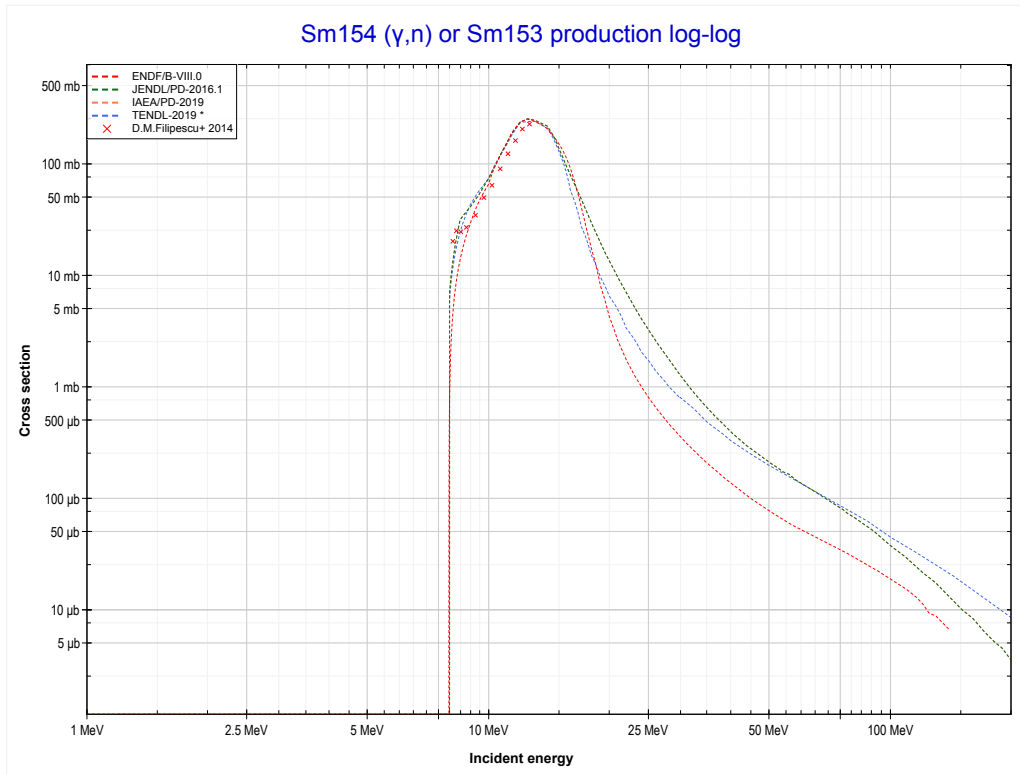
Reaction	Q-Value
Sm154(γ,n)Sm153	-7966.82 keV

<< 62-Sm-152	**62-Sm-154**	63-Eu-153 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Sm152 production)**	63-Eu-153 MT4 (γ,n) >>

Sm154 (γ,2n) or Sm152 production log-log

Sm154 (γ,2n) or Sm152 production lin-log
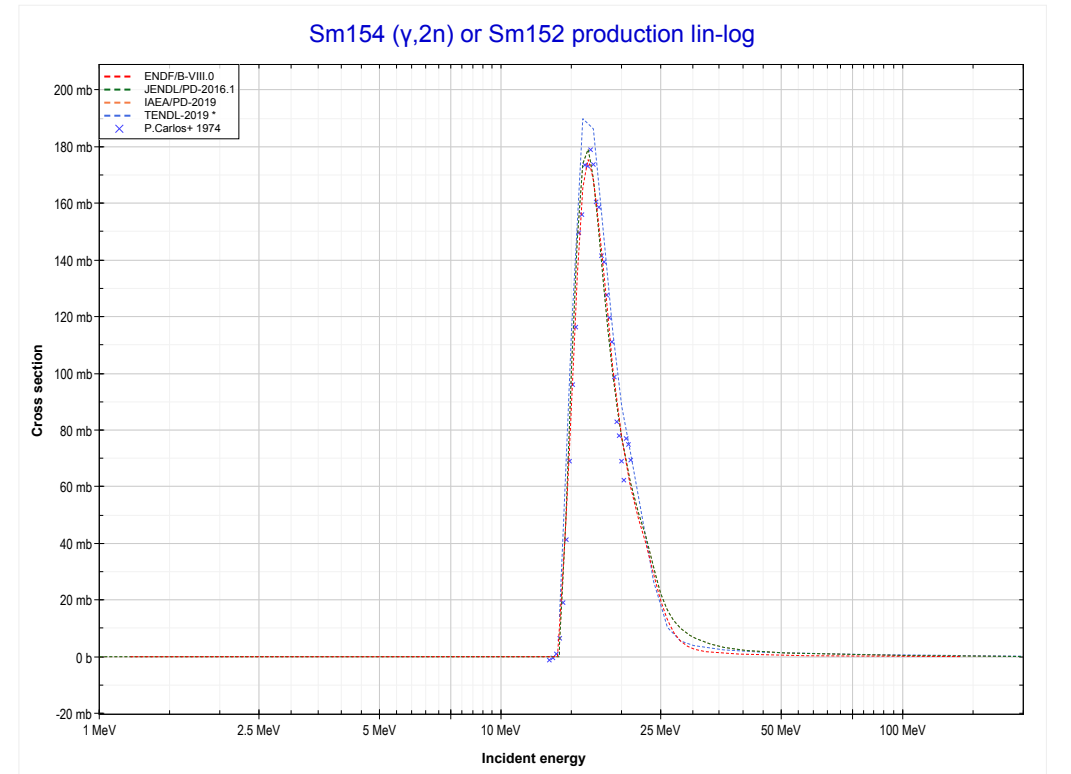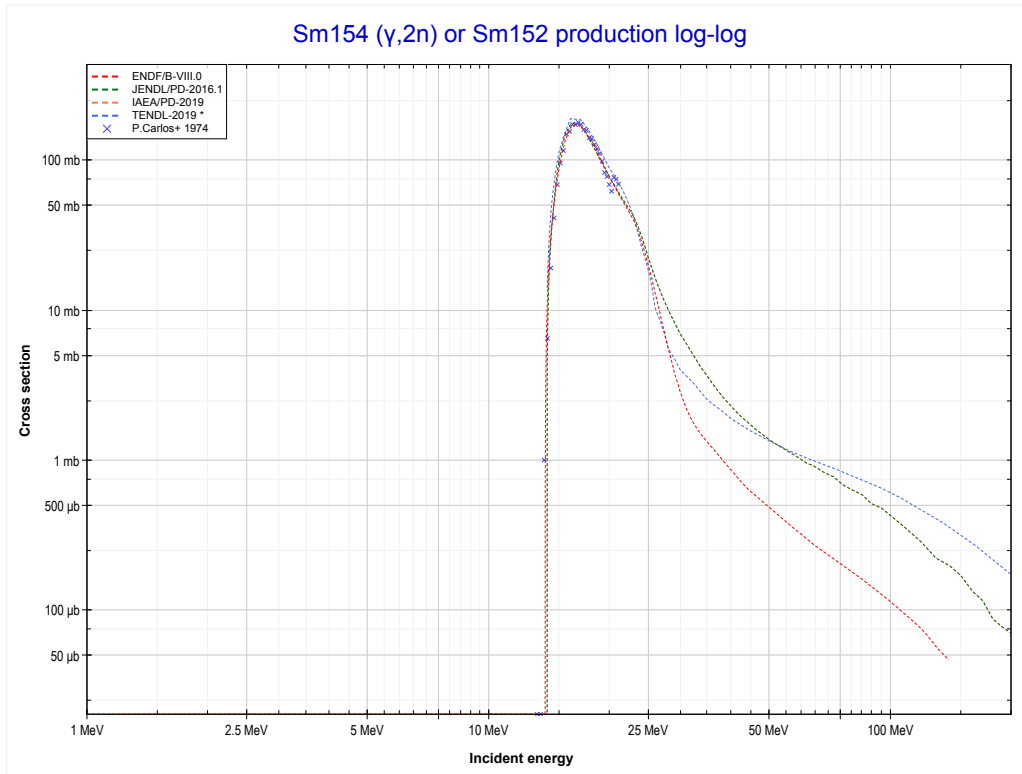
Reaction	Q-Value
Sm154(γ,2n)Sm152	-13835.23 keV

<< 62-Sm-154	**63-Eu-153**	64-Gd-160 >>
<< 62-Sm-154 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Eu152 production)**	MT16 (γ,2n) >>

Eu153 (γ,n) or Eu152 production log-log

Eu153 (γ,n) or Eu152 production lin-log
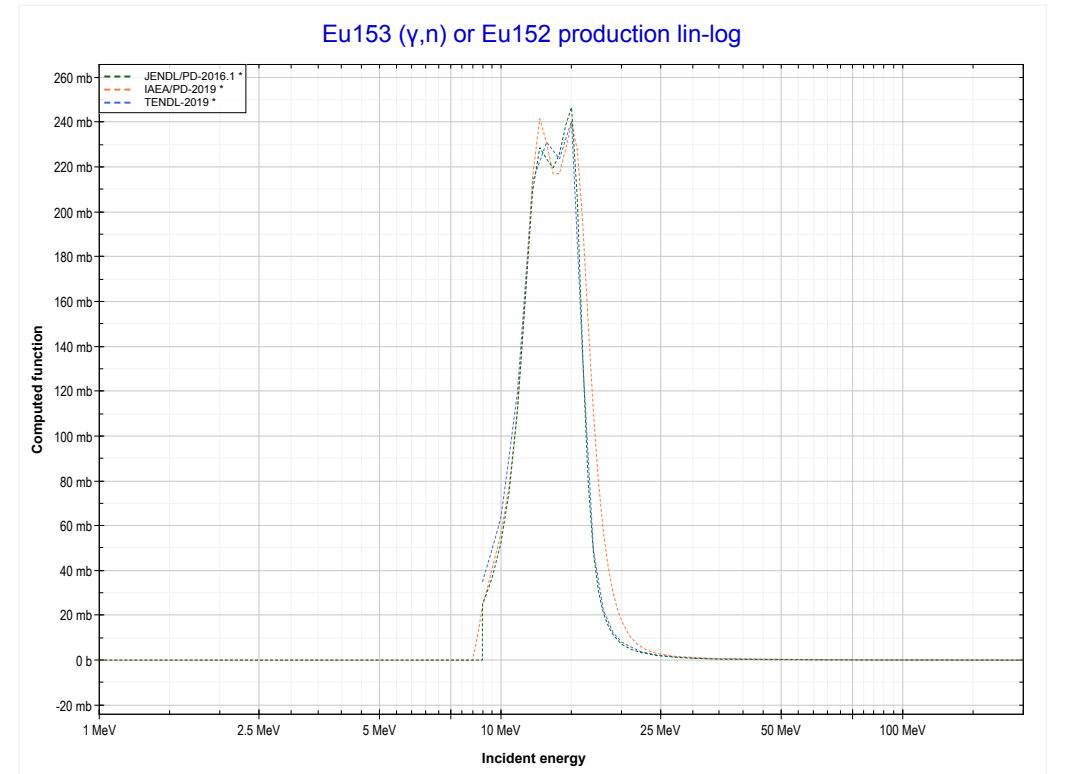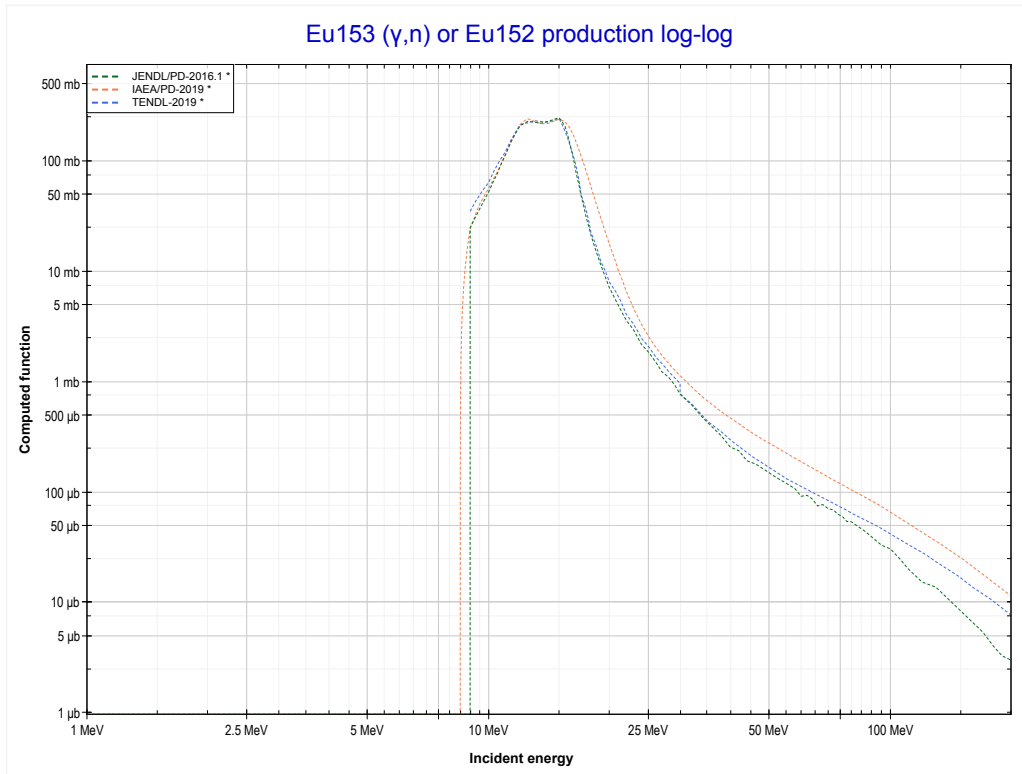
Reaction	Q-Value
Eu153(γ,n)Eu152	-8550.22 keV

<< 62-Sm-154	**63-Eu-153**	64-Gd-160 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Eu151 production)**	MT17 (γ,3n) >>

Eu153 (γ,2n) or Eu151 production log-log

Eu153 (γ,2n) or Eu151 production lin-log
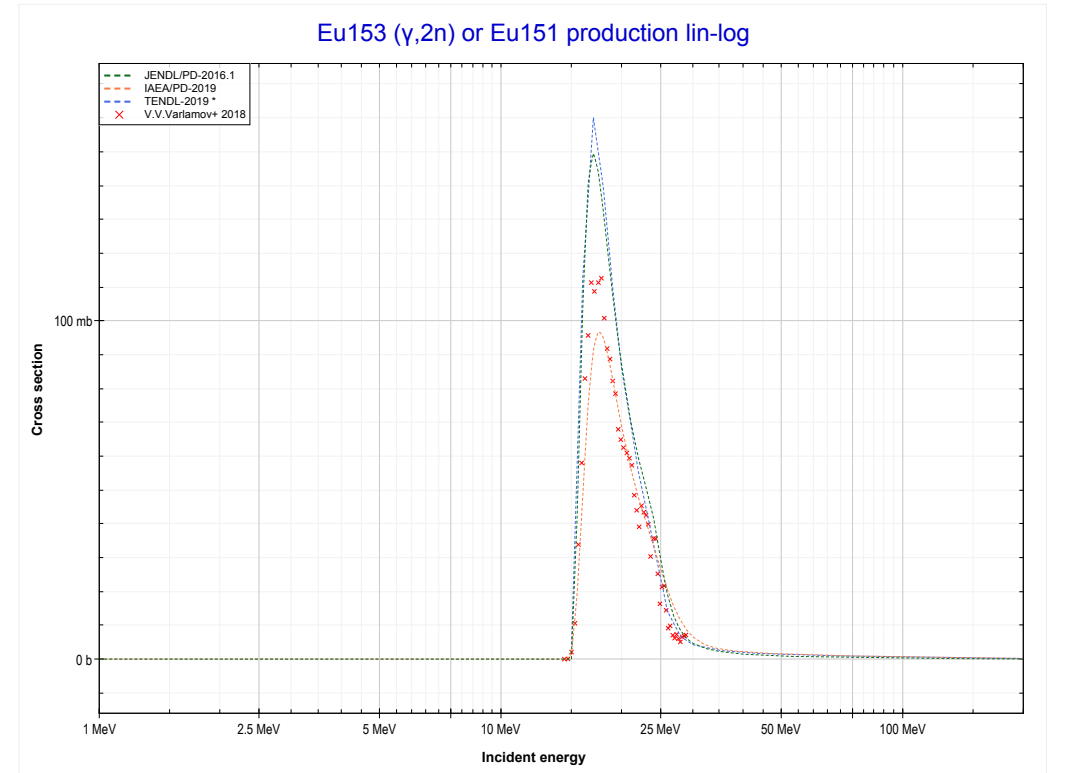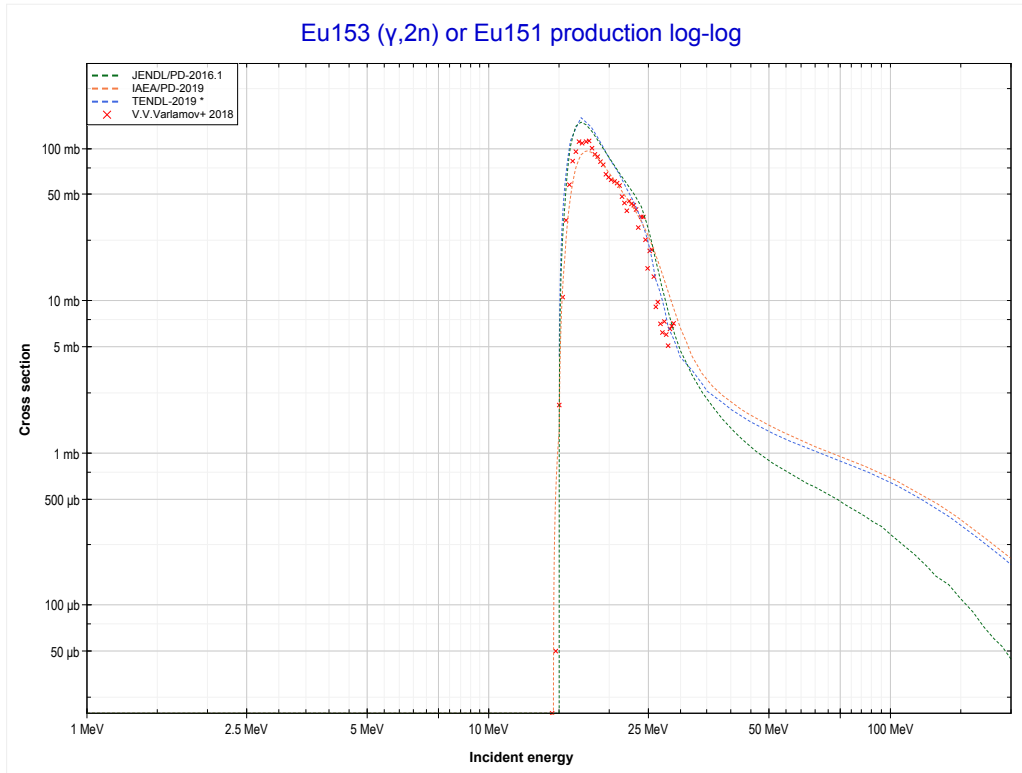
Reaction	Q-Value
Eu153(γ,2n)Eu151	-14856.93 keV

<< 59-Pr-141 >>	**63-Eu-153**	64-Gd-160 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Eu150 production)**	64-Gd-160 MT4 (γ,n) >>

Eu153 (γ,3n) or Eu150 production log-log

Eu153 (γ,3n) or Eu150 production lin-log
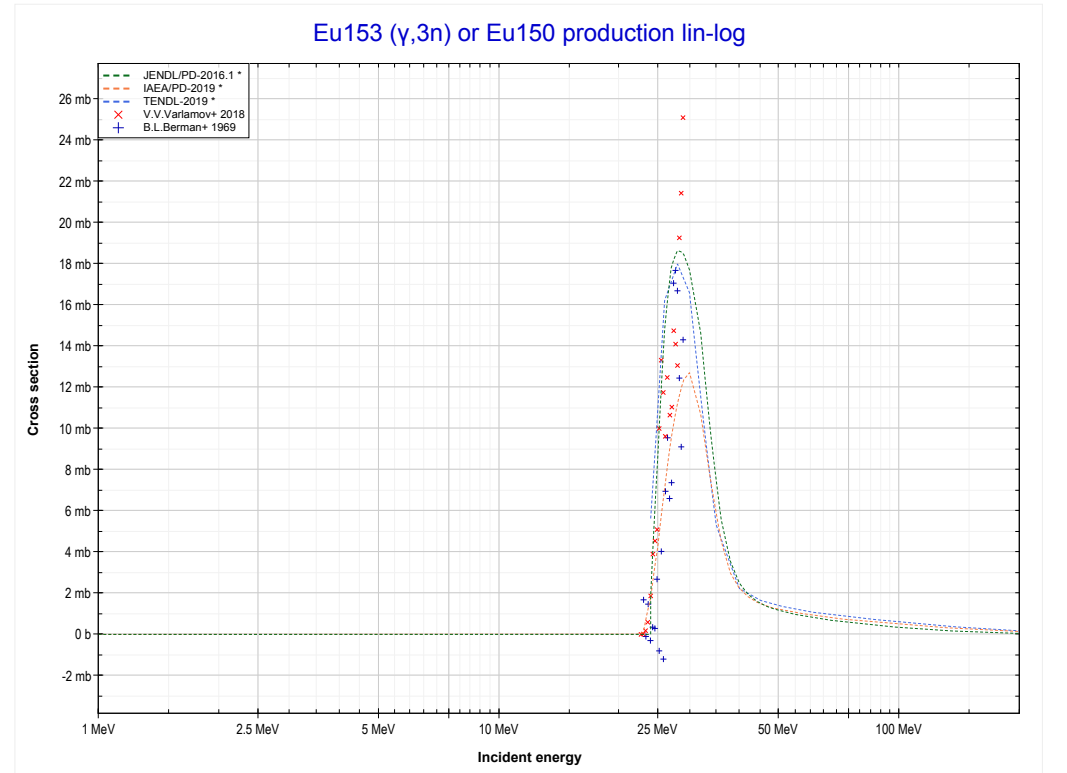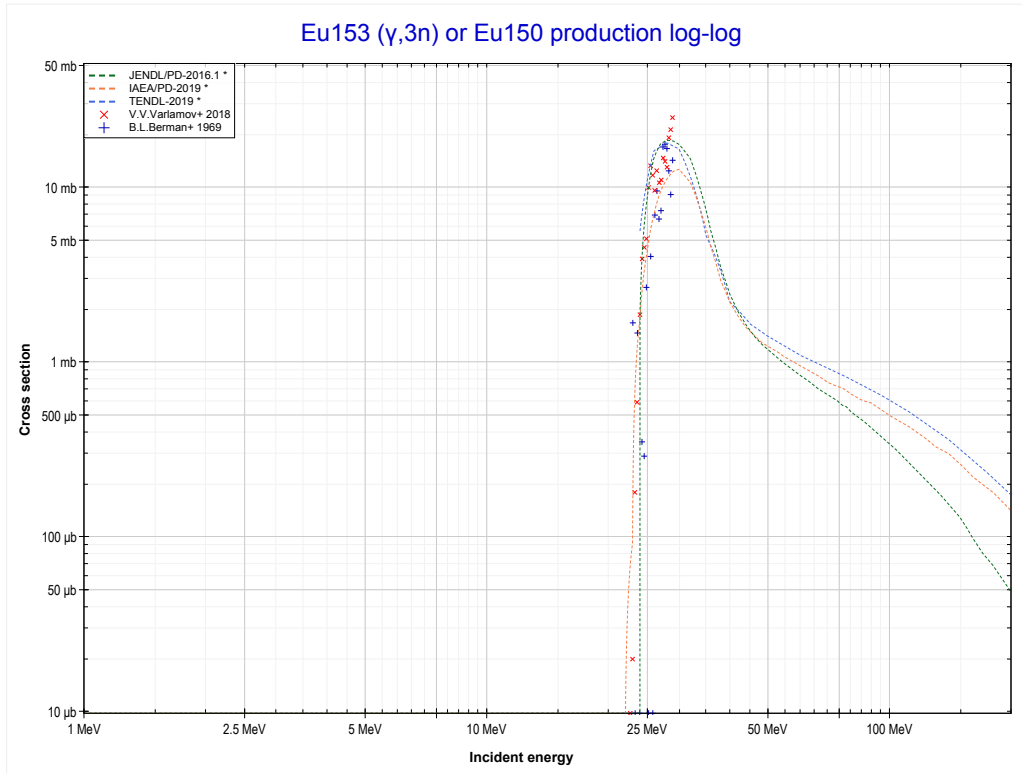
Reaction	Q-Value
Eu153(γ,3n)Eu150	-22789.15 keV

<< 63-Eu-153	**64-Gd-160**	66-Dy-162 >>
<< 63-Eu-153 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Gd159 production)**	MT16 (γ,2n) >>

Gd160 (γ,n) or Gd159 production log-log

Gd160 (γ,n) or Gd159 production lin-log
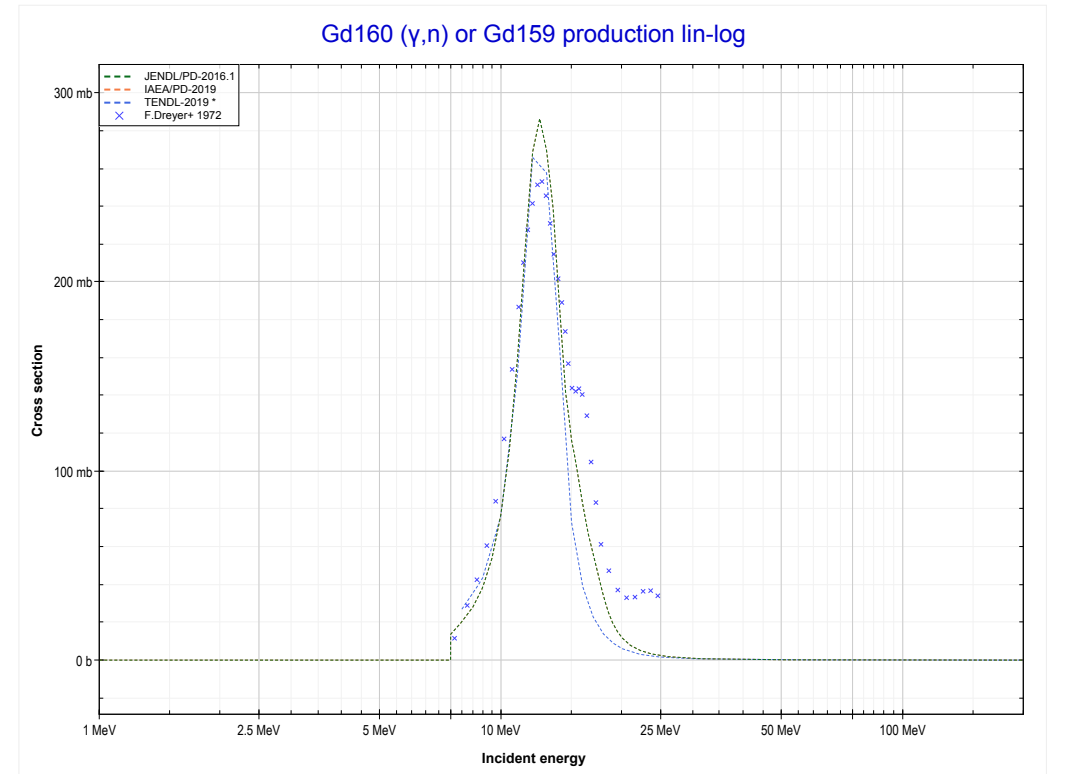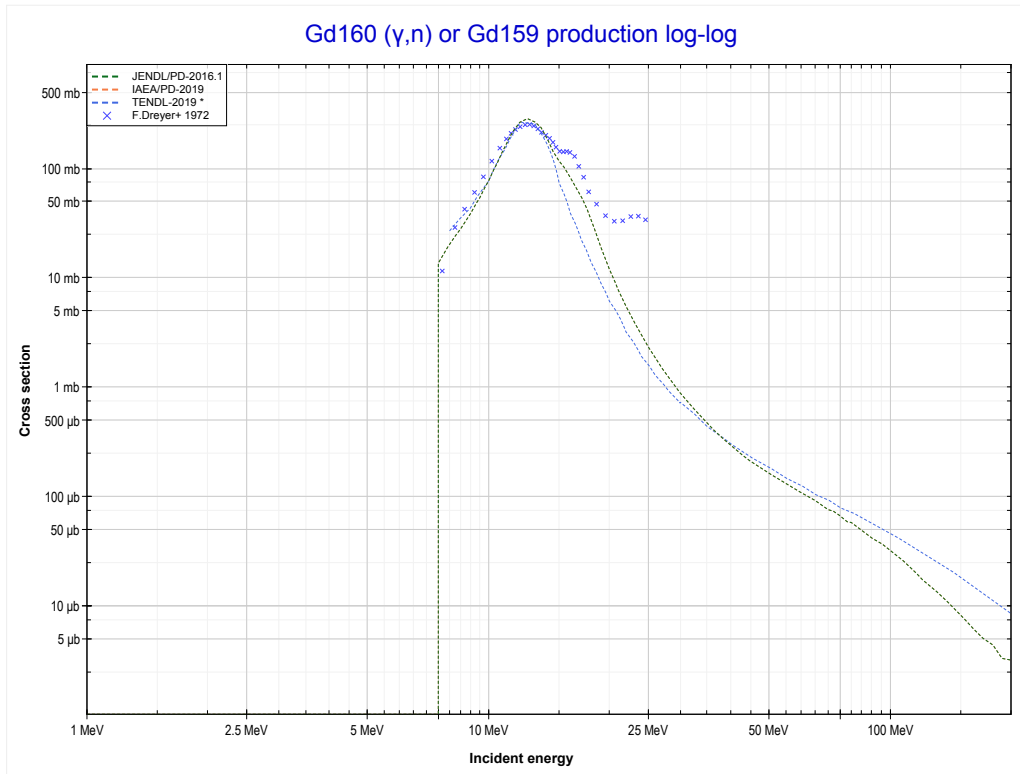
Reaction	Q-Value
Gd160(γ,n)Gd159	-7451.62 keV

<< 63-Eu-153	**64-Gd-160**	67-Ho-165 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Gd158 production)**	MT17 (γ,3n) >>

Gd160 (γ,2n) or Gd158 production log-log

Gd160 (γ,2n) or Gd158 production lin-log
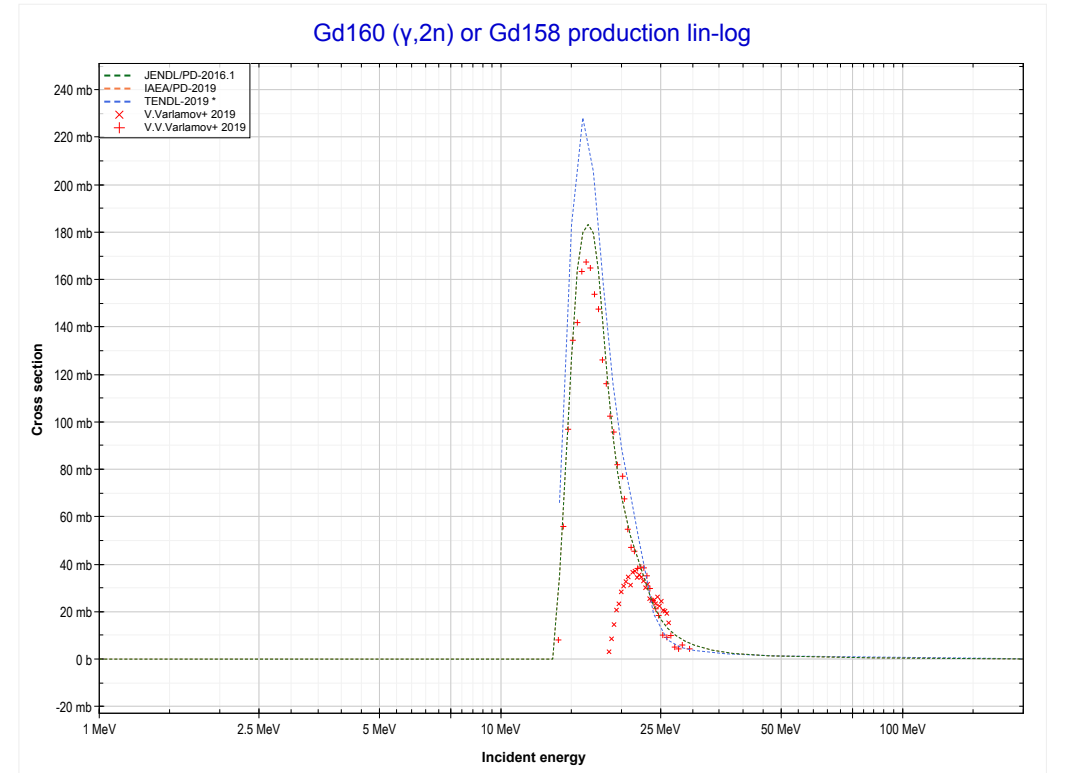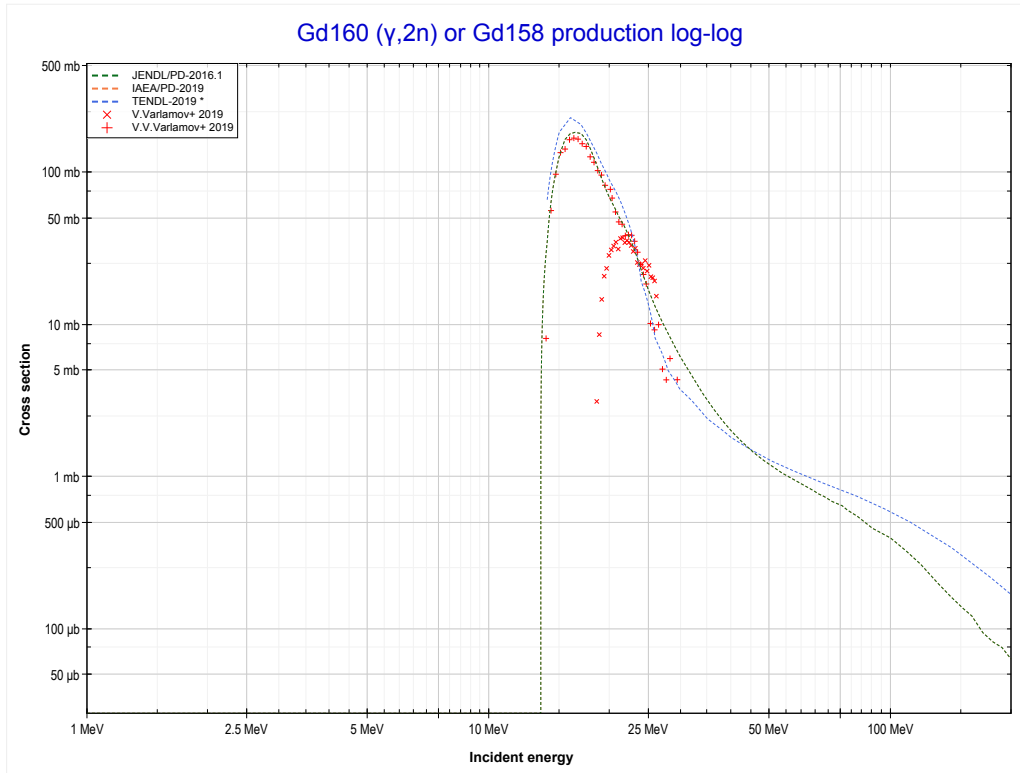
Reaction	Q-Value
Gd160(γ,2n)Gd158	-13394.83 keV

<< 63-Eu-153	**64-Gd-160**	65-Tb-159 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Gd157 production)**	MT28 (γ,n+p) >>

Gd160 (γ,3n) or Gd157 production log-log

Gd160 (γ,3n) or Gd157 production lin-log
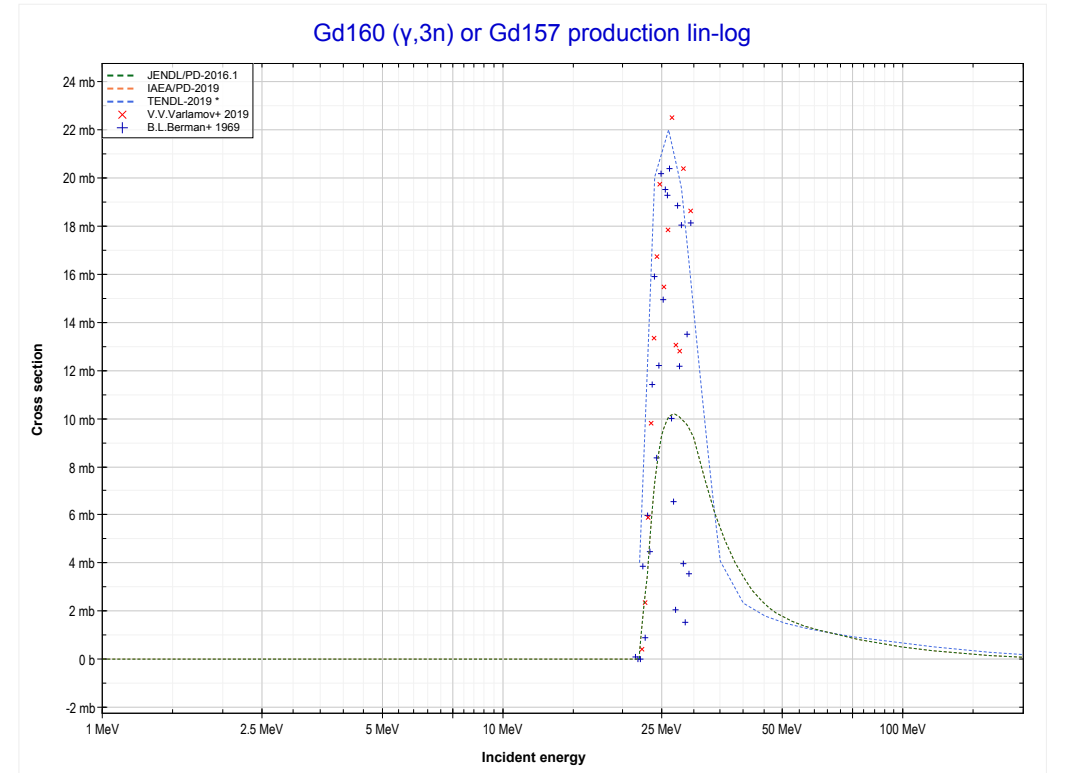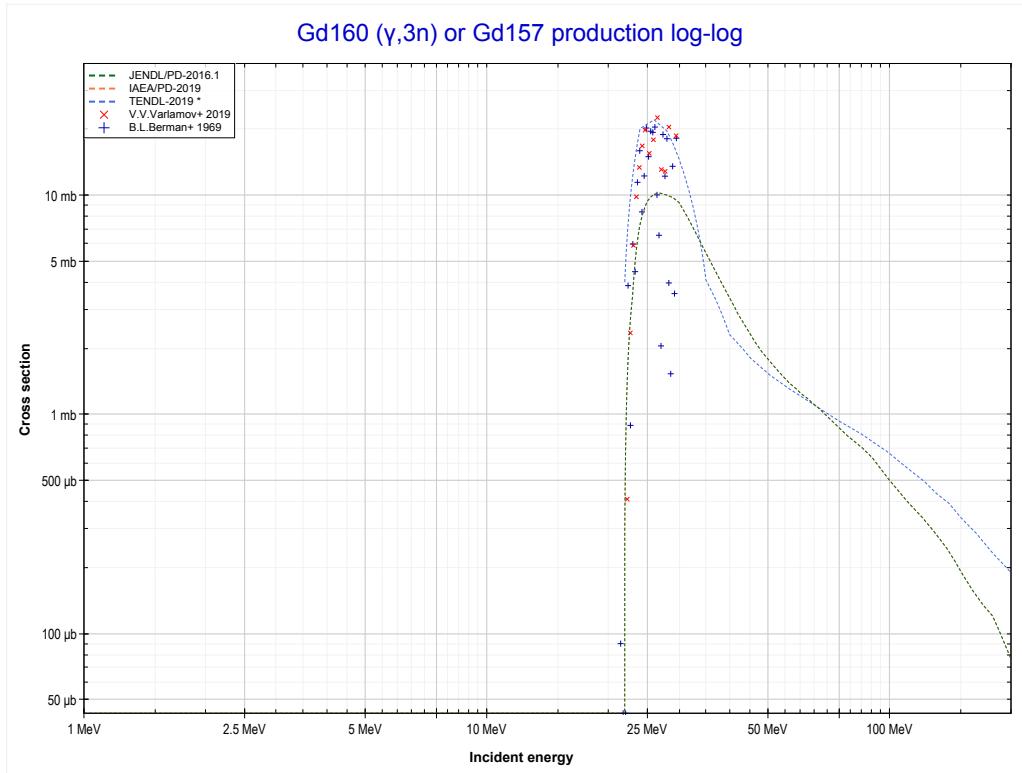
Reaction	Q-Value
Gd160(γ,3n)Gd157	-21332.15 keV

<< 40-Zr-90	64-Gd-160	
<< MT17 (γ,3n)	MT28 (γ,n+p) or MT5 (Eu158 production)	MT103 (γ,p) >>

Gd160 (γ,n+p) or Eu158 production log-log

Gd160 (γ,n+p) or Eu158 production lin-log
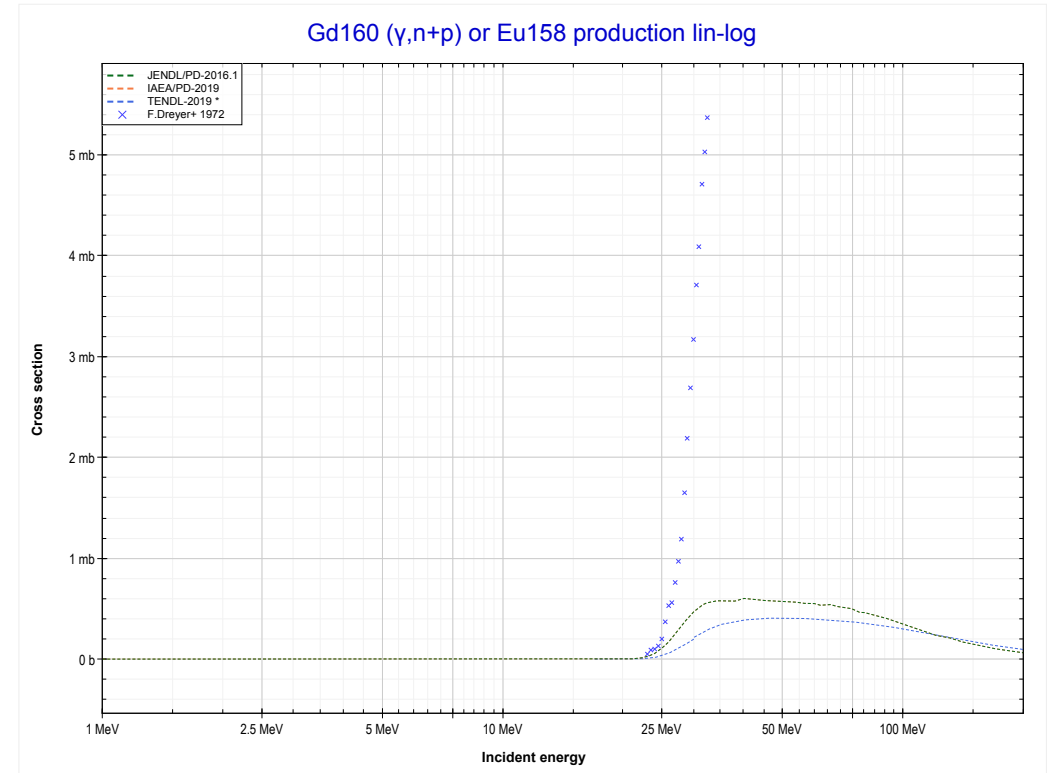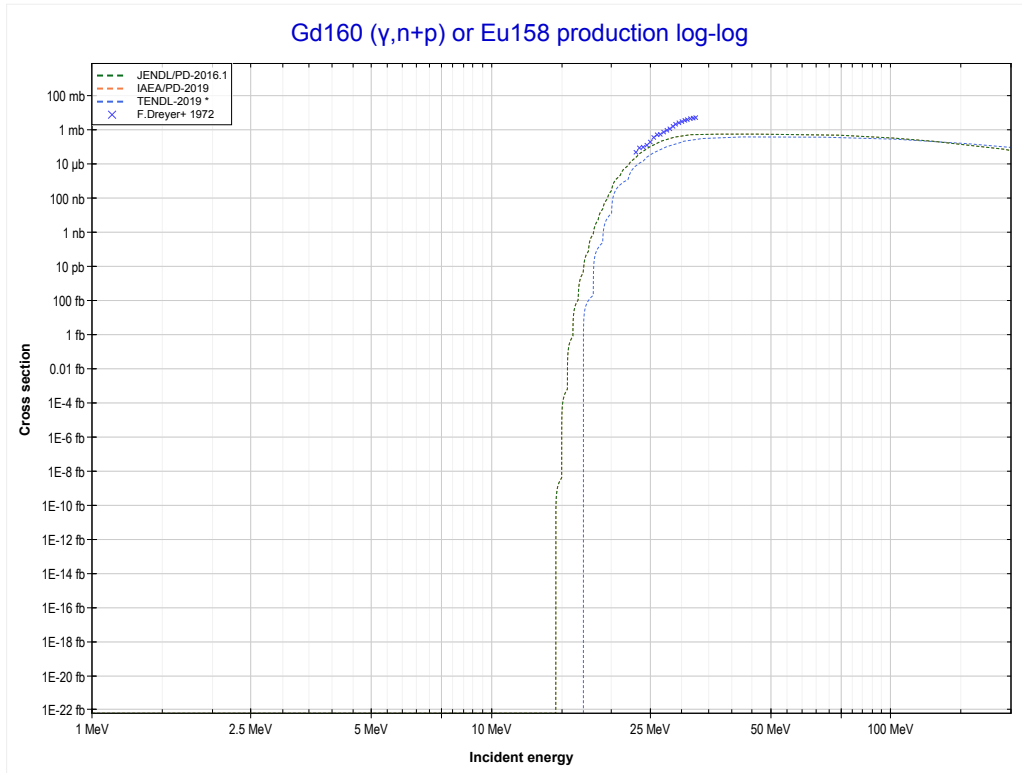
Reaction	Q-Value
Gd160(γ,d)Eu158	-13822.42 keV
Gd160(γ,n+p)Eu158	-16046.99 keV

<< 50-Sn-120	64-Gd-160	
<< MT28 (γ,n+p)	MT103 (γ,p) or MT5 (Eu159 production)	65-Tb-159 MT17 (γ,3n) >>

Gd160 (γ,p) or Eu159 production log-log

Gd160 (γ,p) or Eu159 production lin-log
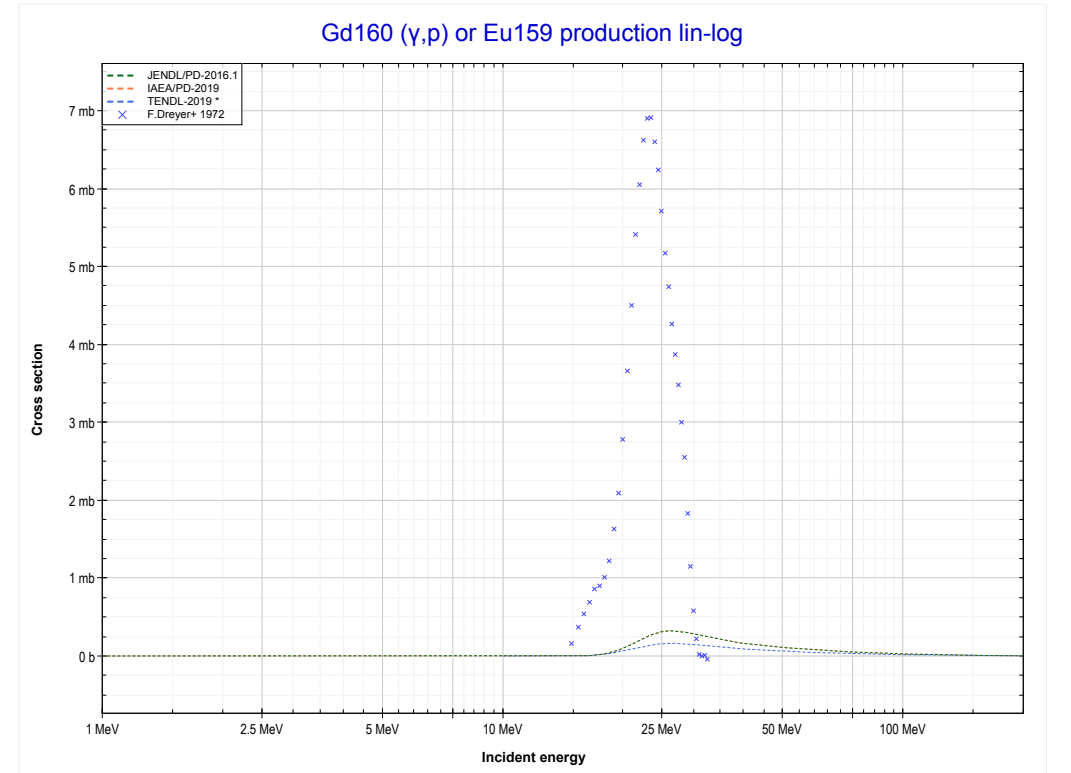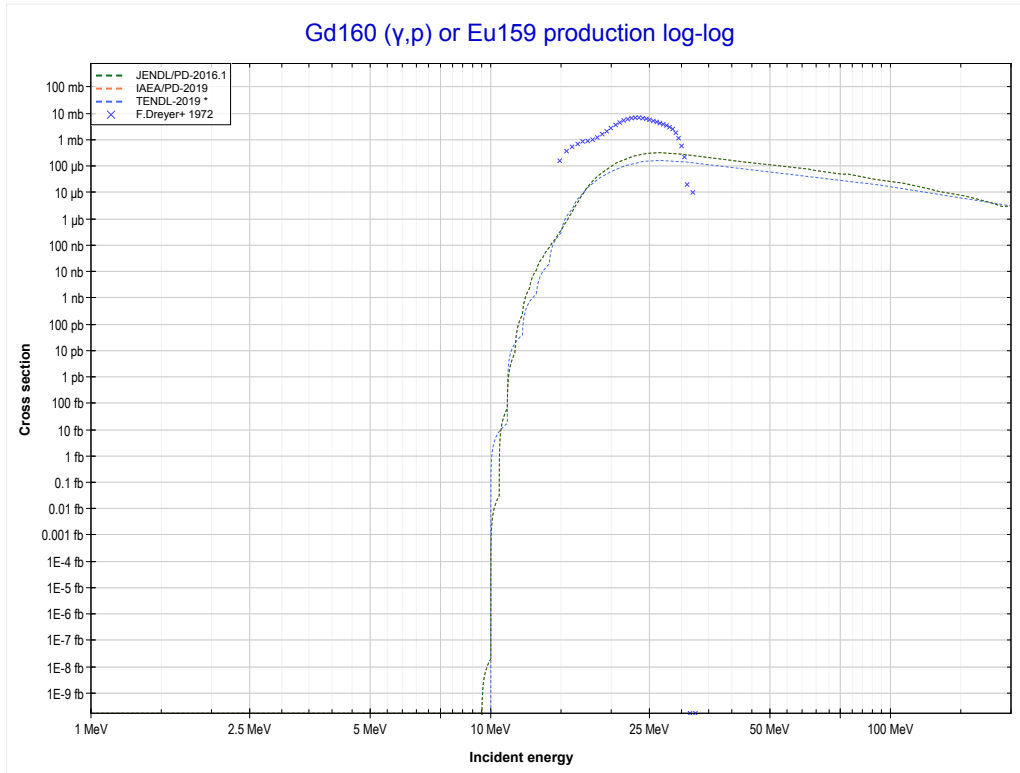
Reaction	Q-Value
Gd160(γ,p)Eu159	-9187.67 keV

<< 64-Gd-160	**65-Tb-159**	67-Ho-165 >>
<< 64-Gd-160 MT103 (γ,p)	**MT17 (γ,3n) or MT5 (Tb156 production)**	66-Dy-162 MT4 (γ,n) >>

Tb159 (γ,3n) or Tb156 production log-log

Tb159 (γ,3n) or Tb156 production lin-log
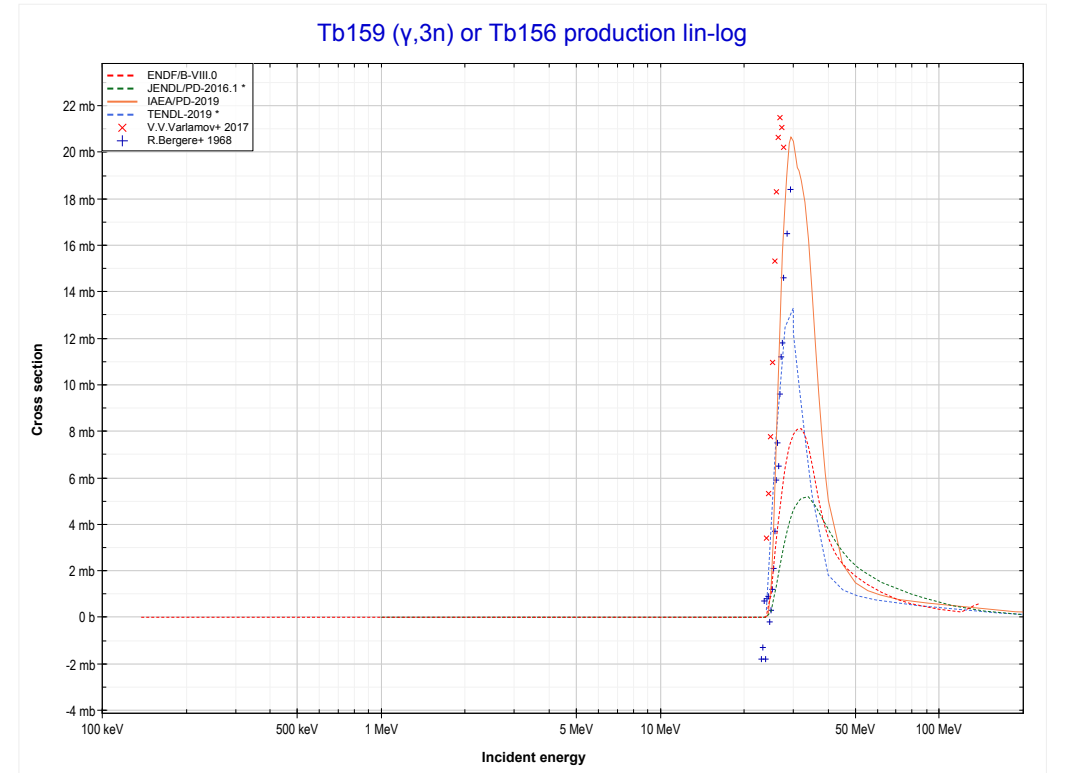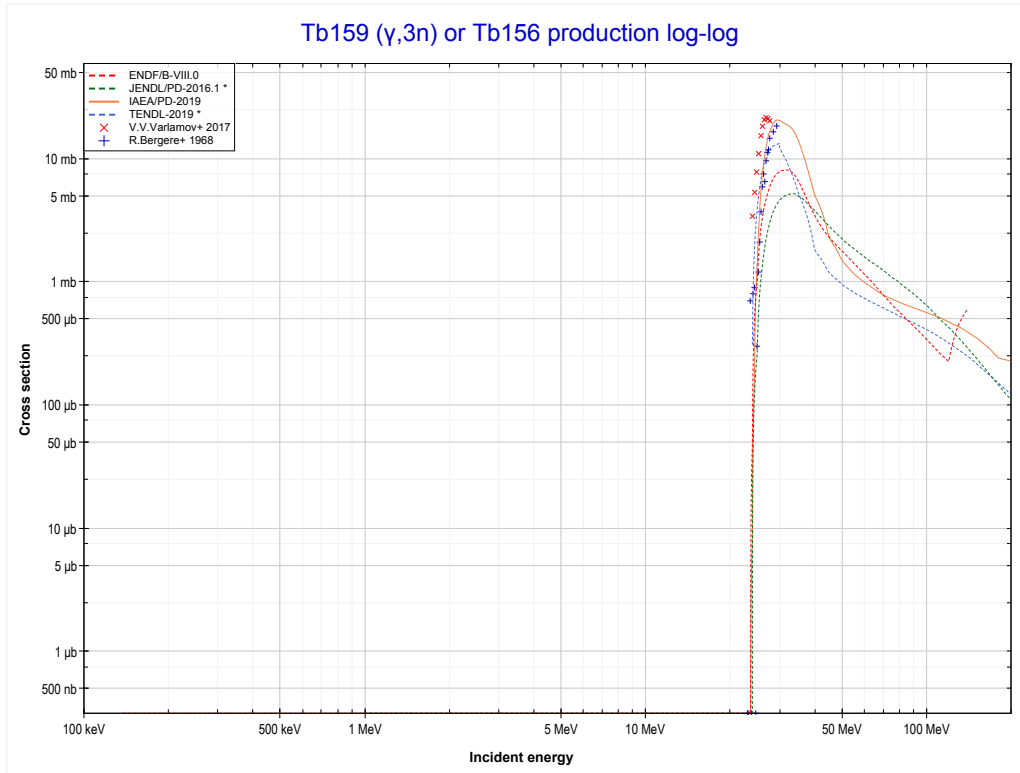
Reaction	Q-Value
Tb159(γ,3n)Tb156	-23655.35 keV

<< 64-Gd-160	**66-Dy-162**	66-Dy-163 >>
<< 65-Tb-159 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Dy161 production)**	66-Dy-163 MT4 (γ,n) >>

Dy162 (γ,n) or Dy161 production log-log

Dy162 (γ,n) or Dy161 production lin-log
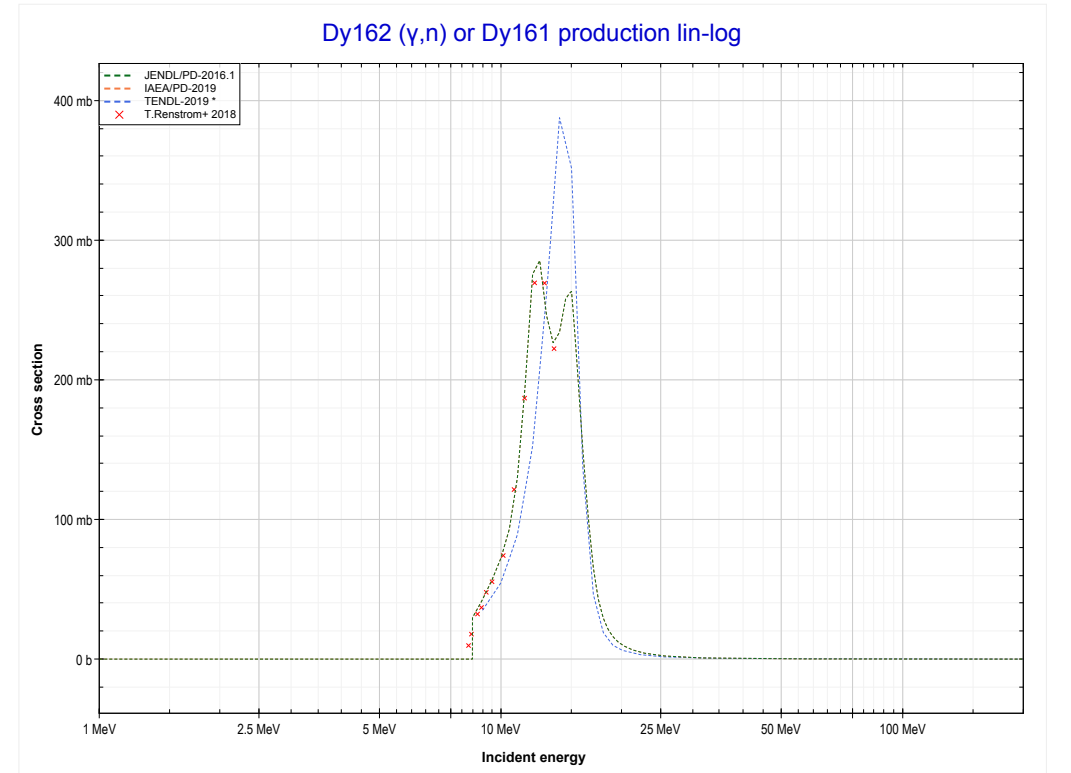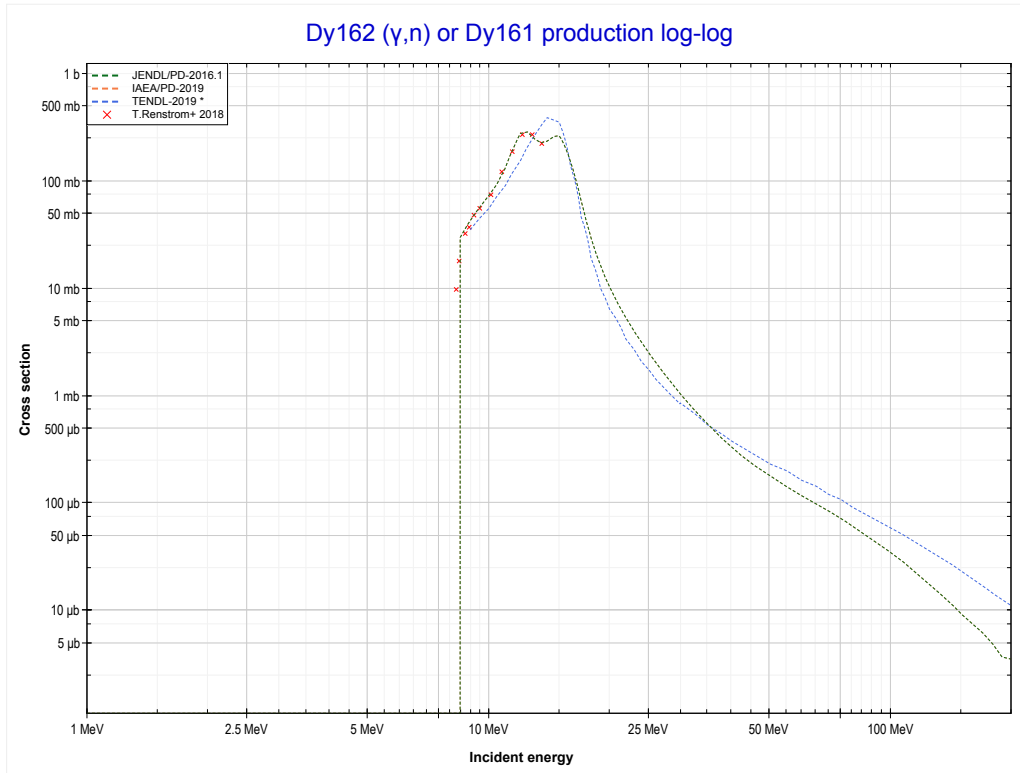
Reaction	Q-Value
Dy162(γ,n)Dy161	-8197.02 keV

<< 66-Dy-162	**66-Dy-163**	73-Ta-181 >>
<< 66-Dy-162 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Dy162 production)**	67-Ho-165 MT16 (γ,2n) >>

Dy163 (γ,n) or Dy162 production log-log

Dy163 (γ,n) or Dy162 production lin-log
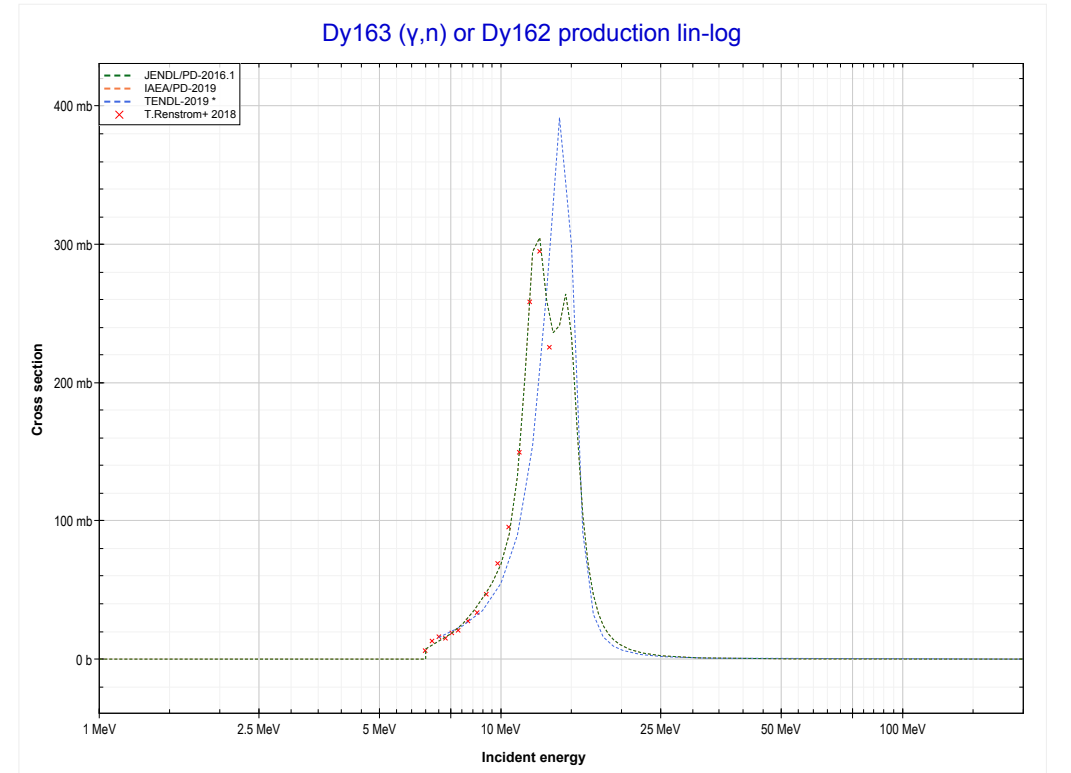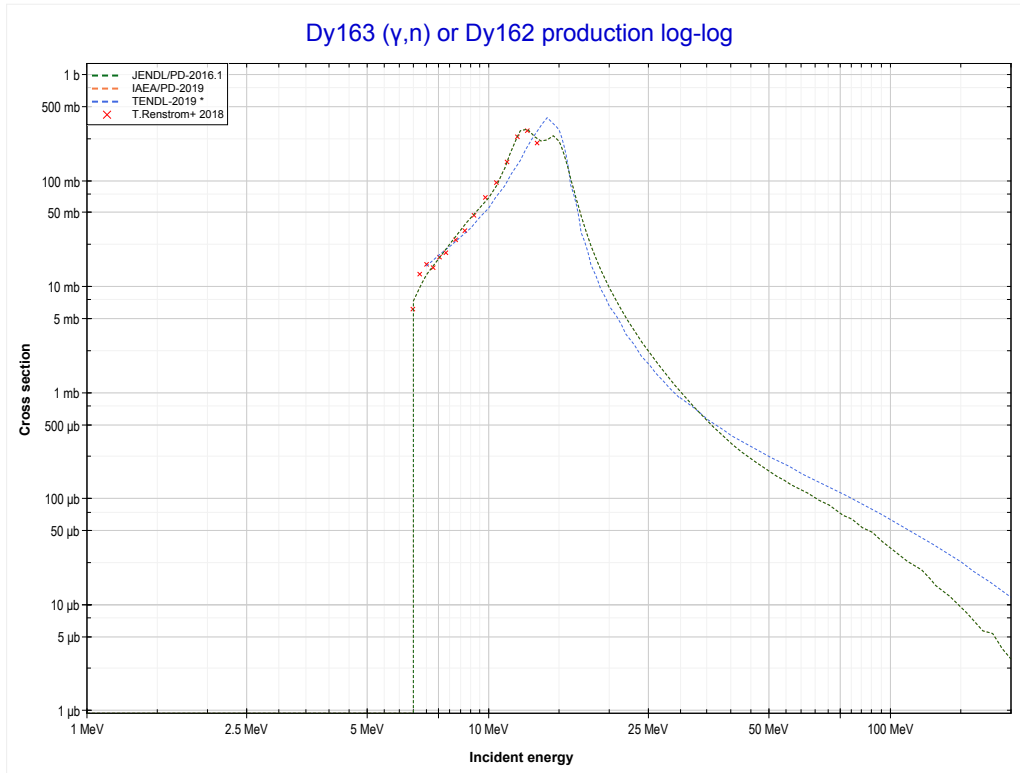
Reaction	Q-Value
Dy163(γ,n)Dy162	-6271.02 keV

<< 64-Gd-160	67-Ho-165	68-Er-166 >>
<< 66-Dy-163 MT4 (γ,n)	MT16 (γ,2n) or MT5 (Ho163 production)	MT17 (γ,3n) >>

Ho165 (γ,2n) or Ho163 production log-log

Ho165 (γ,2n) or Ho163 production lin-log
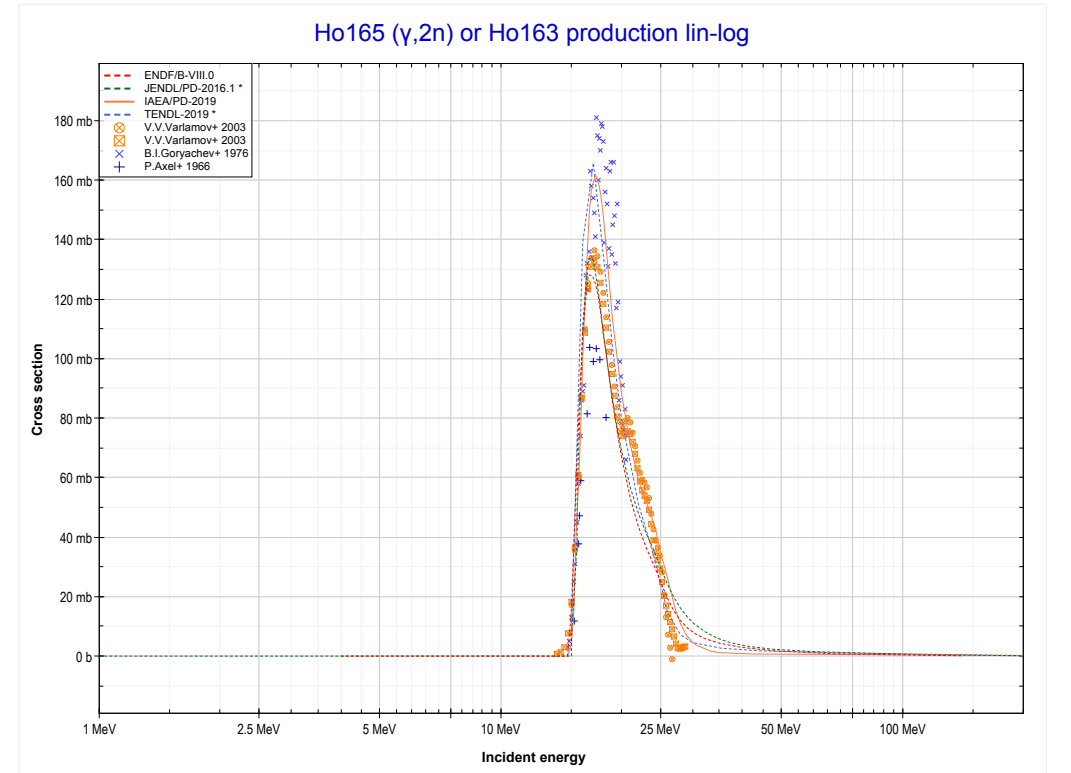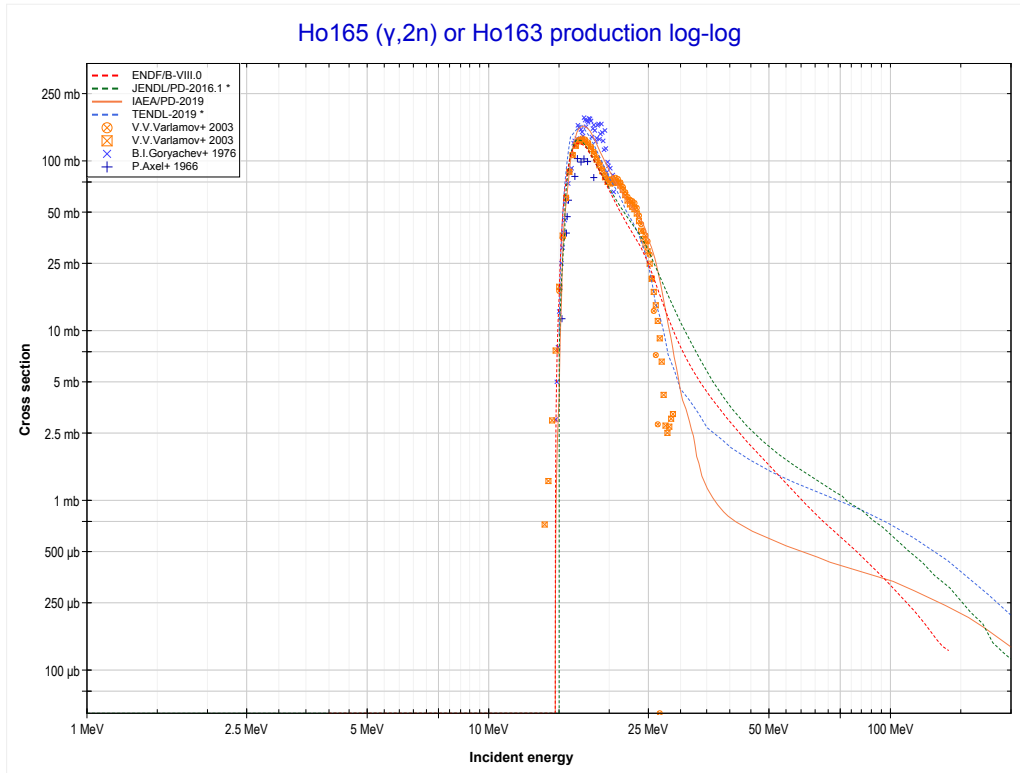
Reaction	Q-Value
Ho165(γ,2n)Ho163	-14663.33 keV

<< 65-Tb-159	**67-Ho-165**	71-Lu-175 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Ho162 production)**	68-Er-166 MT16 (γ,2n) >>

Ho165 (γ,3n) or Ho162 production log-log

Ho165 (γ,3n) or Ho162 production lin-log
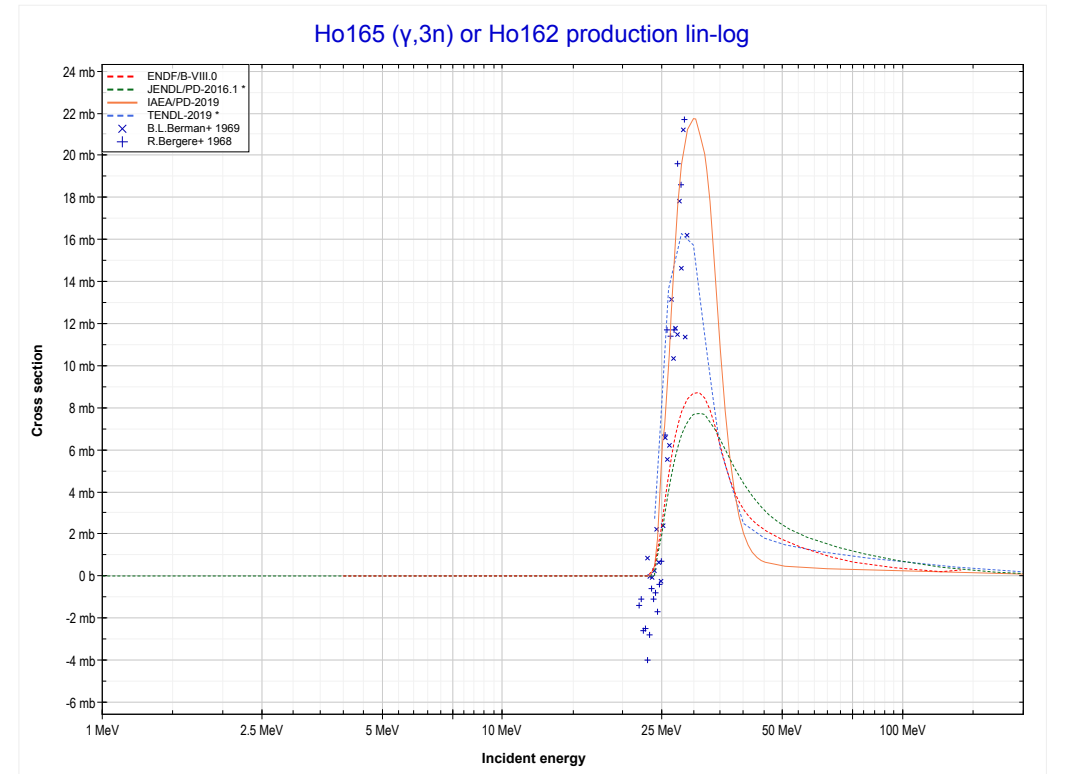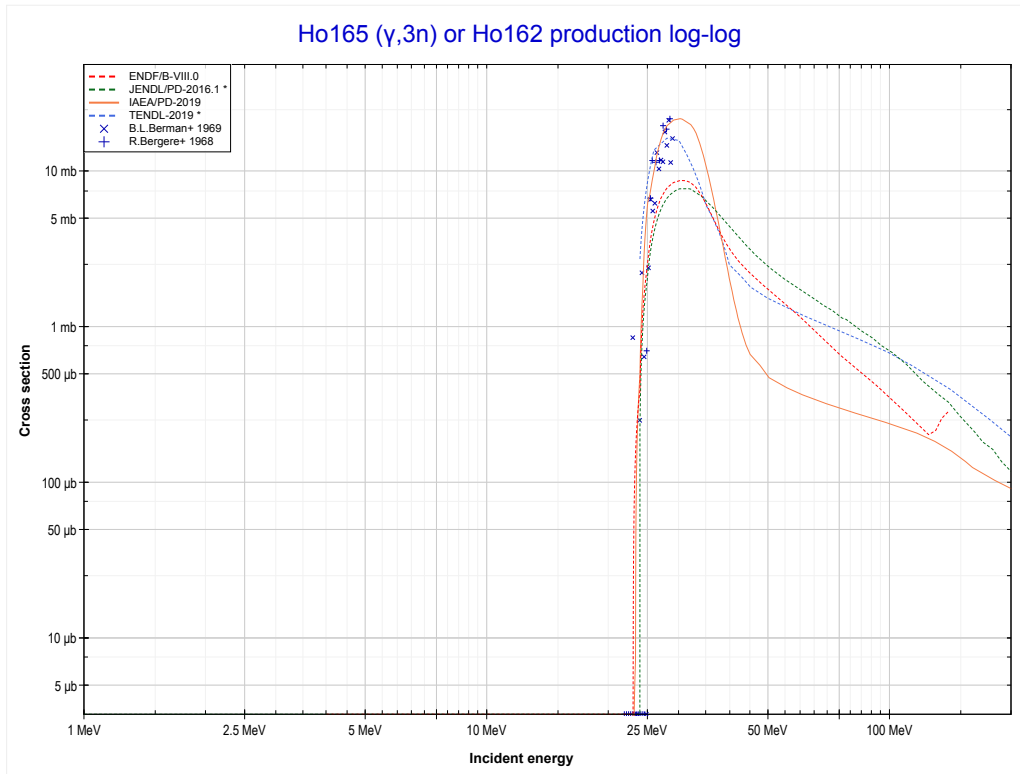
Reaction	Q-Value
Ho165(γ,3n)Ho162	-23070.95 keV

<< 67-Ho-165	**68-Er-166**	72-Hf-178 >>
<< 67-Ho-165 MT17 (γ,3n)	**MT16 (γ,2n) or MT5 (Er164 production)**	68-Er-170 MT107 (γ,α) >>

Er166 (γ,2n) or Er164 production log-log

Er166 (γ,2n) or Er164 production lin-log
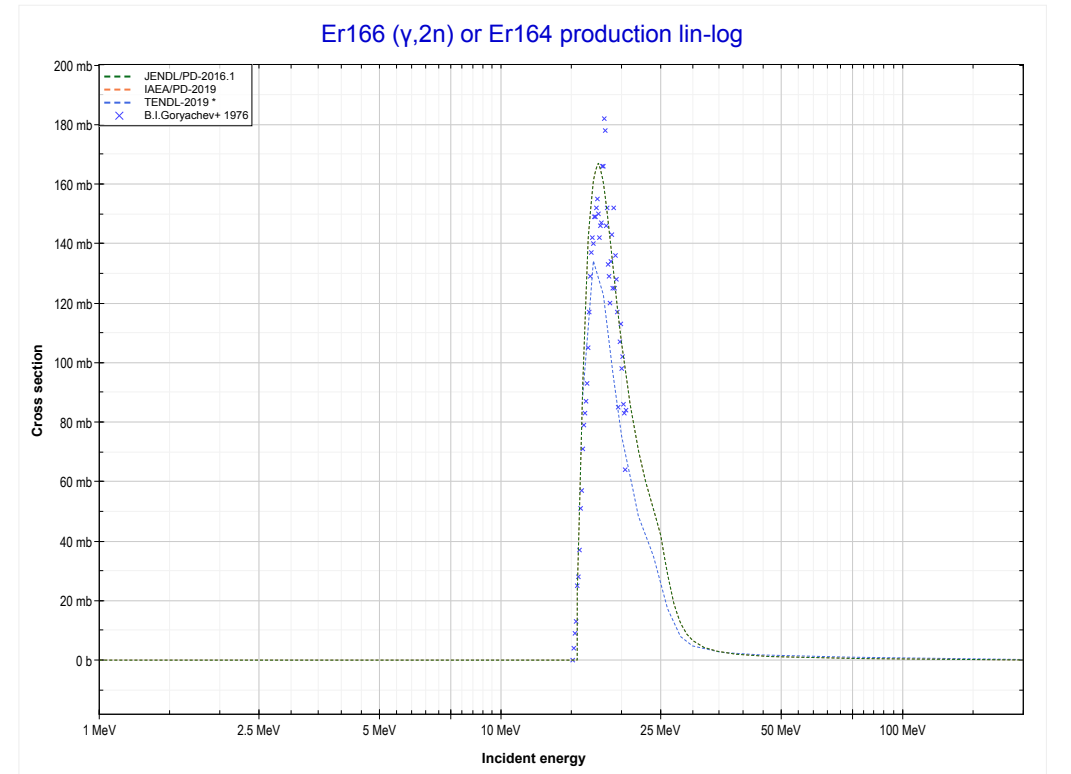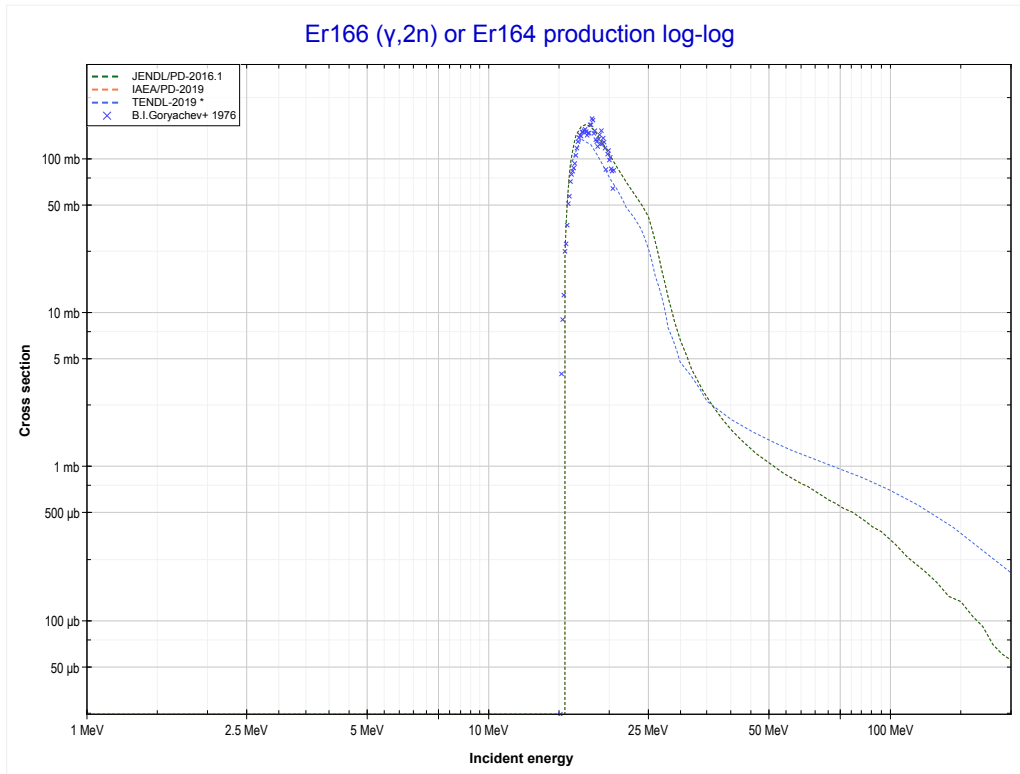
Reaction	Q-Value
Er166(γ,2n)Er164	-15125.73 keV

<< 41-Nb-93	**68-Er-170**	
<< 68-Er-166 MT16 (γ,2n)	**MT107 (γ,α) or MT5 (Dy166 production)**	71-Lu-175 MT17 (γ,3n) >>

Er170 (γ,α) or Dy166 production log-log

Er170 (γ,α) or Dy166 production lin-log
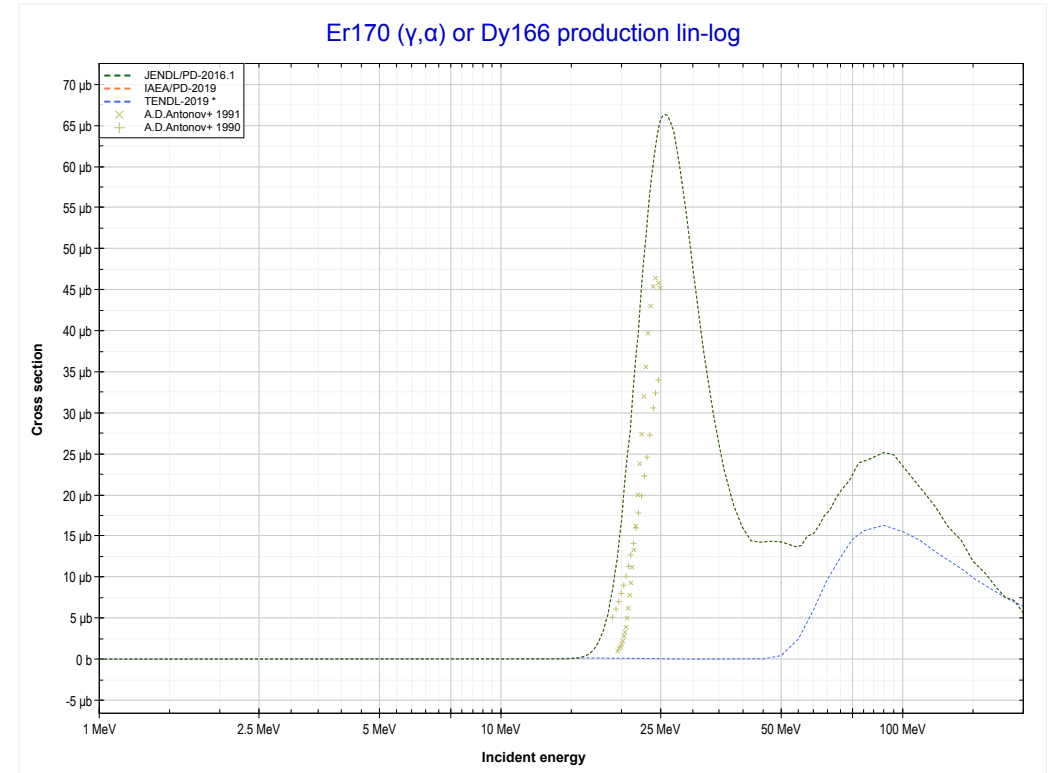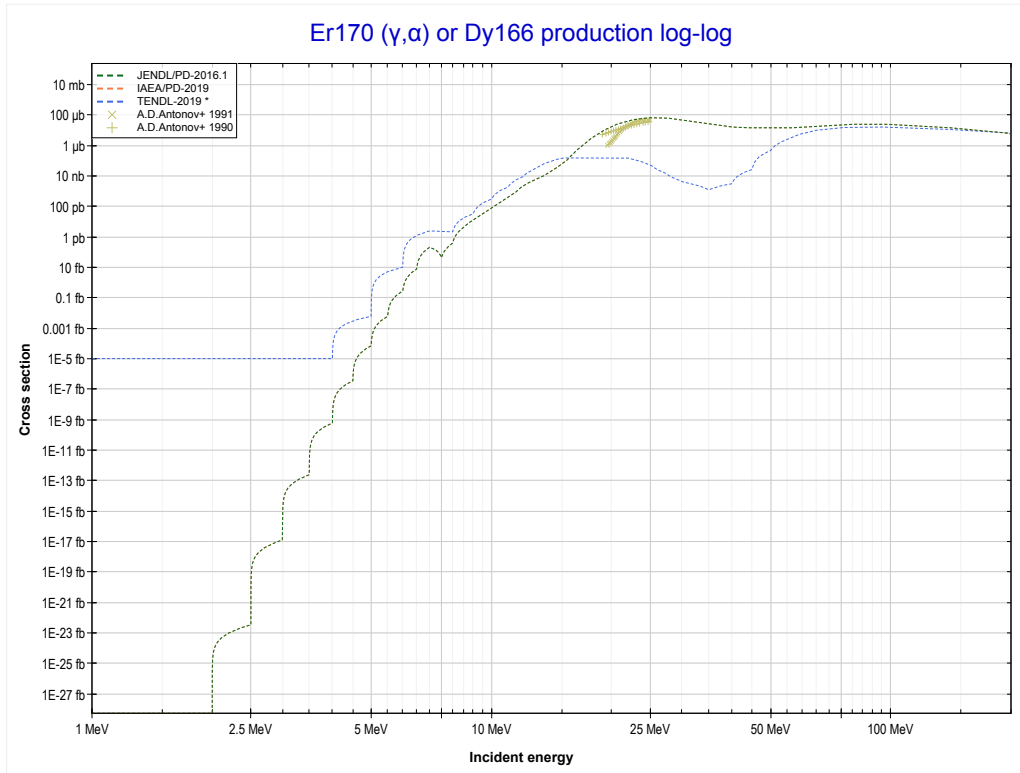
Reaction	Q-Value
Er170(γ,α)Dy166	51.18 keV
Er170(γ,p+t)Dy166	-19762.68 keV
Er170(γ,n+He3)Dy166	-20526.44 keV
Er170(γ,2d)Dy166	-23795.34 keV
Er170(γ,n+p+d)Dy166	-26019.91 keV
Er170(γ,2n+2p)Dy166	-28244.48 keV

<< 67-Ho-165	**71-Lu-175**	73-Ta-181 >>
<< 68-Er-170 MT107 (γ,α)	**MT17 (γ,3n) or MT5 (Lu172 production)**	72-Hf-178 MT16 (γ,2n) >>

Lu175 (γ,3n) or Lu172 production log-log

Lu175 (γ,3n) or Lu172 production lin-log
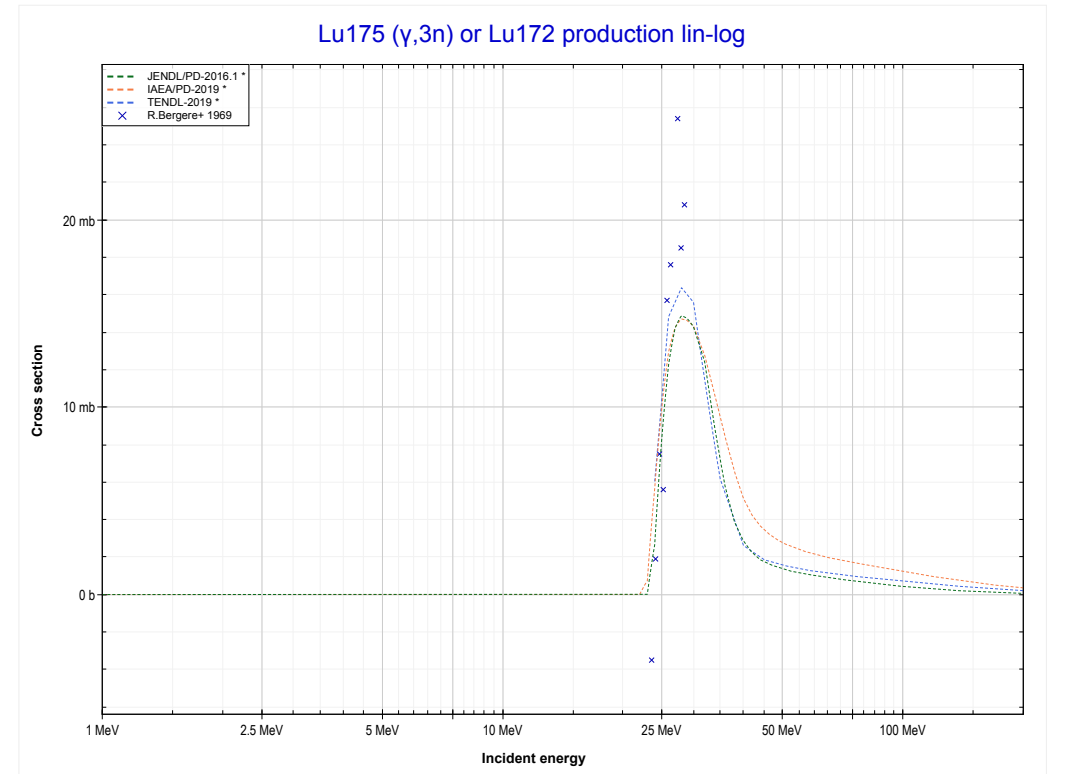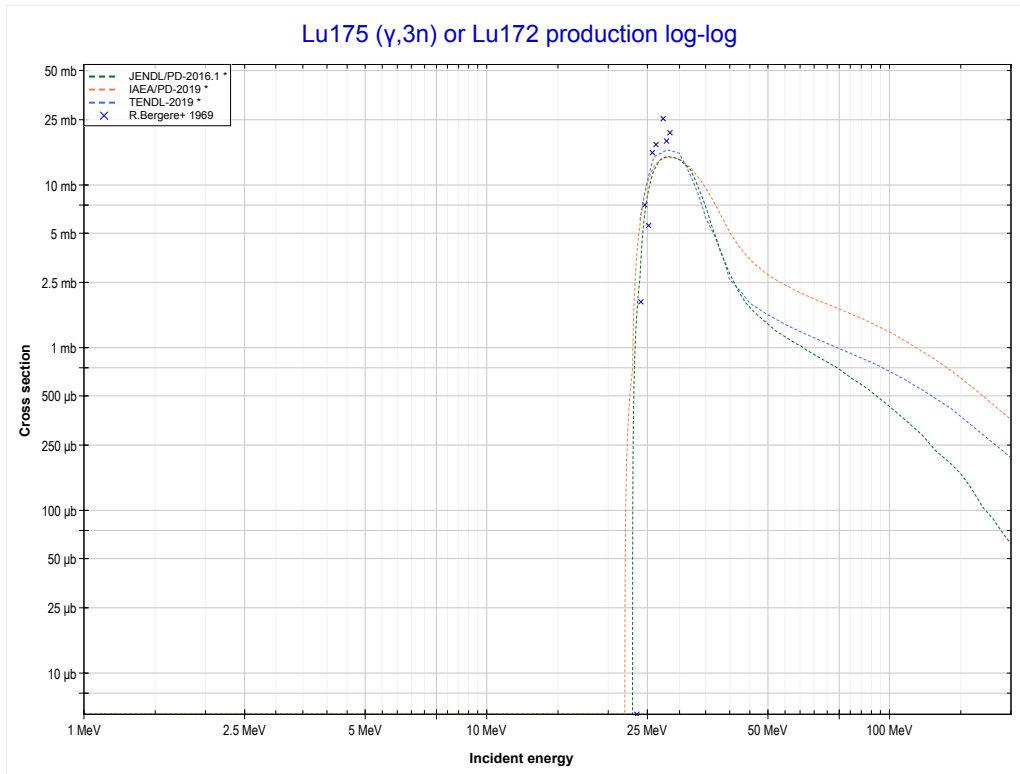
Reaction	Q-Value
Lu175(γ,3n)Lu172	-22643.55 keV

<< 68-Er-166	**72-Hf-178**	73-Ta-181 >>
<< 71-Lu-175 MT17 (γ,3n)	**MT16 (γ,2n) or MT5 (Hf176 production)**	73-Ta-181 MT4 (γ,n) >>

Hf178 (γ,2n) or Hf176 production log-log

Hf178 (γ,2n) or Hf176 production lin-log
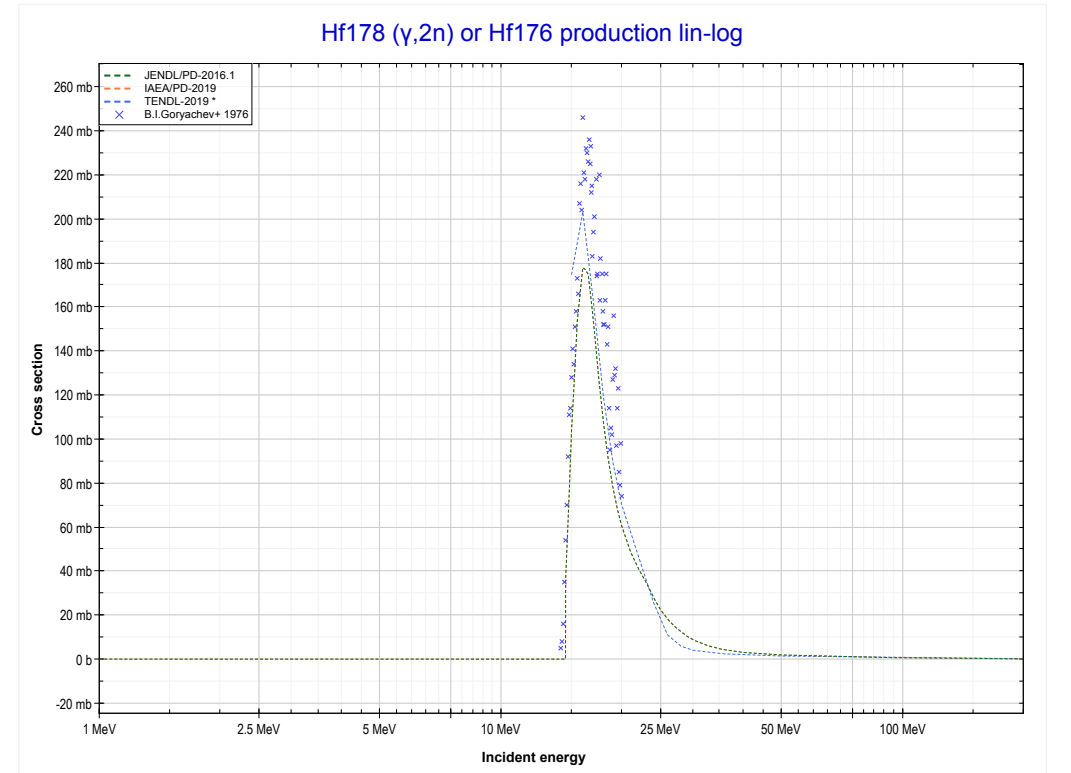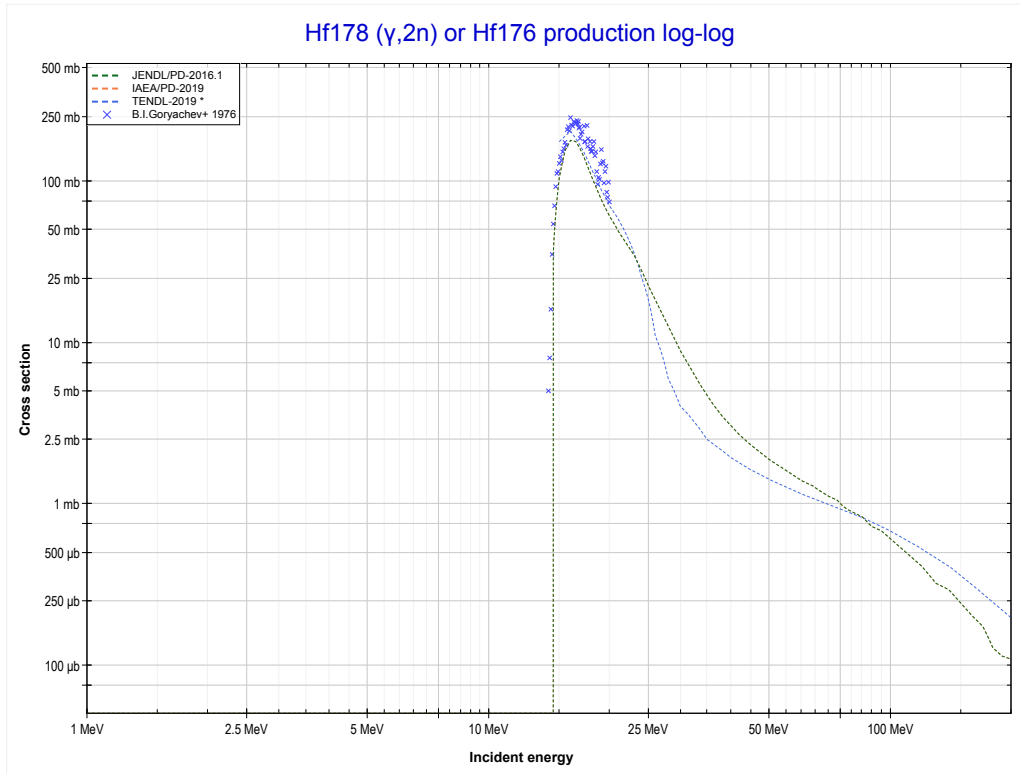
Reaction	Q-Value
Hf178(γ,2n)Hf176	-14001.53 keV

<< 66-Dy-163	**73-Ta-181**	74-W-186 >>
<< 72-Hf-178 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Ta180 production)**	MT16 (γ,2n) >>

Ta181 (γ,n) or Ta180 production log-log

Ta181 (γ,n) or Ta180 production lin-log
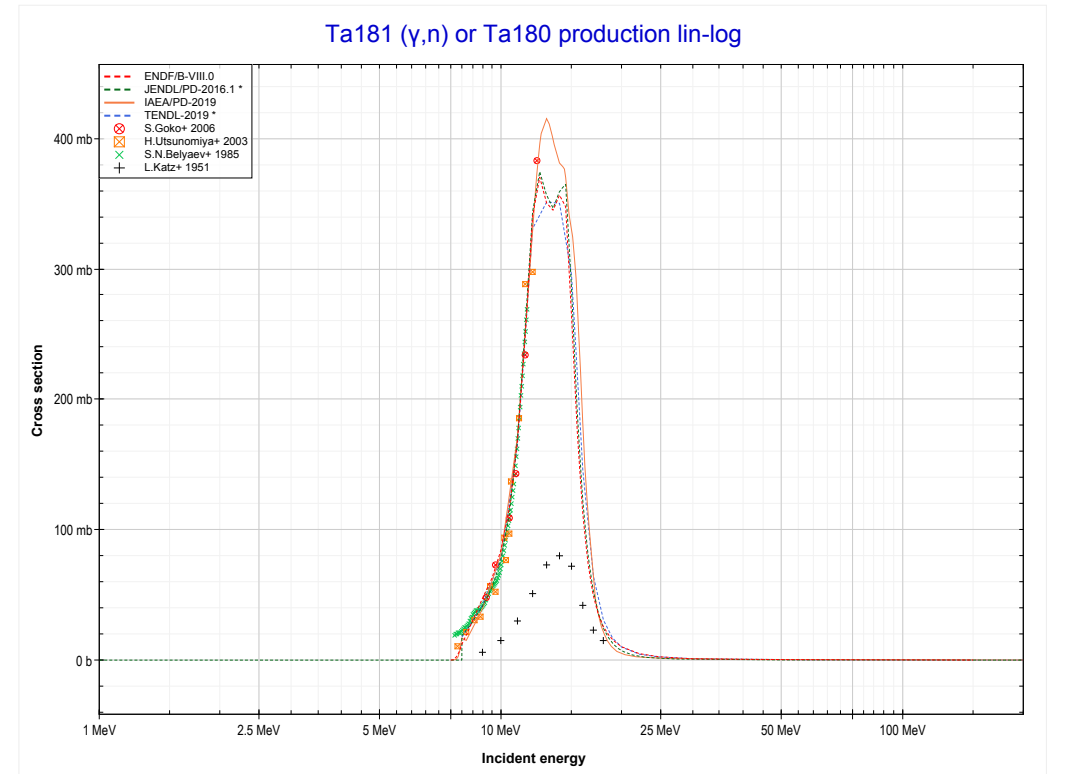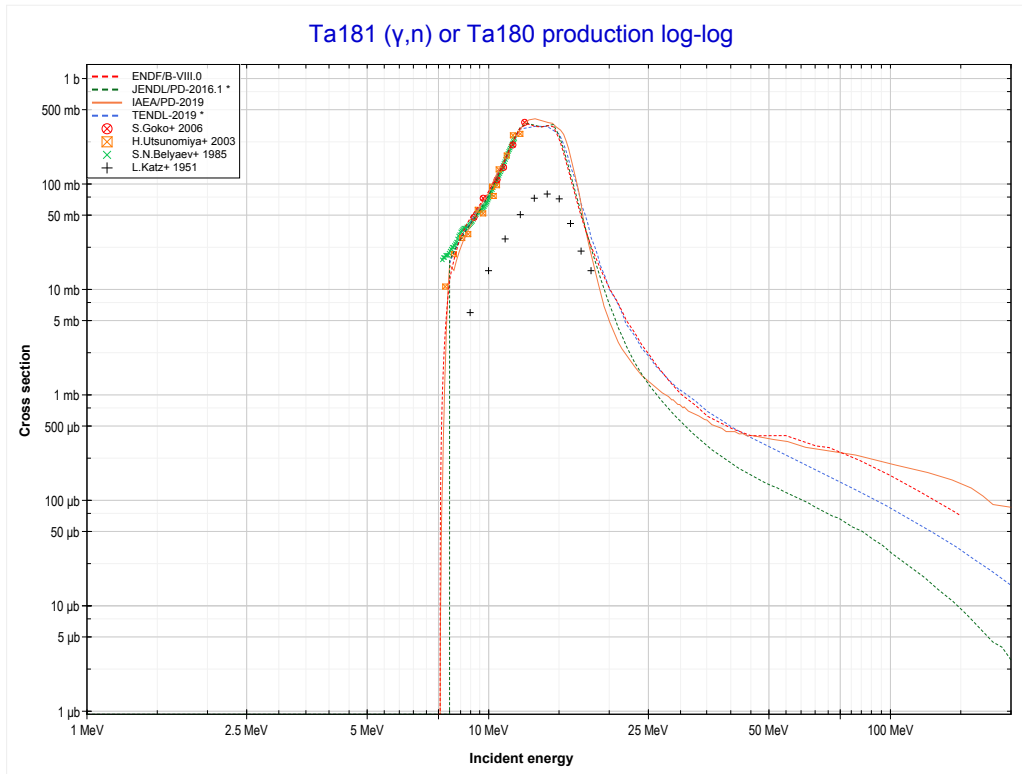
Reaction	Q-Value
Ta181(γ,n)Ta180	-7576.72 keV

<< 72-Hf-178	**73-Ta-181**	76-Os-186 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Ta179 production)**	MT17 (γ,3n) >>

Ta181 (γ,2n) or Ta179 production log-log

Ta181 (γ,2n) or Ta179 production lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- × G.P.Antropov+ 1967
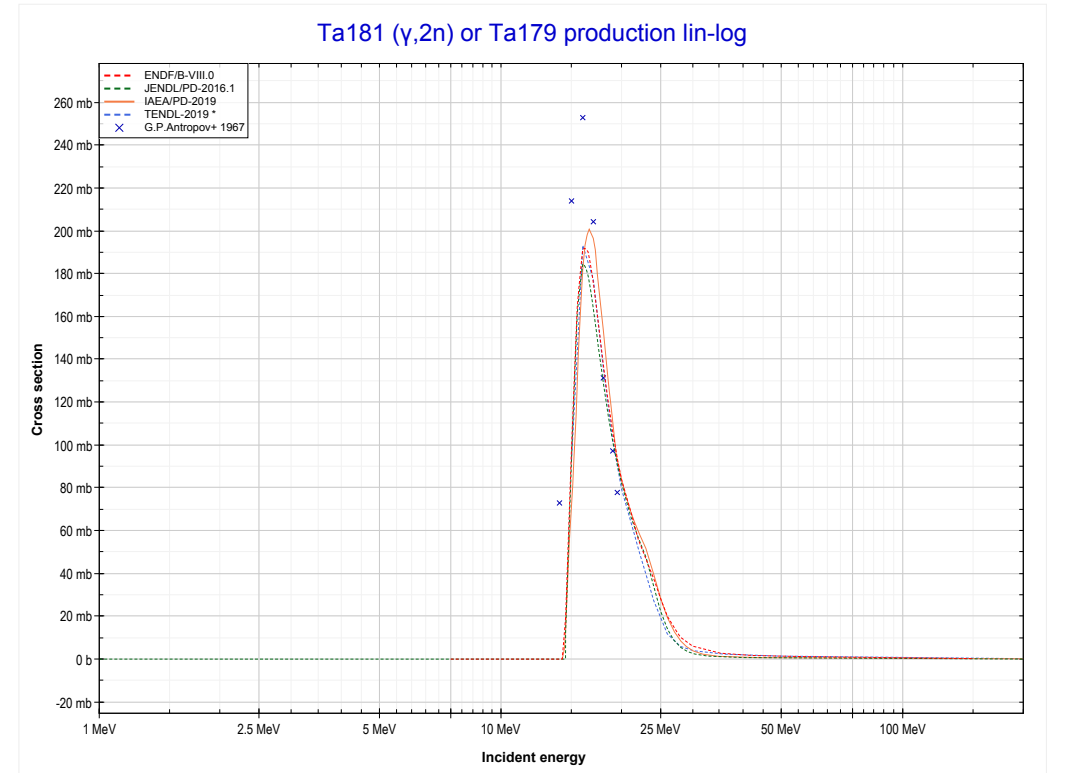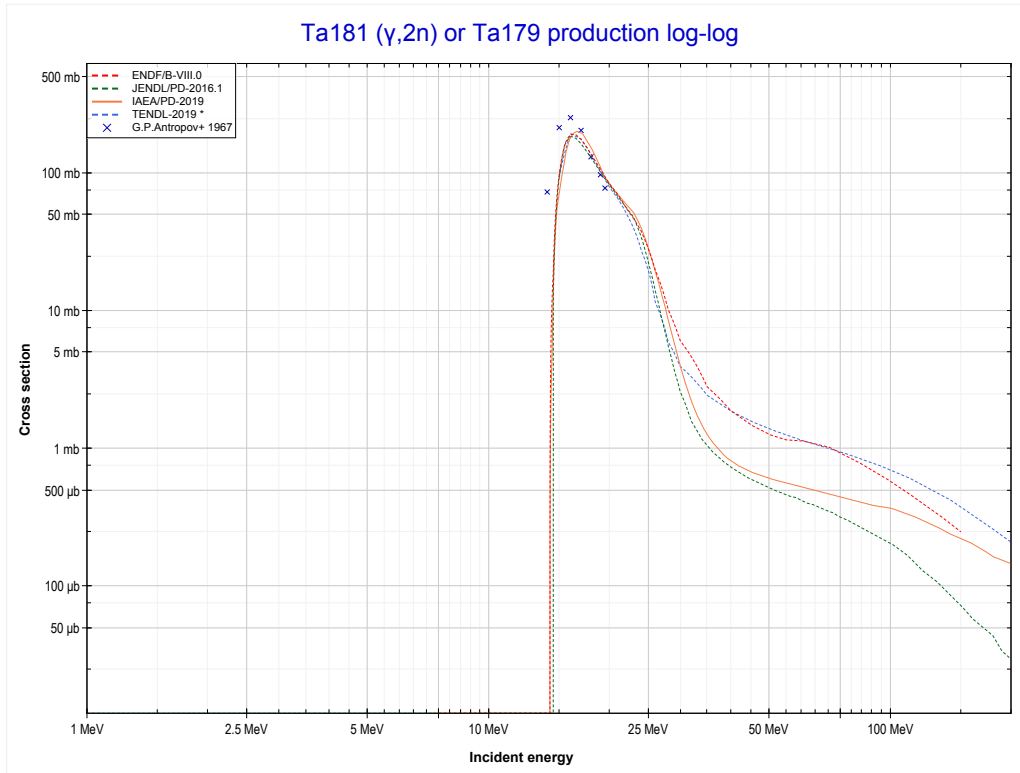
Reaction	Q-Value
Ta181(γ,2n)Ta179	-14223.63 keV

<< 71-Lu-175	**73-Ta-181**	74-W-186 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Ta178 production)**	MT18 (γ,fission) >>

Ta181 (γ,3n) or Ta178 production log-log

Ta181 (γ,3n) or Ta178 production lin-log
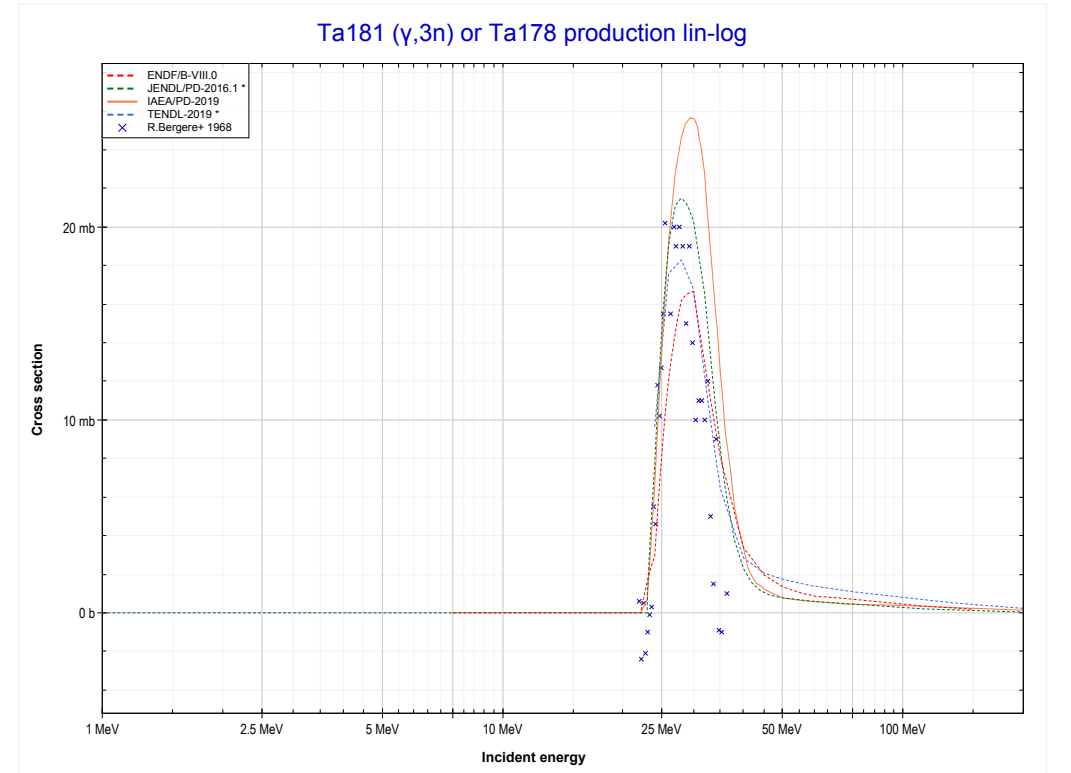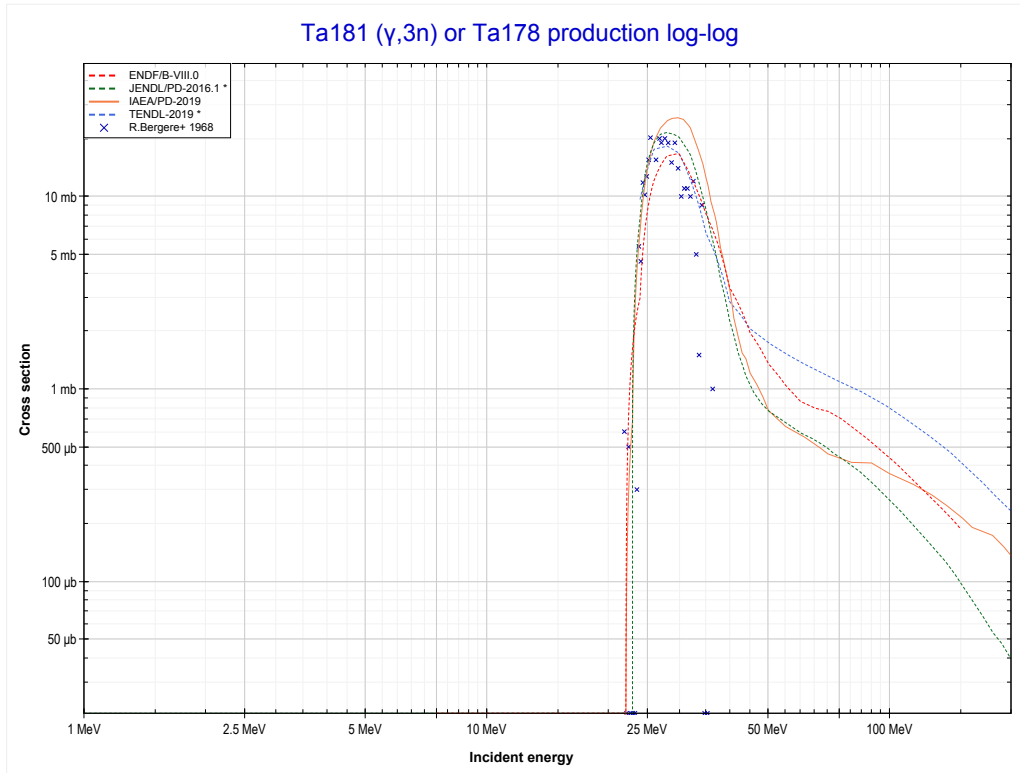
Reaction	Q-Value
Ta181(γ,3n)Ta178	-22052.25 keV

73-Ta-181		74-W-182 >>
<< MT17 (γ,3n)	**MT18 (γ,fission)**	MT175 (γ,6n+t) >>

Ta181 (γ,fission) log-log

Ta181 (γ,fission) lin-log
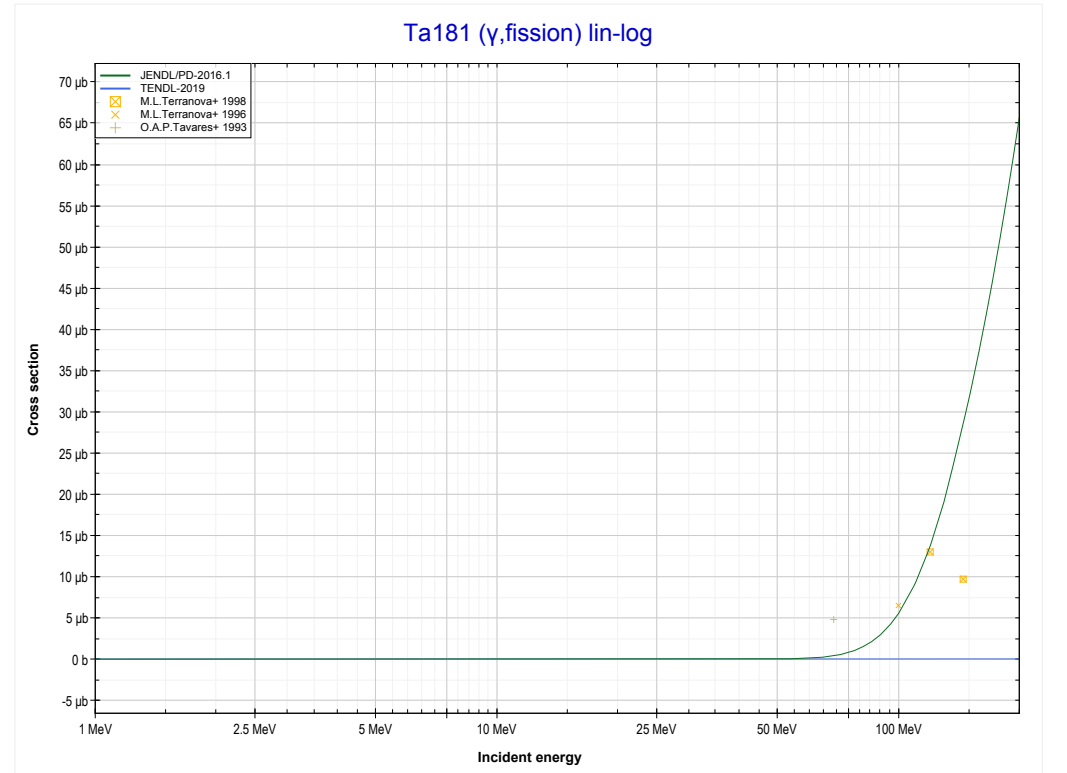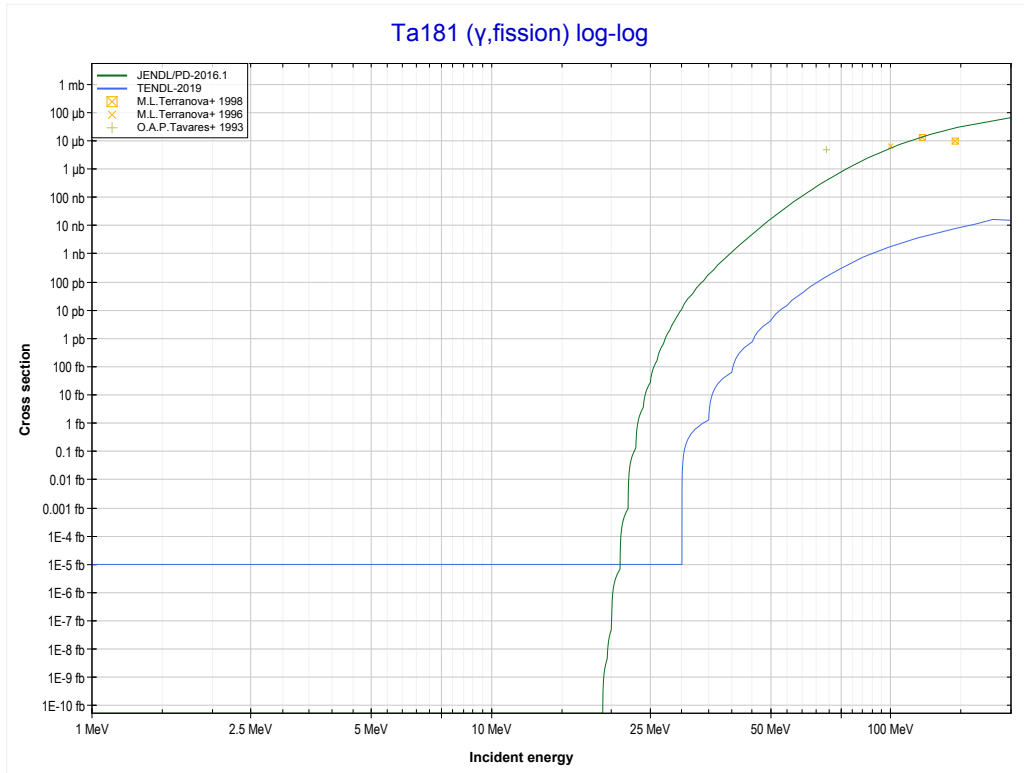
73-Ta-181		
<< MT18 (γ,fission)	**MT175 (γ,6n+t) or MT5 (Hf172 production)**	74-W-182 MT18 (γ,fission) >>

Ta181 (γ,6n+t) or Hf172 production log-log

Ta181 (γ,6n+t) or Hf172 production lin-log
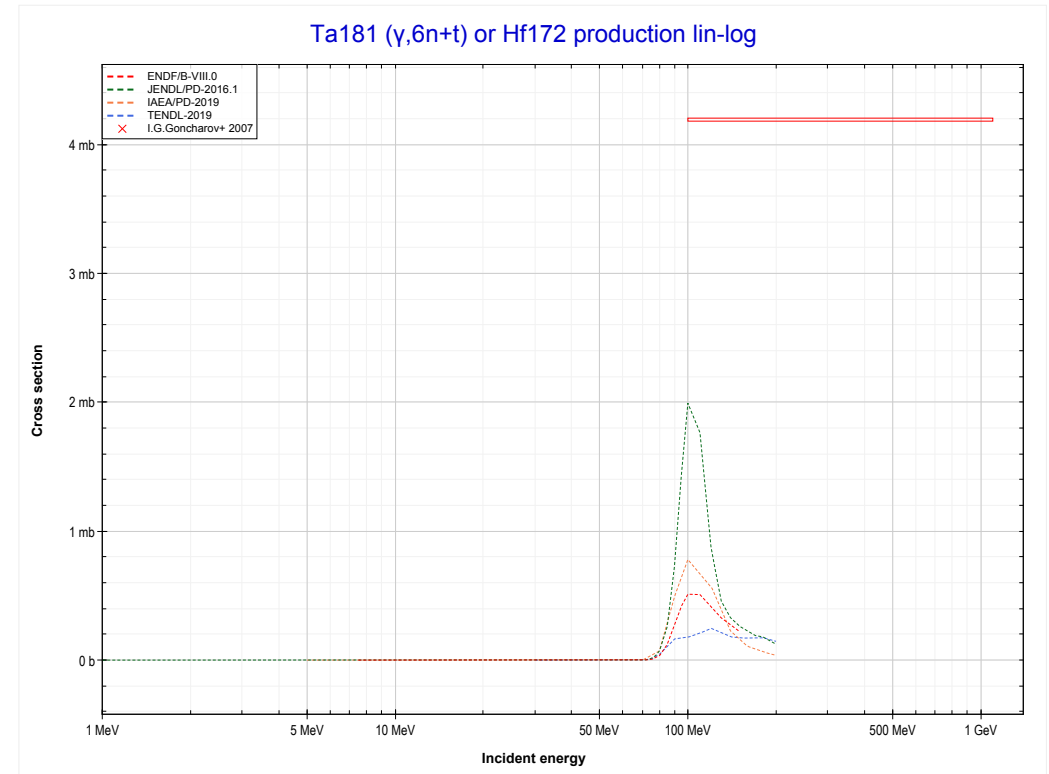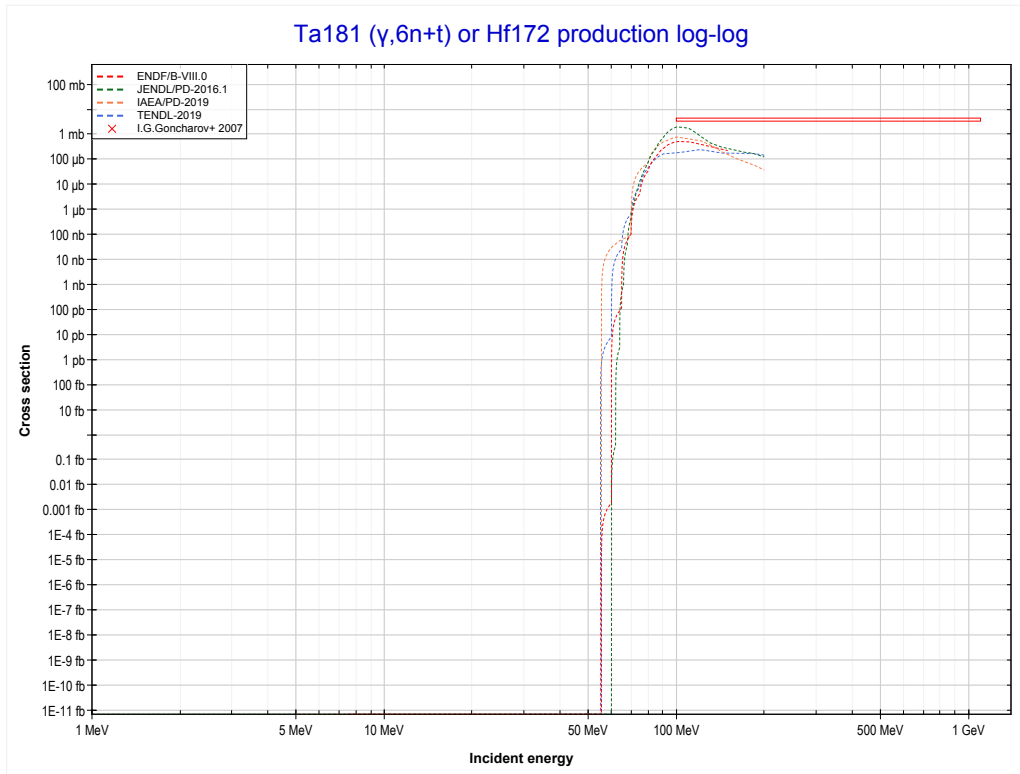
Reaction	Q-Value
Ta181(γ,6n+t)Hf172	-55414.01 keV
Ta181(γ,7n+d)Hf172	-61671.24 keV
Ta181(γ,8n+p)Hf172	-63895.81 keV

<< 73-Ta-181	**74-W-182**	79-Au-197 >>
<< 73-Ta-181 MT175 (γ,6n+t)	**MT18 (γ,fission)**	74-W-186 MT4 (γ,n) >>

W182 (γ,fission) log-log

Legend:
- JENDL/PD-2016.1
- TENDL-2019
- J.D.T.Arruda-Neto+ 1995

W182 (γ,fission) lin-log

Legend:
- JENDL/PD-2016.1
- TENDL-2019
- J.D.T.Arruda-Neto+ 1995
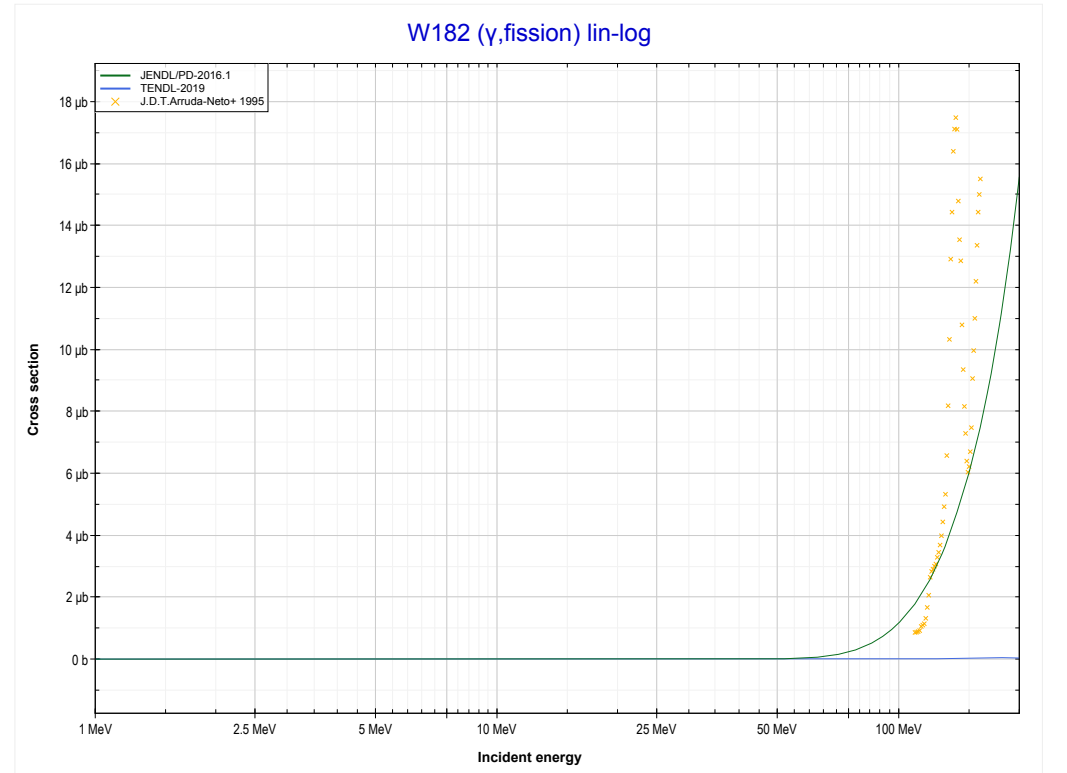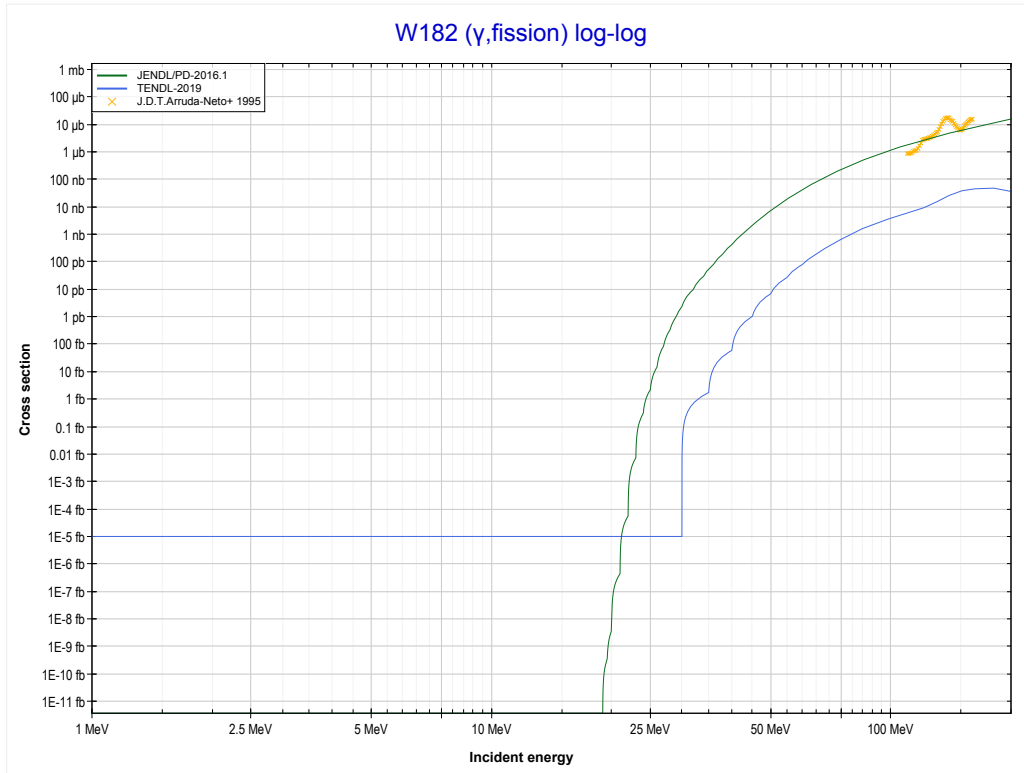
<< 73-Ta-181 >>	**74-W-186**	75-Re-187 >>
<< 74-W-182 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (W185 production)**	MT17 (γ,3n) >>

W186 (γ,n) or W185 production log-log

W186 (γ,n) or W185 production lin-log
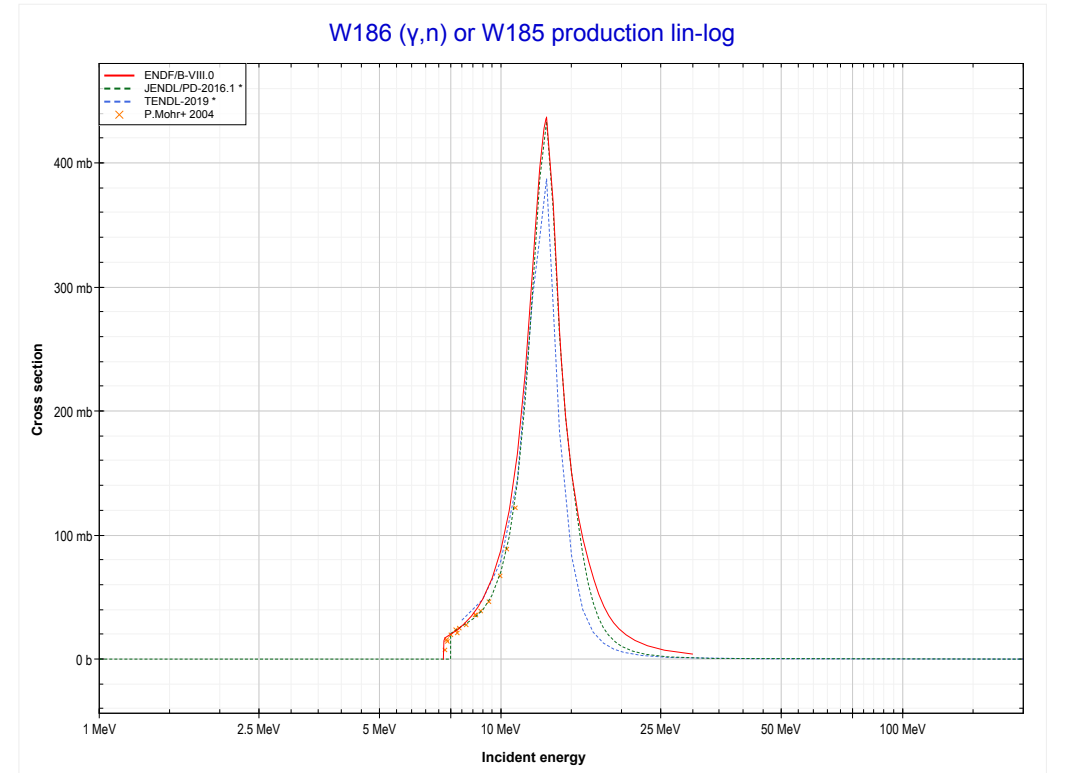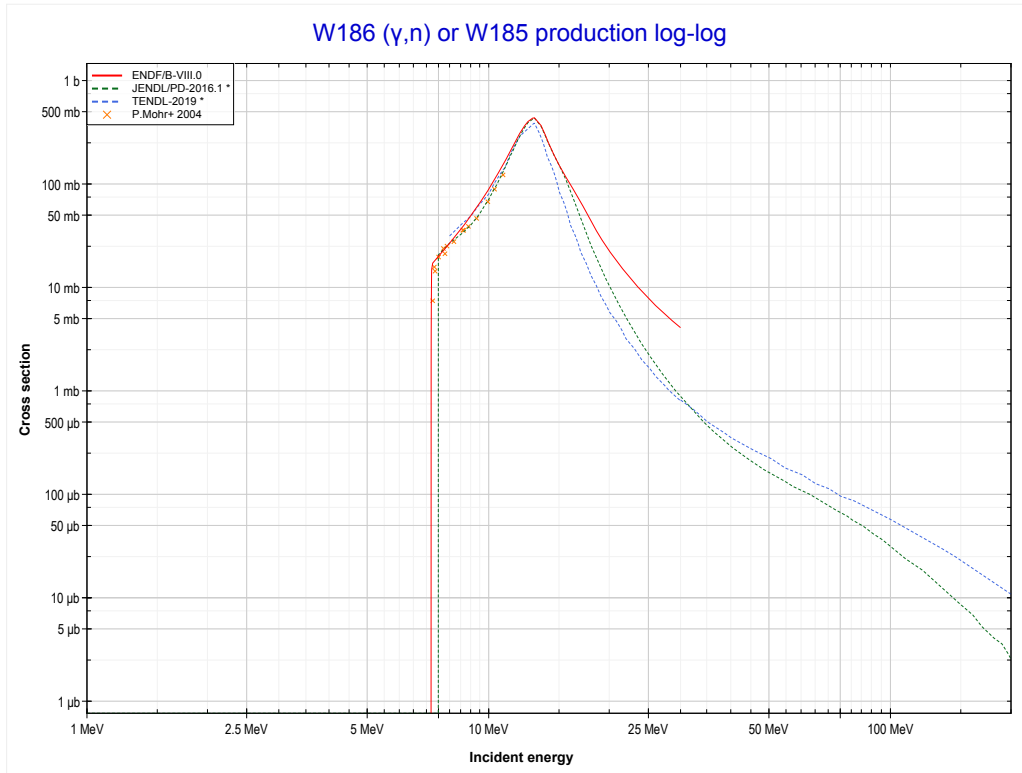
Reaction	Q-Value
W186(γ,n)W185	-7192.02 keV

<< 73-Ta-181 >>	**74-W-186**	76-Os-188 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (W183 production)**	75-Re-187 MT4 (γ,n) >>

W186 (γ,3n) or W183 production log-log

W186 (γ,3n) or W183 production lin-log
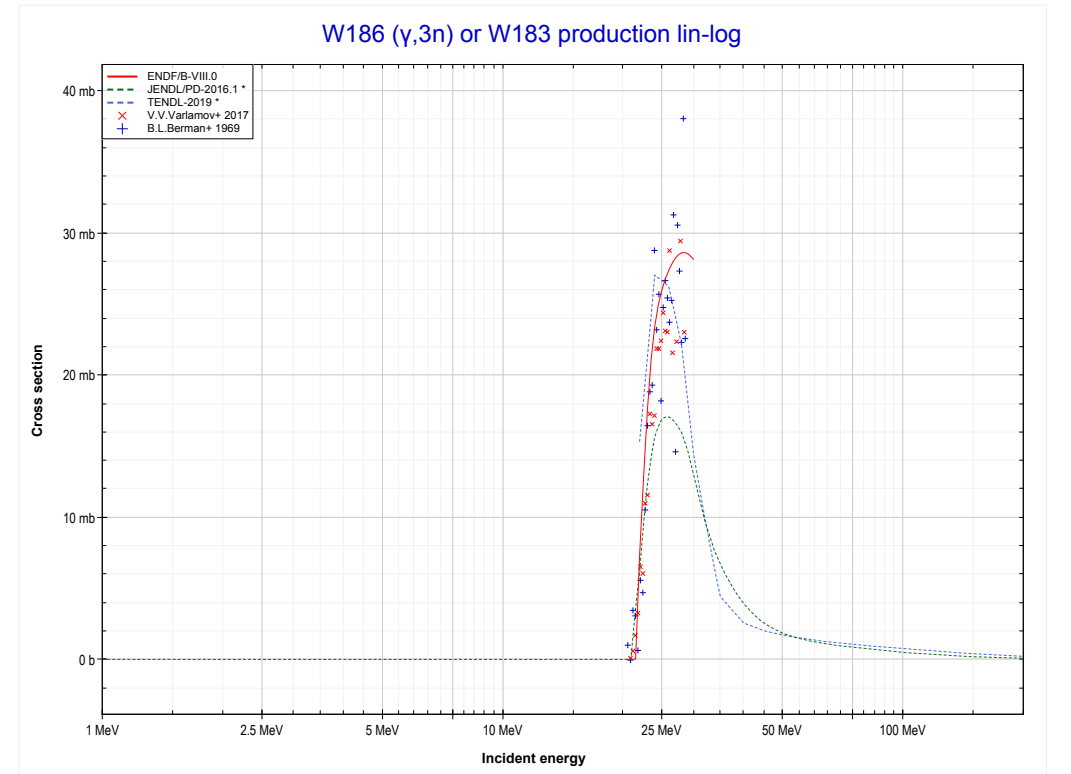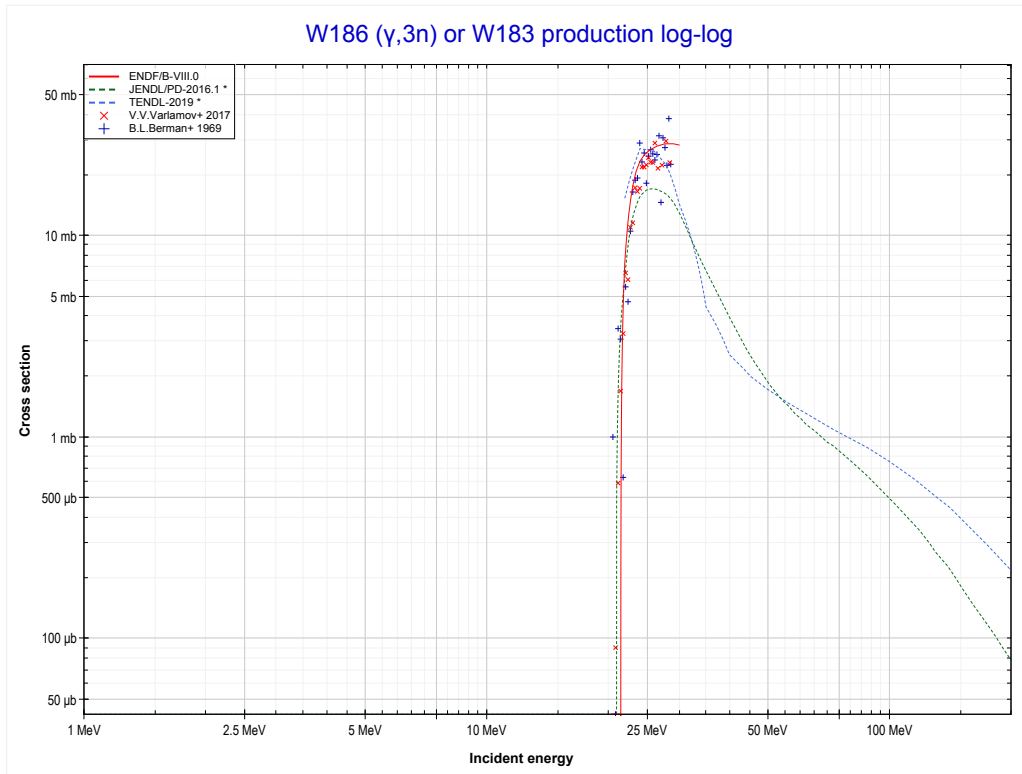
Reaction	Q-Value
W186(γ,3n)W183	-20356.85 keV

<< 74-W-186	75-Re-187	76-Os-188 >>
<< 74-W-186 MT17 (γ,3n)	MT4 (γ,n) or MT5 (Re186 production)	76-Os-186 MT16 (γ,2n) >>

Re187 (γ,n) or Re186 production log-log

Re187 (γ,n) or Re186 production lin-log
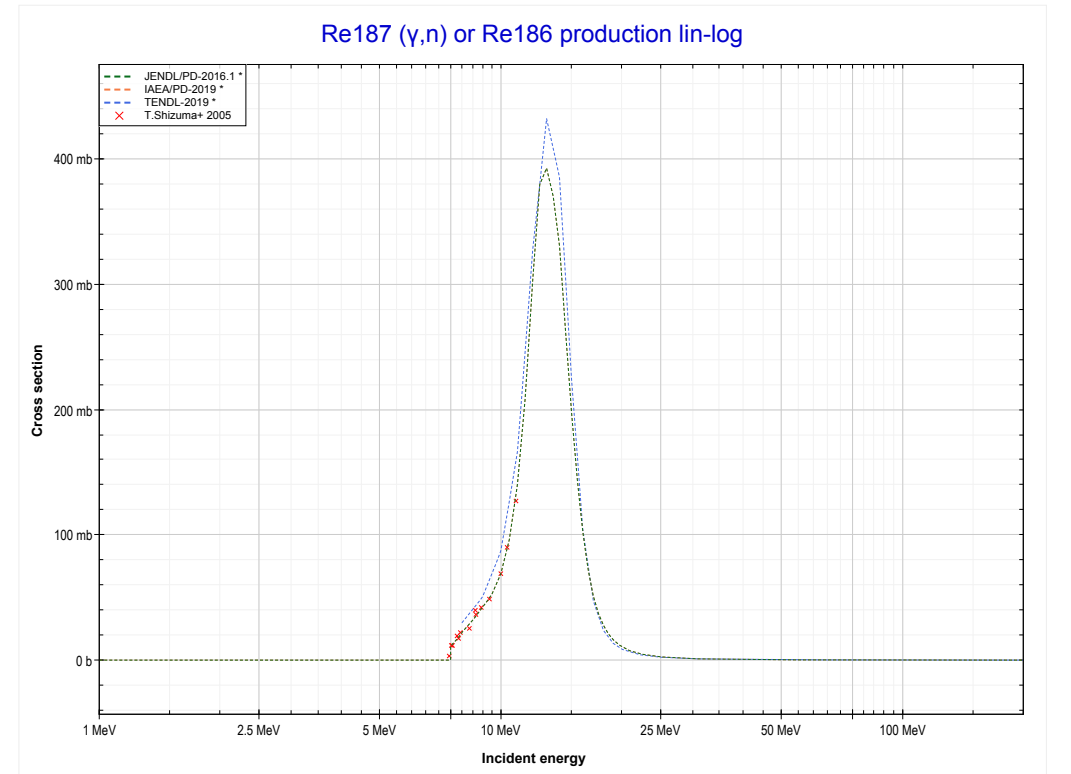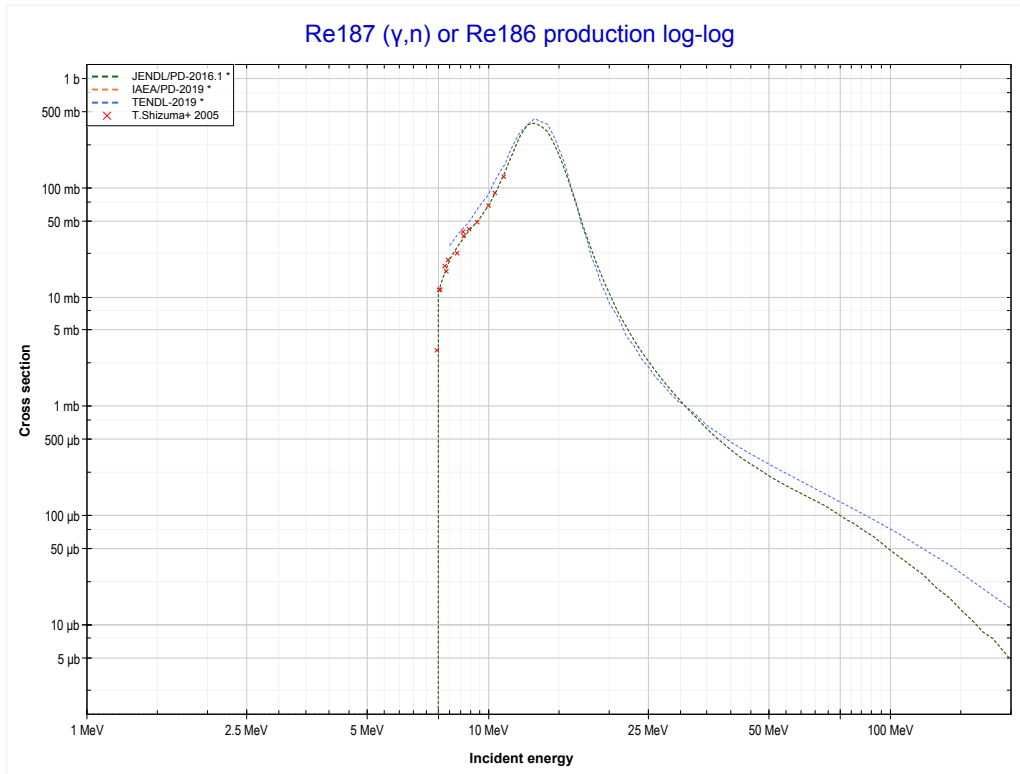
Reaction	Q-Value
Re187(γ,n)Re186	-7360.72 keV

<< 73-Ta-181	76-Os-186	79-Au-197 >>
<< 75-Re-187 MT4 (γ,n)	MT16 (γ,2n) or MT5 (Os184 production)	76-Os-188 MT4 (γ,n) >>

Os186 (γ,2n) or Os184 production log-log

Os186 (γ,2n) or Os184 production lin-log
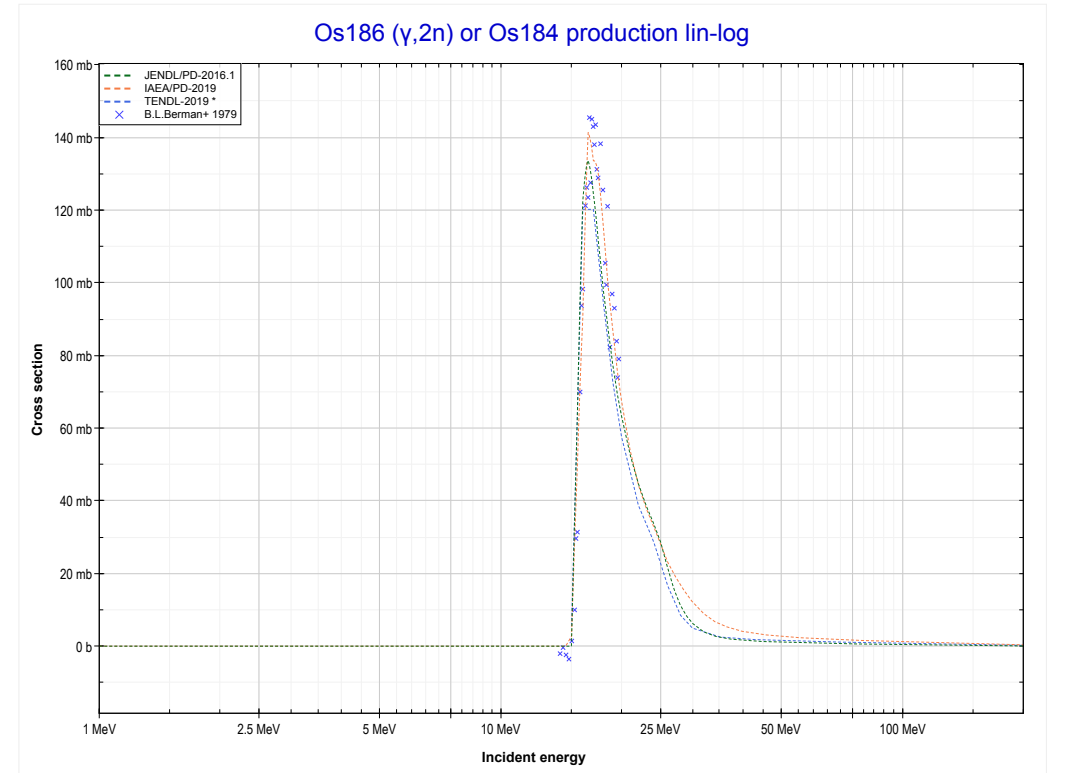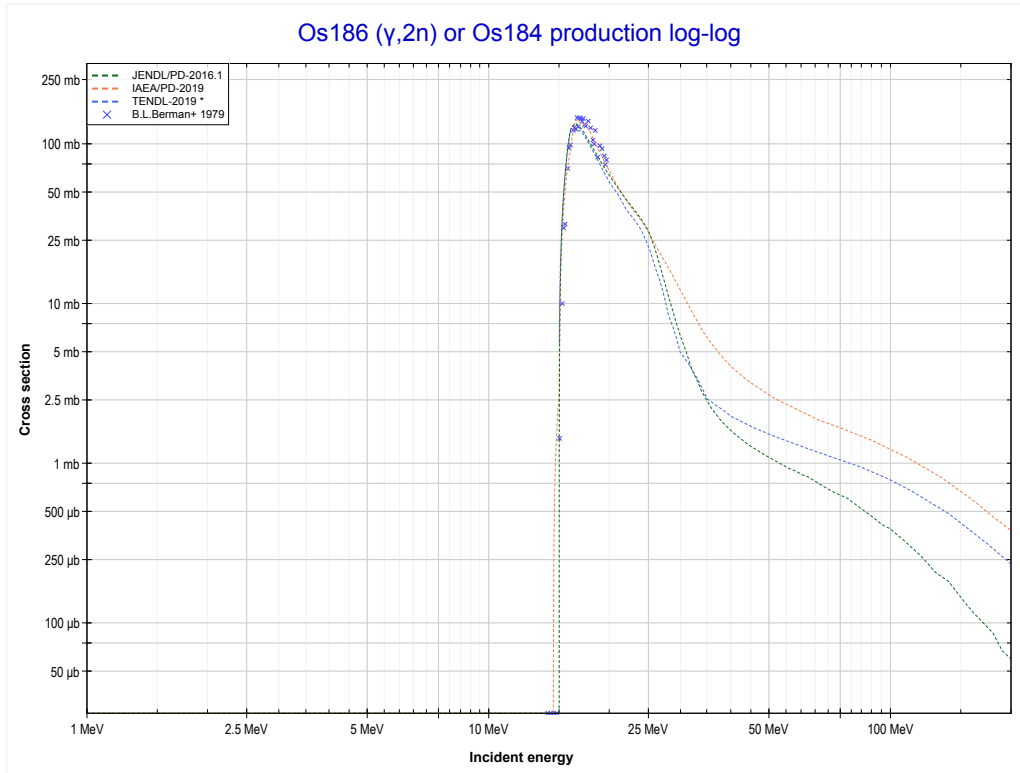
Reaction	Q-Value
Os186(γ,2n)Os184	-14890.03 keV

<< 75-Re-187	**76-Os-188**	78-Pt-198 >>
<< 76-Os-186 MT16 (γ,2n)	**MT4 (γ,n) or MT5 (Os187 production)**	MT17 (γ,3n) >>

Os188 (γ,n) or Os187 production log-log

Os188 (γ,n) or Os187 production lin-log
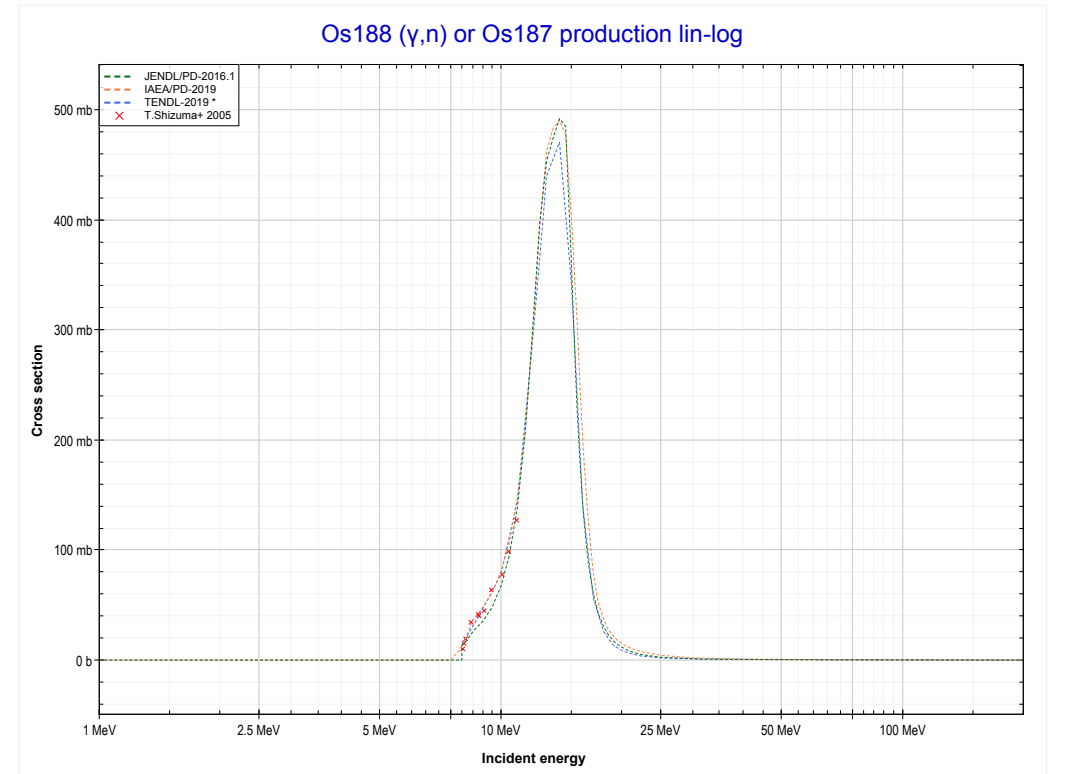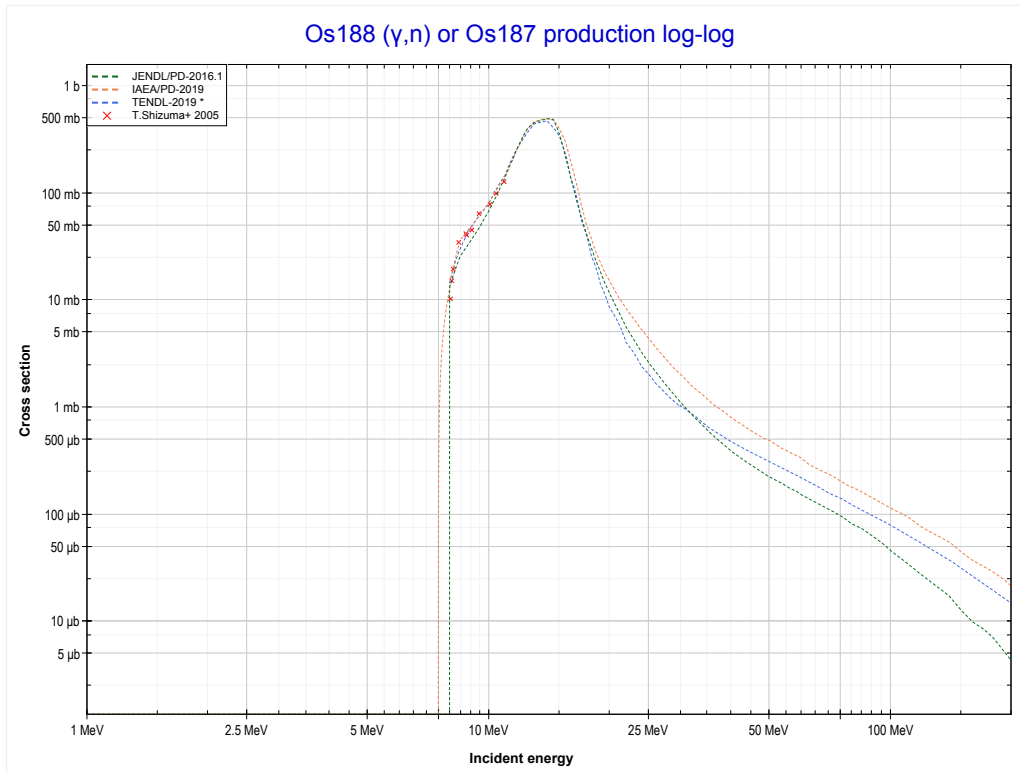
Reaction	Q-Value
Os188(γ,n)Os187	-7989.62 keV

<< 74-W-186	**76-Os-188**	76-Os-189 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Os185 production)**	76-Os-189 MT17 (γ,3n) >>

Os188 (γ,3n) or Os185 production log-log

Os188 (γ,3n) or Os185 production lin-log
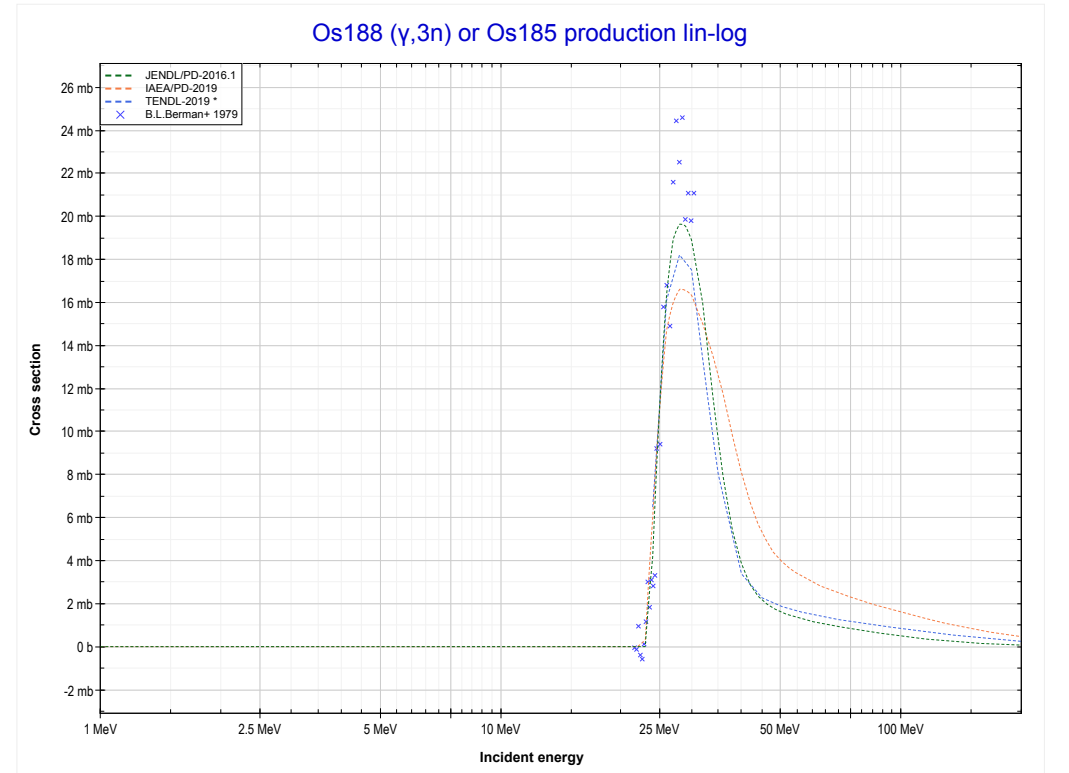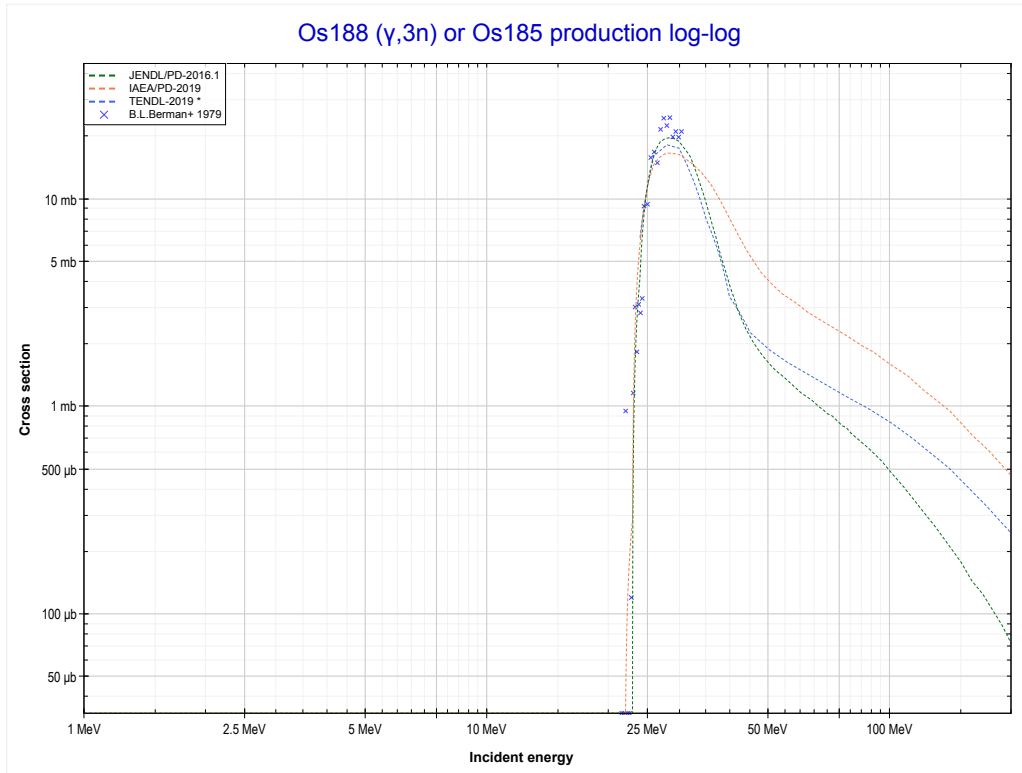
Reaction	Q-Value
Os188(γ,3n)Os185	-22545.25 keV

<< 76-Os-188	**76-Os-189**	76-Os-190 >>
<< 76-Os-188 MT17 (γ,3n)	**MT17 (γ,3n) or MT5 (Os186 production)**	76-Os-190 MT17 (γ,3n) >>

Os189 (γ,3n) or Os186 production log-log

Os189 (γ,3n) or Os186 production lin-log
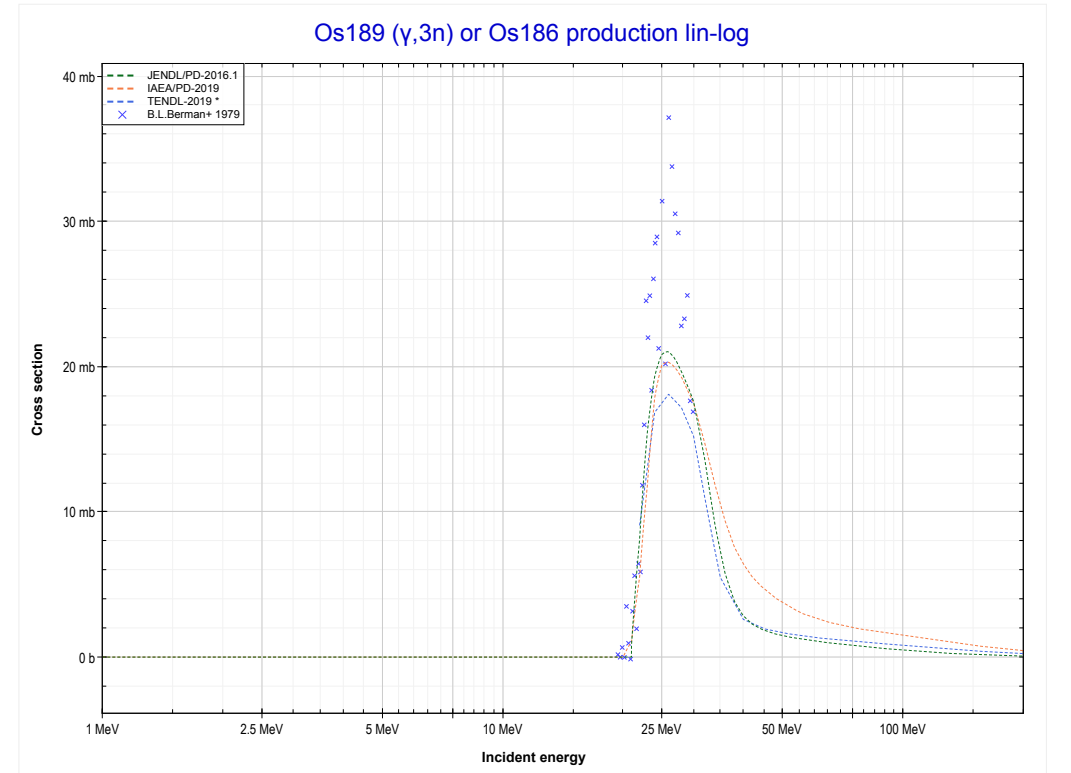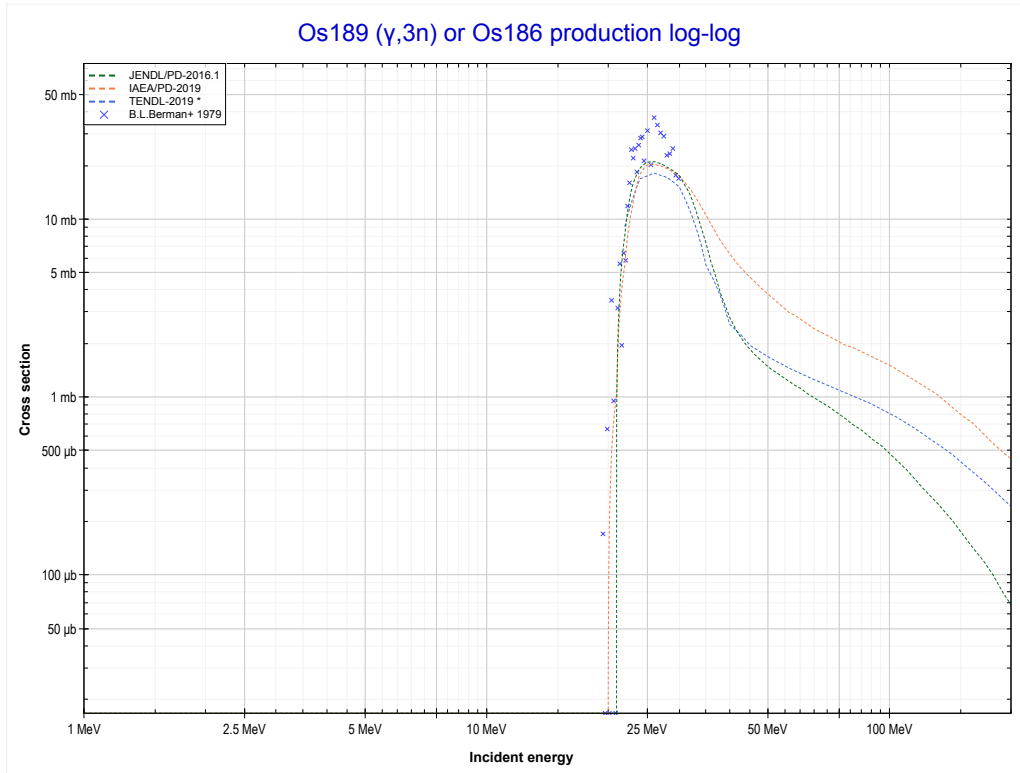
Reaction	Q-Value
Os189(γ,3n)Os186	-20200.75 keV

<< 76-Os-189	**76-Os-190**	76-Os-192 >>
<< 76-Os-189 MT17 (γ,3n)	**MT17 (γ,3n) or MT5 (Os187 production)**	76-Os-192 MT17 (γ,3n) >>

Os190 (γ,3n) or Os187 production log-log

Os190 (γ,3n) or Os187 production lin-log
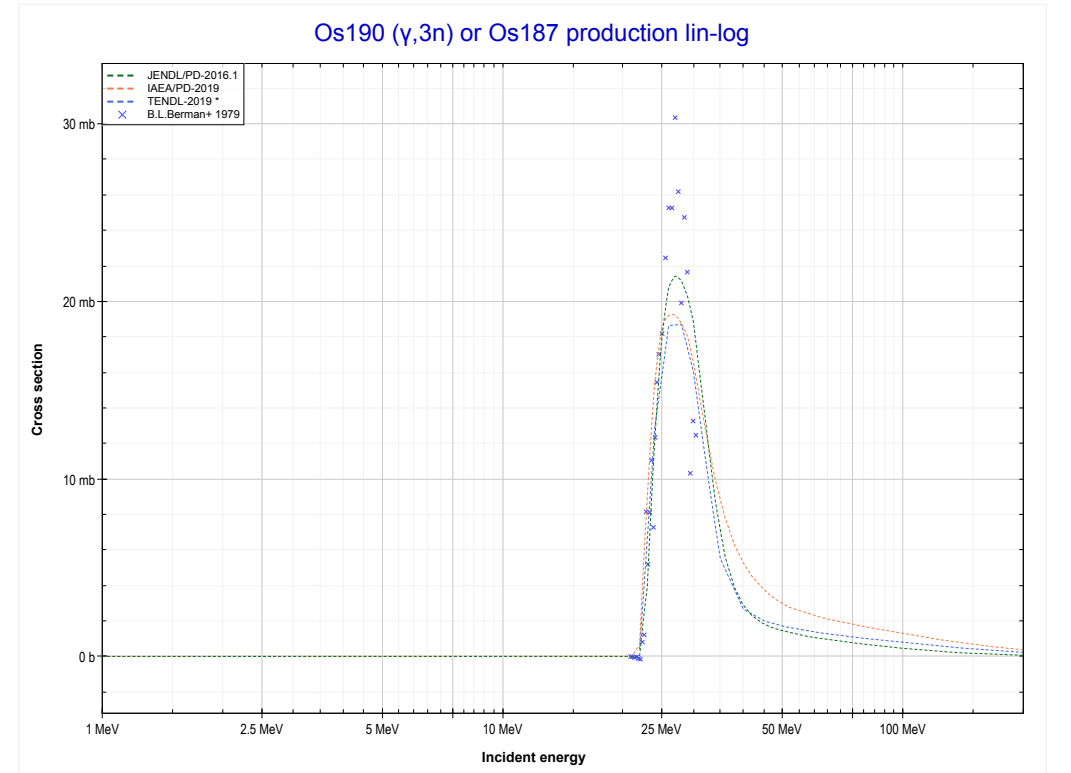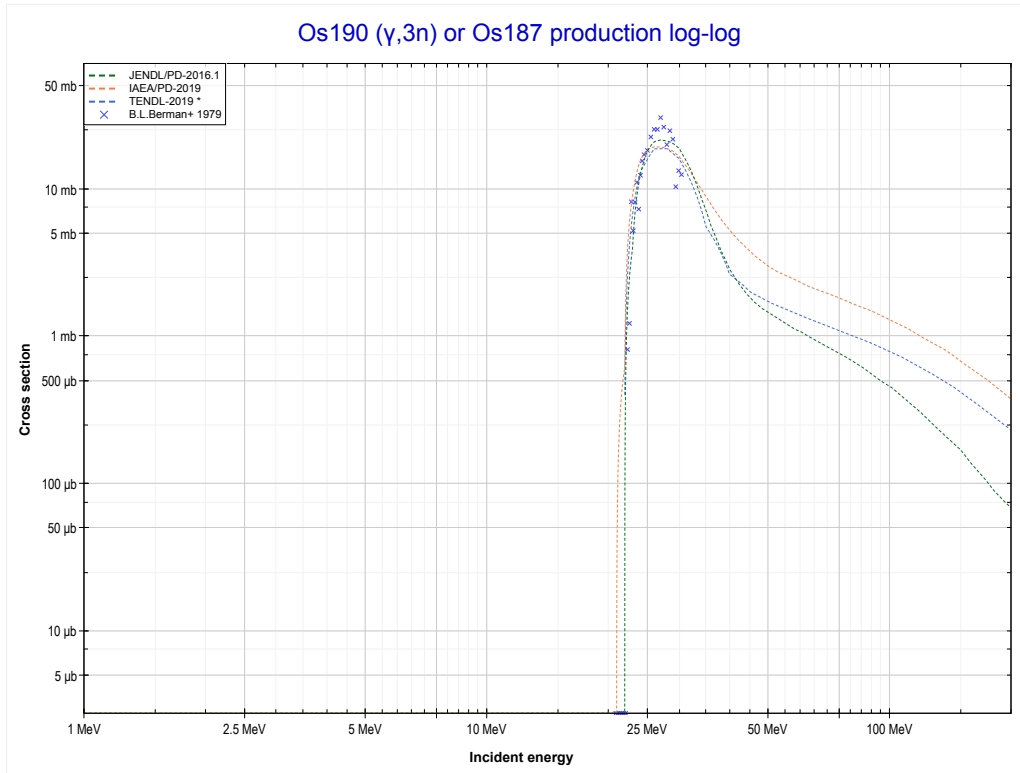
Reaction	Q-Value
Os190(γ,3n)Os187	-21702.85 keV

<< 76-Os-190	**76-Os-192**	79-Au-197 >>
<< 76-Os-190 MT17 (γ,3n)	**MT17 (γ,3n) or MT5 (Os189 production)**	78-Pt-198 MT4 (γ,n) >>

Os192 (γ,3n) or Os189 production log-log

Os192 (γ,3n) or Os189 production lin-log
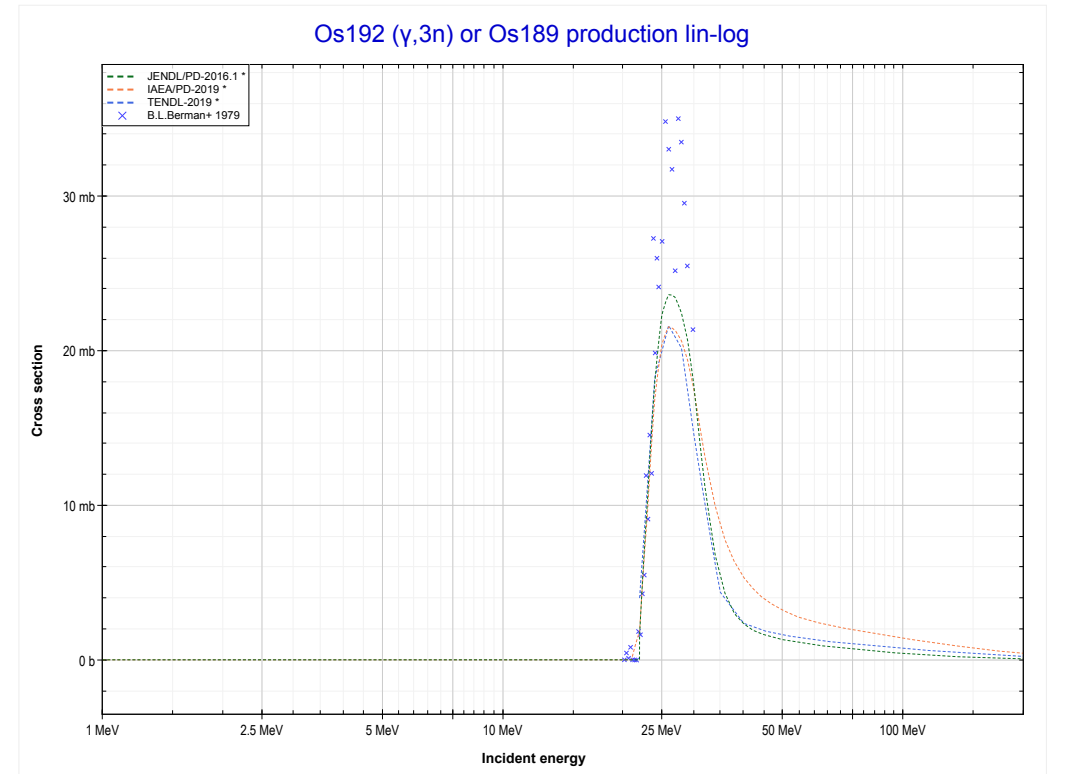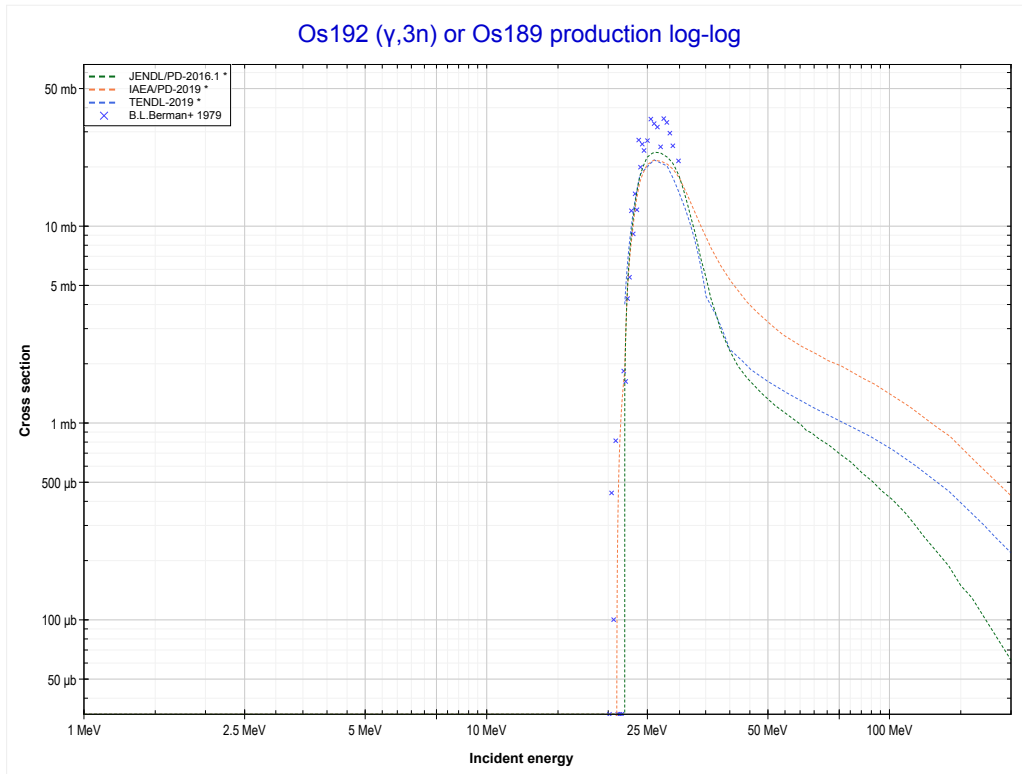
Reaction	Q-Value
Os192(γ,3n)Os189	-21109.45 keV

<< 76-Os-188	**78-Pt-198**	79-Au-197 >>
<< 76-Os-192 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Pt197 production)**	79-Au-197 MT4 (γ,n) >>

Pt198 (γ,n) or Pt197 production log-log

Pt198 (γ,n) or Pt197 production lin-log
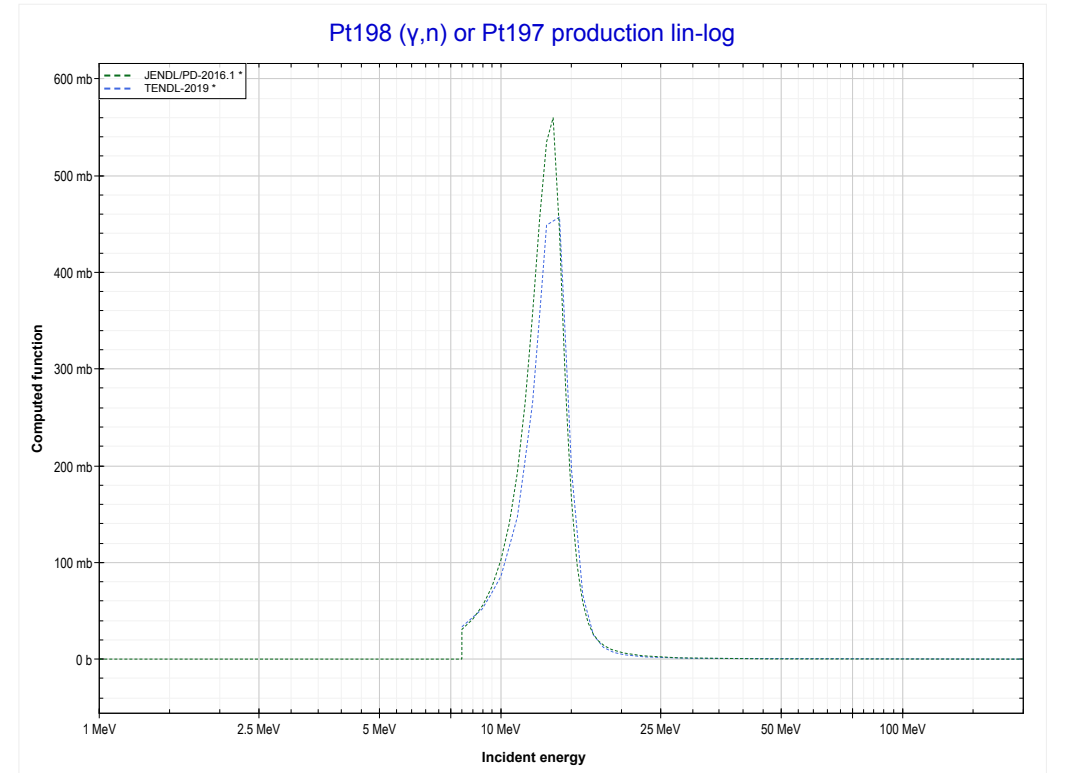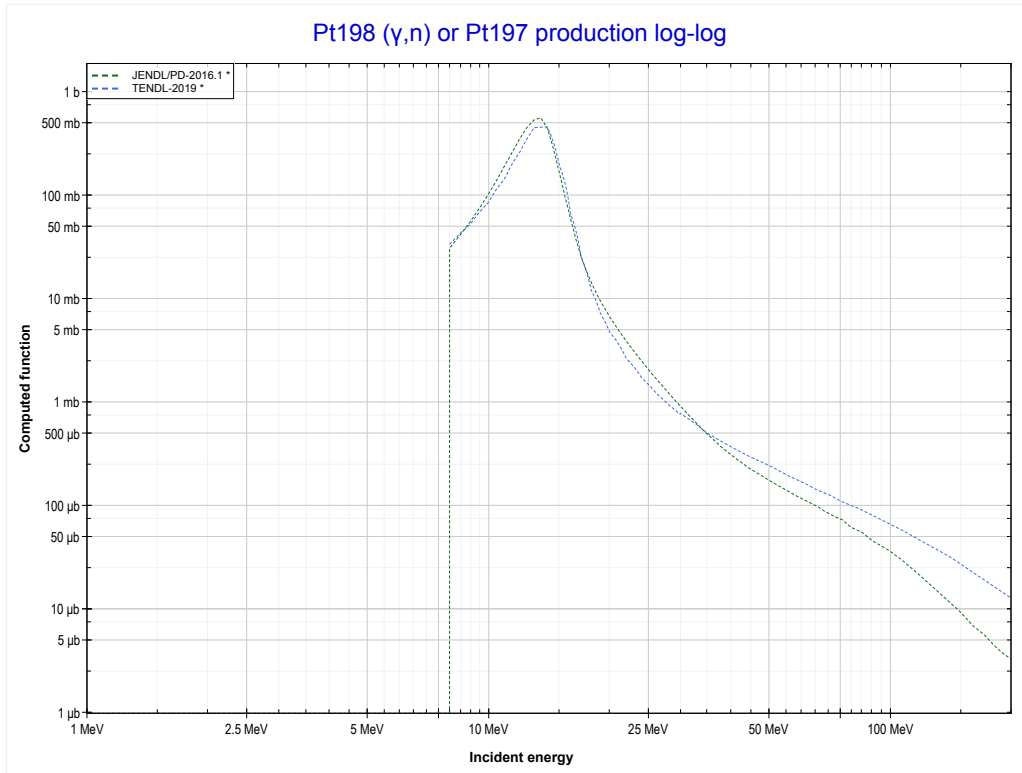
Reaction	Q-Value
Pt198(γ,n)Pt197	-7555.62 keV

<< 78-Pt-198	**79-Au-197**	80-Hg-198 >>
<< 78-Pt-198 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Au196 production)**	MT16 (γ,2n) >>

Au197 (γ,n) or Au196 production log-log

Au197 (γ,n) or Au196 production lin-log
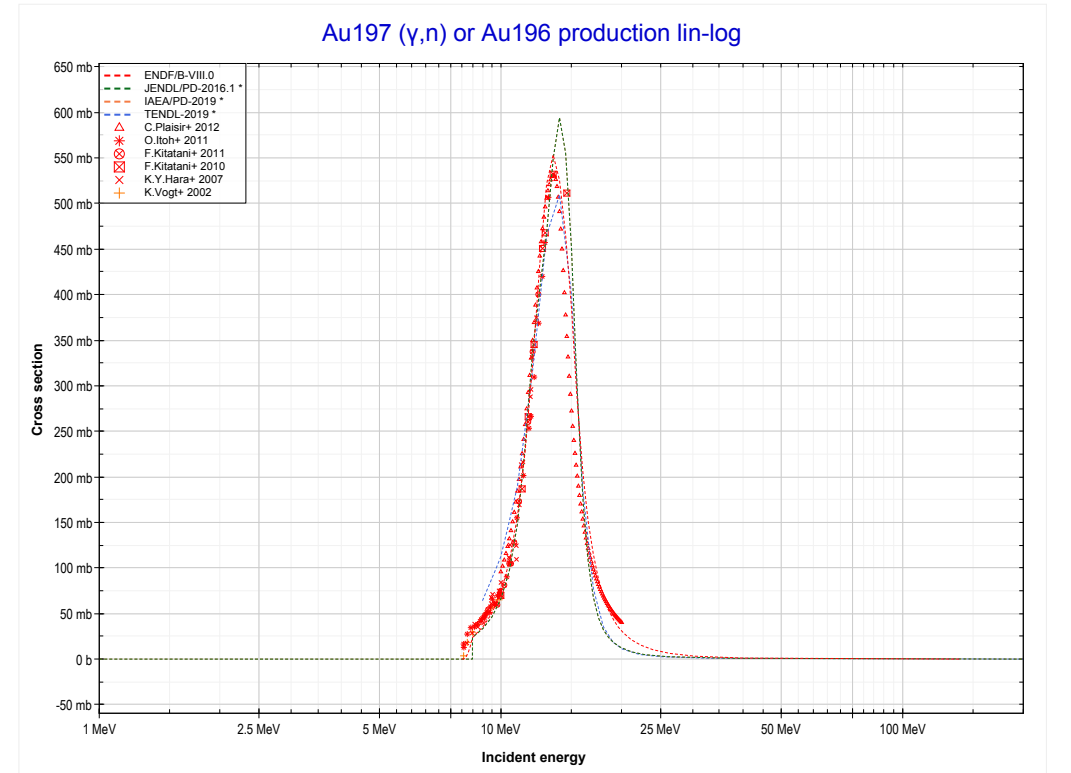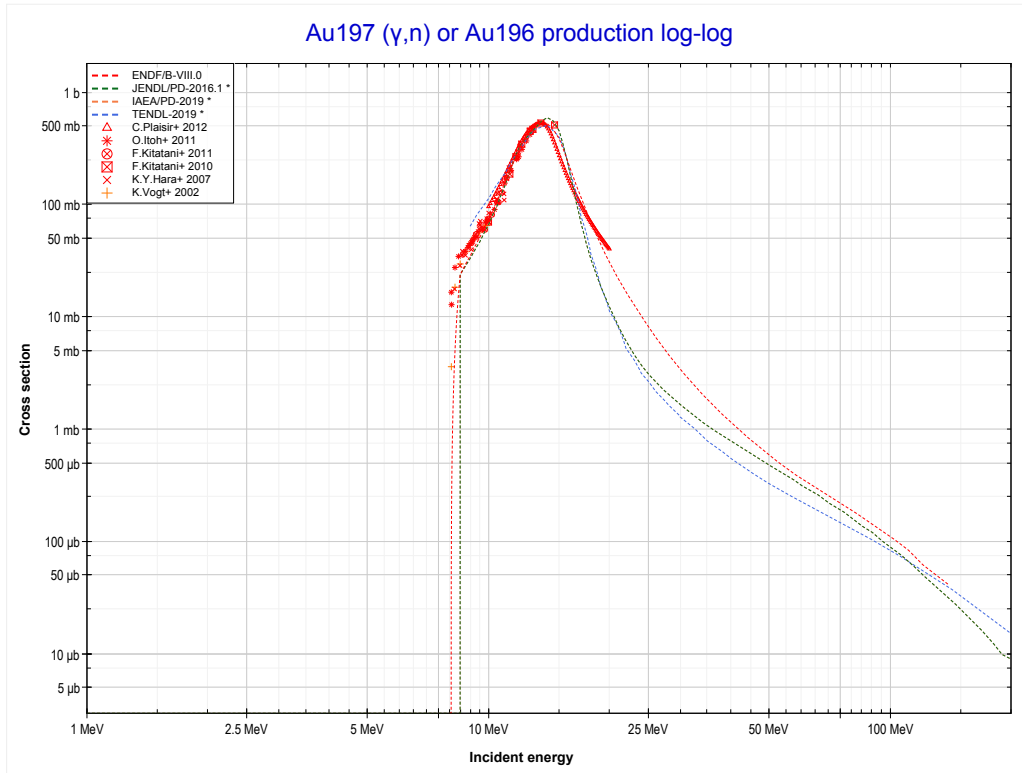
Reaction	Q-Value
Au197(γ,n)Au196	-8072.32 keV

<< 76-Os-186 >>	**79-Au-197**	90-Th-232 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Au195 production)**	MT17 (γ,3n) >>

Au197 (γ,2n) or Au195 production log-log

Au197 (γ,2n) or Au195 production lin-log
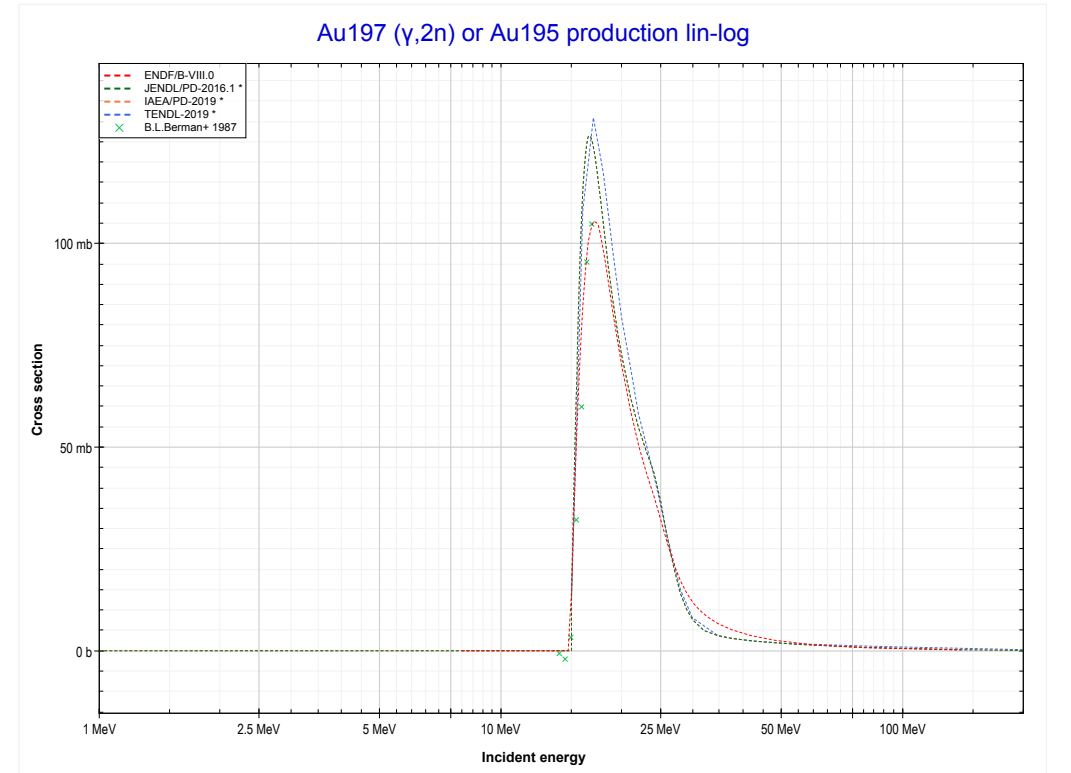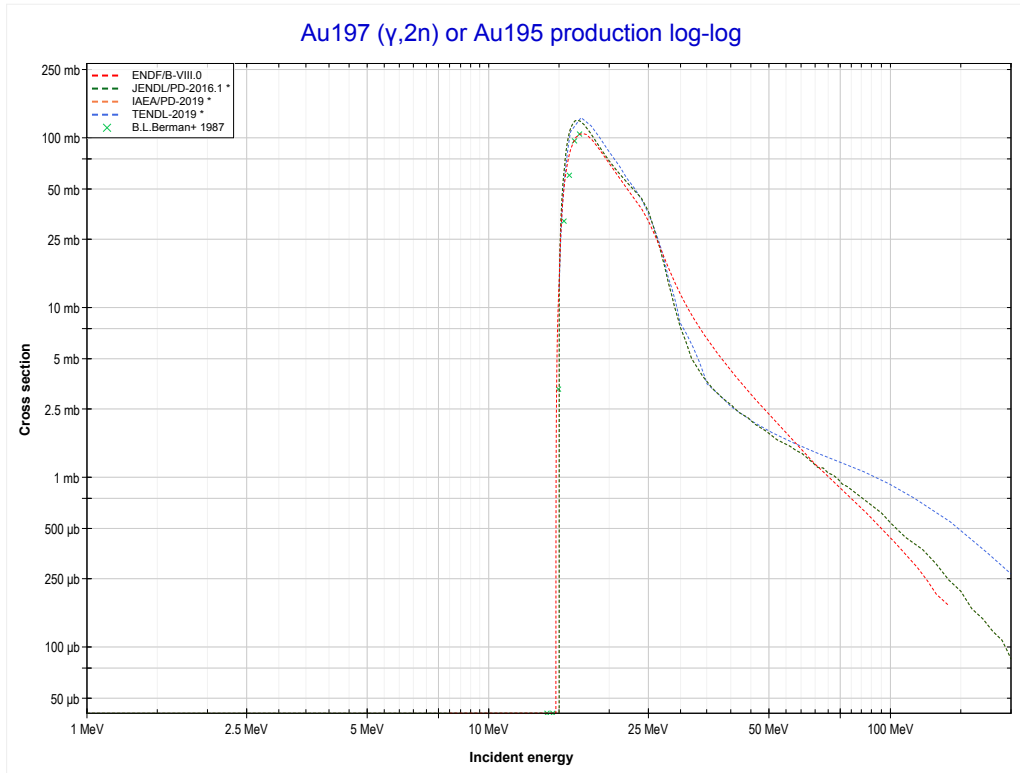
Reaction	Q-Value
Au197(γ,2n)Au195	-14715.33 keV

<< 76-Os-192	**79-Au-197**	82-Pb-208 >>
<< MT16 (γ,2n)	**MT17 (γ,3n) or MT5 (Au194 production)**	MT18 (γ,fission) >>

Au197 (γ,3n) or Au194 production log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- A.Veyssiere+ 1970

Au197 (γ,3n) or Au194 production lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019 *
- A.Veyssiere+ 1970
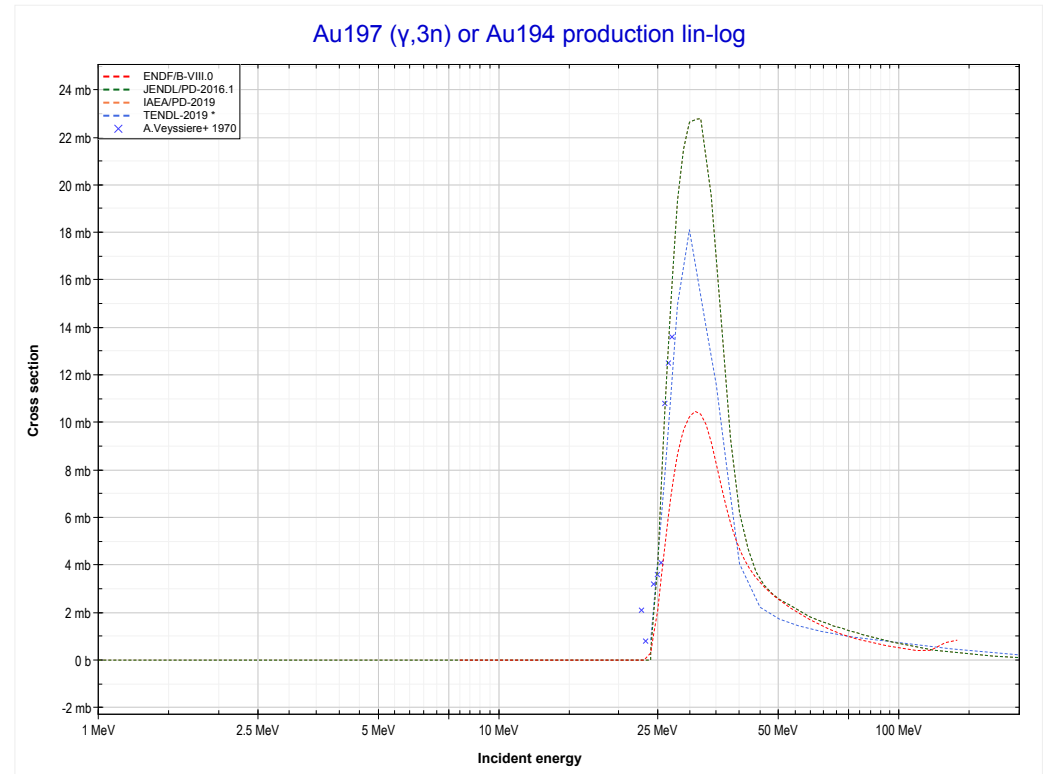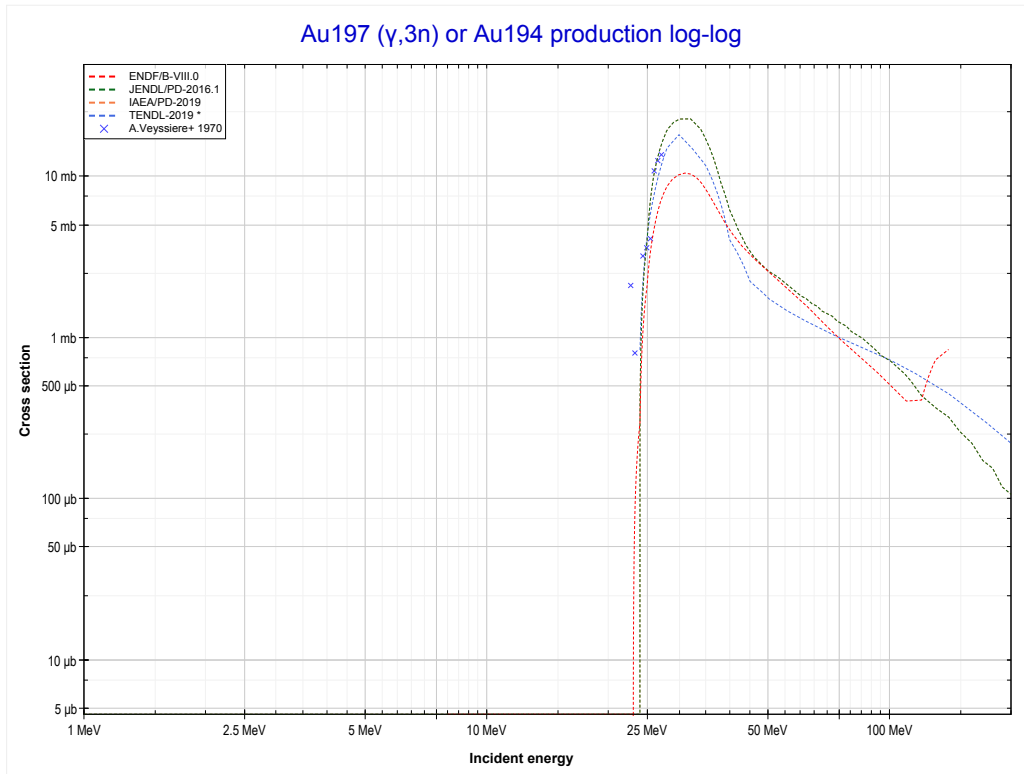
Reaction	Q-Value
Au197(γ,3n)Au194	-23141.75 keV

<< 74-W-182	**79-Au-197**	83-Bi-209 >>
<< MT17 (γ,3n)	**MT18 (γ,fission)**	80-Hg-198 MT4 (γ,n) >>

Au197 (γ,fission) log-log

Au197 (γ,fission) lin-log
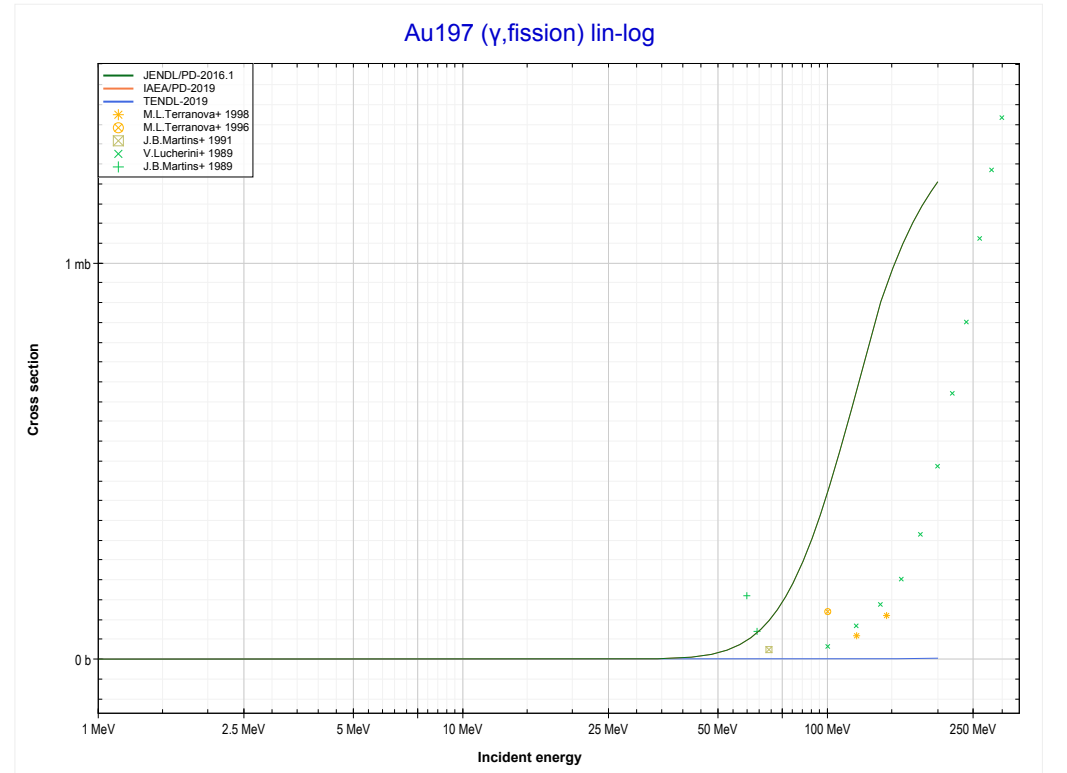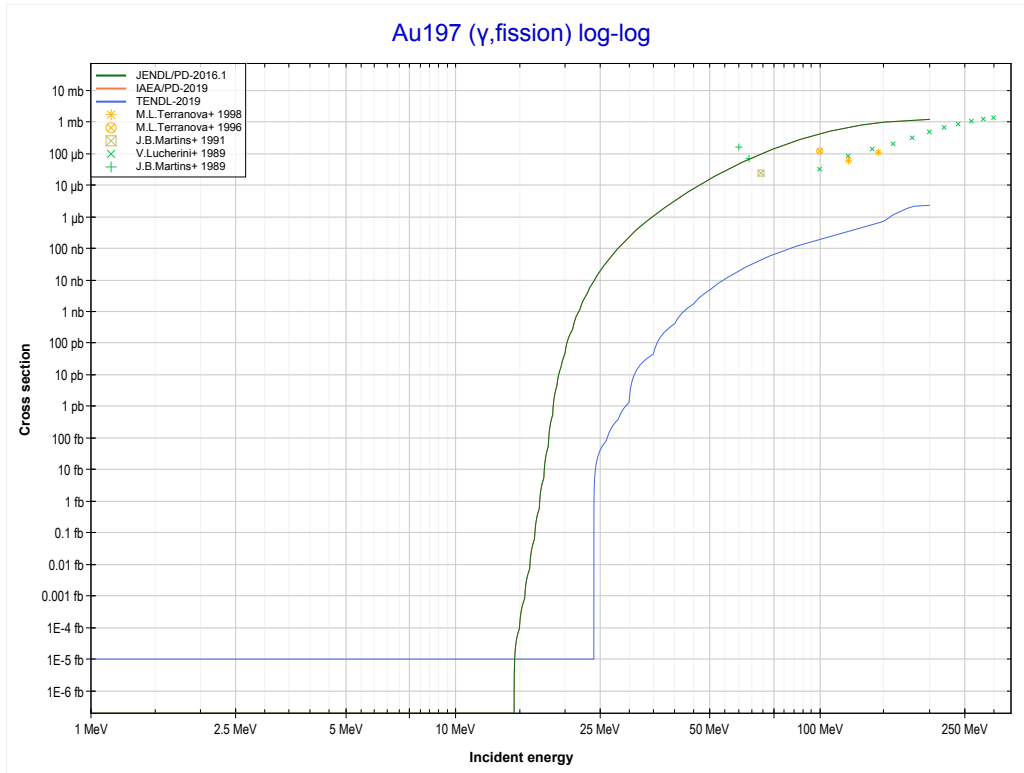
<< 79-Au-197	**80-Hg-198**	81-Tl-203 >>
<< 79-Au-197 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (Hg197 production)**	81-Tl-203 MT4 (γ,n) >>

Hg198 (γ,n) or Hg197 production log-log

Hg198 (γ,n) or Hg197 production lin-log
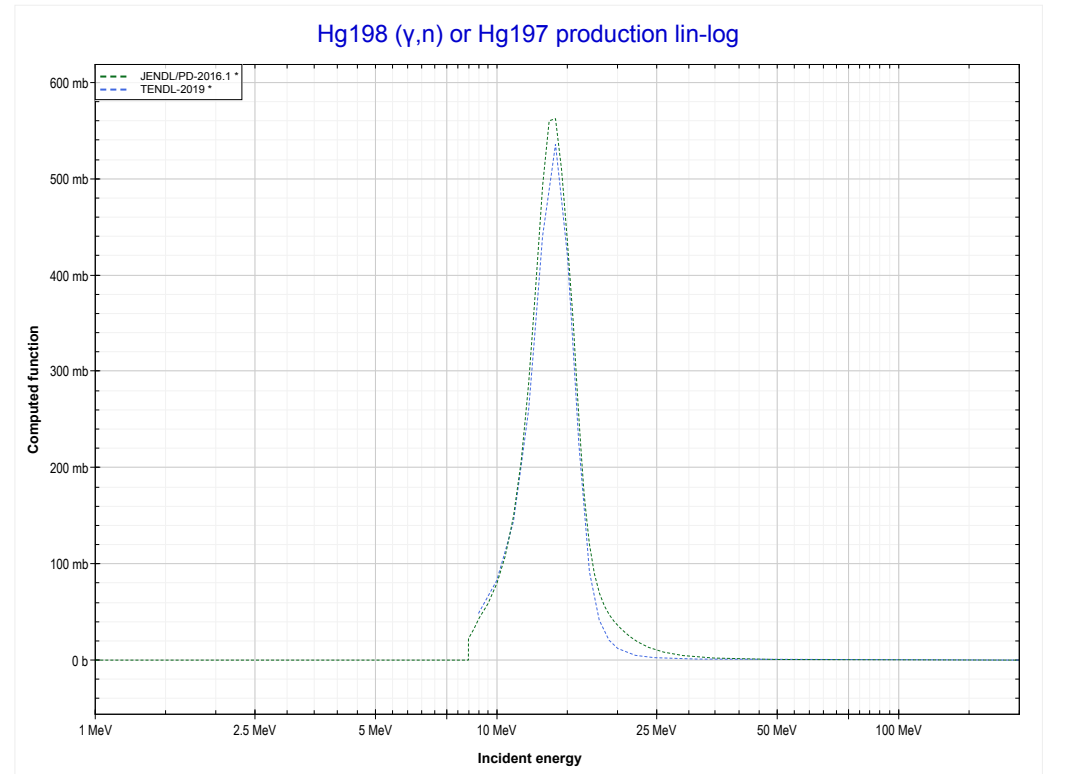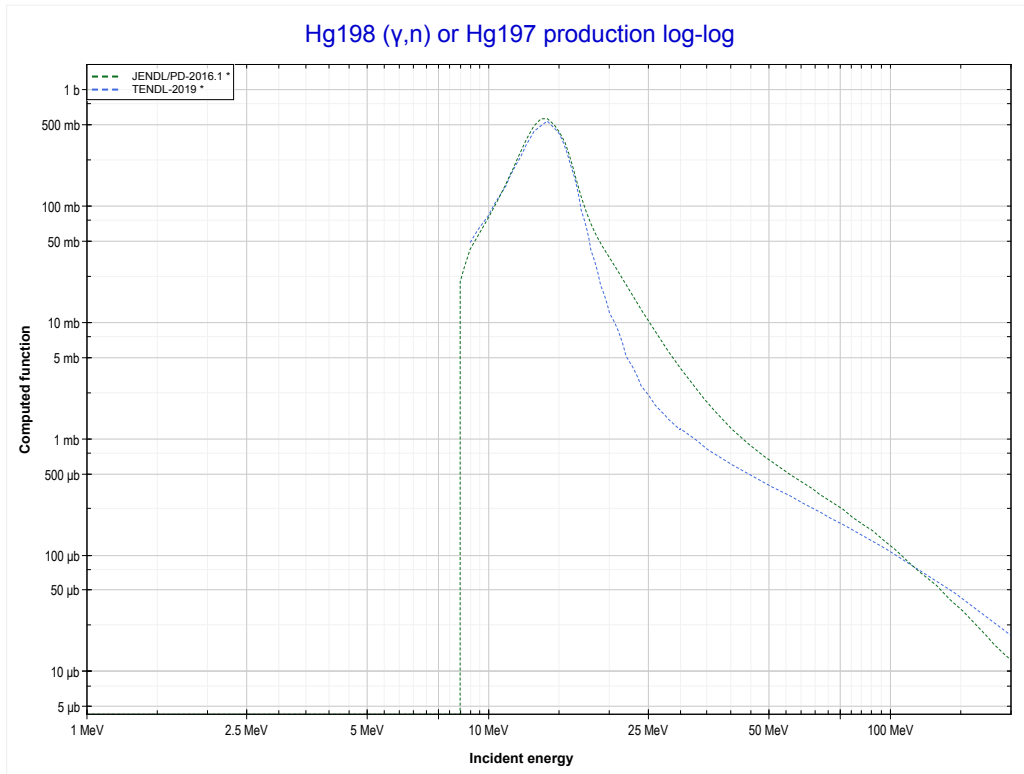
Reaction	Q-Value
Hg198(γ,n)Hg197	-8485.62 keV

<< 80-Hg-198	**81-TI-203**	81-TI-205 >>
<< 80-Hg-198 MT4 (γ,n)	**MT4 (γ,n) or MT5 (TI202 production)**	81-TI-205 MT4 (γ,n) >>
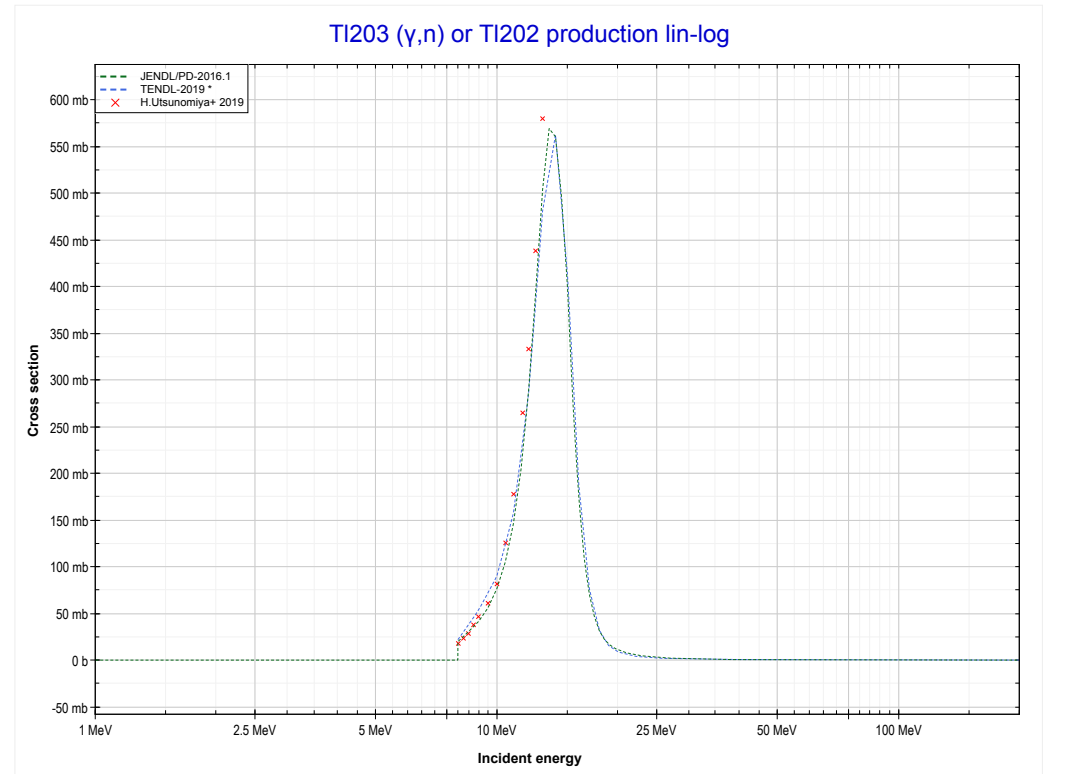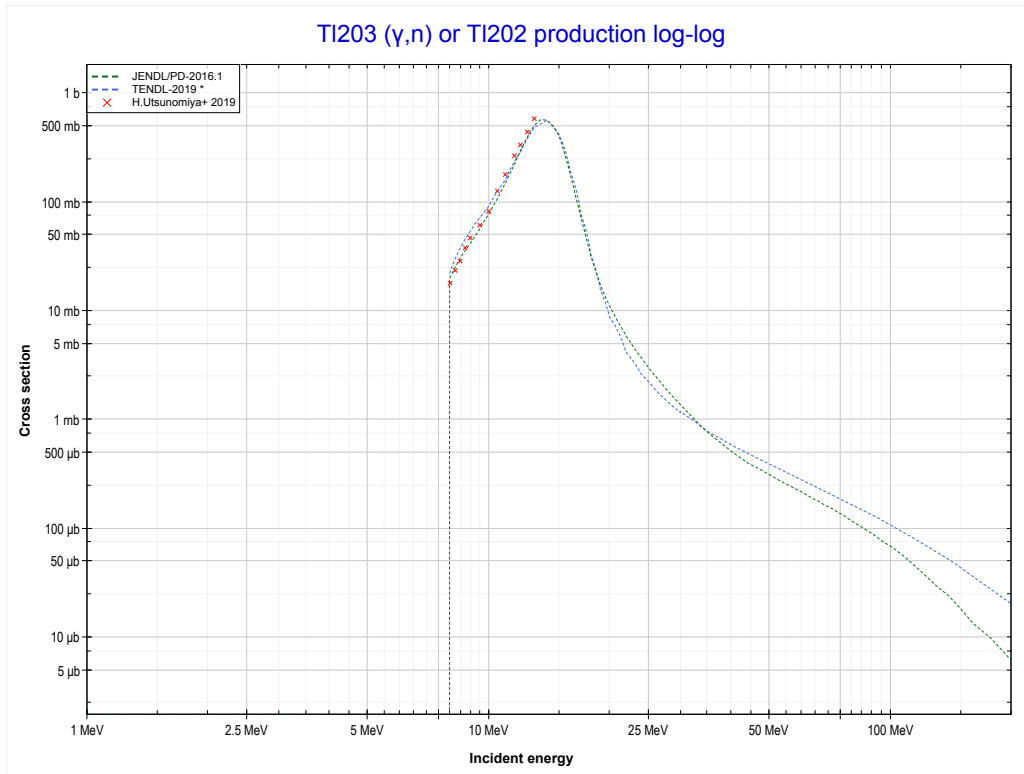
TI203 (γ,n) or TI202 production log-log

TI203 (γ,n) or TI202 production lin-log

Reaction	Q-Value
TI203(γ,n)TI202	-7852.52 keV

<< 81-TI-203	**81-TI-205**	82-Pb-206 >>
<< 81-TI-203 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Tl204 production)**	82-Pb-206 MT4 (γ,n) >>

Tl205 (γ,n) or Tl204 production log-log

Tl205 (γ,n) or Tl204 production lin-log
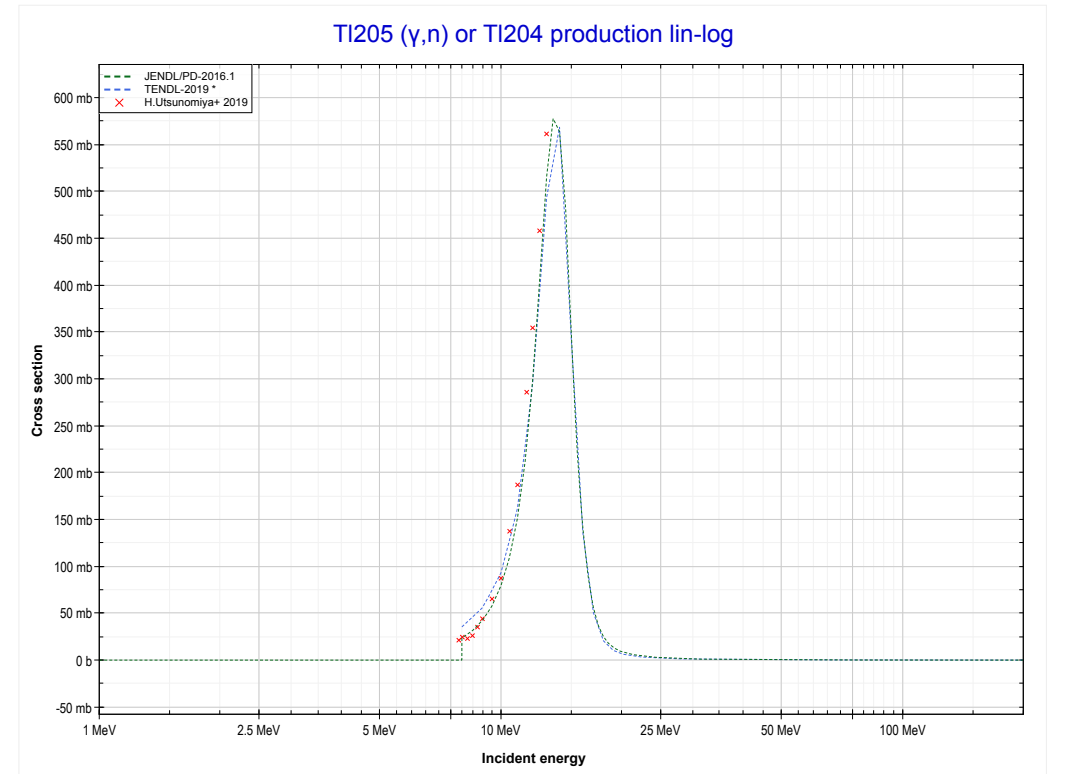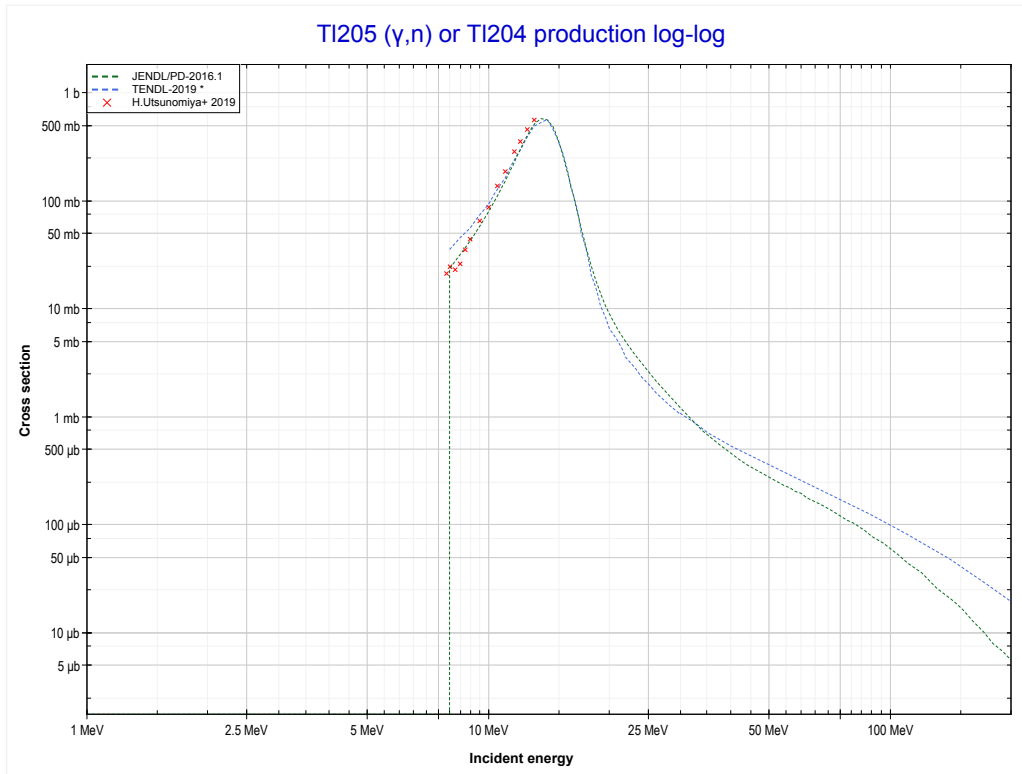
Reaction	Q-Value
Tl205(γ,n)Tl204	-7546.12 keV

<< 81-Tl-205	**82-Pb-206**	82-Pb-207 >>
<< 81-Tl-205 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Pb205 production)**	82-Pb-207 MT4 (γ,n) >>

Pb206 (γ,n) or Pb205 production log-log

Pb206 (γ,n) or Pb205 production lin-log
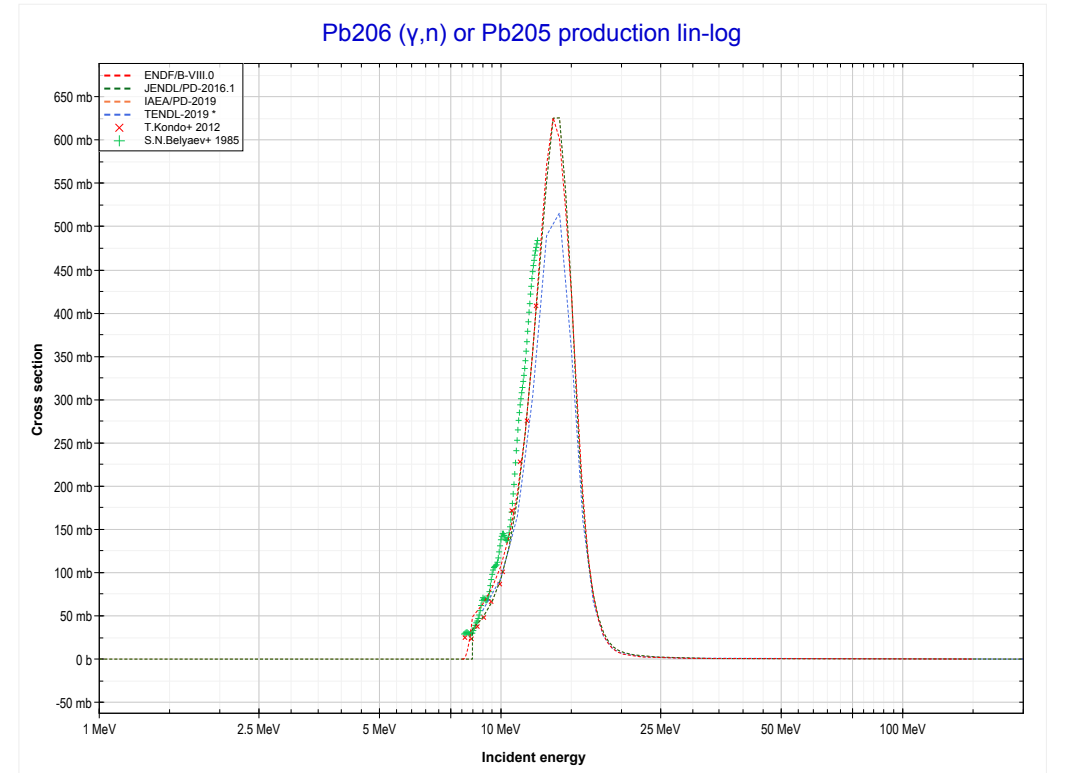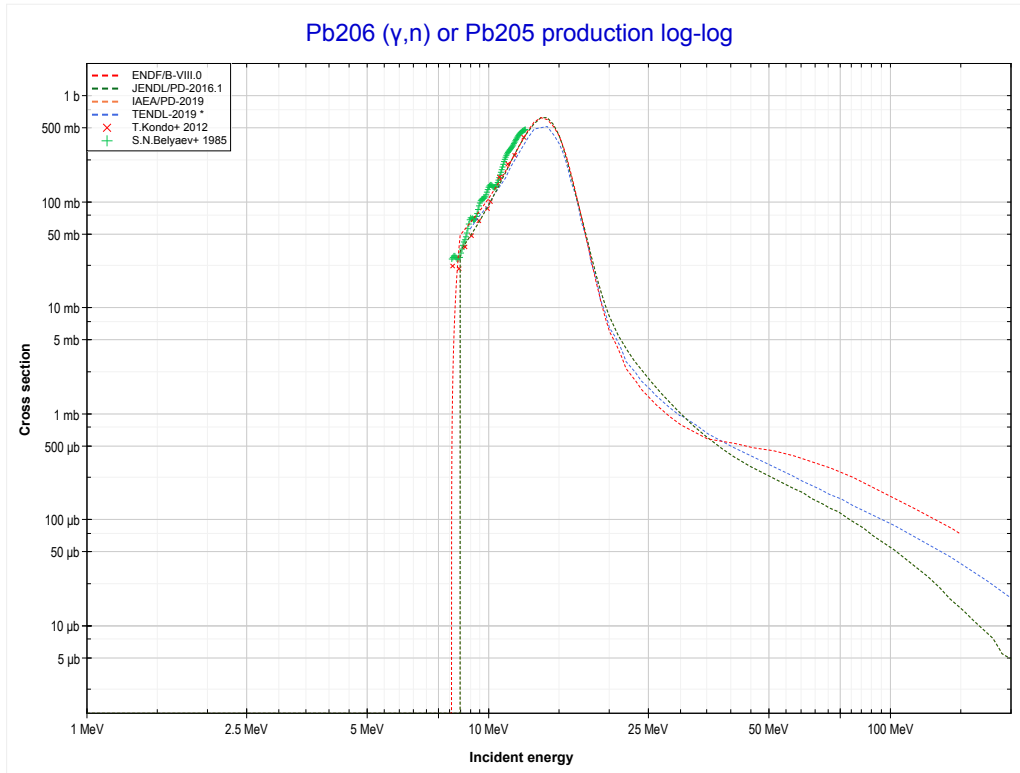
Reaction	Q-Value
Pb206(γ,n)Pb205	-8086.72 keV

<< 82-Pb-206	**82-Pb-207**	82-Pb-208 >>
<< 82-Pb-206 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Pb206 production)**	82-Pb-208 MT4 (γ,n) >>

Pb207 (γ,n) or Pb206 production log-log

Pb207 (γ,n) or Pb206 production lin-log
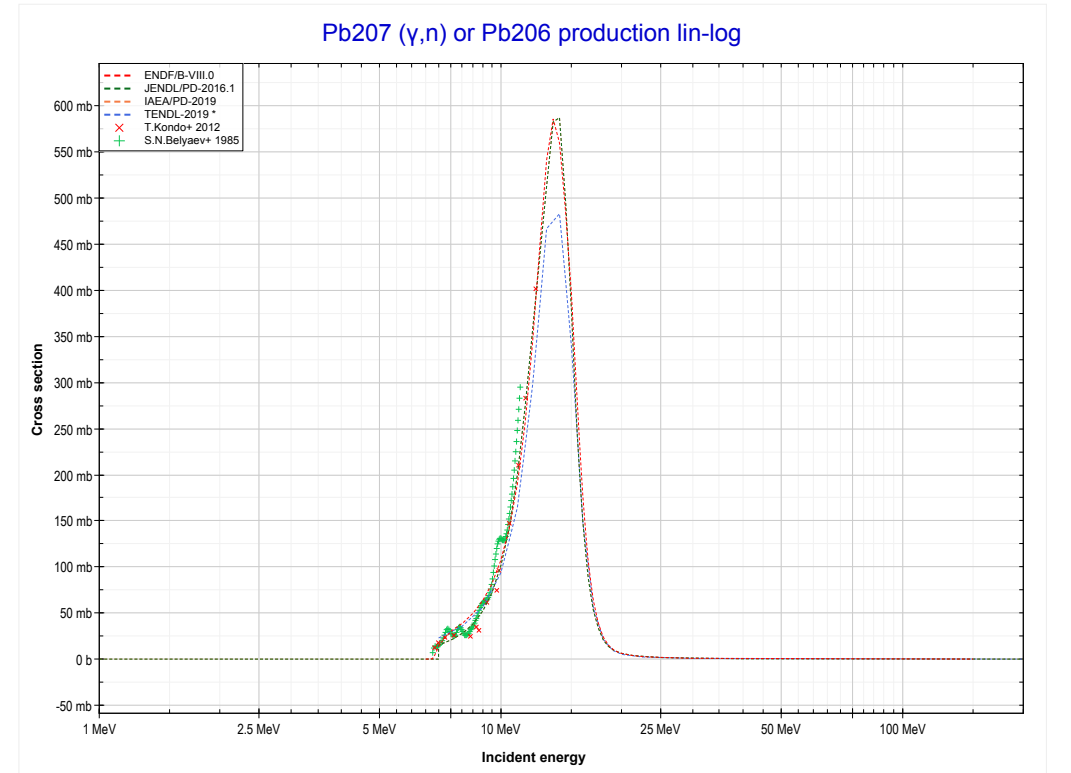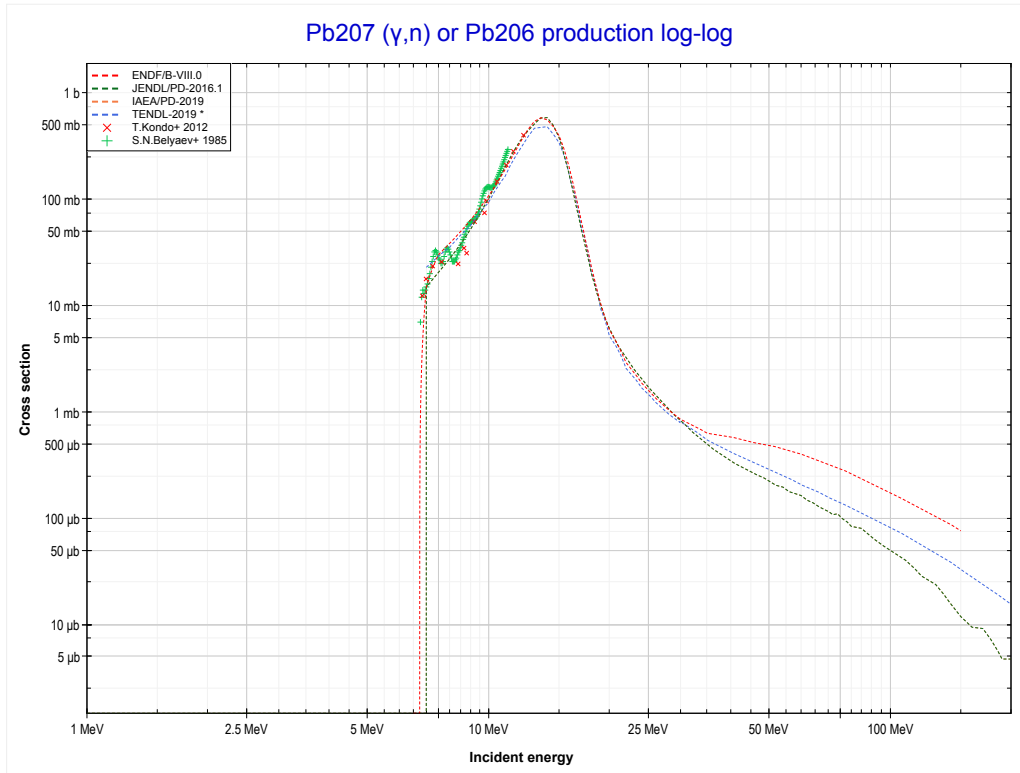
Reaction	Q-Value
Pb207(γ,n)Pb206	-6737.72 keV

<< 82-Pb-207	**82-Pb-208**	83-Bi-209 >>
<< 82-Pb-207 MT4 (γ,n)	**MT4 (γ,n) or MT5 (Pb207 production)**	MT17 (γ,3n) >>

Pb208 (γ,n) or Pb207 production log-log

Pb208 (γ,n) or Pb207 production lin-log
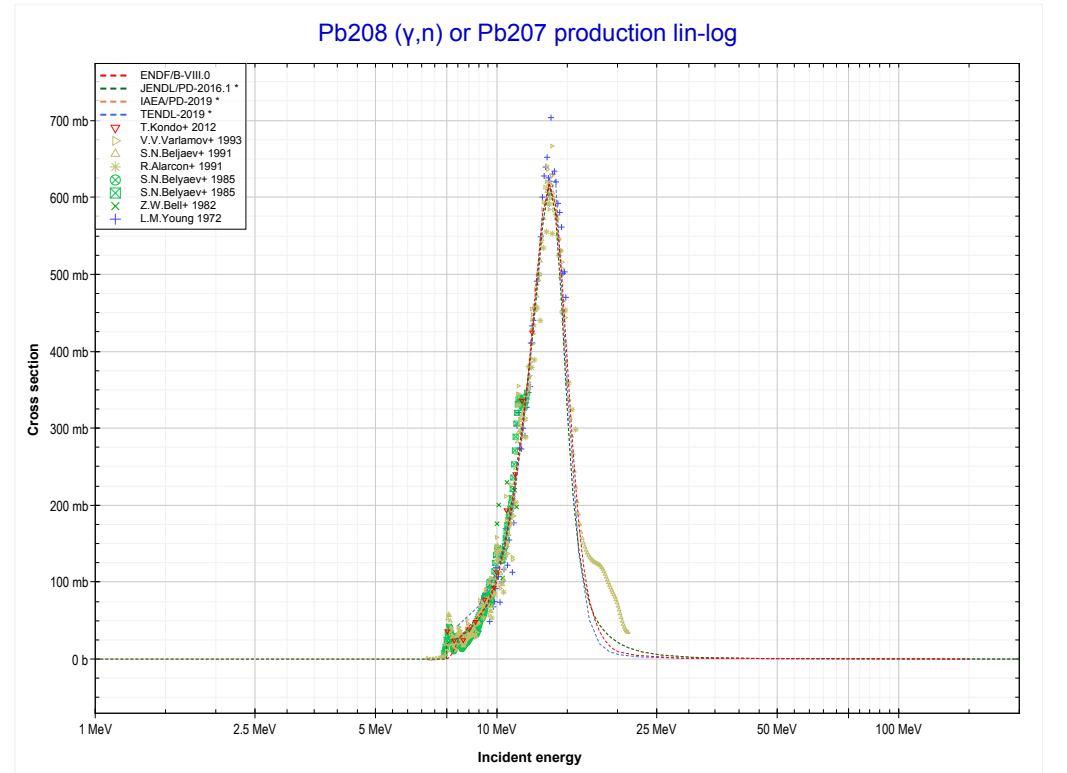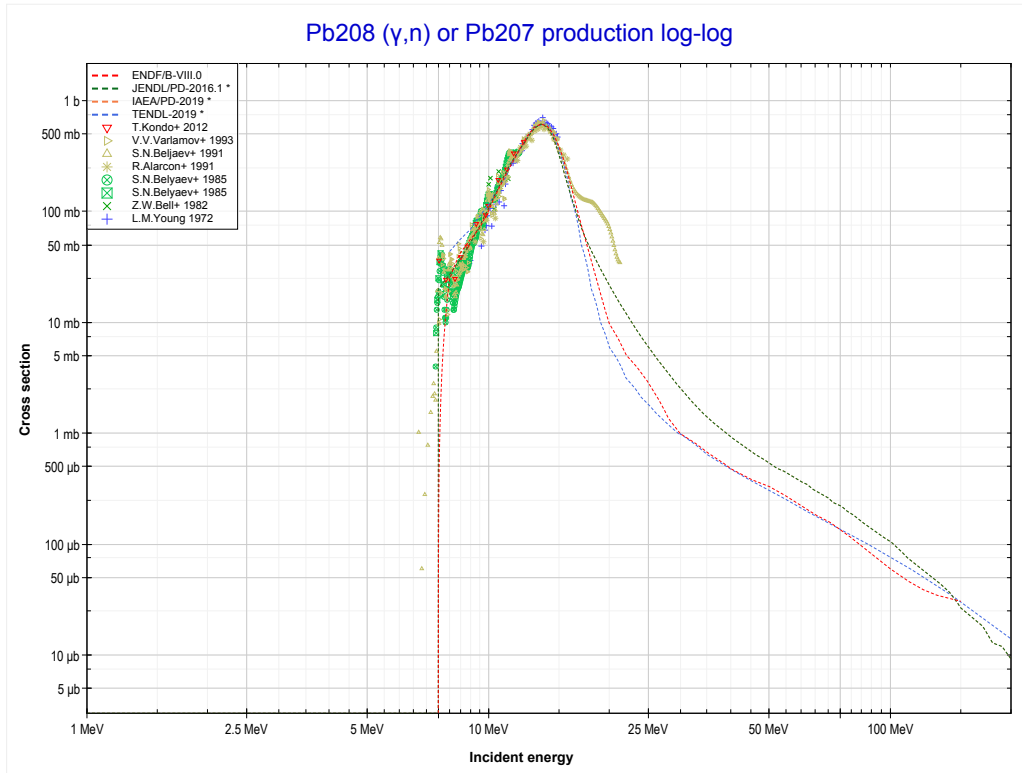
Reaction	Q-Value
Pb208(γ,n)Pb207	-7367.92 keV

<< 79-Au-197	**82-Pb-208**	83-Bi-209 >>
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Pb205 production)**	83-Bi-209 MT4 (γ,n) >>

Pb208 (γ,3n) or Pb205 production log-log

Pb208 (γ,3n) or Pb205 production lin-log
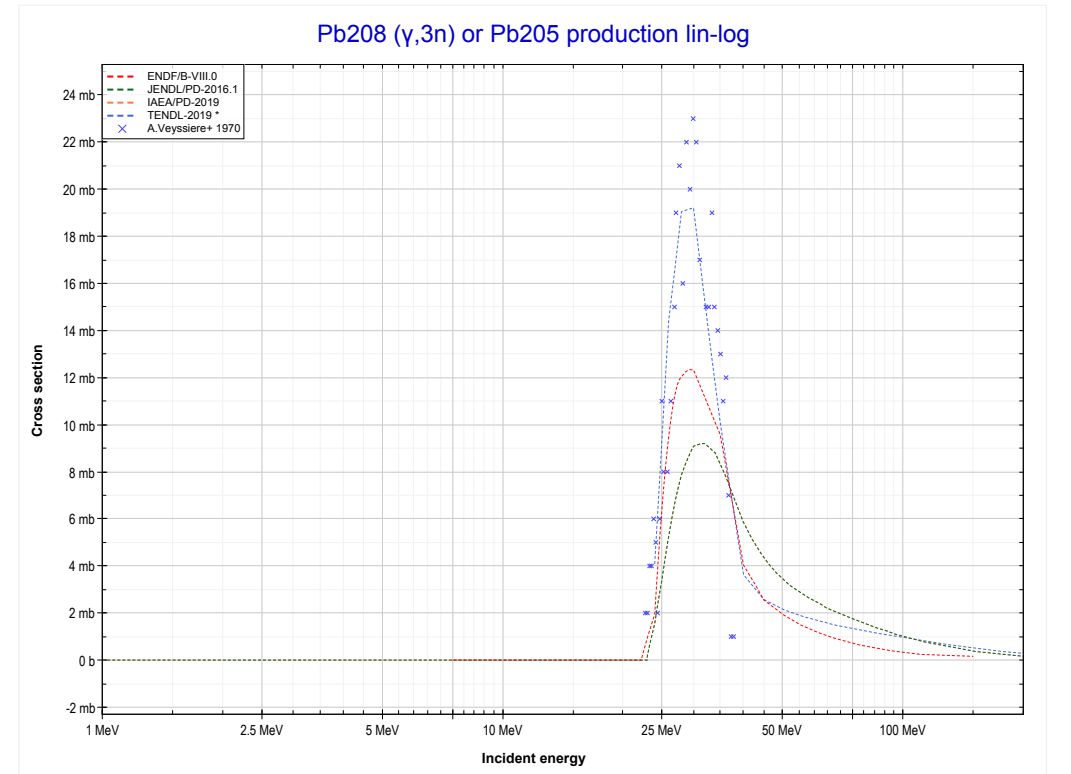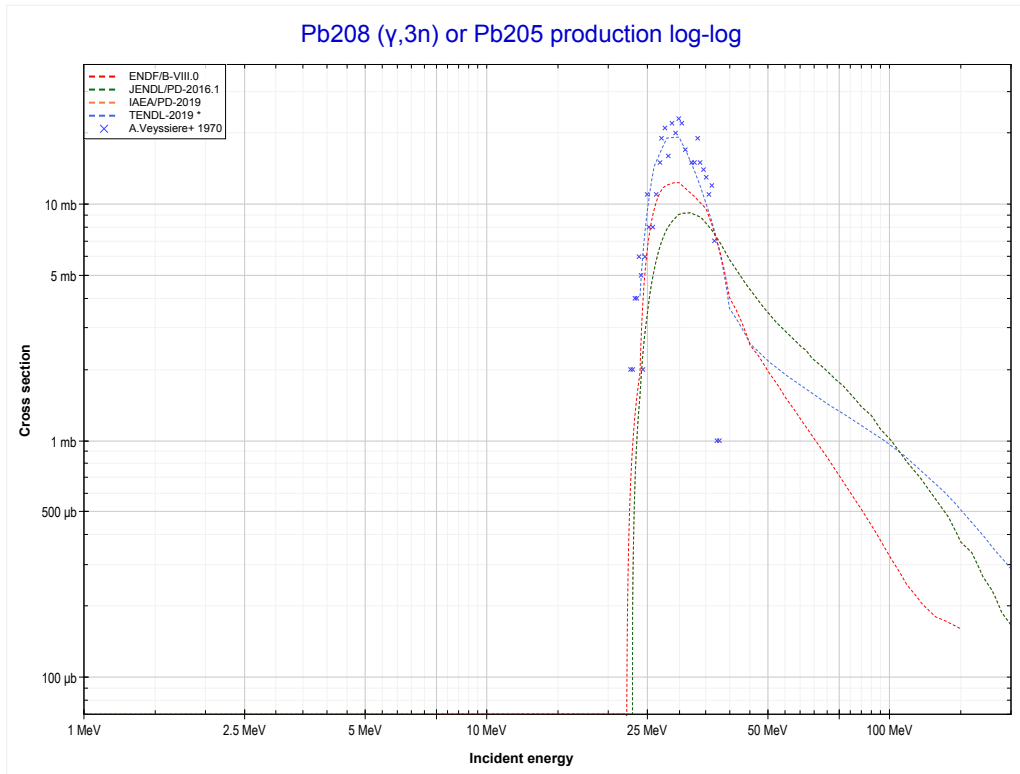
Reaction	Q-Value
Pb208(γ,3n)Pb205	-22192.35 keV

<< 82-Pb-208	**83-Bi-209**	90-Th-232 >>
<< 82-Pb-208 MT17 (γ,3n)	**MT4 (γ,n) or MT5 (Bi208 production)**	MT17 (γ,3n) >>

Bi209 (γ,n) or Bi208 production log-log

Bi209 (γ,n) or Bi208 production lin-log
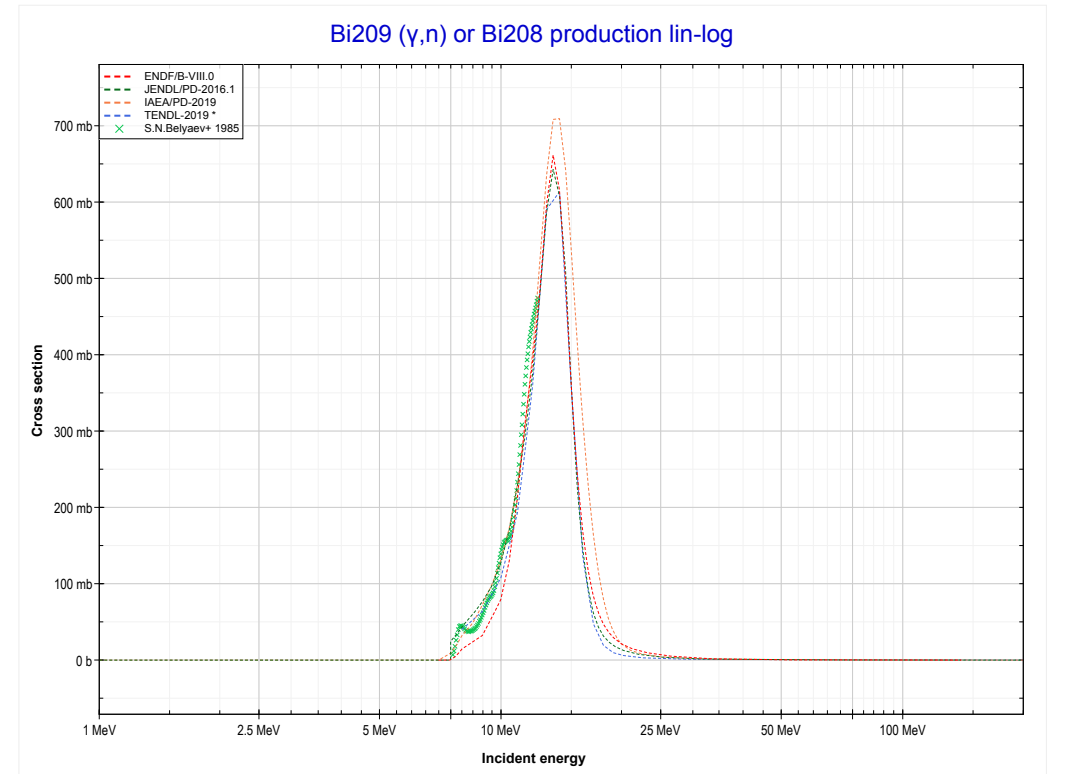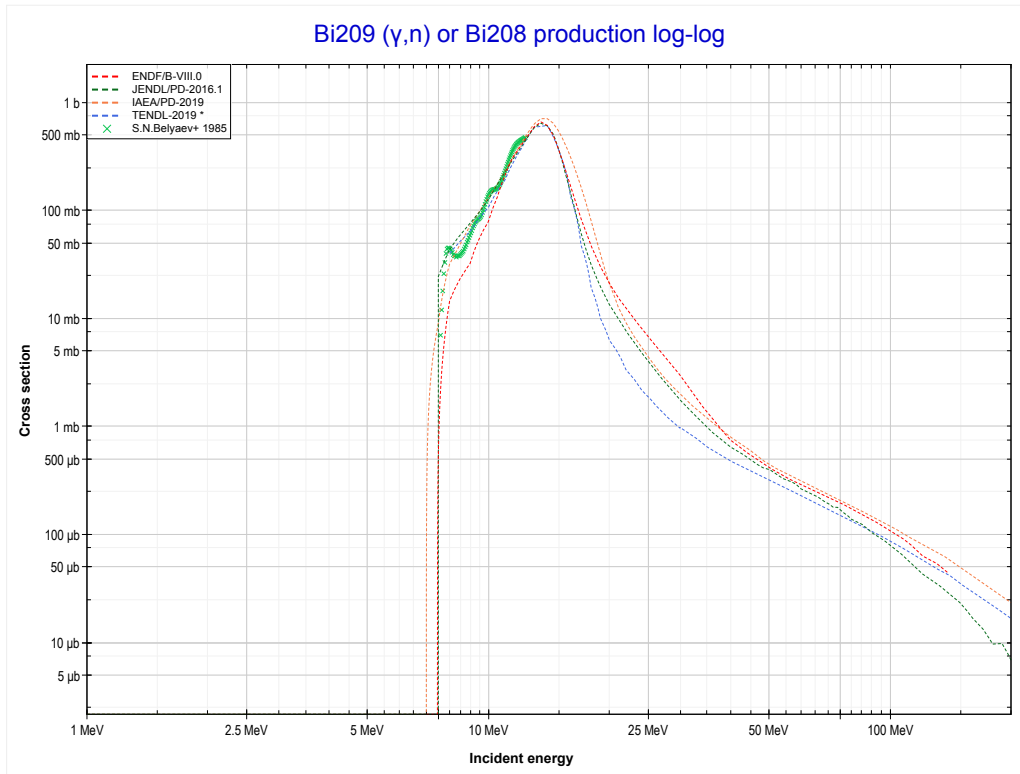
Reaction	Q-Value
Bi209(γ,n)Bi208	-7459.82 keV

<< 82-Pb-208	**83-Bi-209**	
<< MT4 (γ,n)	**MT17 (γ,3n) or MT5 (Bi206 production)**	MT18 (γ,fission) >>

Bi209 (γ,3n) or Bi206 production log-log

Bi209 (γ,3n) or Bi206 production lin-log
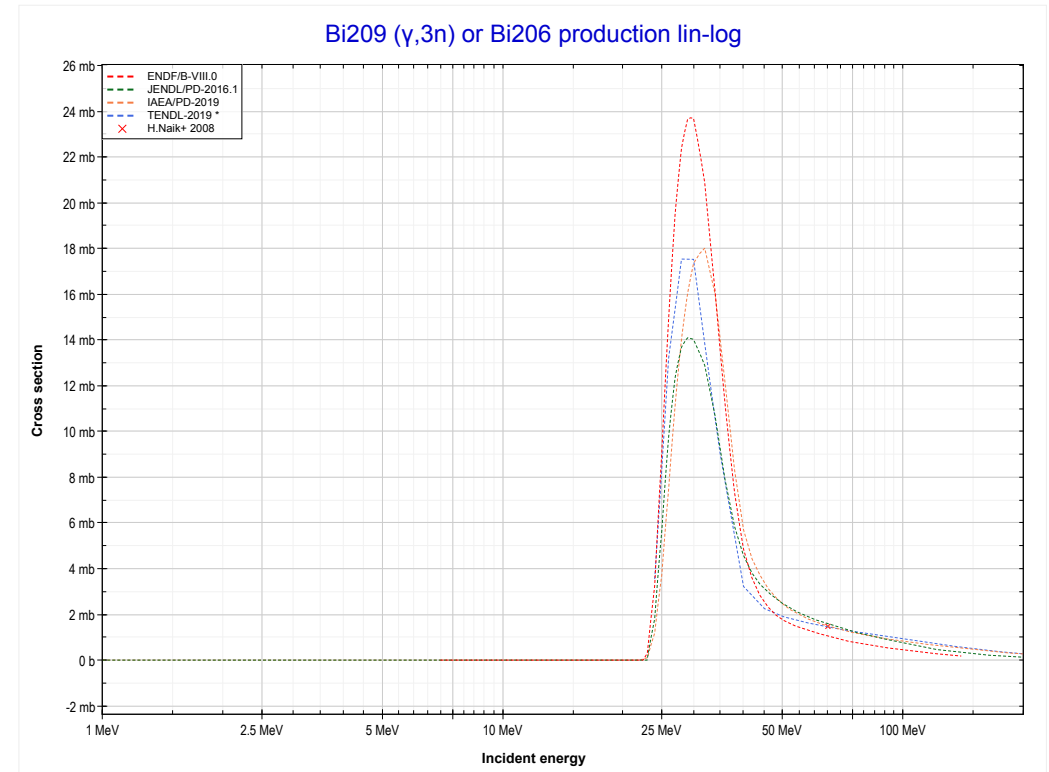
Reaction	Q-Value
Bi209(γ,3n)Bi206	-22444.65 keV

<< 79-Au-197	**83-Bi-209**	88-Ra-226 >>
<< MT17 (γ,3n)	**MT18 (γ,fission)**	88-Ra-226 MT18 (γ,fission) >>

Bi209 (γ,fission) log-log

Bi209 (γ,fission) lin-log
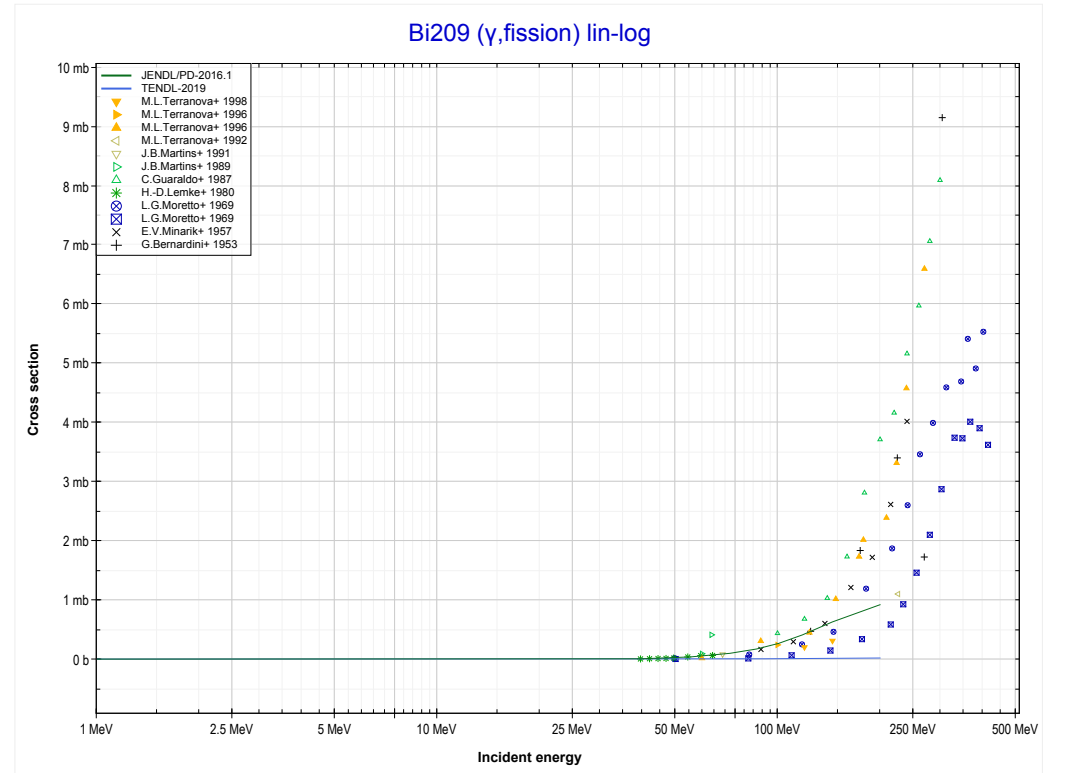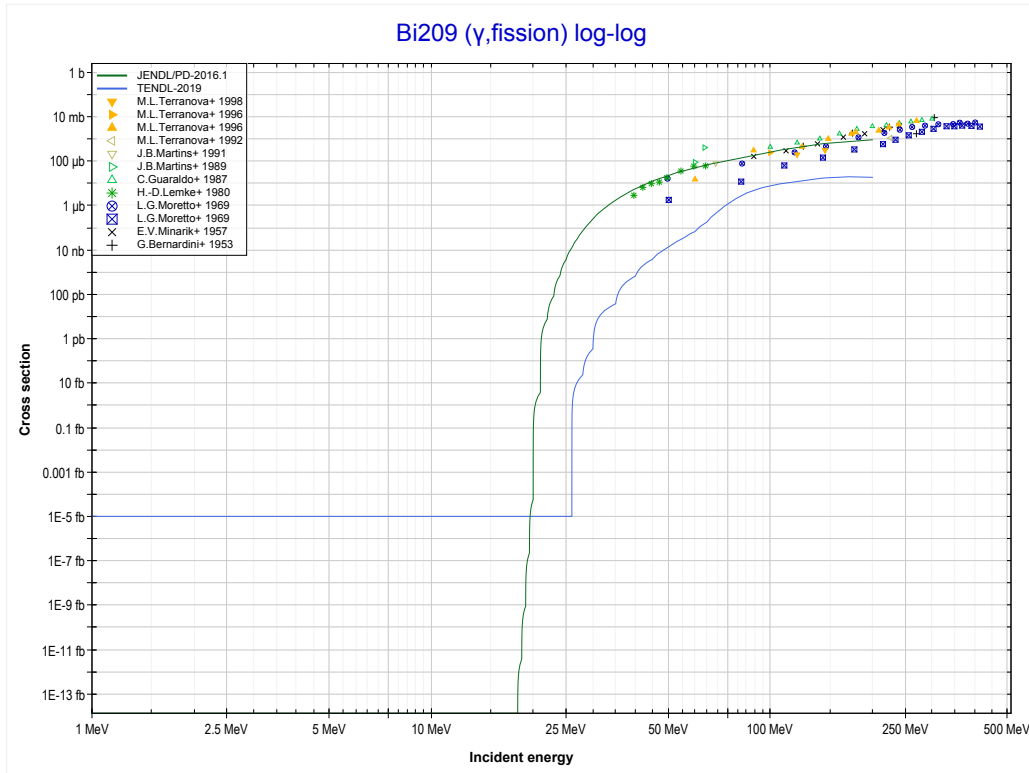
<< 83-Bi-209	**88-Ra-226**	89-Ac-227 >>
<< 83-Bi-209 MT18 (γ,fission)	**MT18 (γ,fission)**	89-Ac-227 MT18 (γ,fission) >>

Ra226 (γ,fission) log-log

Ra226 (γ,fission) lin-log

Ac227 (γ,fission) log-log

Ac227 (γ,fission) lin-log
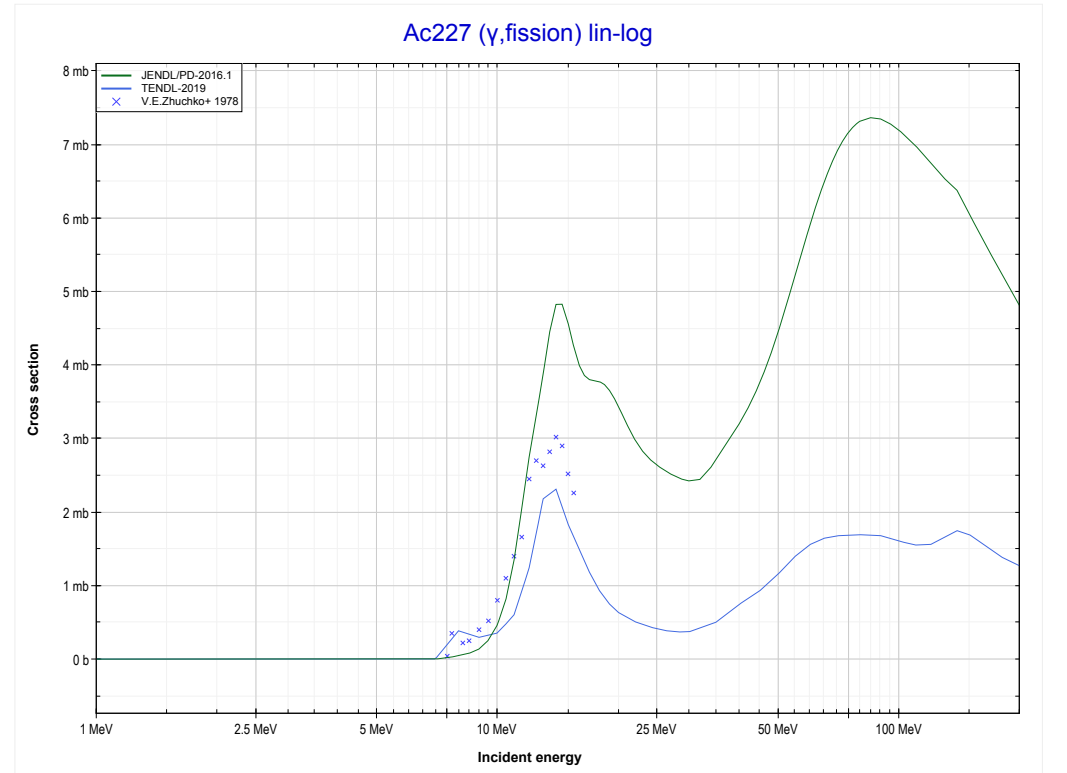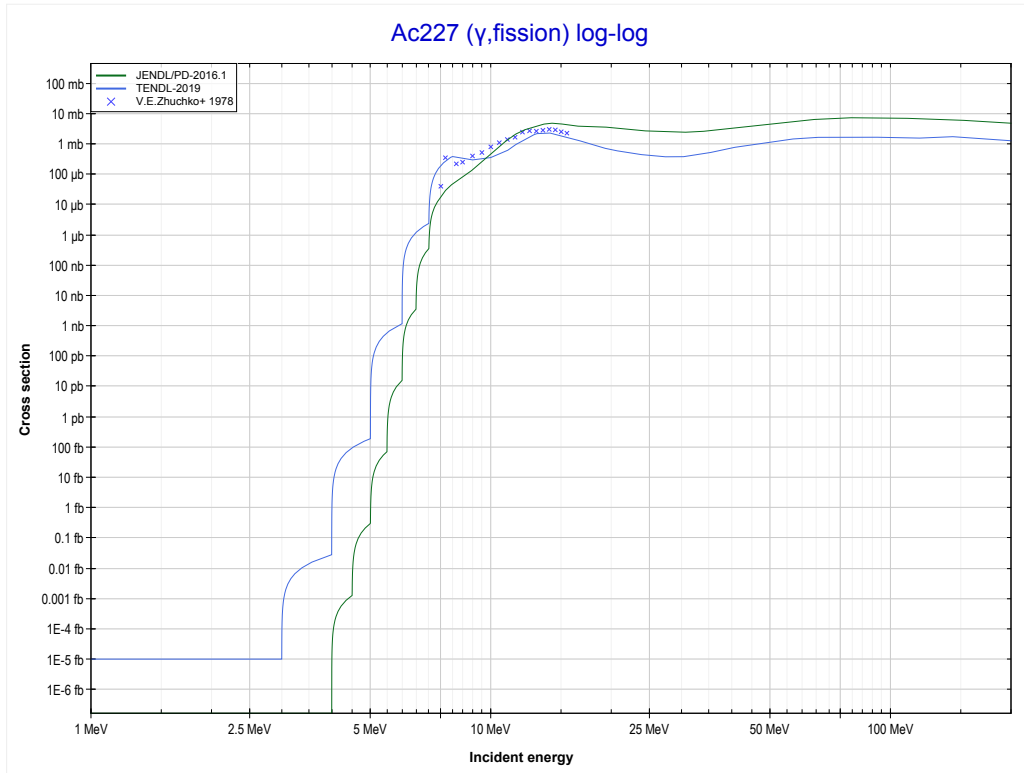
<< 83-Bi-209	**90-Th-232**	92-U-233 >>
<< 89-Ac-227 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (Th231 production)**	MT16 (γ,2n) >>

Th232 (γ,n) or Th231 production log-log

Th232 (γ,n) or Th231 production lin-log
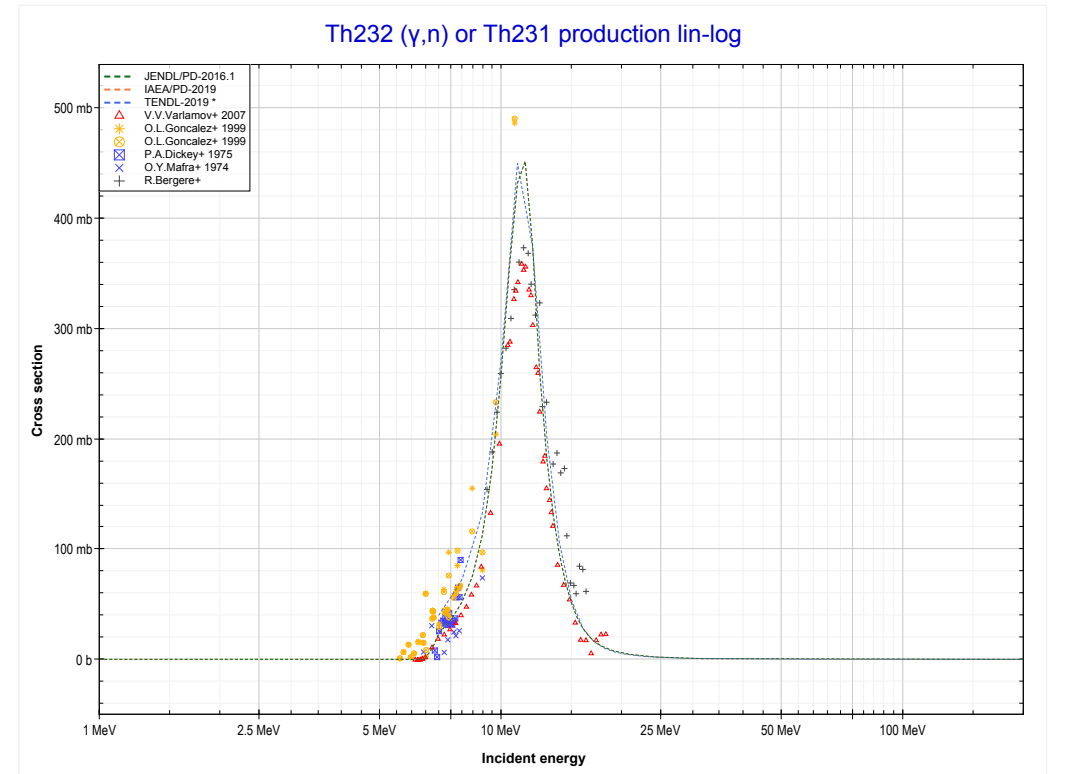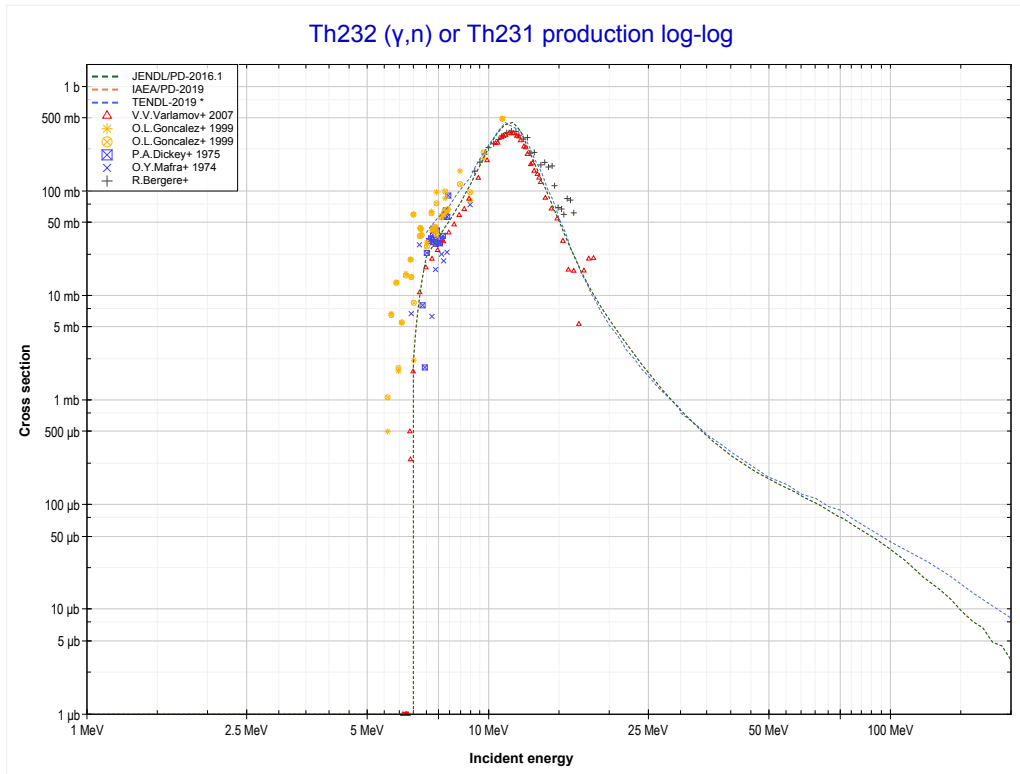
Reaction	Q-Value
Th232(γ,n)Th231	-6440.42 keV

<< 79-Au-197	**90-Th-232**	92-U-235 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Th230 production)**	MT18 (γ,fission) >>

Th232 (γ,2n) or Th230 production log-log

Th232 (γ,2n) or Th230 production lin-log
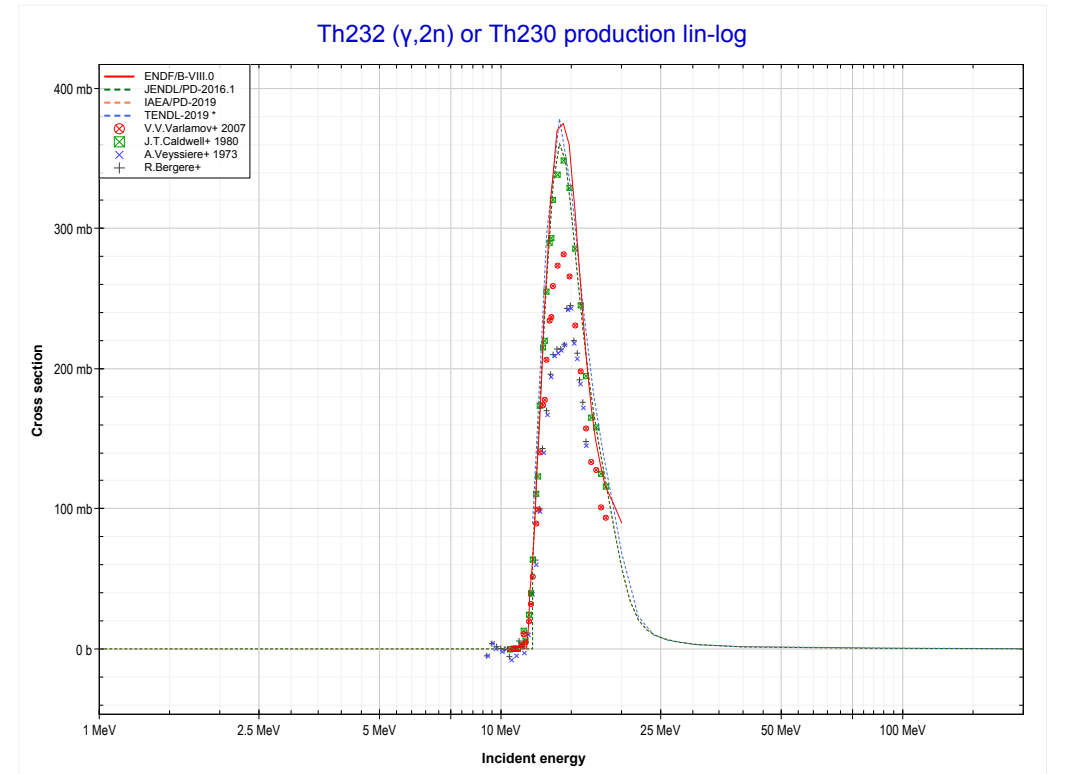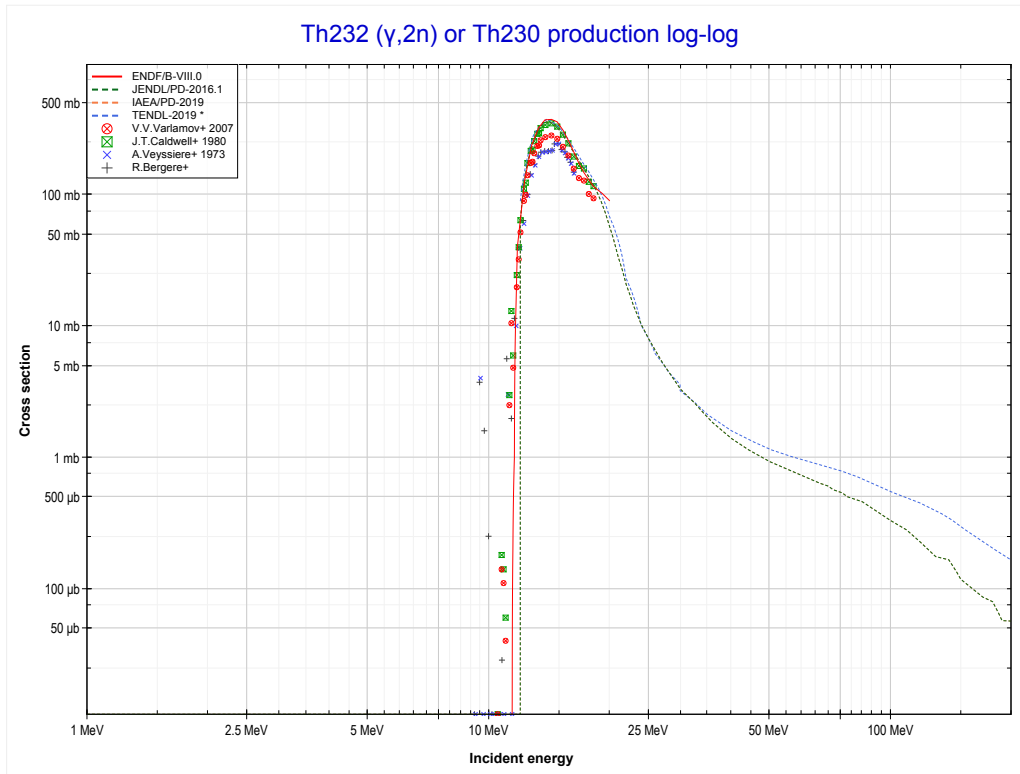
Reaction	Q-Value
Th232(γ,2n)Th230	-11558.43 keV

<< 89-Ac-227	**90-Th-232**	91-Pa-231 >>
<< MT16 (γ,2n)	**MT18 (γ,fission)**	91-Pa-231 MT18 (γ,fission) >>

Th232 (γ,fission) log-log

Th232 (γ,fission) lin-log

Pa231 (γ,fission) log-log

Pa231 (γ,fission) lin-log
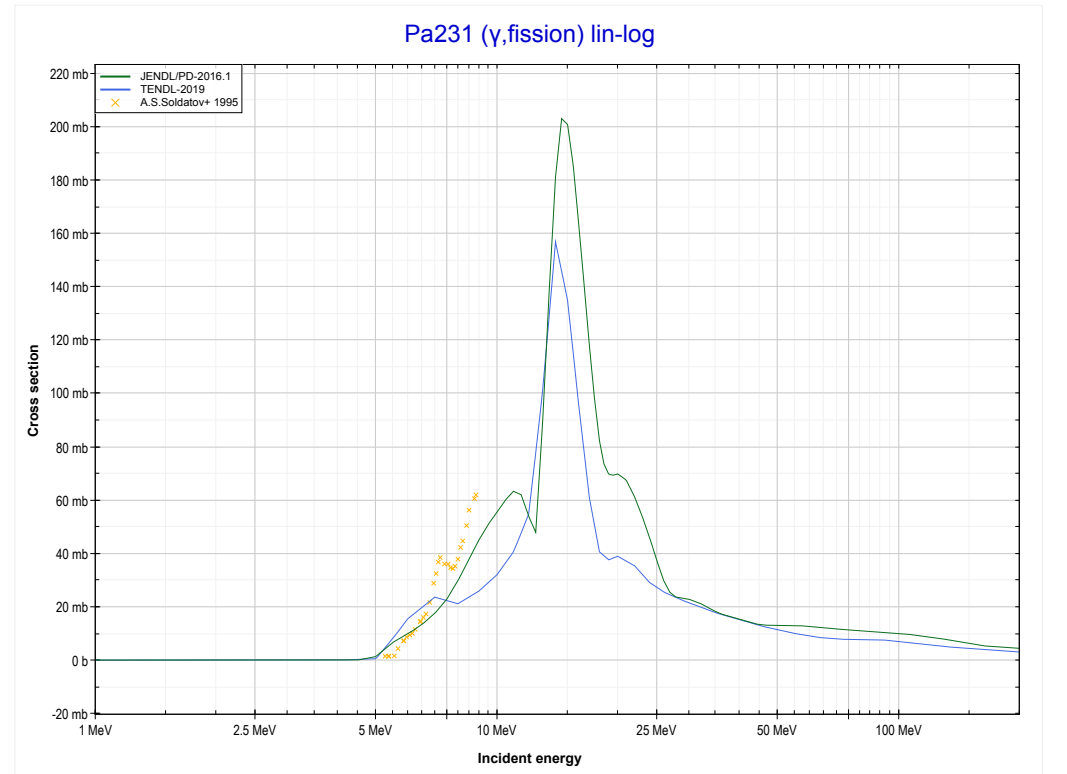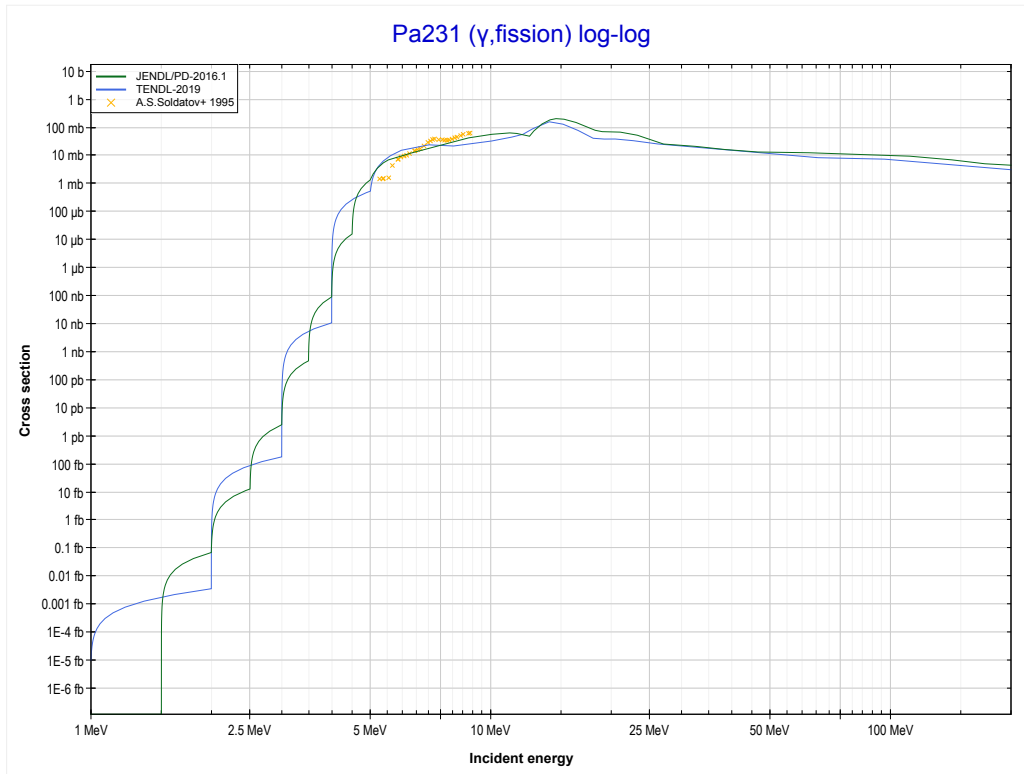
<< 90-Th-232	**92-U-233**	92-U-238 >>
<< 91-Pa-231 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (U232 production)**	MT18 (γ,fission) >>

U233 (γ,n) or U232 production log-log

U233 (γ,n) or U232 production lin-log
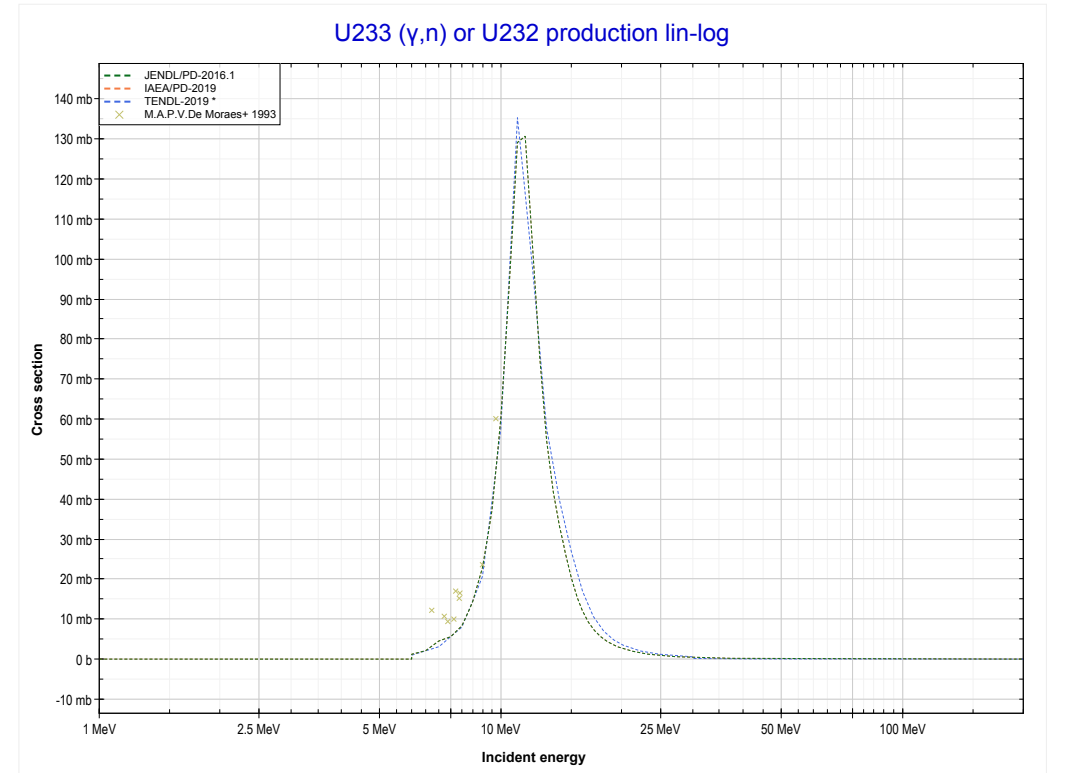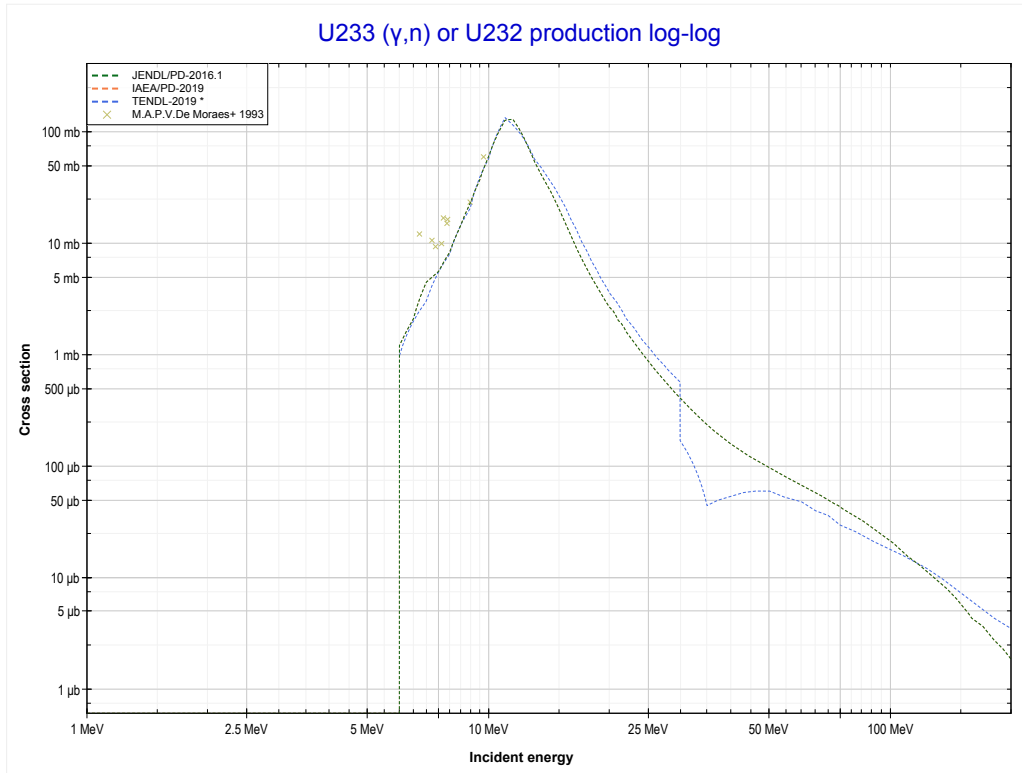
Reaction	Q-Value
U233(γ,n)U232	-5761.62 keV

<< 91-Pa-231 >>	**92-U-233**	92-U-234 >>
<< MT4 (γ,n)	**MT18 (γ,fission)**	92-U-234 MT18 (γ,fission) >>

U233 (γ,fission) log-log

U233 (γ,fission) lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019
- C.Cetina+ 2002
- J.C.Sanabria+ 2000
- M.A.P.V.De Moraes+ 1993
- A.S.Soldatov+ 1992
- M.A.P.V.De Moraes+ 1989
- B.L.Berman+ 1986
- Yu.B.Ostapenko+ 1978
- V.E.Zduchko+ 1978
- S.P.Kapitza+ 1969
- J.R.Huizenga+ 1962
- L.Katz+ 1958
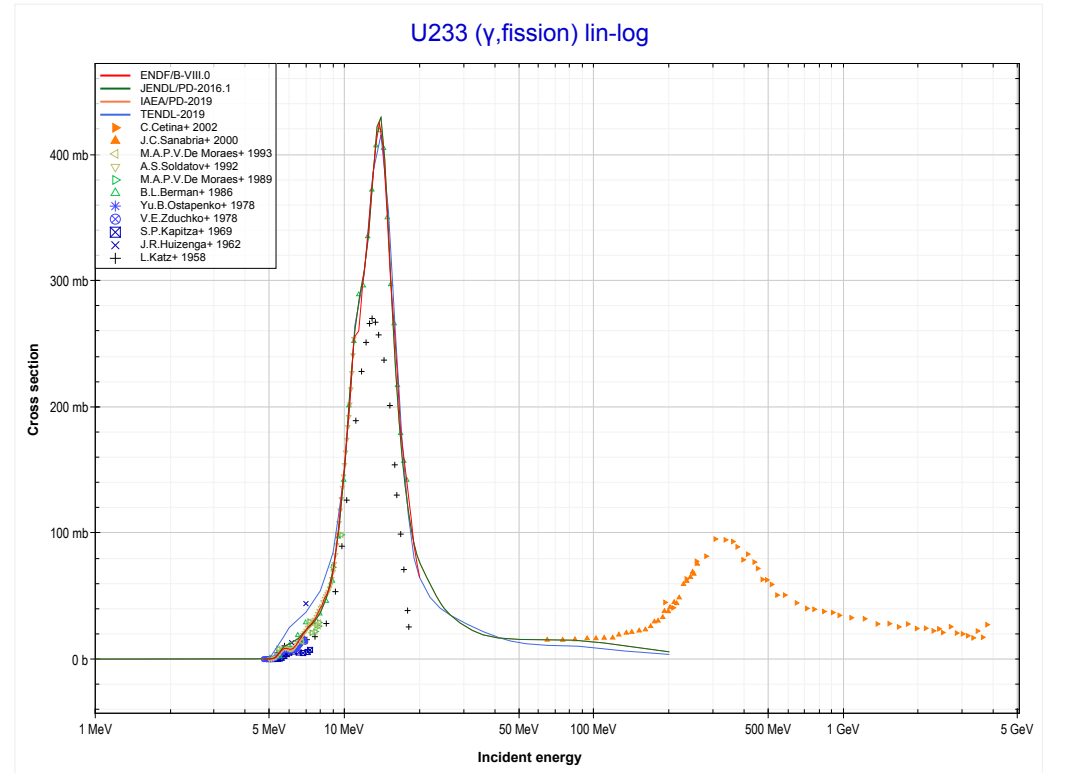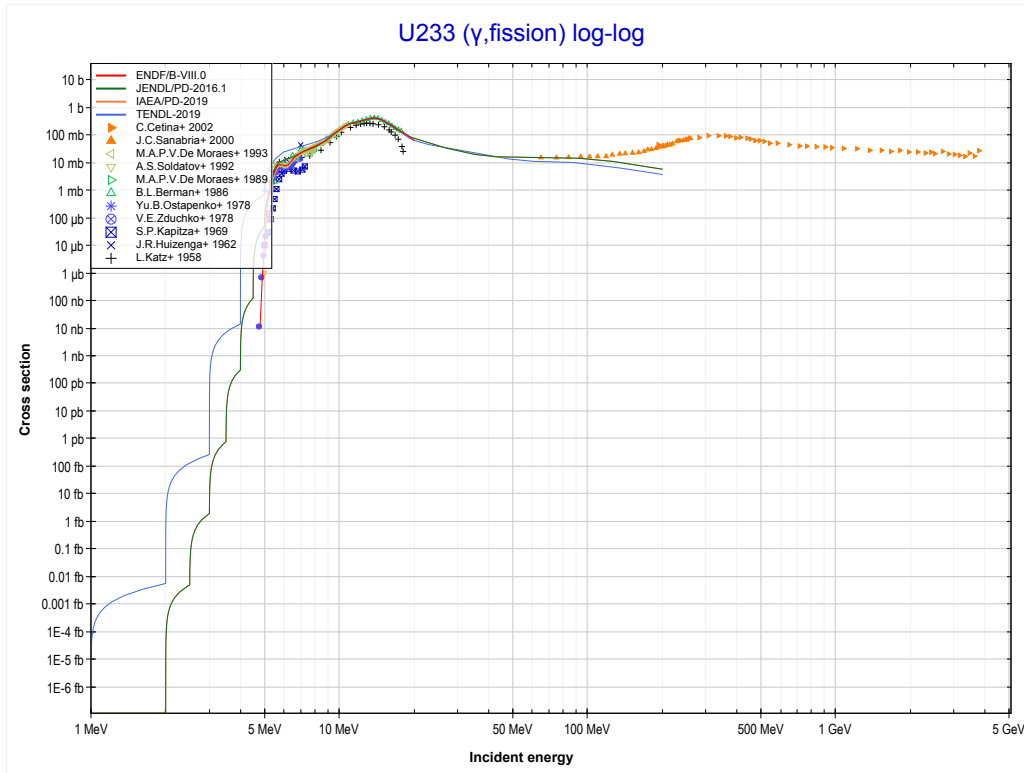
<< 92-U-233	**92-U-234**	92-U-235 >>
<< 92-U-233 MT18 (γ,fission)	**MT18 (γ,fission)**	92-U-235 MT16 (γ,2n) >>

U234 (γ,fission) log-log

U234 (γ,fission) lin-log
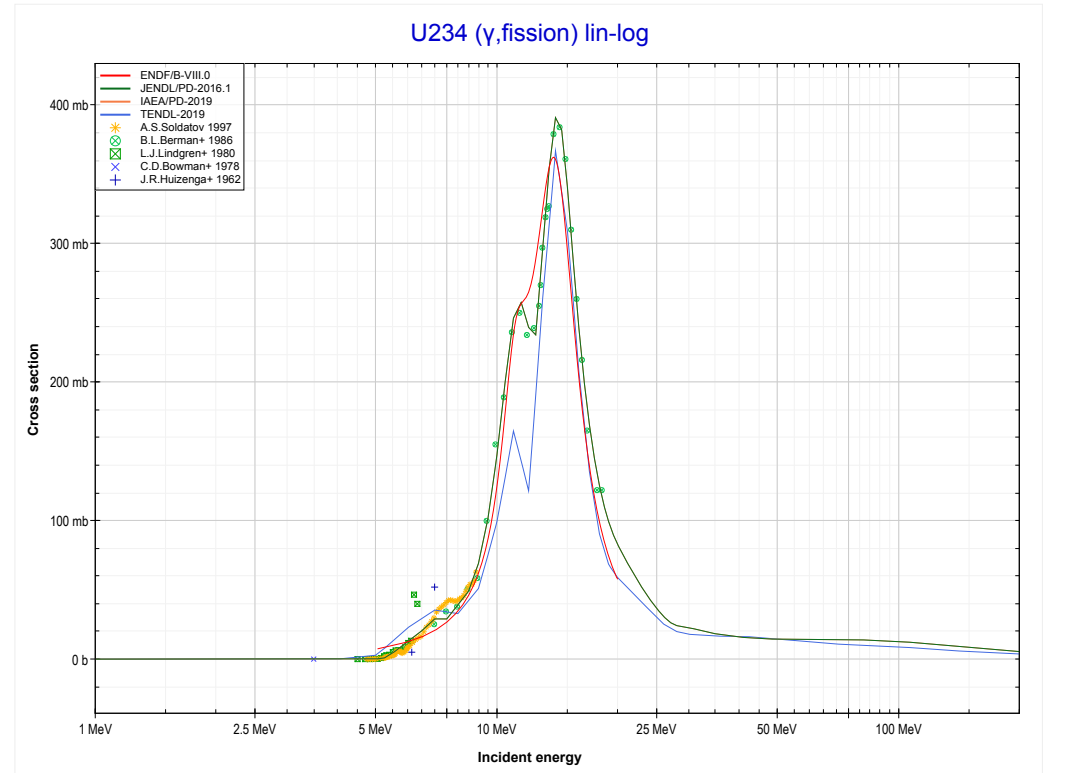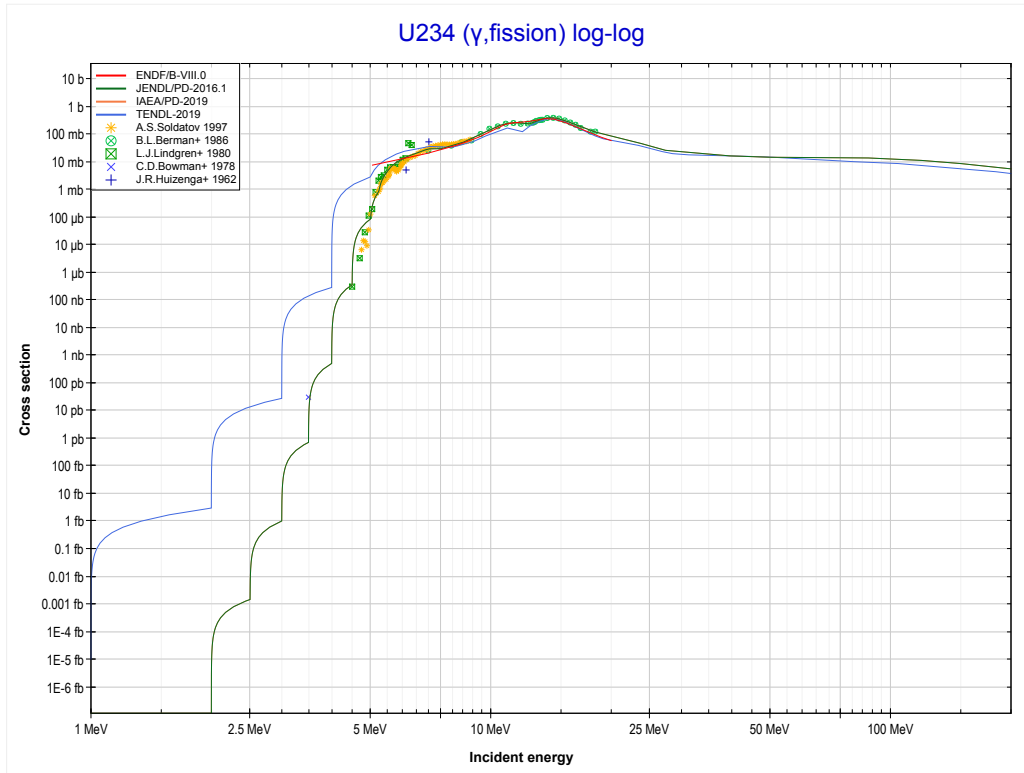
<< 90-Th-232	**92-U-235**	92-U-236 >>
<< 92-U-234 MT18 (γ,fission)	**MT16 (γ,2n) or MT5 (U233 production)**	MT18 (γ,fission) >>

U235 (γ,2n) or U233 production log-log

U235 (γ,2n) or U233 production lin-log
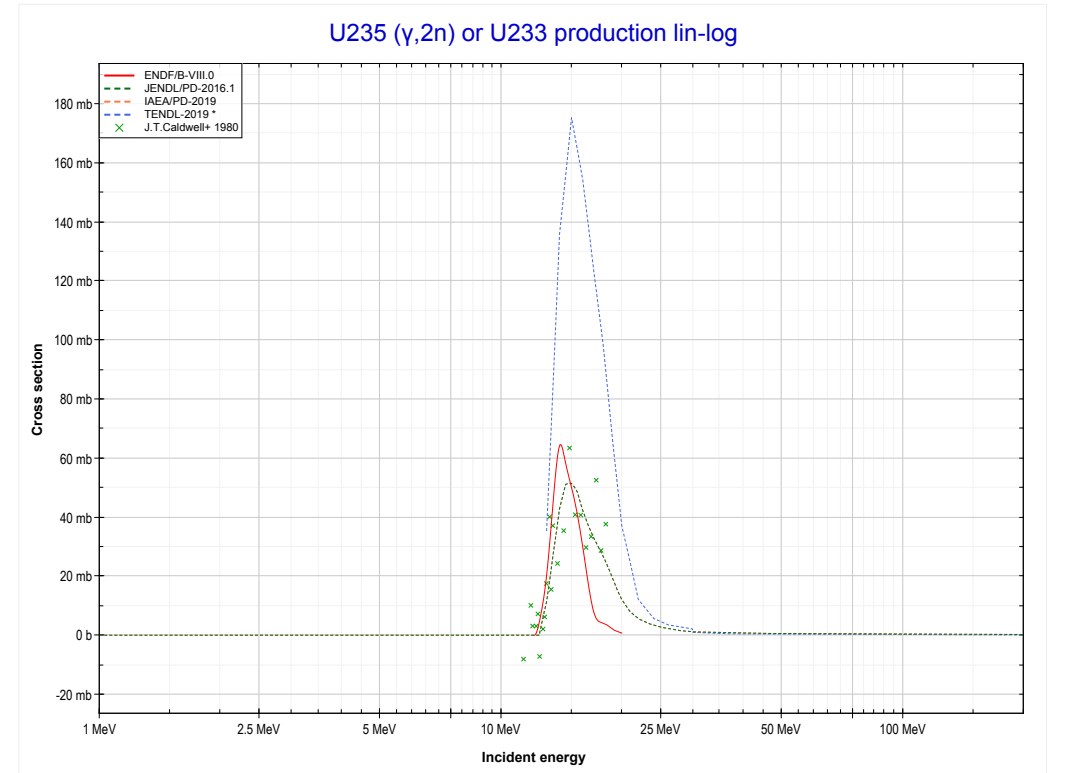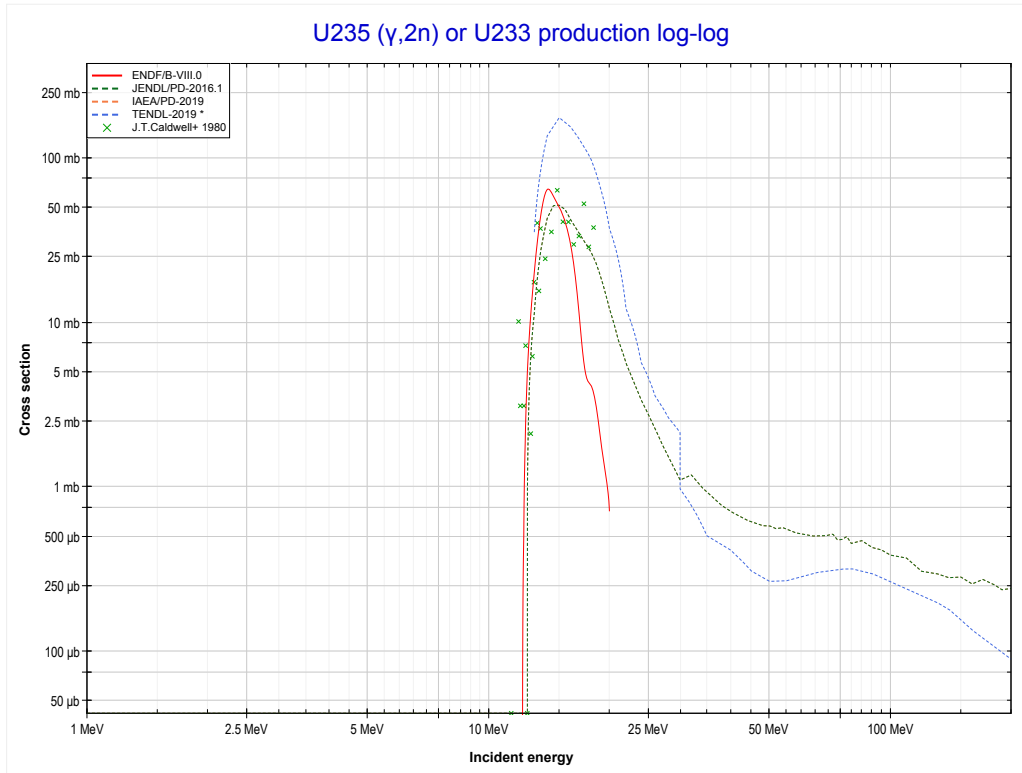
Reaction	Q-Value
U235(γ,2n)U233	-12143.03 keV

<< 92-U-234	**92-U-235**	92-U-236 >>
<< MT16 (γ,2n)	**MT18 (γ,fission)**	92-U-236 MT16 (γ,2n) >>

U235 (γ,fission) log-log

U235 (γ,fission) lin-log
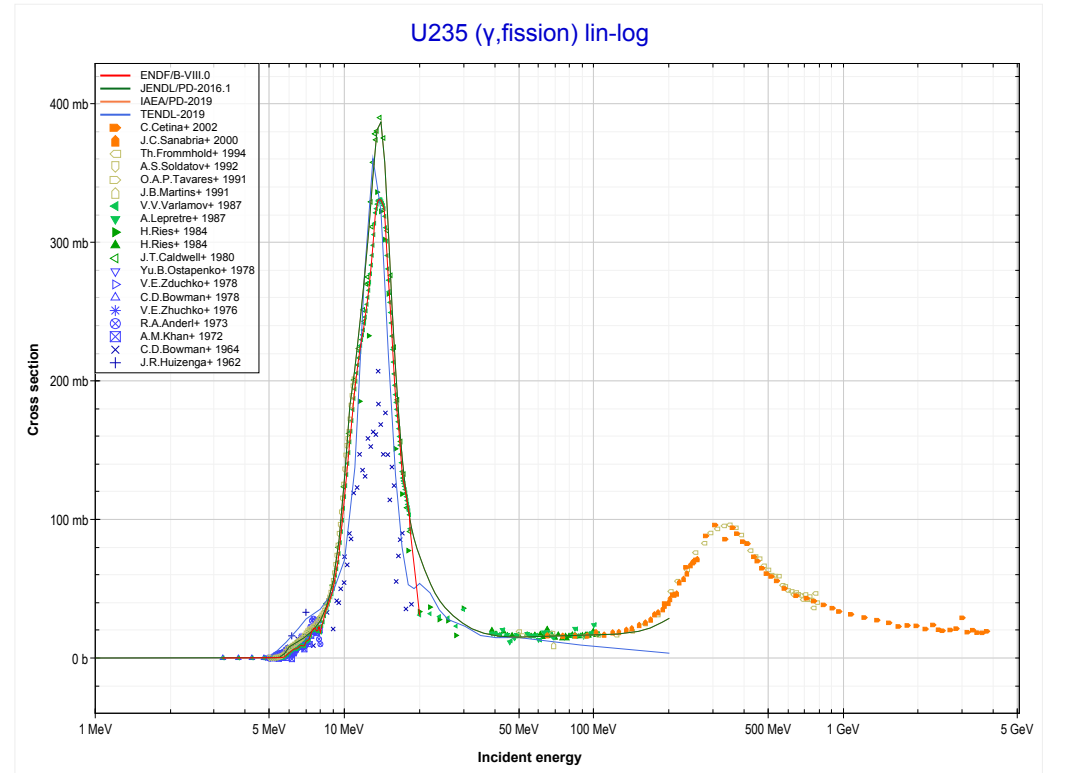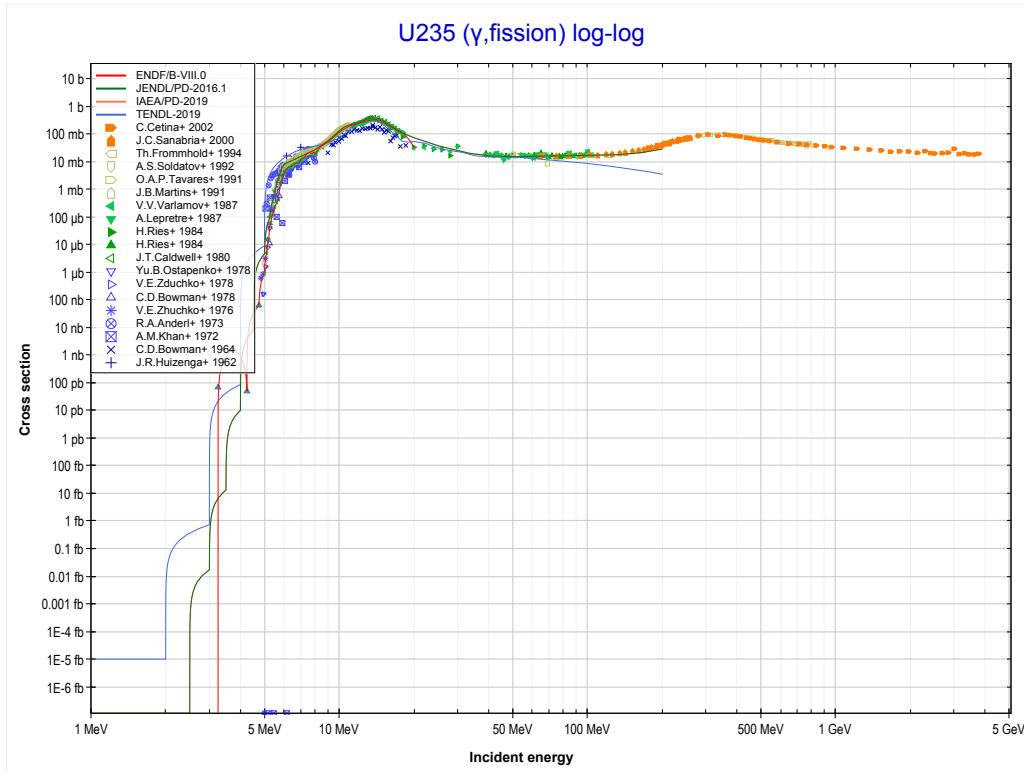
<< 92-U-235	**92-U-236**	92-U-238 >>
<< 92-U-235 MT18 (γ,fission)	**MT16 (γ,2n) or MT5 (U234 production)**	MT18 (γ,fission) >>

U236 (γ,2n) or U234 production log-log

U236 (γ,2n) or U234 production lin-log
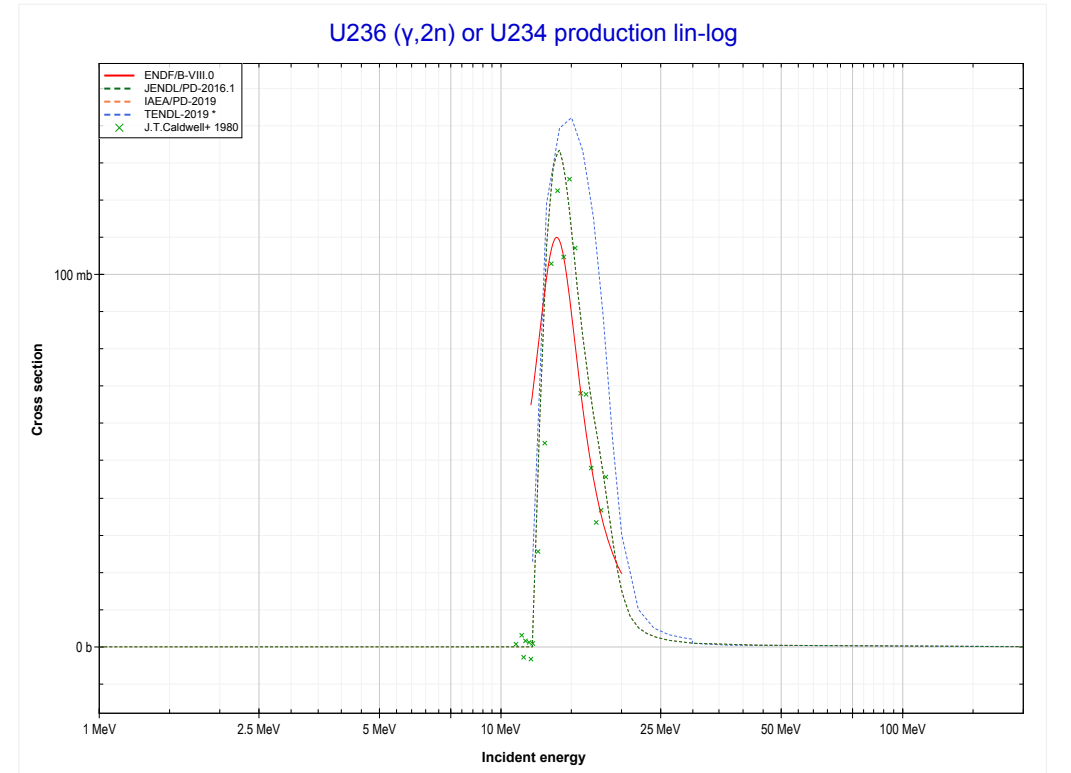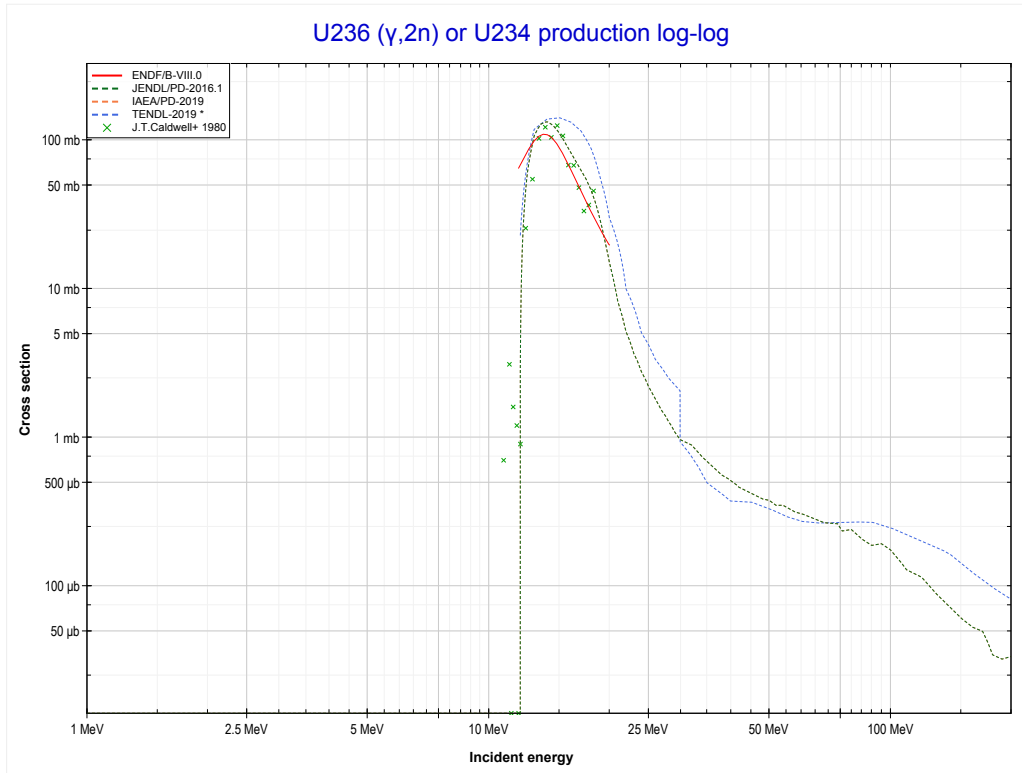
Reaction	Q-Value
U236(γ,2n)U234	-11843.03 keV

<< 92-U-235	**92-U-236**	92-U-238 >>
<< MT16 (γ,2n)	**MT18 (γ,fission)**	92-U-238 MT4 (γ,n) >>

U236 (γ,fission) log-log

U236 (γ,fission) lin-log

Legend (both plots):
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019
- A.S.Soldatov+ 1995
- J.T.Caldwell+ 1980
- Yu.B.Ostapenko+ 1978
- V.E.Zhuchko+ 1978
- V.E.Zduchko+ 1978
- C.D.Bowman+ 1978
- M.V.Yester+ 1973
- J.R.Huizenga+ 1962
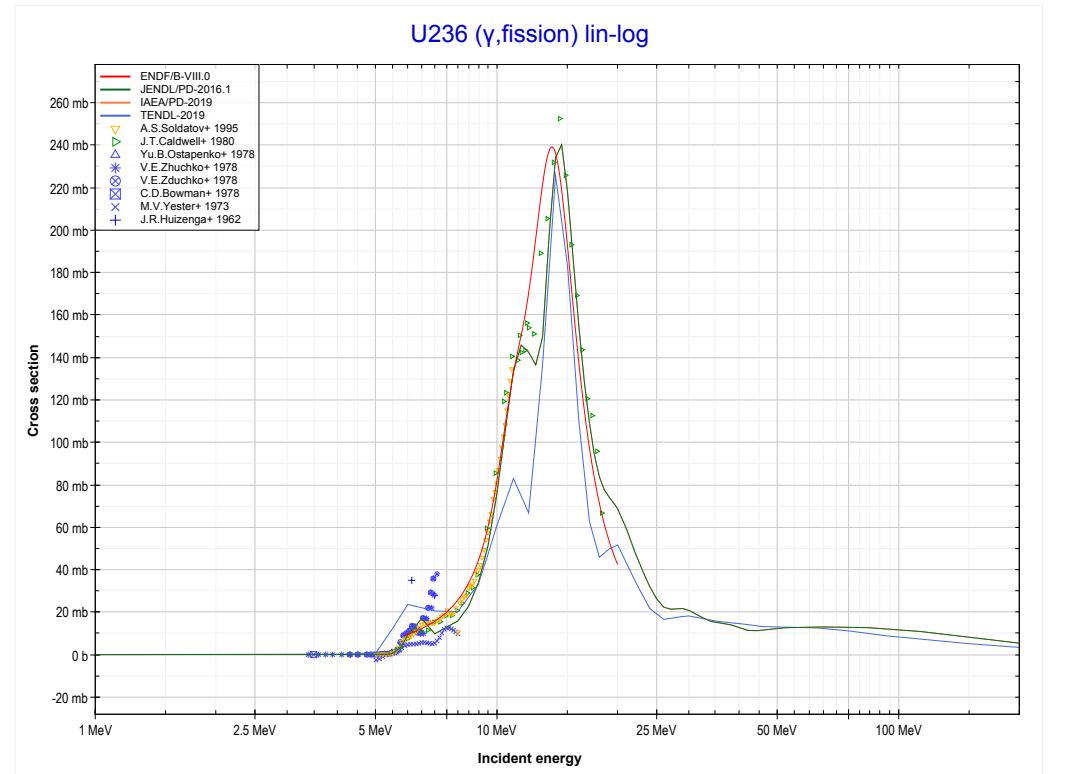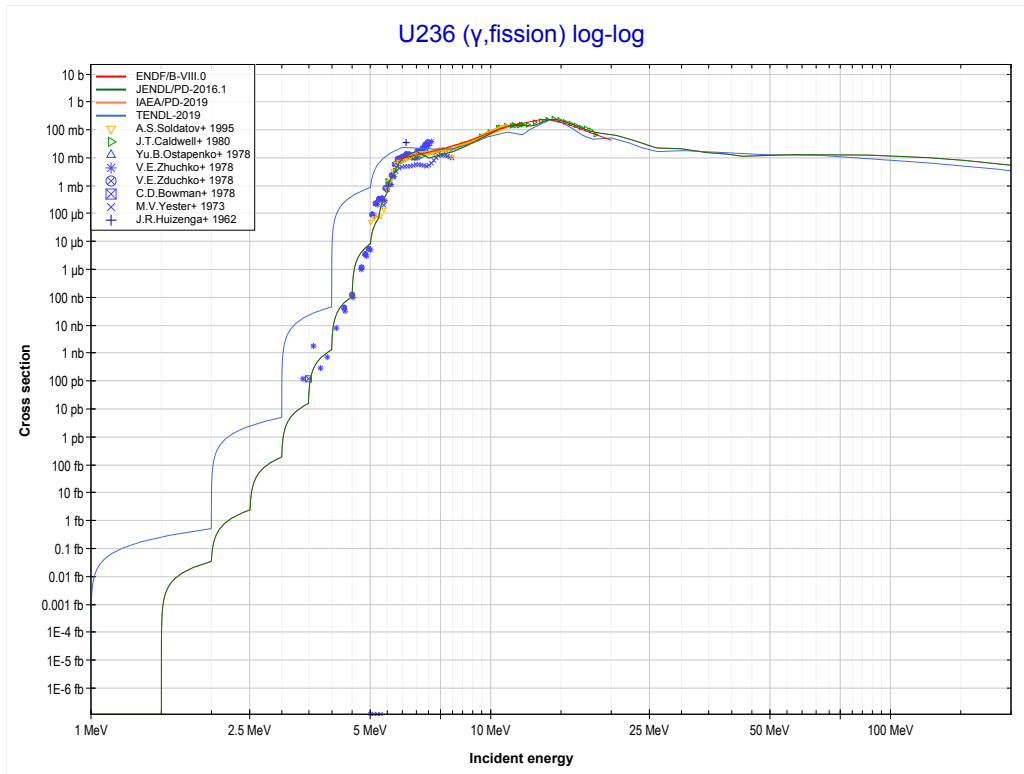
<< 92-U-233	**92-U-238**	93-Np-237 >>
<< 92-U-236 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (U237 production)**	MT16 (γ,2n) >>

U238 (γ,n) or U237 production log-log

U238 (γ,n) or U237 production lin-log
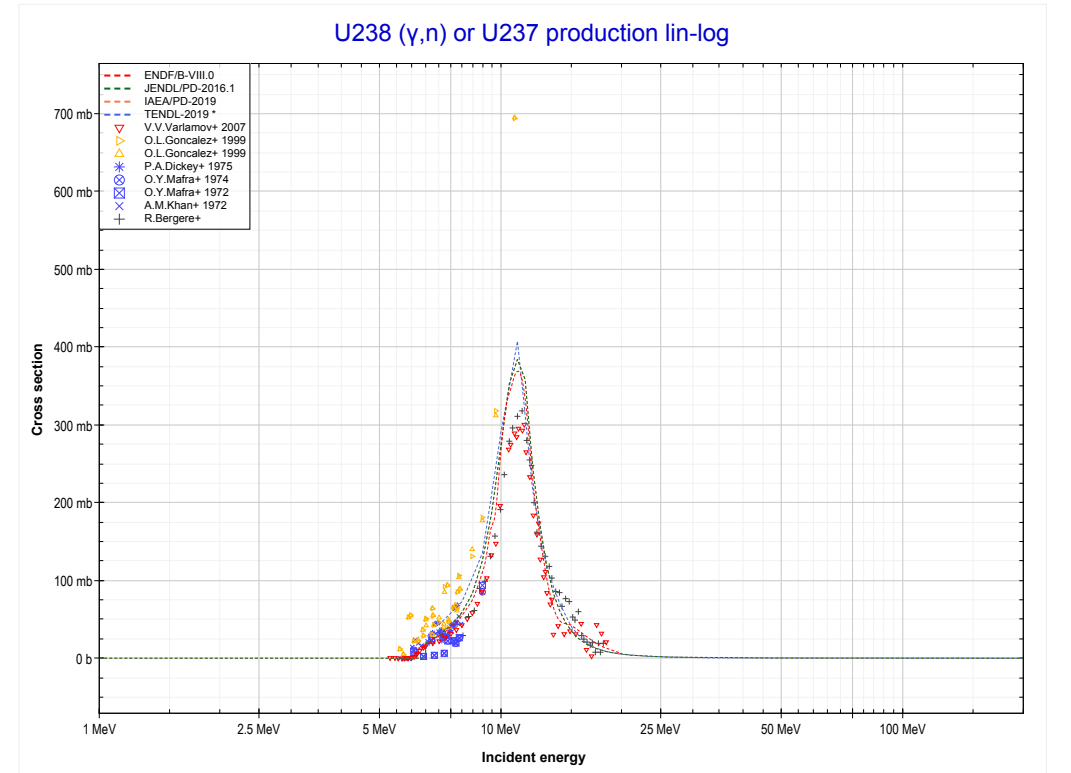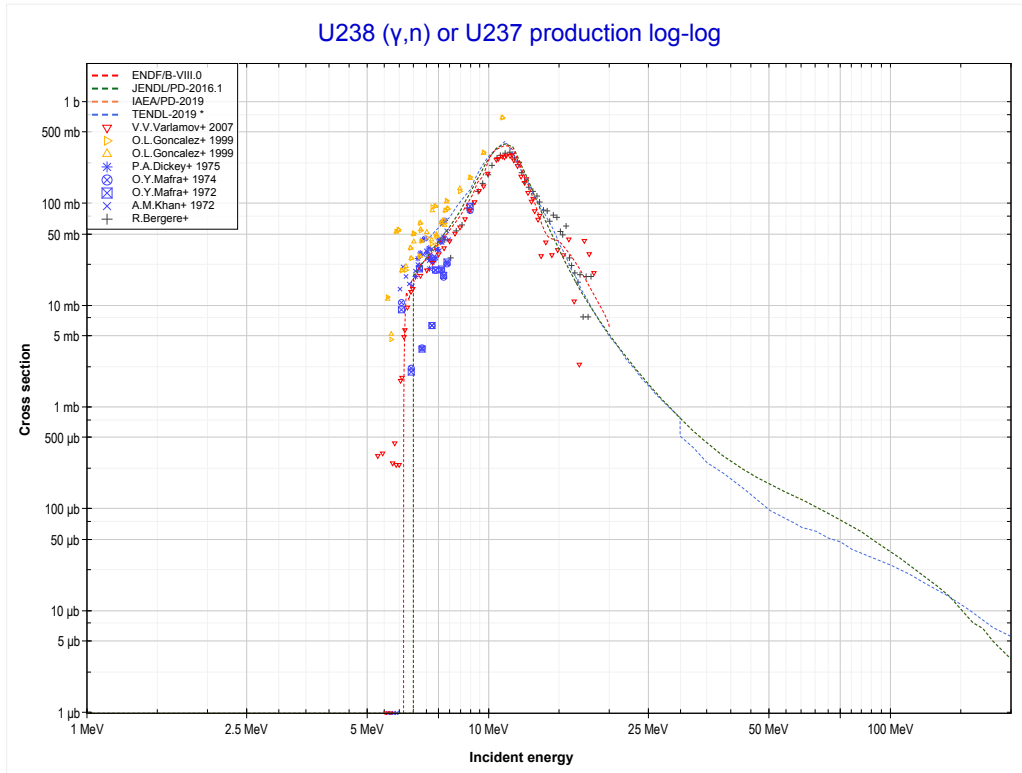
Reaction	Q-Value
U238(γ,n)U237	-6153.72 keV

<< 92-U-236	**92-U-238**	93-Np-237 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (U236 production)**	MT18 (γ,fission) >>

U238 (γ,2n) or U236 production log-log

U238 (γ,2n) or U236 production lin-log
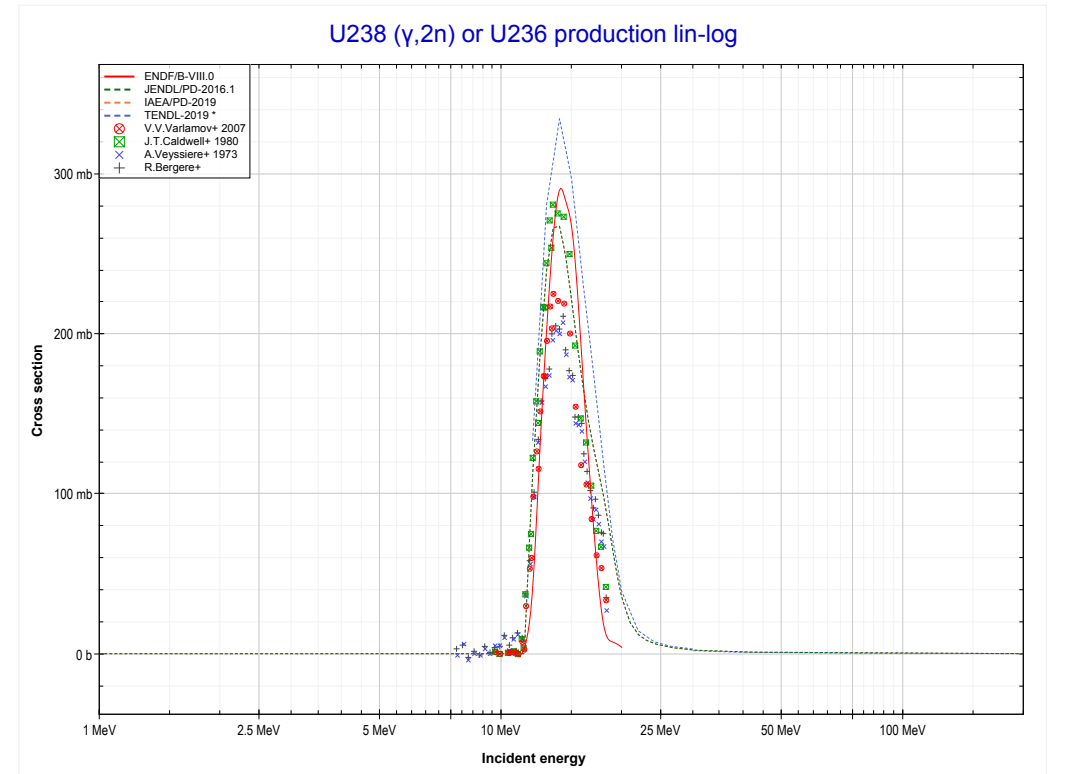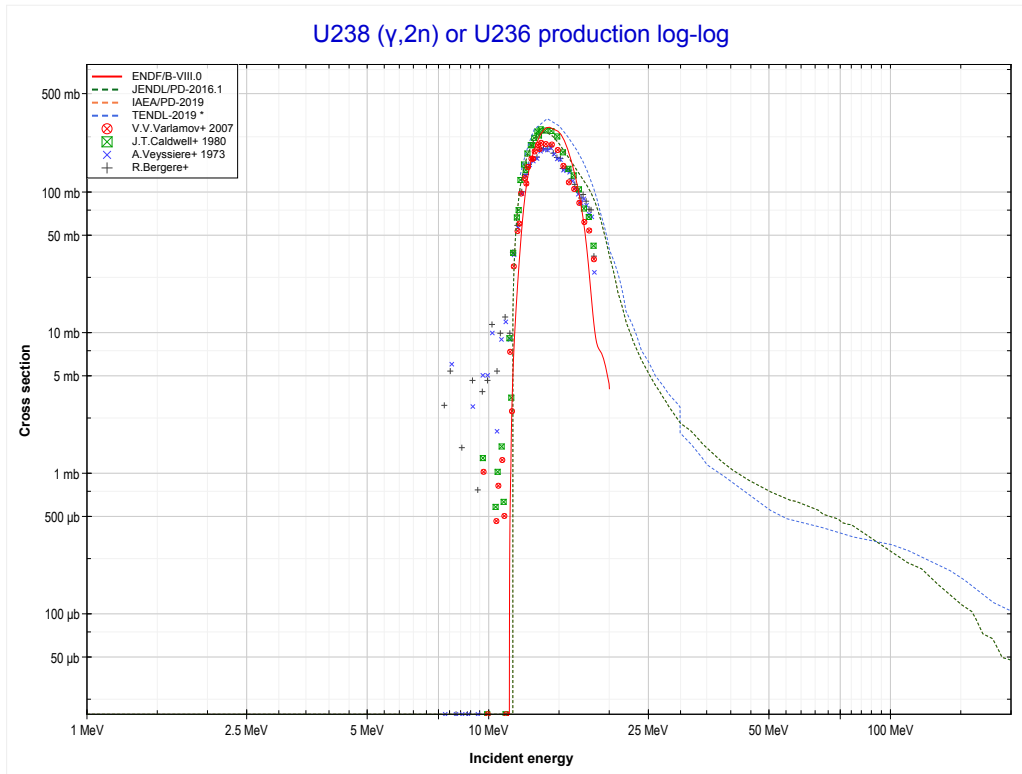
Reaction	Q-Value
U238(γ,2n)U236	-11279.43 keV

<< 92-U-236	**92-U-238**	93-Np-237 >>
<< MT16 (γ,2n)	**MT18 (γ,fission)**	93-Np-237 MT4 (γ,n) >>

U238 (γ,fission) log-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019

U238 (γ,fission) lin-log

Legend:
- ENDF/B-VIII.0
- JENDL/PD-2016.1
- IAEA/PD-2019
- TENDL-2019

Np237 (γ,n) or Np236 production log-log

Np237 (γ,n) or Np236 production lin-log

Reaction	Q-Value
Np237(γ,n)Np236	-6579.62 keV

<< 92-U-238	**93-Np-237**	94-Pu-239 >>
<< MT4 (γ,n)	**MT16 (γ,2n) or MT5 (Np235 production)**	MT18 (γ,fission) >>

Np237 (γ,2n) or Np235 production log-log

Np237 (γ,2n) or Np235 production lin-log

Reaction	Q-Value
Np237(γ,2n)Np235	-12314.03 keV

Np237 (γ,fission) log-log

Np237 (γ,fission) lin-log
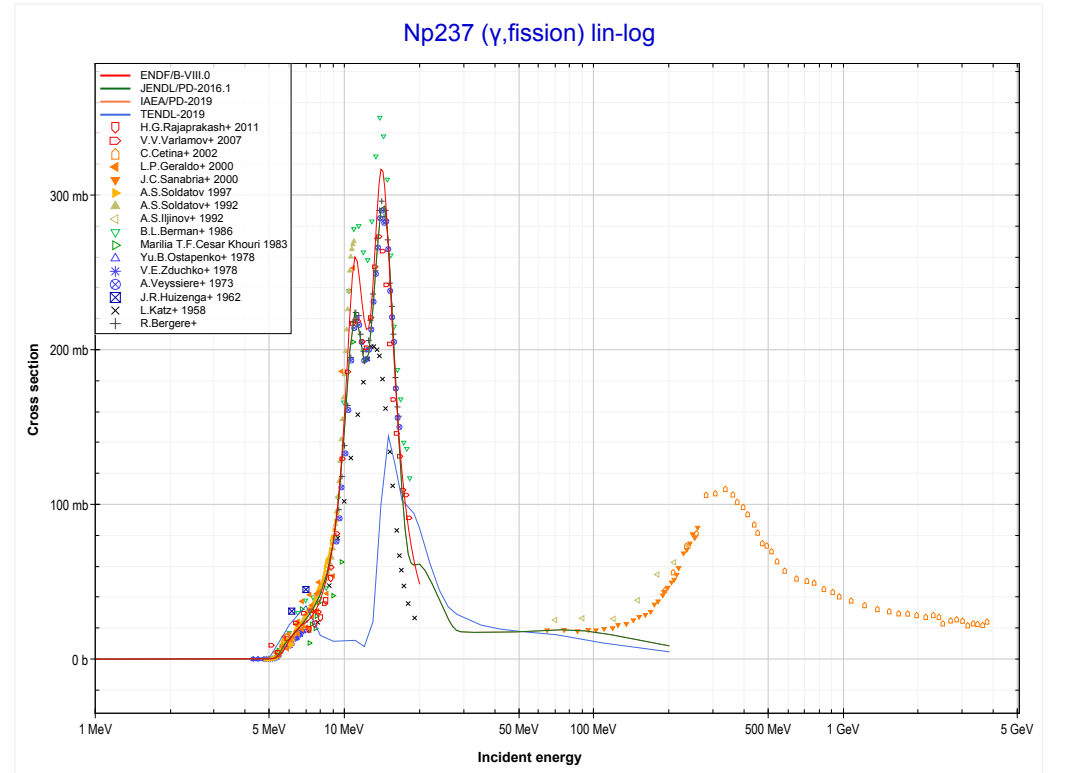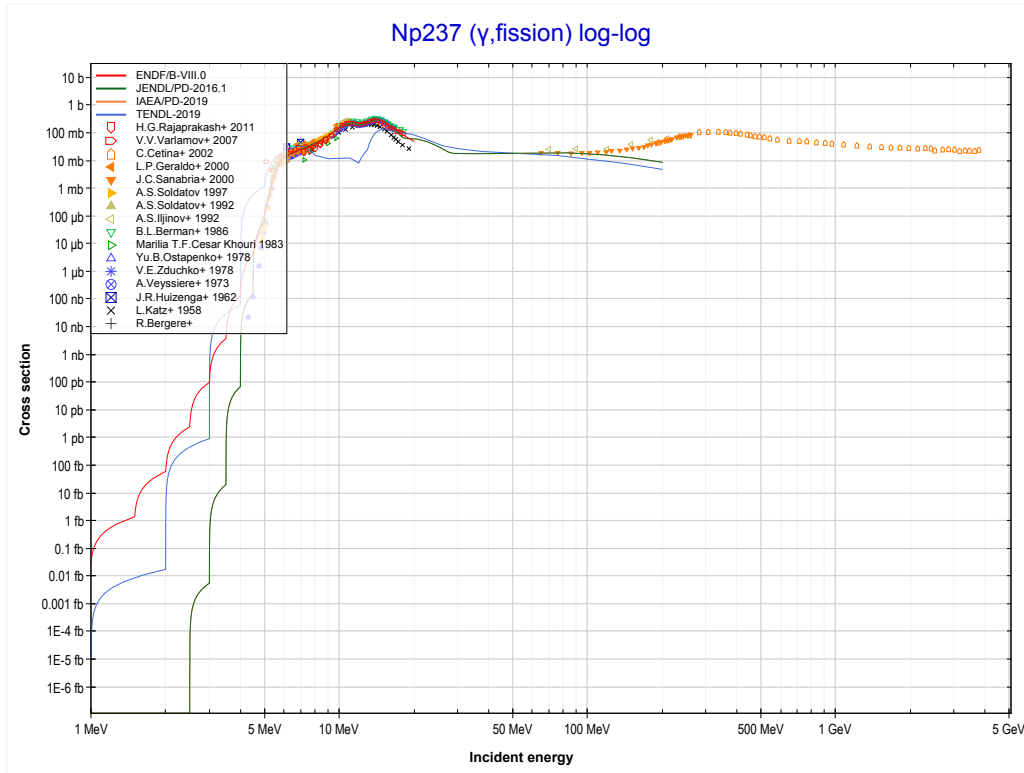
<< 93-Np-237	**94-Pu-238**	94-Pu-239 >>
<< 93-Np-237 MT18 (γ,fission)	**MT18 (γ,fission)**	94-Pu-239 MT4 (γ,n) >>

Pu238 (γ,fission) log-log

Pu238 (γ,fission) lin-log
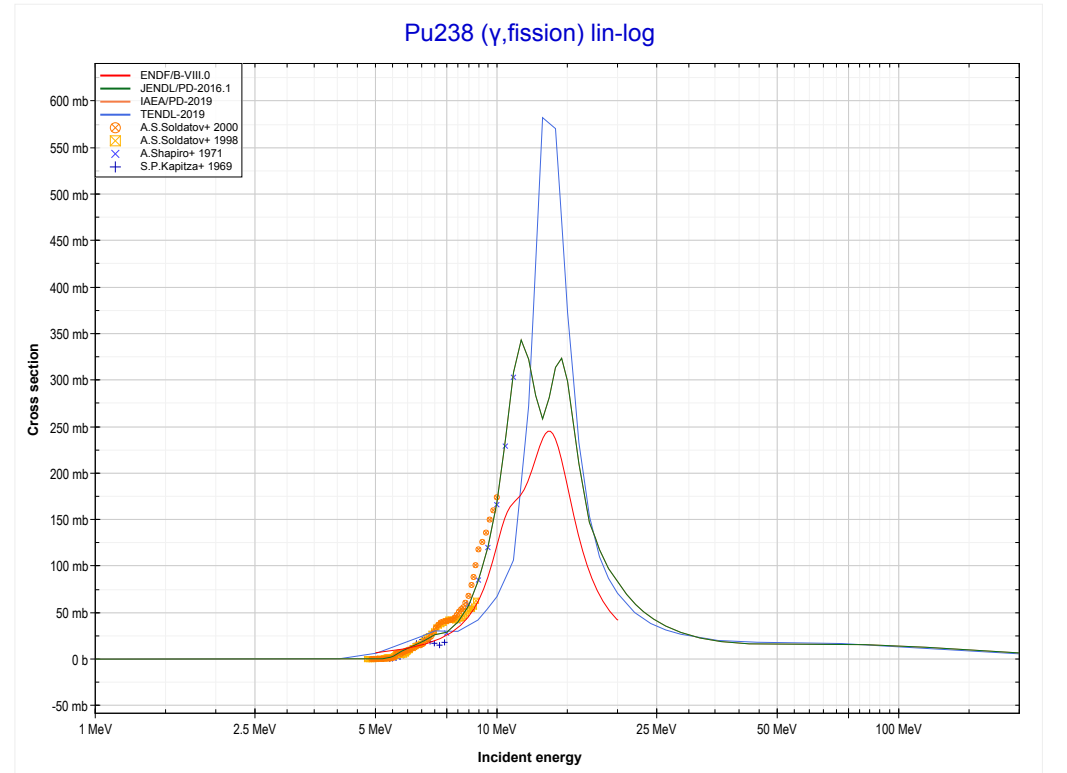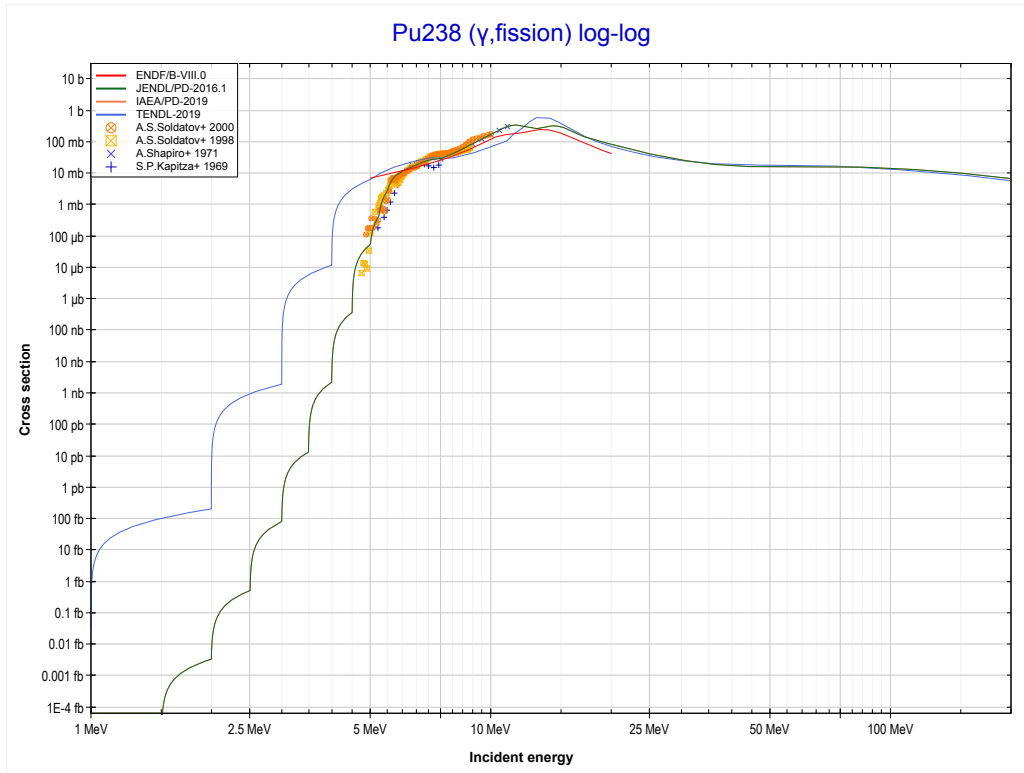
<< 93-Np-237 >>	**94-Pu-239**	95-Am-241 >>
<< 94-Pu-238 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (Pu238 production)**	MT16 (γ,2n) >>

Pu239 (γ,n) or Pu238 production log-log

Pu239 (γ,n) or Pu238 production lin-log
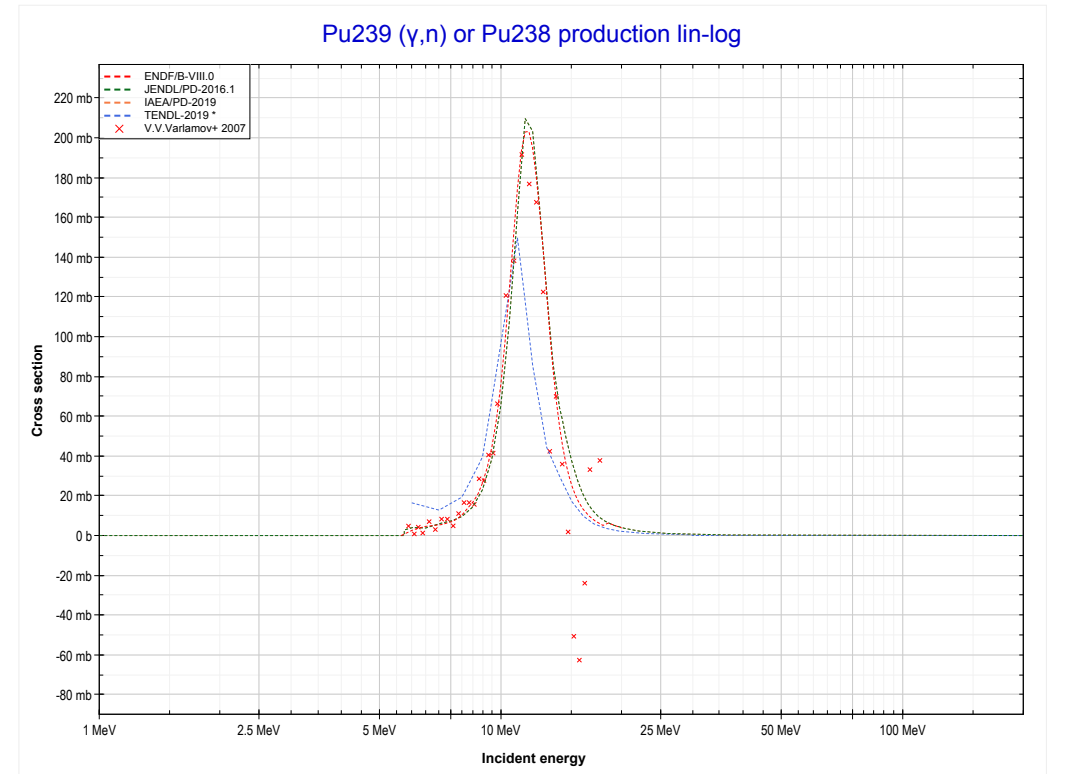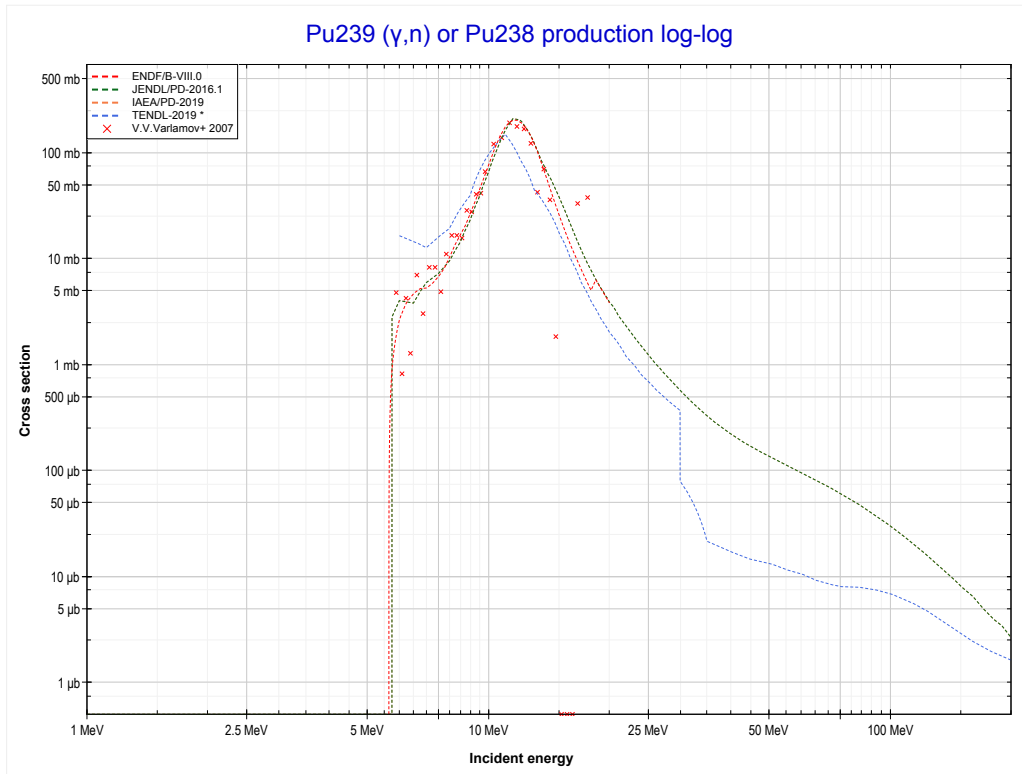
Reaction	Q-Value
Pu239(γ,n)Pu238	-5646.22 keV

<< 93-Np-237	94-Pu-239	
<< MT4 (γ,n)	MT16 (γ,2n) or MT5 (Pu237 production)	MT18 (γ,fission) >>

Pu239 (γ,2n) or Pu237 production log-log

Pu239 (γ,2n) or Pu237 production lin-log

Reaction	Q-Value
Pu239(γ,2n)Pu237	-12646.03 keV

Pu239 (γ,fission) log-log

Pu239 (γ,fission) lin-log

<< 94-Pu-239	**94-Pu-240**	94-Pu-241 >>
<< 94-Pu-239 MT18 (γ,fission)	**MT18 (γ,fission)**	94-Pu-241 MT18 (γ,fission) >>

Pu240 (γ,fission) log-log

Pu240 (γ,fission) lin-log

Pu241 (γ,fission) log-log

Pu241 (γ,fission) lin-log

Pu242 (γ,fission) log-log

Pu242 (γ,fission) lin-log
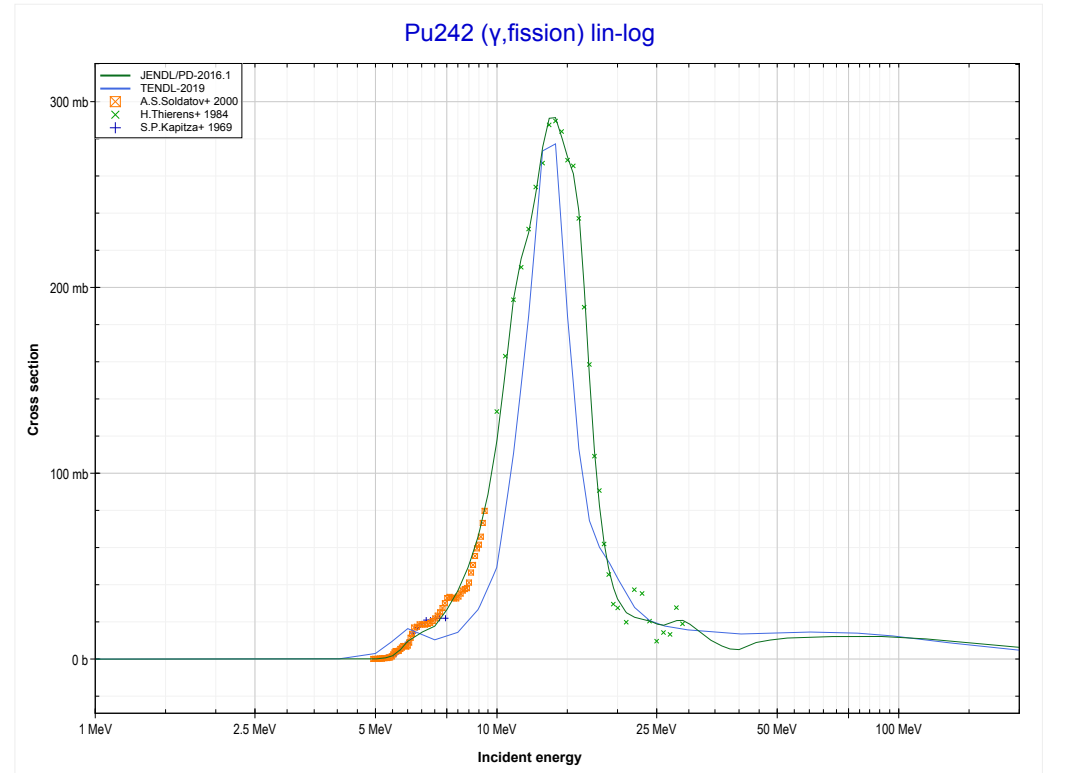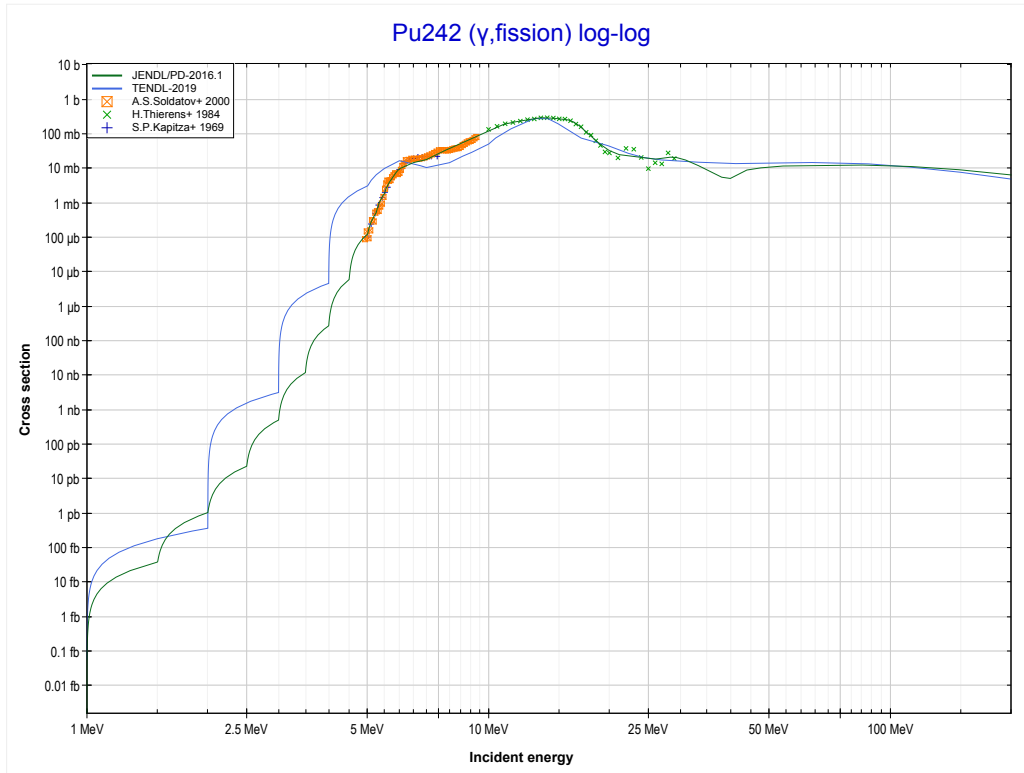
<< 94-Pu-242	**94-Pu-244**	95-Am-241 >>
<< 94-Pu-242 MT18 (γ,fission)	**MT18 (γ,fission)**	95-Am-241 MT4 (γ,n) >>

Pu244 (γ,fission) log-log

Pu244 (γ,fission) lin-log
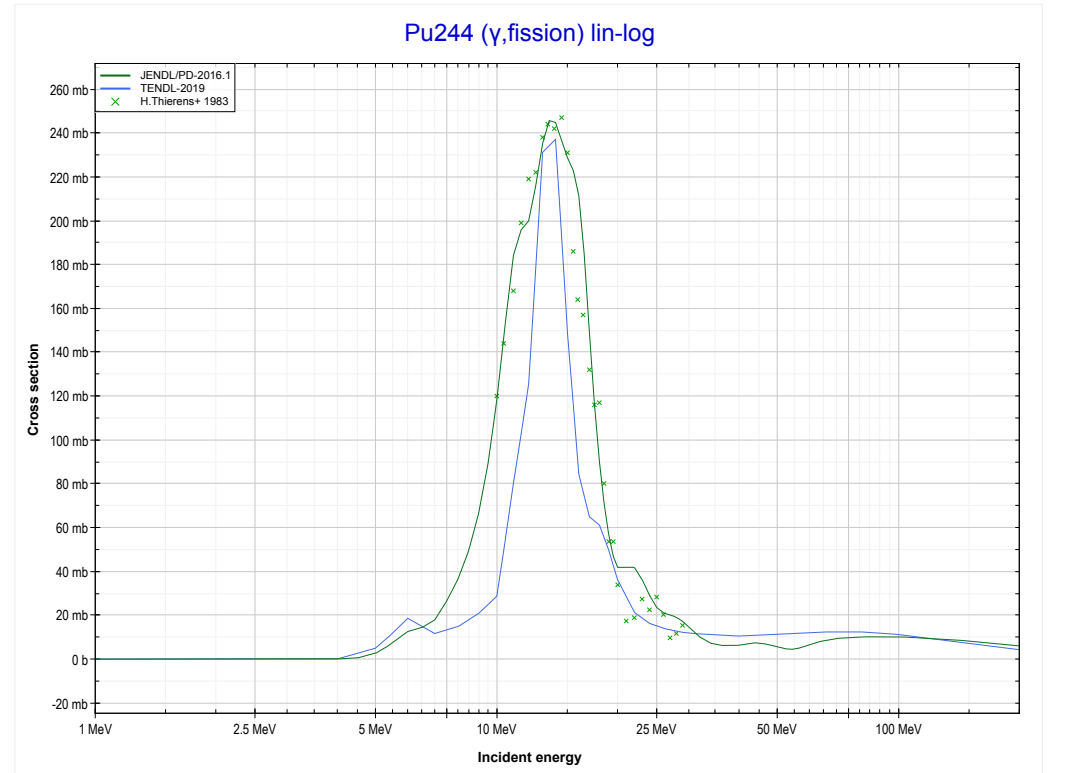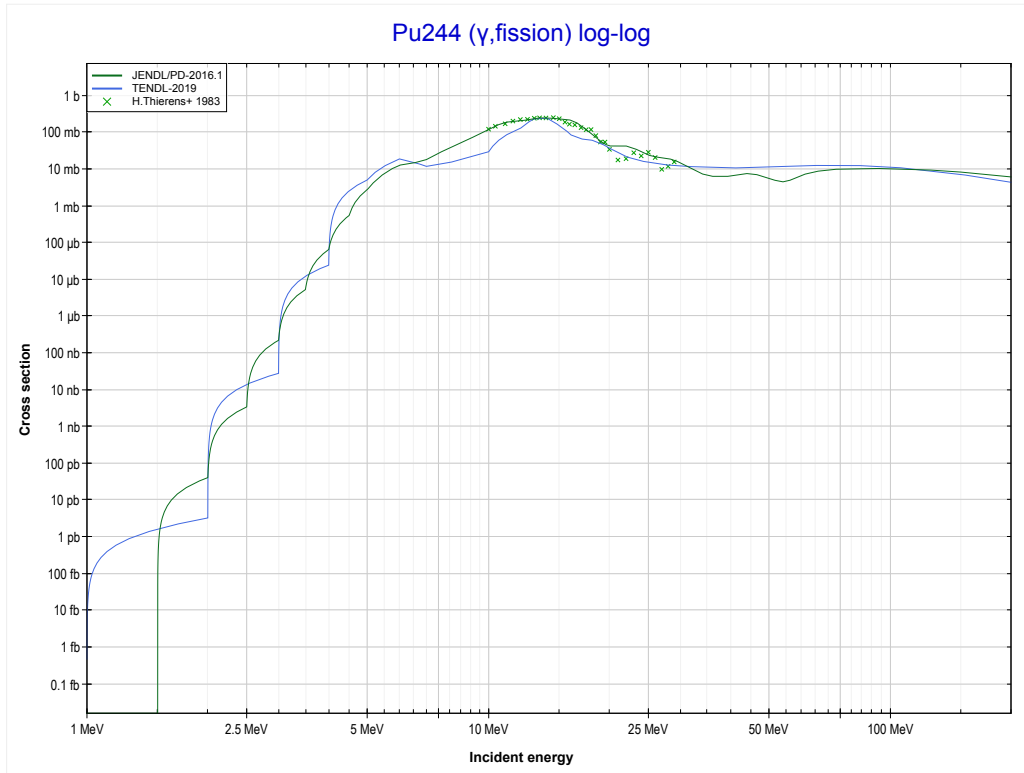
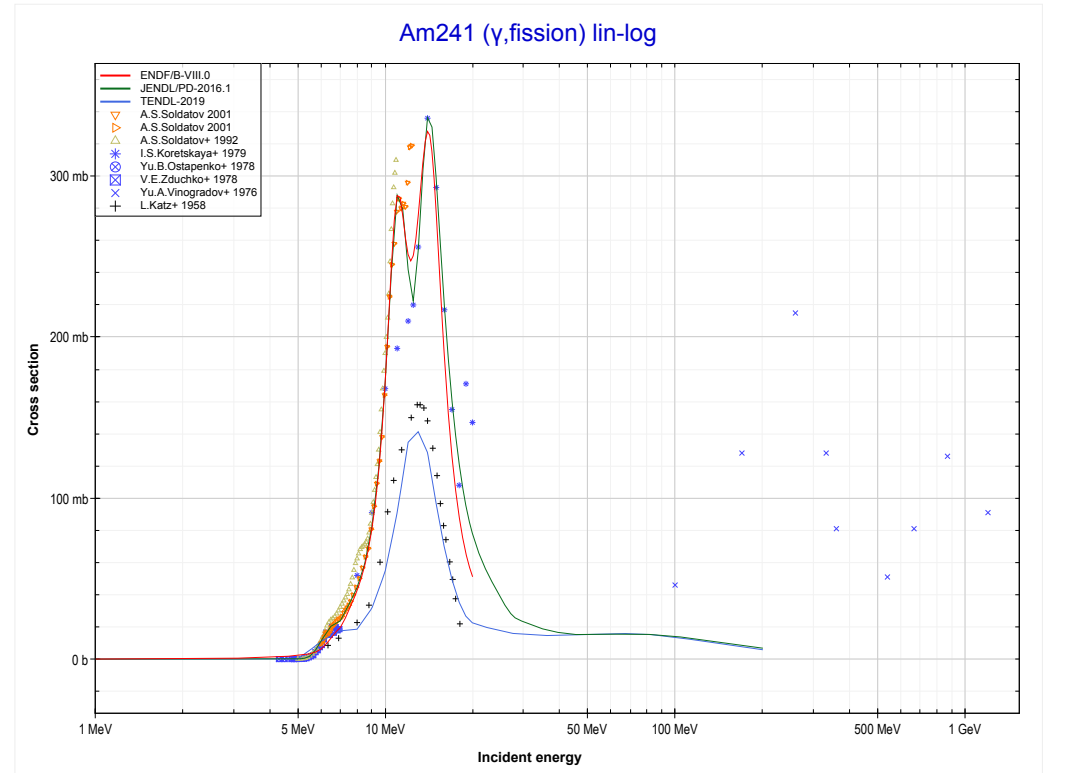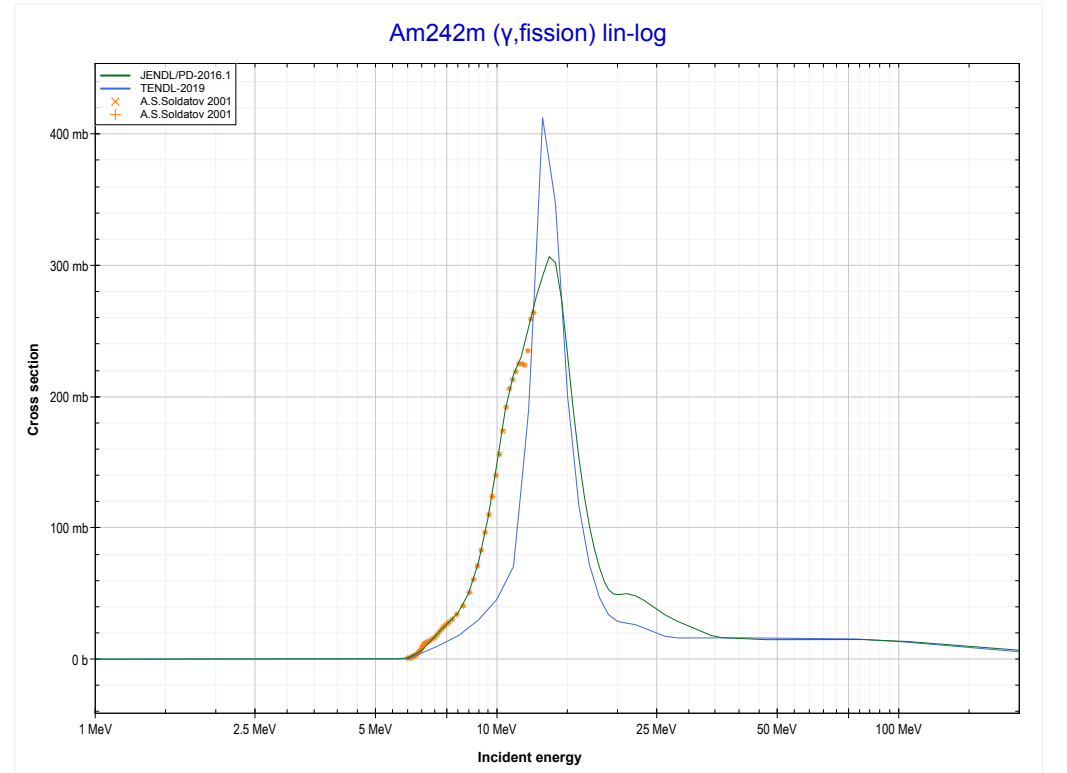| << 94-Pu-239	**95-Am-241**	95-Am-243 >>
<< 94-Pu-244 MT18 (γ,fission)	**MT4 (γ,n) or MT5 (Am240 production)**	MT18 (γ,fission) >>

Am241 (γ,n) or Am240 production log-log

Am241 (γ,n) or Am240 production lin-log
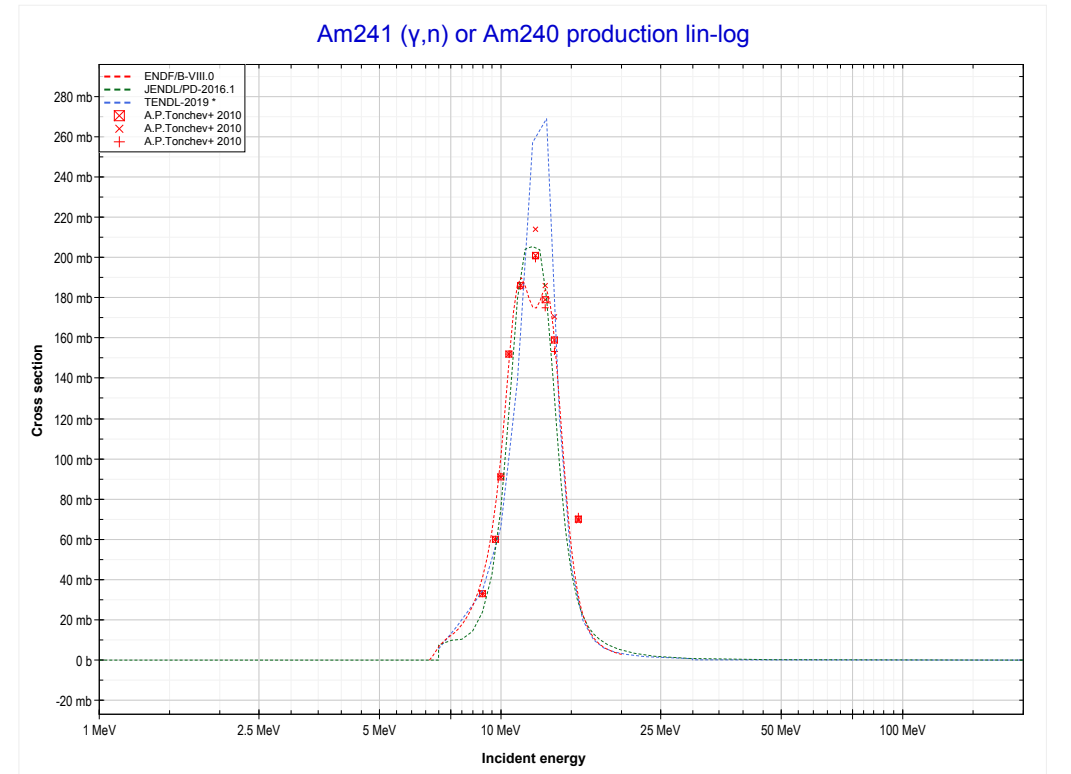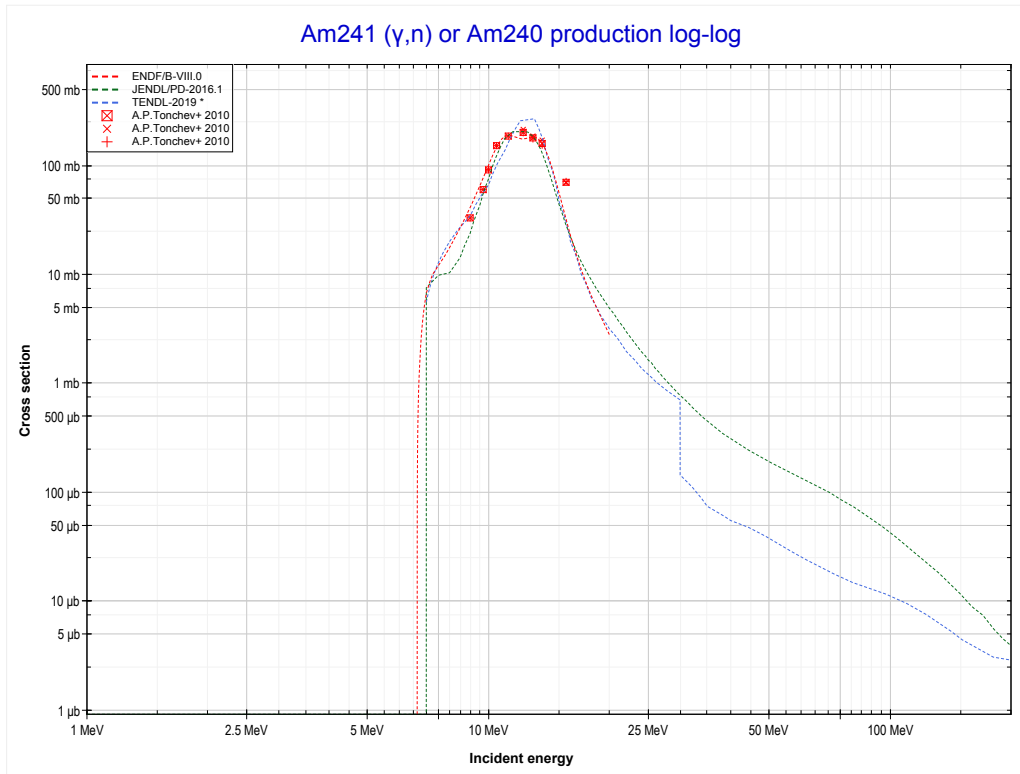
Reaction	Q-Value
Am241(γ,n)Am240	-6646.92 keV

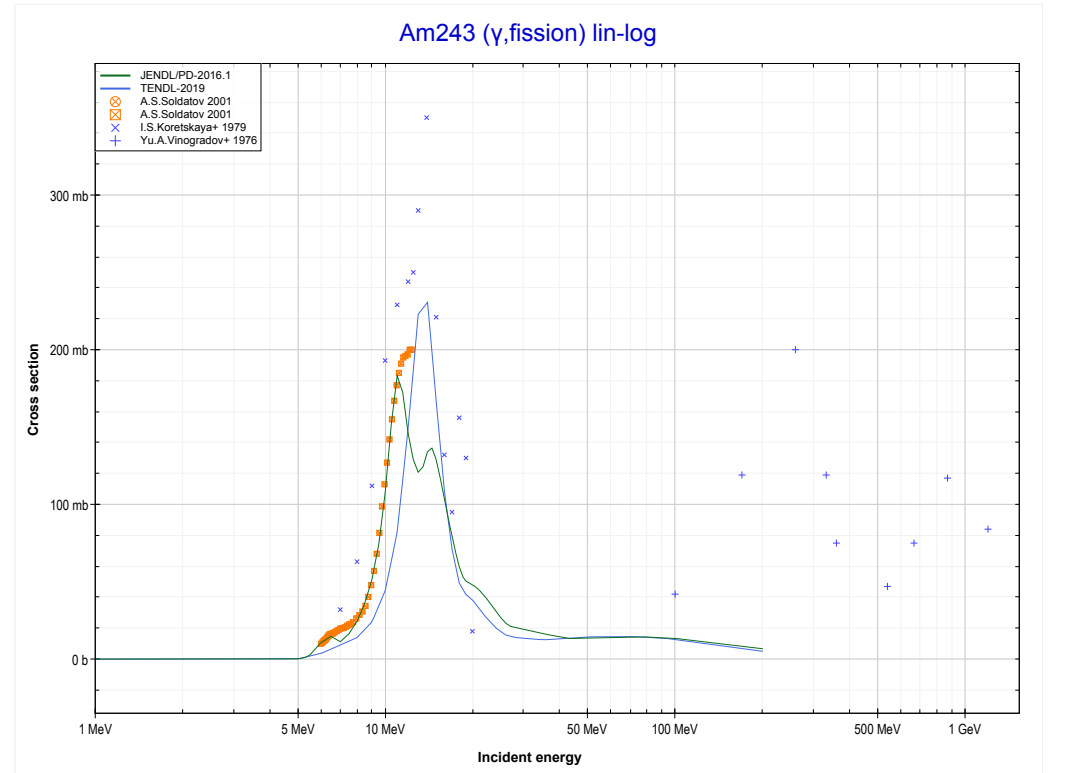| << 94-Pu-244	**95-Am-241**	95-Am-242m >>
<< MT4 (γ,n)	**MT18 (γ,fission)**	95-Am-242m MT18 (γ,fission) >>

Am241 (γ,fission) log-log

Am241 (γ,fission) lin-log
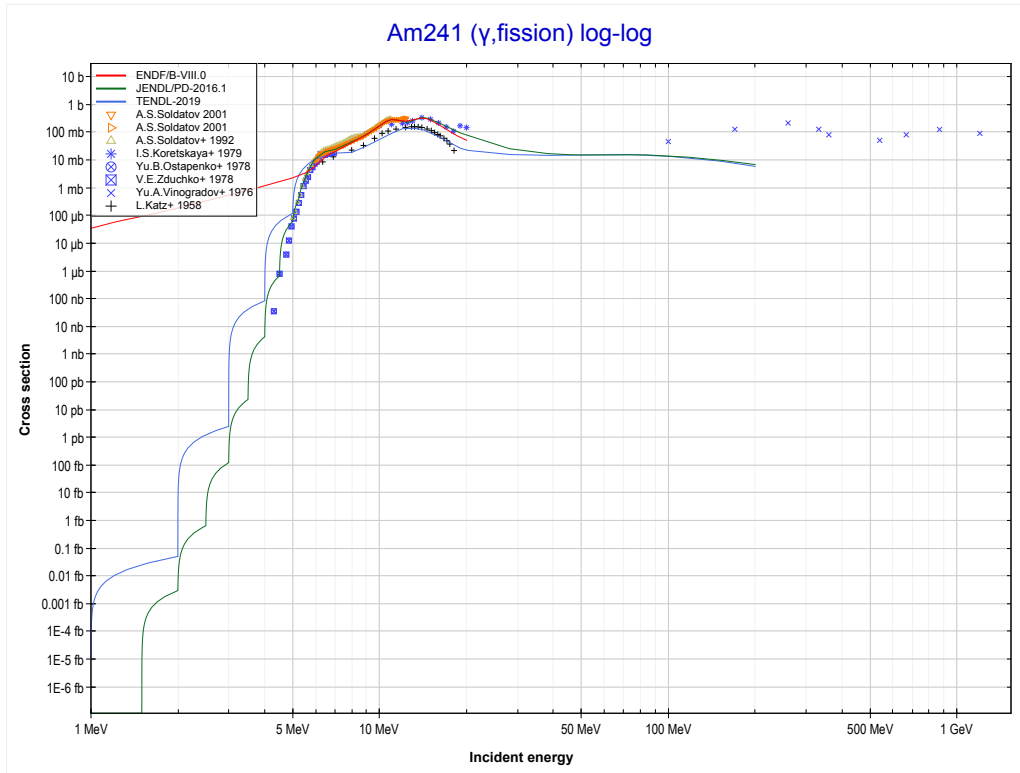
<< 95-Am-241	**95-Am-242m**	95-Am-243 >>
<< 95-Am-241 MT18 (γ,fission)	**MT18 (γ,fission)**	95-Am-243 MT4 (γ,n) >>

Am242m (γ,fission) log-log

Am242m (γ,fission) lin-log
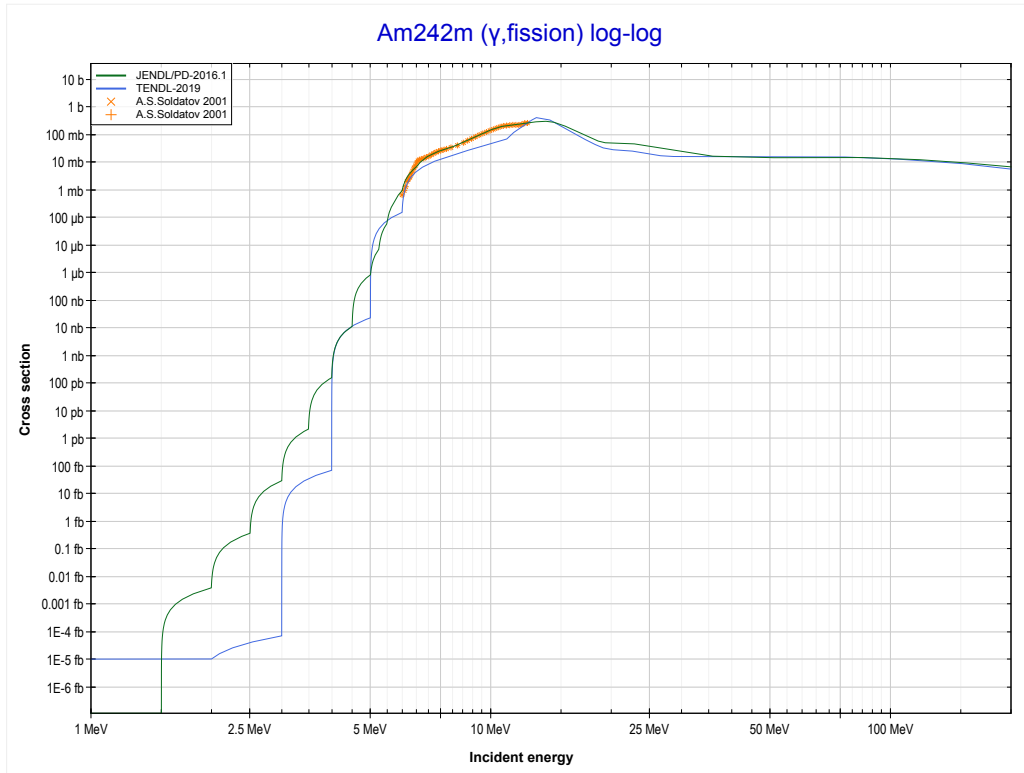
<< 95-Am-241	**95-Am-243**	
<< 95-Am-242m MT18 (γ,fission)	**MT4 (γ,n) or MT5 (Am242 production)**	MT18 (γ,fission) >>

Am243 (γ,n) or Am242 production log-log

Am243 (γ,n) or Am242 production lin-log
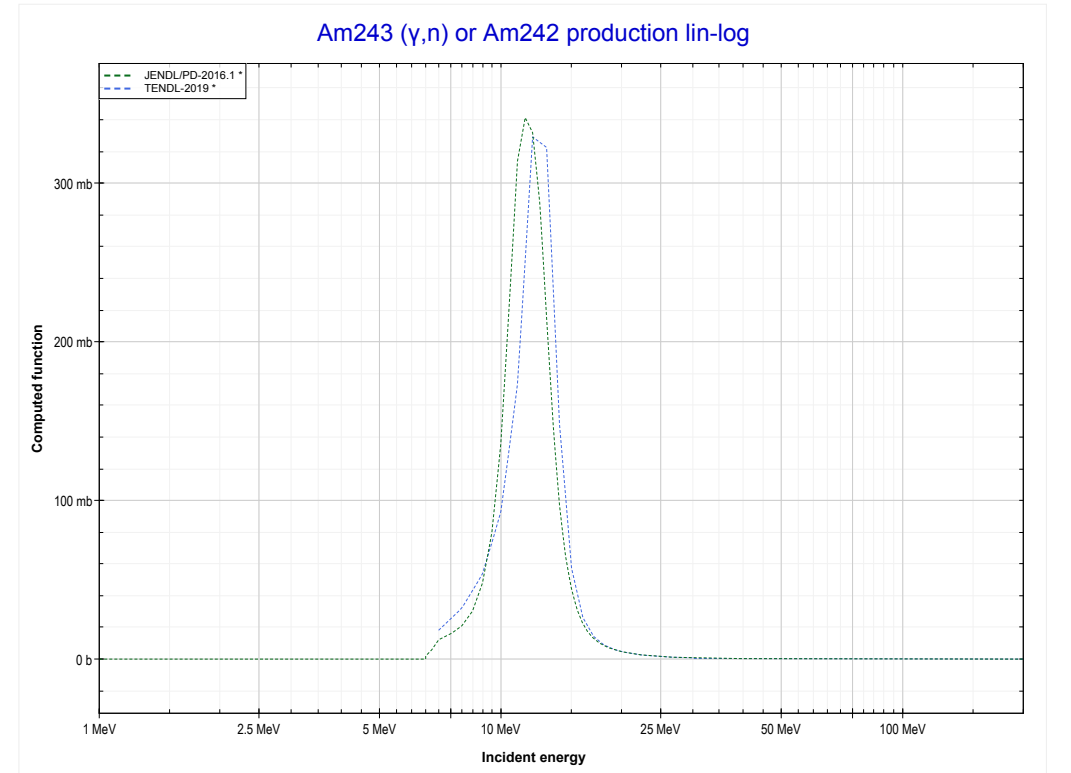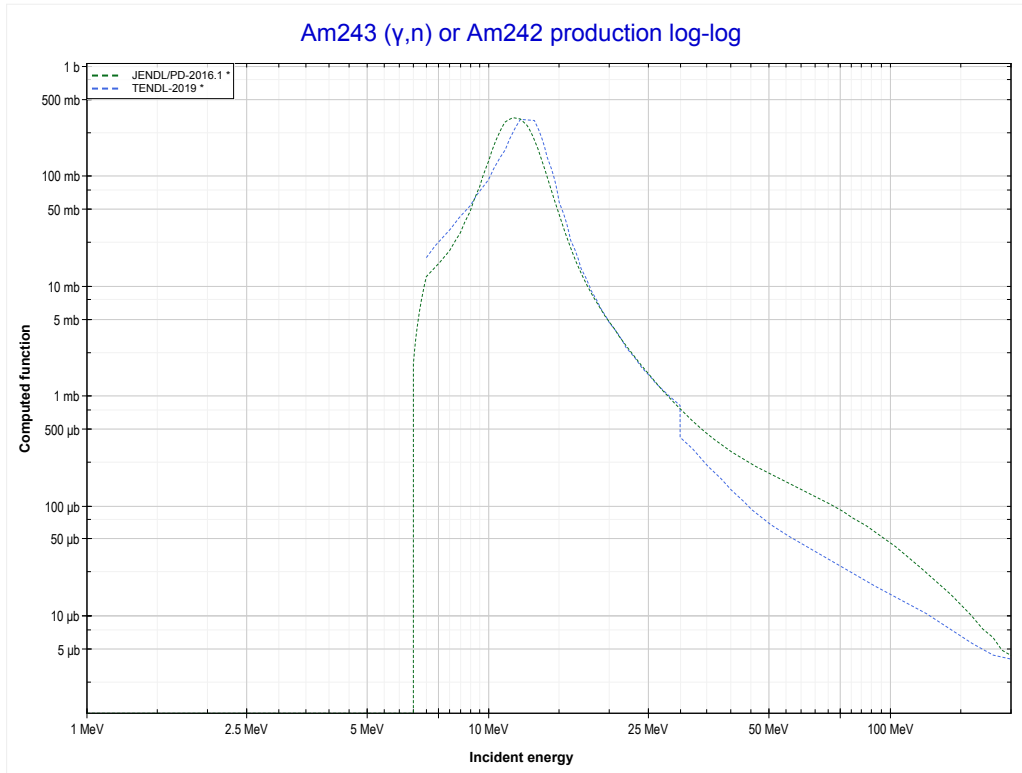
Reaction	Q-Value
Am243(γ,n)Am242	-6364.42 keV

<< 95-Am-242m	**95-Am-243**	96-Cm-243 >>
<< MT4 (γ,n)	**MT18 (γ,fission)**	96-Cm-243 MT18 (γ,fission) >>

Am243 (γ,fission) log-log

Am243 (γ,fission) lin-log
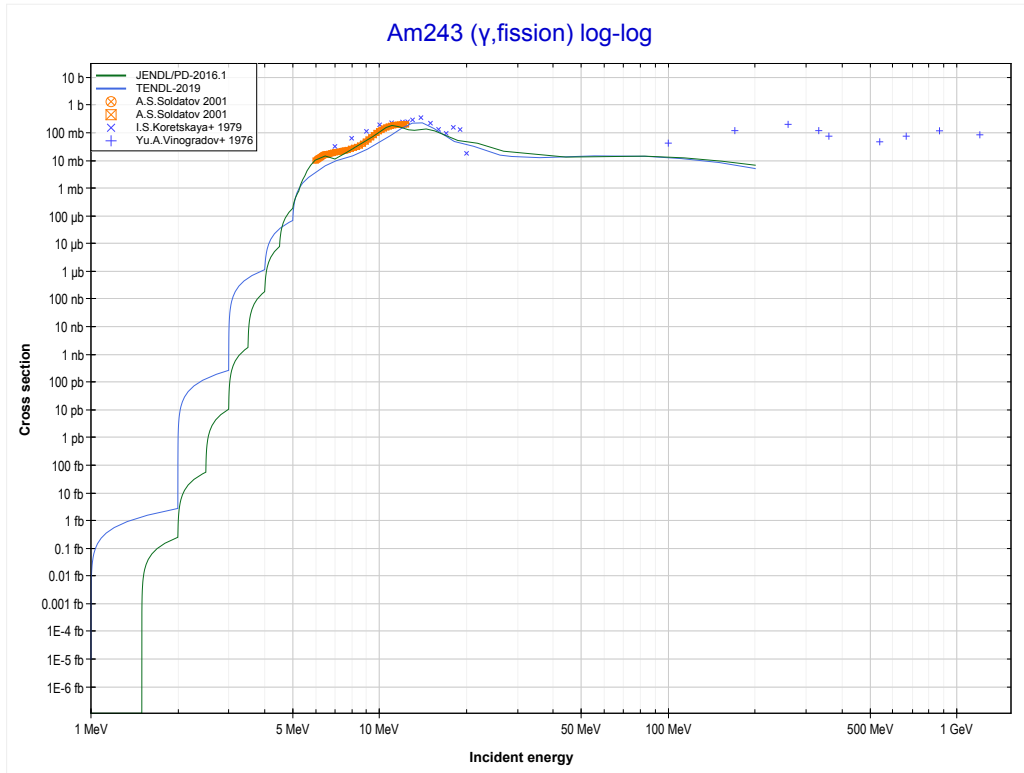
<< 95-Am-243	**96-Cm-243**	96-Cm-245 >>
<< 95-Am-243 MT18 (γ,fission)	**MT18 (γ,fission)**	96-Cm-245 MT18 (γ,fission) >>

Cm243 (γ,fission) log-log

Cm243 (γ,fission) lin-log
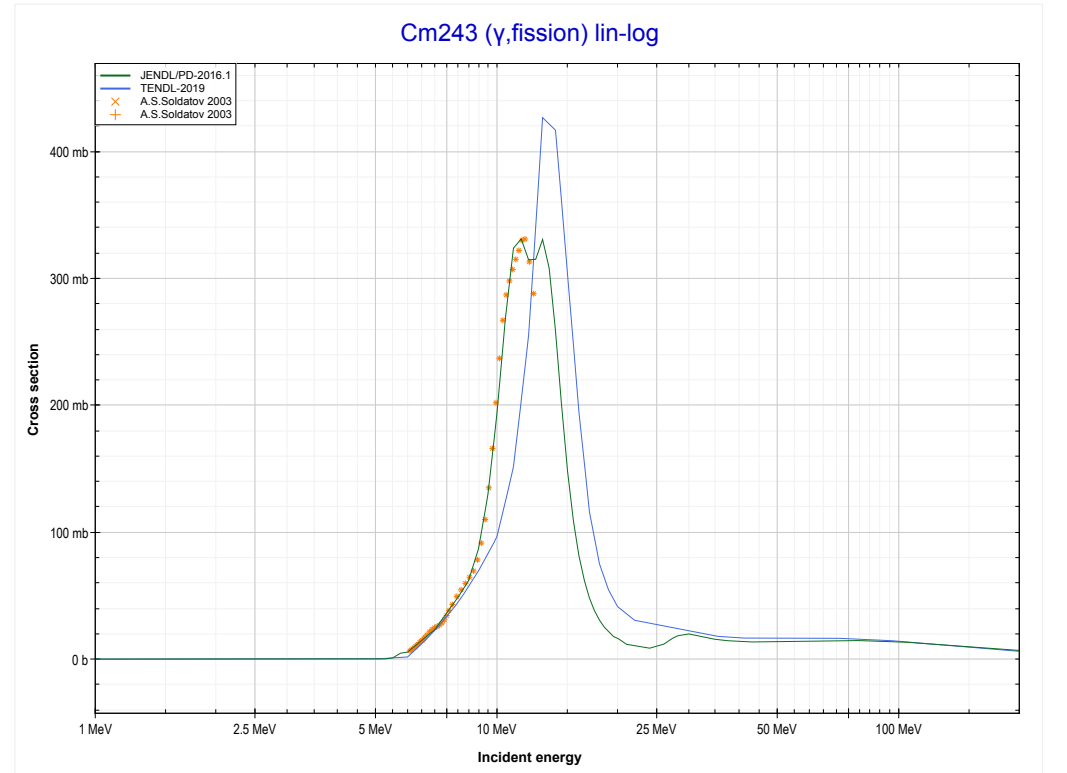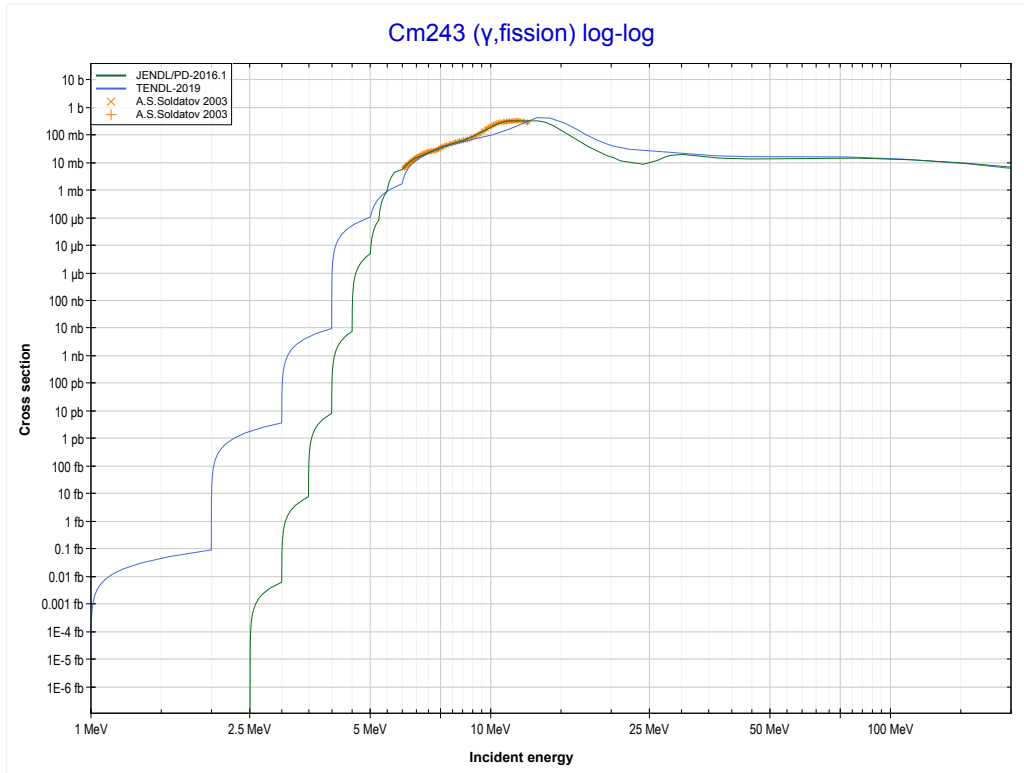
| << 96-Cm-243 | **96-Cm-245** | 97-Bk-249 >> |
| << 96-Cm-243 MT18 (γ,fission) | **MT18 (γ,fission)** | 97-Bk-249 MT18 (γ,fission) >> |

Cm245 (γ,fission) log-log

Cm245 (γ,fission) lin-log
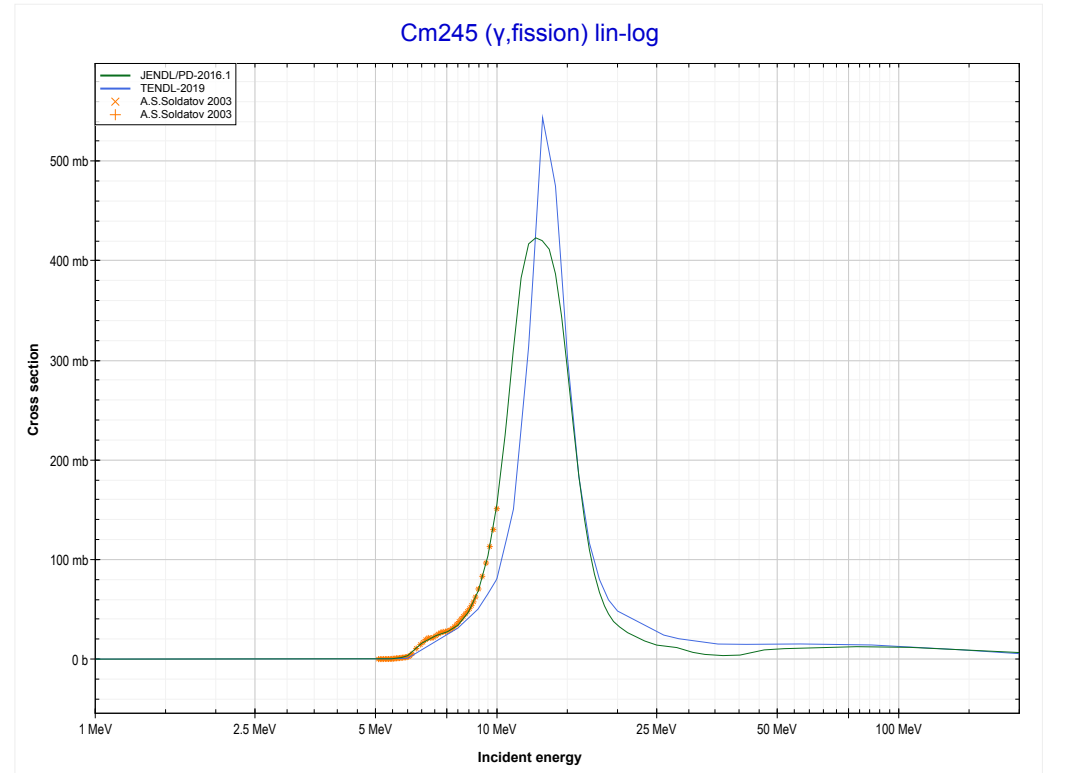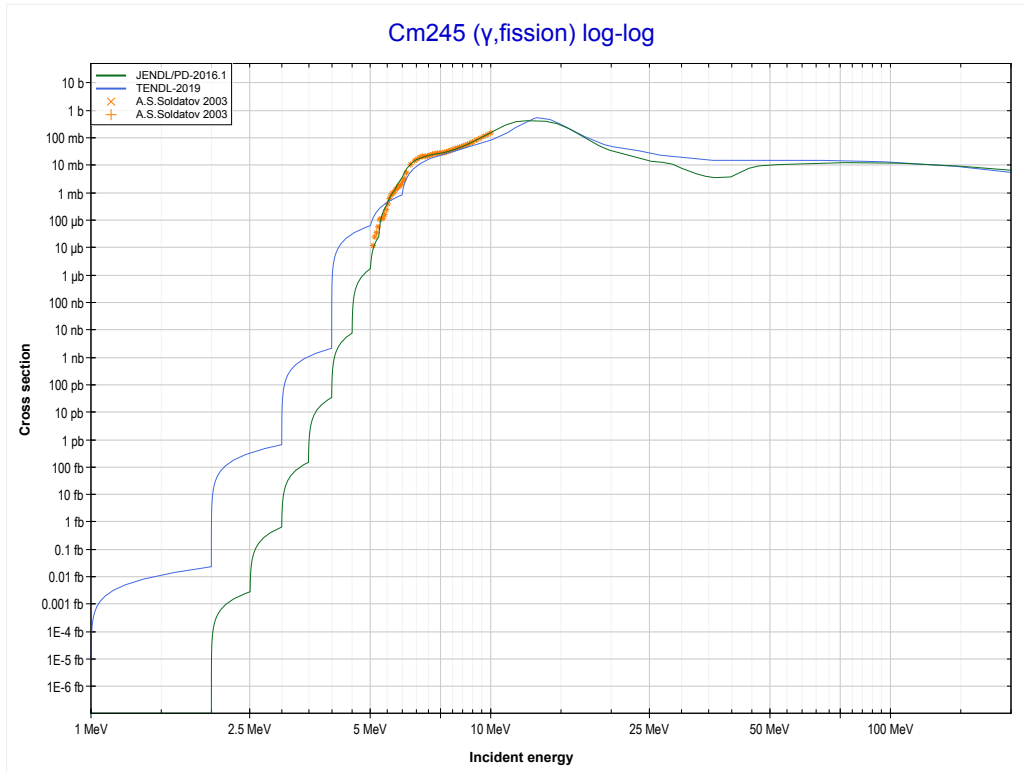
<< 96-Cm-245	**97-Bk-249**	98-Cf-249 >>
<< 96-Cm-245 MT18 (γ,fission)	**MT18 (γ,fission)**	98-Cf-249 MT18 (γ,fission) >>

Bk249 (γ,fission) log-log

Bk249 (γ,fission) lin-log
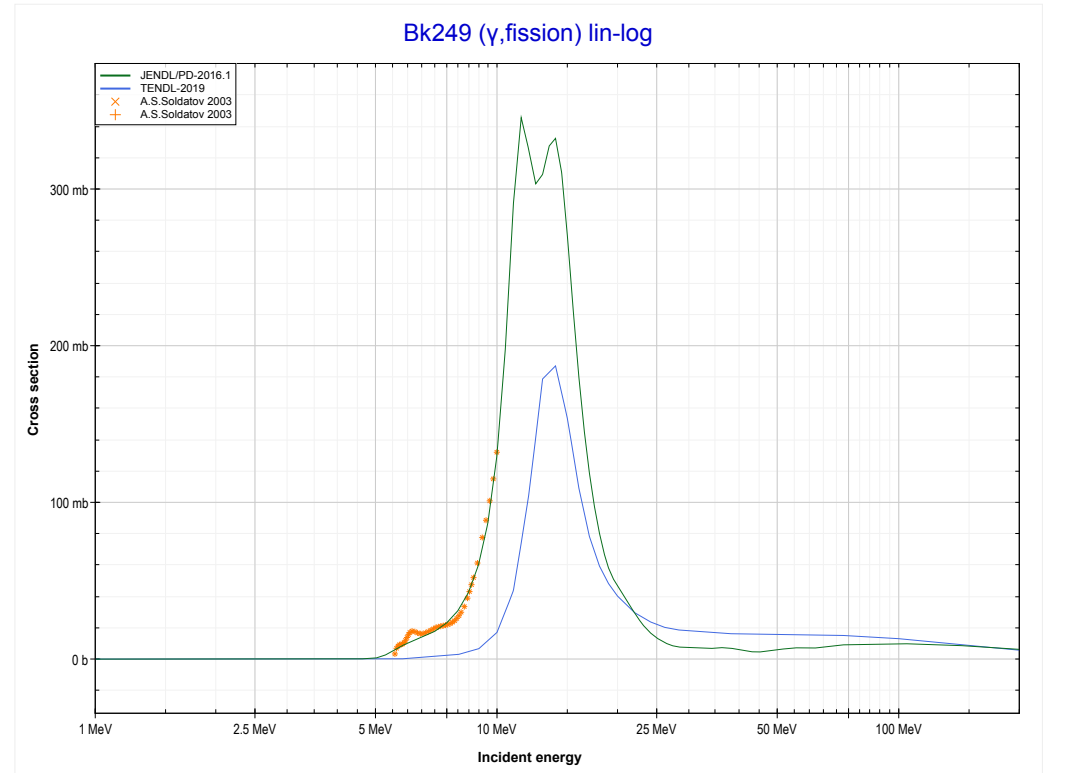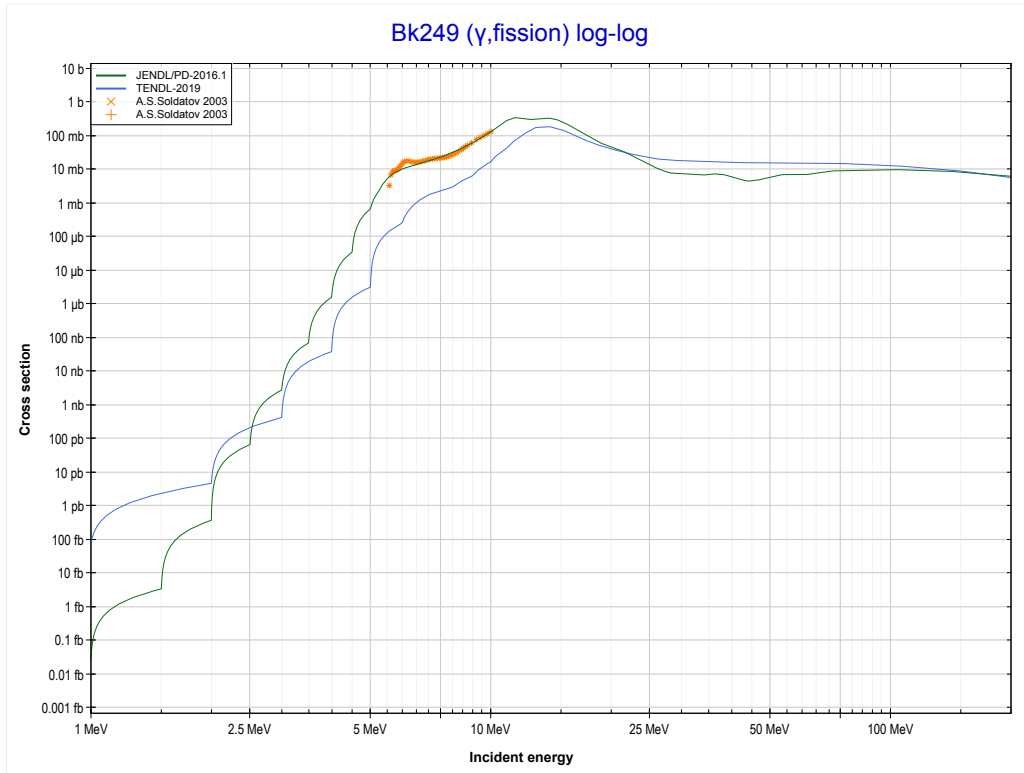
<< 97-Bk-249	**98-Cf-249**	
<< 97-Bk-249 MT18 (γ,fission)	**MT18 (γ,fission)**	

Cf249 (γ,fission) log-log

Cf249 (γ,fission) lin-log