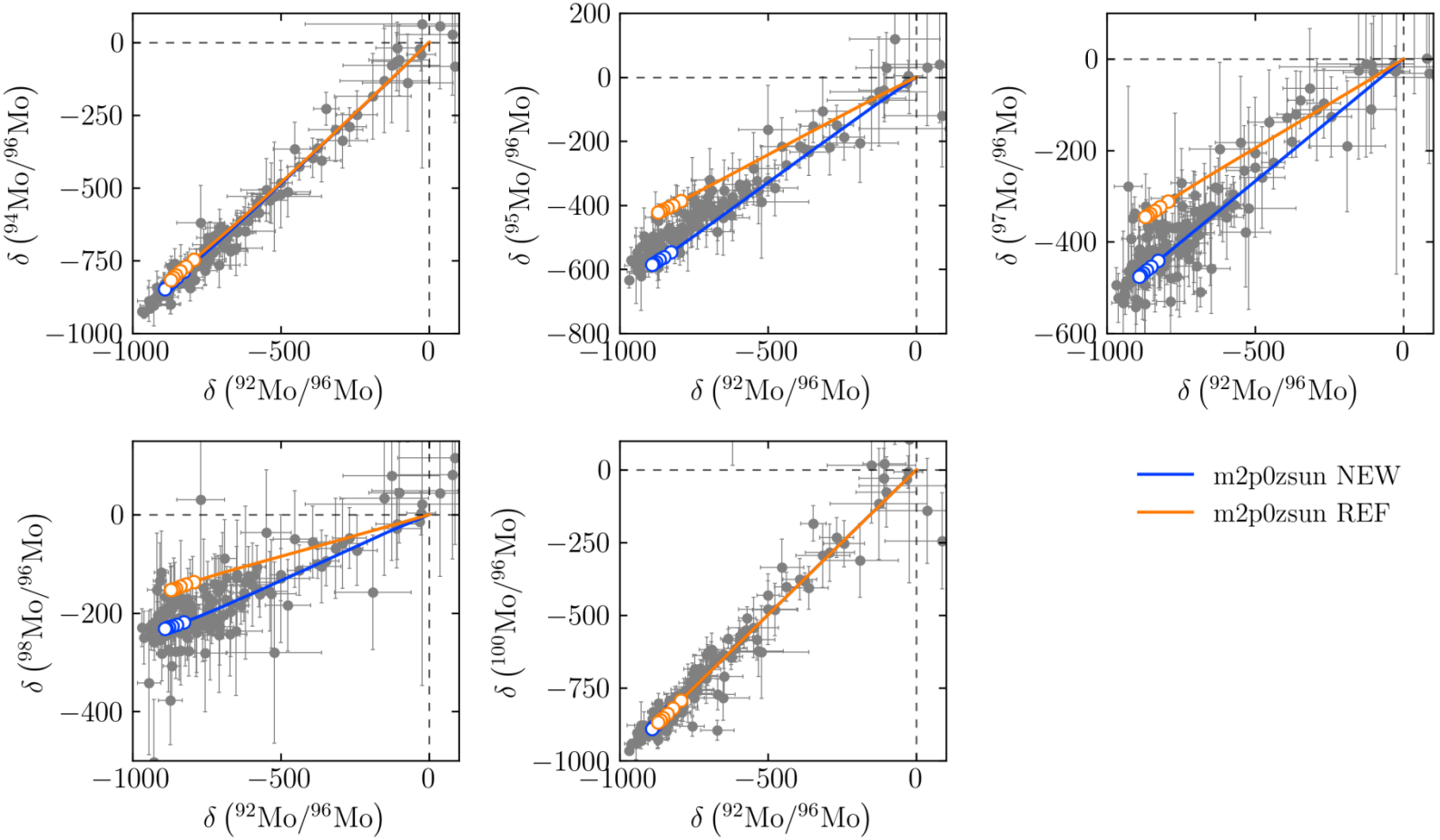
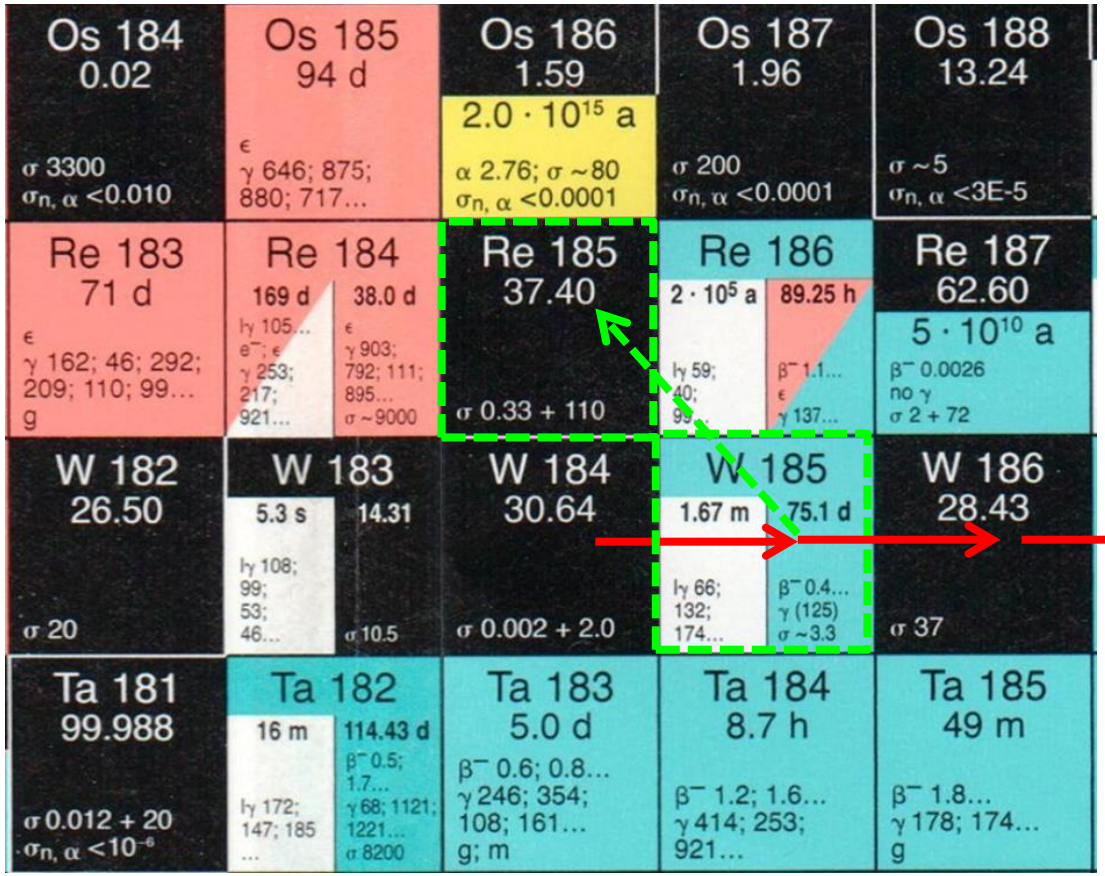
Idee x nuove misure

D. Vescovi
S. Cristallo

Da ieri…


δ (94Mo/96Mo)
δ (95Mo/96Mo)
δ (97Mo/96Mo)
δ (98Mo/96Mo)
δ (100Mo/96Mo)
δ (92Mo/96Mo)
m2p0zsun NEW
m2p0zsun REF

^{184,185,186}W(n,γ)



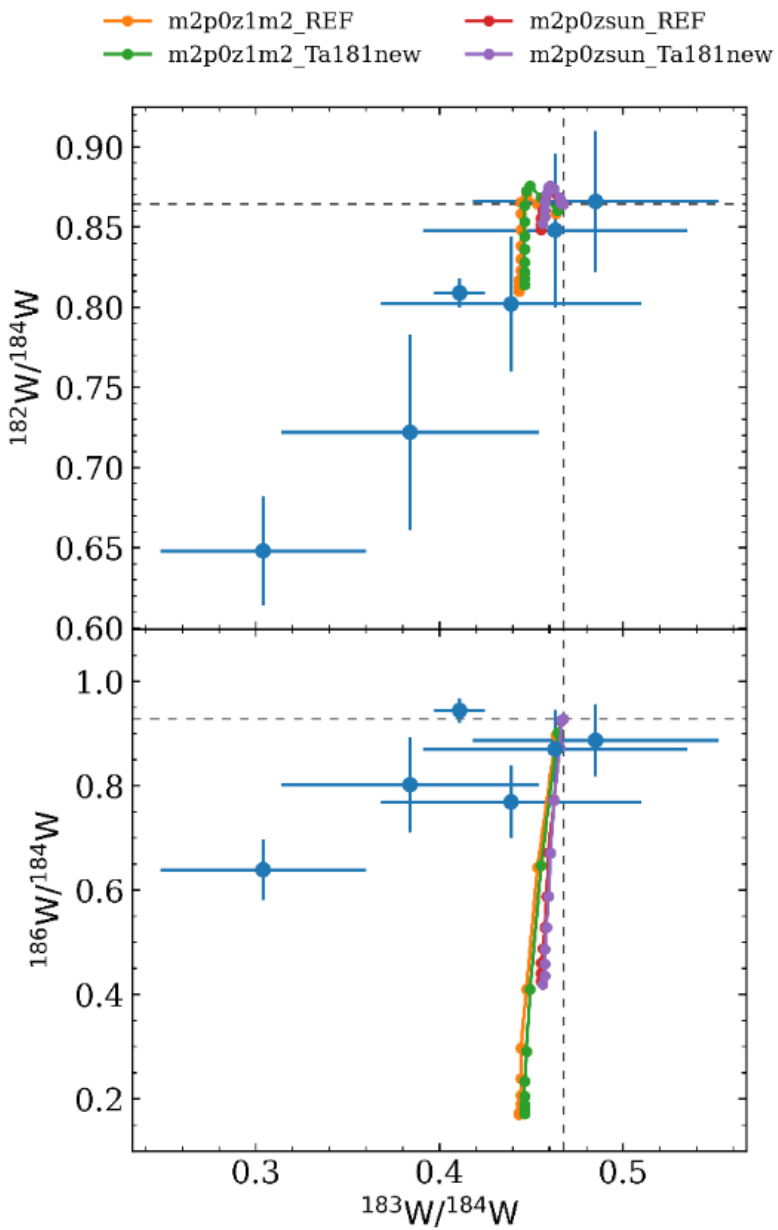
EAR1,

EAR2

oppure

NEAR?

Tungsten isotopes: why?



Literature

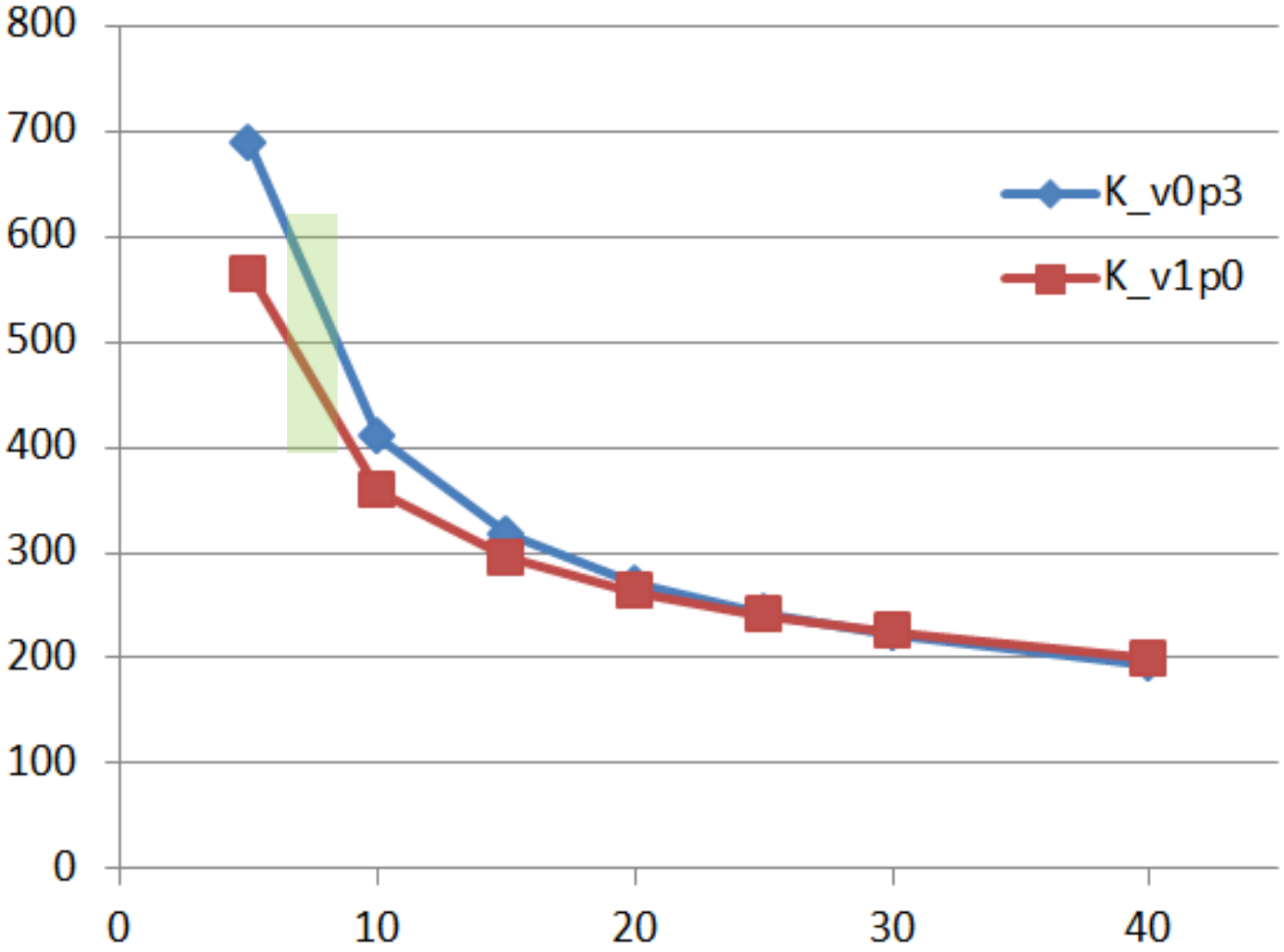
List of all available values

original	renorm.	year	type	Comment	Ref
225 ± 27		2009,2013	r	VdG, Act., Au:RaK88; en. dep. from jeff31,endfb71,jendl40	MDD09b
222 ± 15		2009	c	VdG, Act., Au:RaK88	MDD09b
229 ± 11 E(n)= 31.5 (35) keV		1987	c	VdG, TOF, ^{7}Li(p,n); Au+Ag+Nd+Ta+W:Sat.	BKK87
217 ± 6		1983	b	Linac, TOF, ^{6}Li, Au:Sat.	MDA83
256 ± 10	238	1982	c	VdG, TOF, Au:B-IV	BKW82
252.2 ± 16.9		2011	e	ENDF/B-VII.1 incl. standard deviation	endfb71
244.2		2011	e	JENDL-4.0	jendl40
222.4		2006	e	ENDF/B-VII.0	endfb7
203.4		2004	e	JEFF-3.1	jeff31
203.4		2002	e	JENDL-3.3	jendl33
286 ± 38		1991	t		KJB91
180 ± 20		1971	e		AGM71
292		2005	t	MOST 2005	Gor05
324		2002	t	MOST 2002	Gor02
266		2000	t	NON-SMOKER	RaT99
234		1981	t		Har81
314		1976	t		HWF76

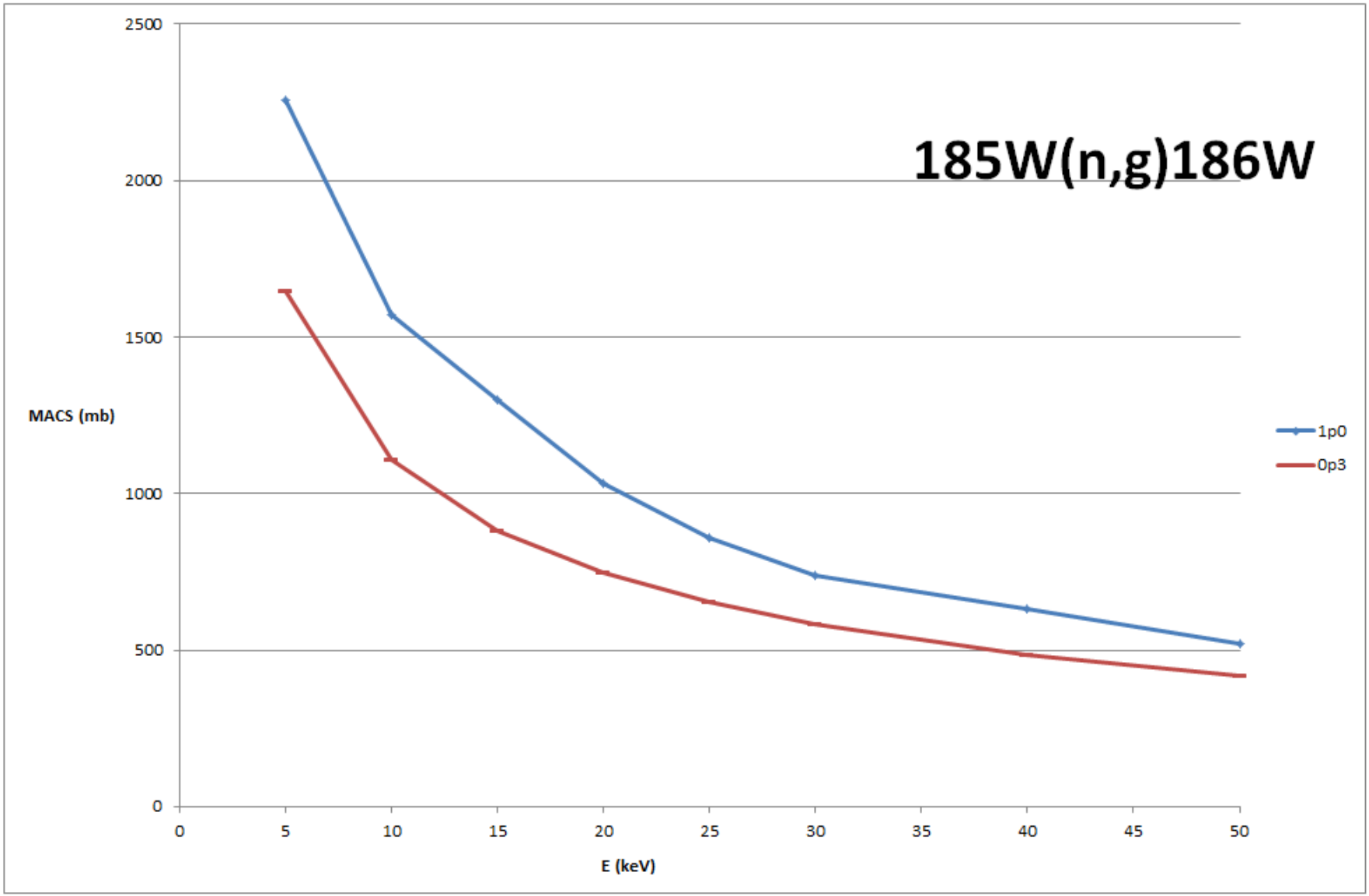
MDD09b = J. Marganiec, I. Dillmann, C. Domingo-Pardo, F. Käppeler, Phys. Rev. C **80**, (2009) 025804.

Tungsten isotopes

184W(n,g)185W



Tungsten isotopes



ASTRAL

ASTrophysical Rate and rAw data Library

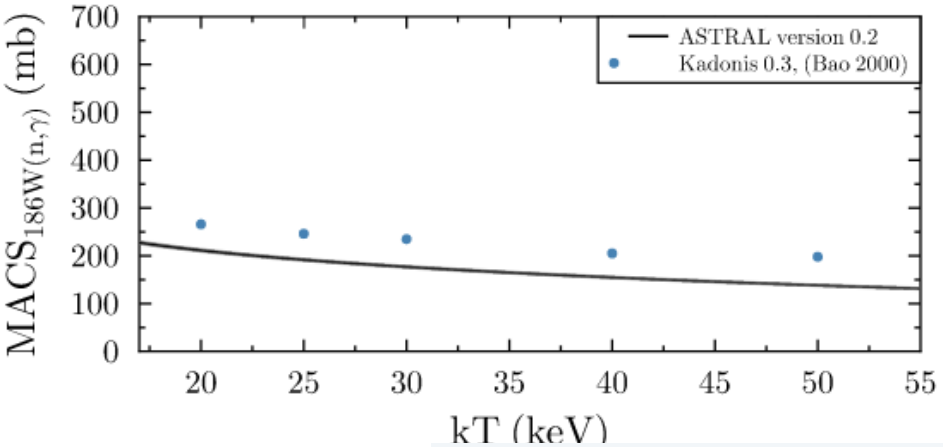
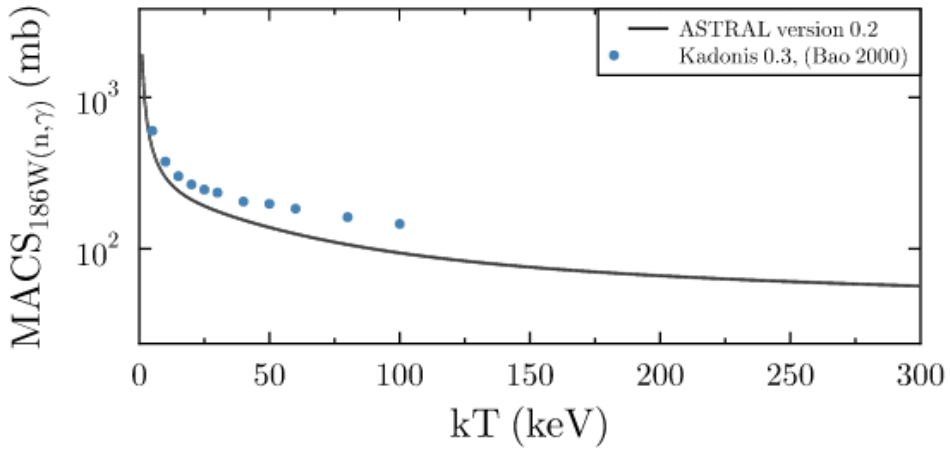


TABLE II. Decay properties of product nuclei.

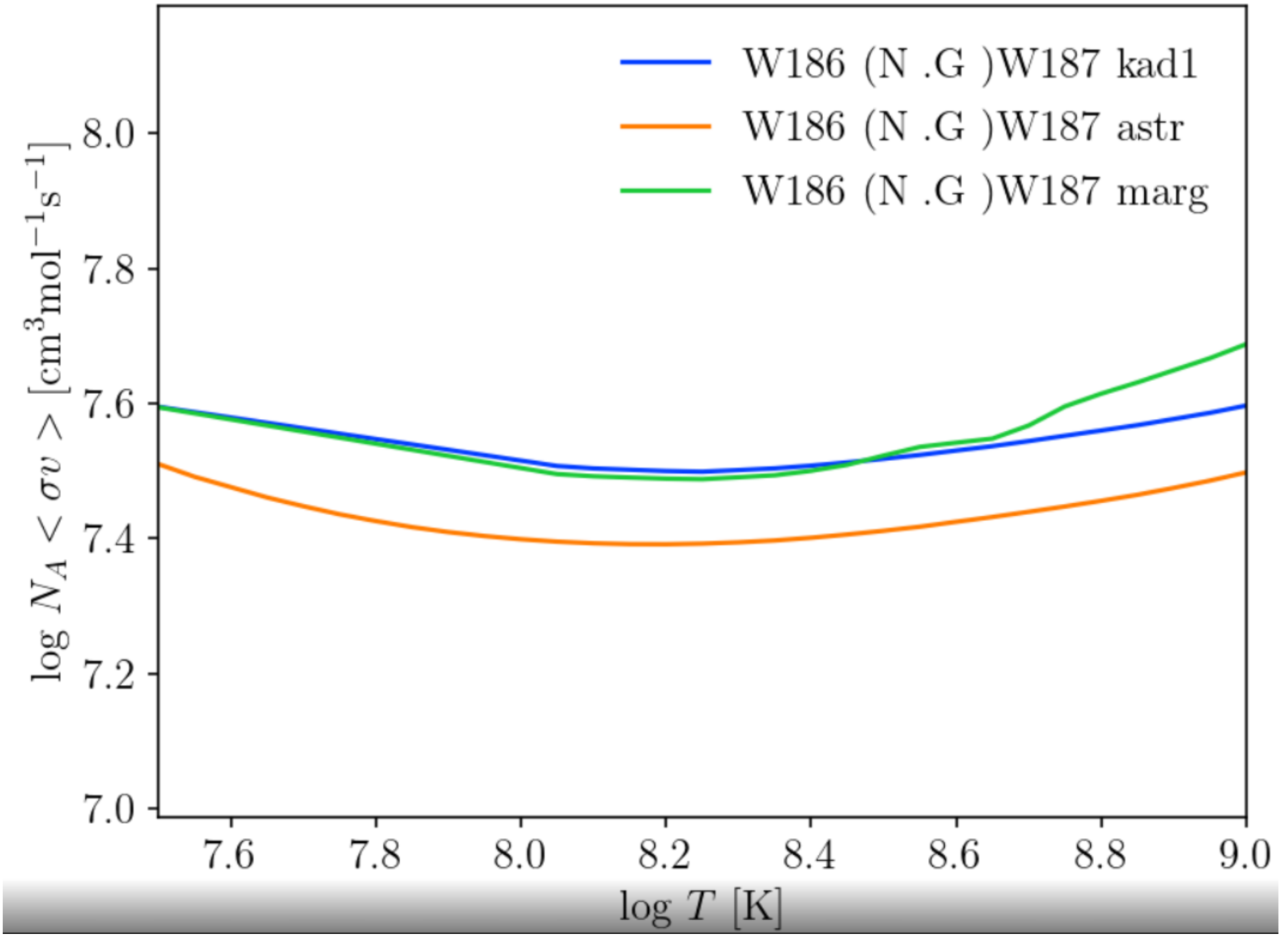
Isotope	$t_{1/2}$	E_γ (keV)	I_γ (%)	Reference
^{185}W	75.1 (3) d	125.358	0.0192 (7)	[21]
^{187}W	23.72 (6) h	685.73	27.3 (9)	[22]
		772.89	4.12 (13)	
^{198}Au	2.69517 (21) d	411.8	95.58 (12)	[23]

Firestone 1991

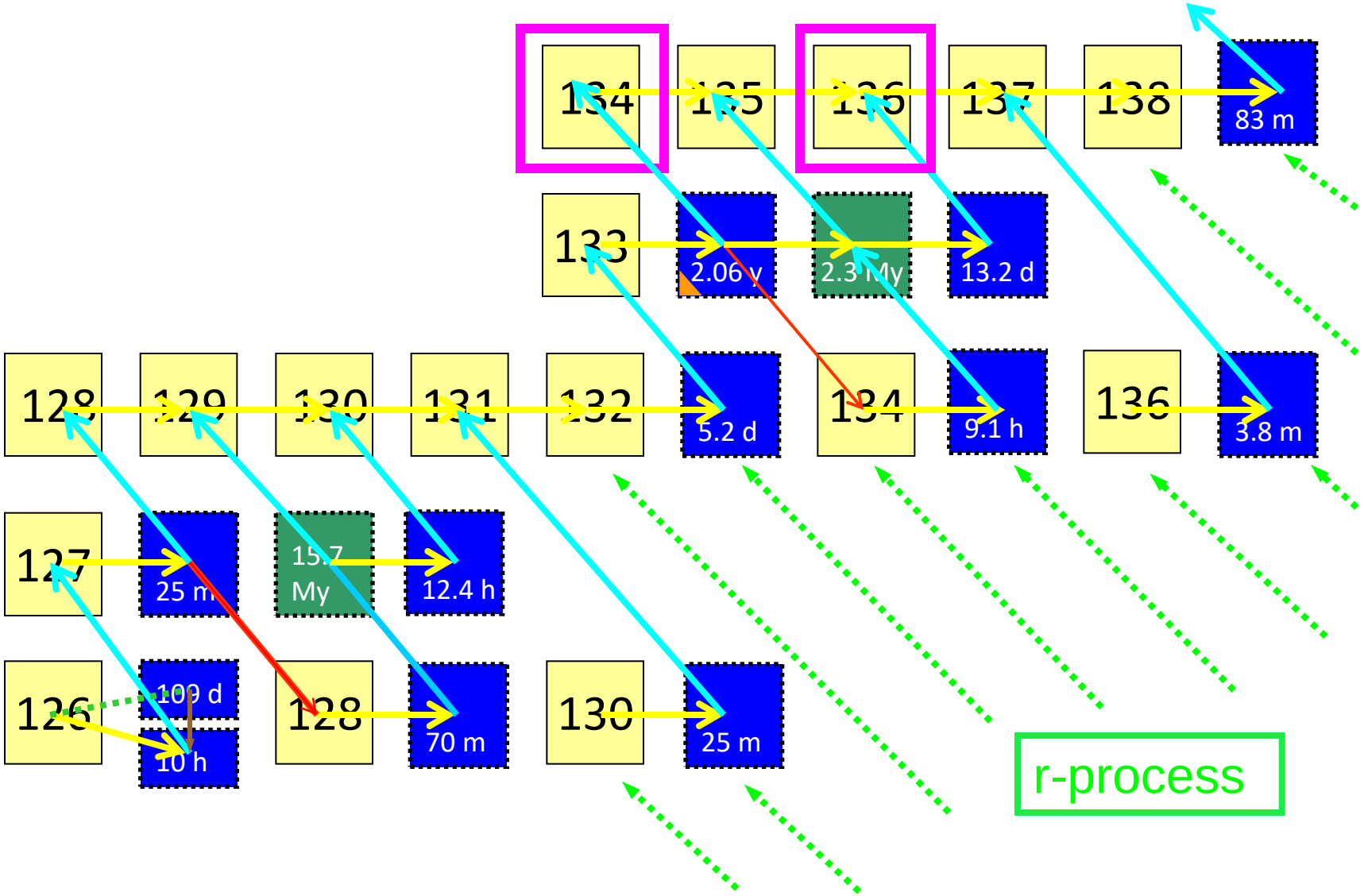
Correction factor for revised gamma-intensitiy of the 685.81 keV transition in the 187W-decay (27.3/33.2 = 0.822)



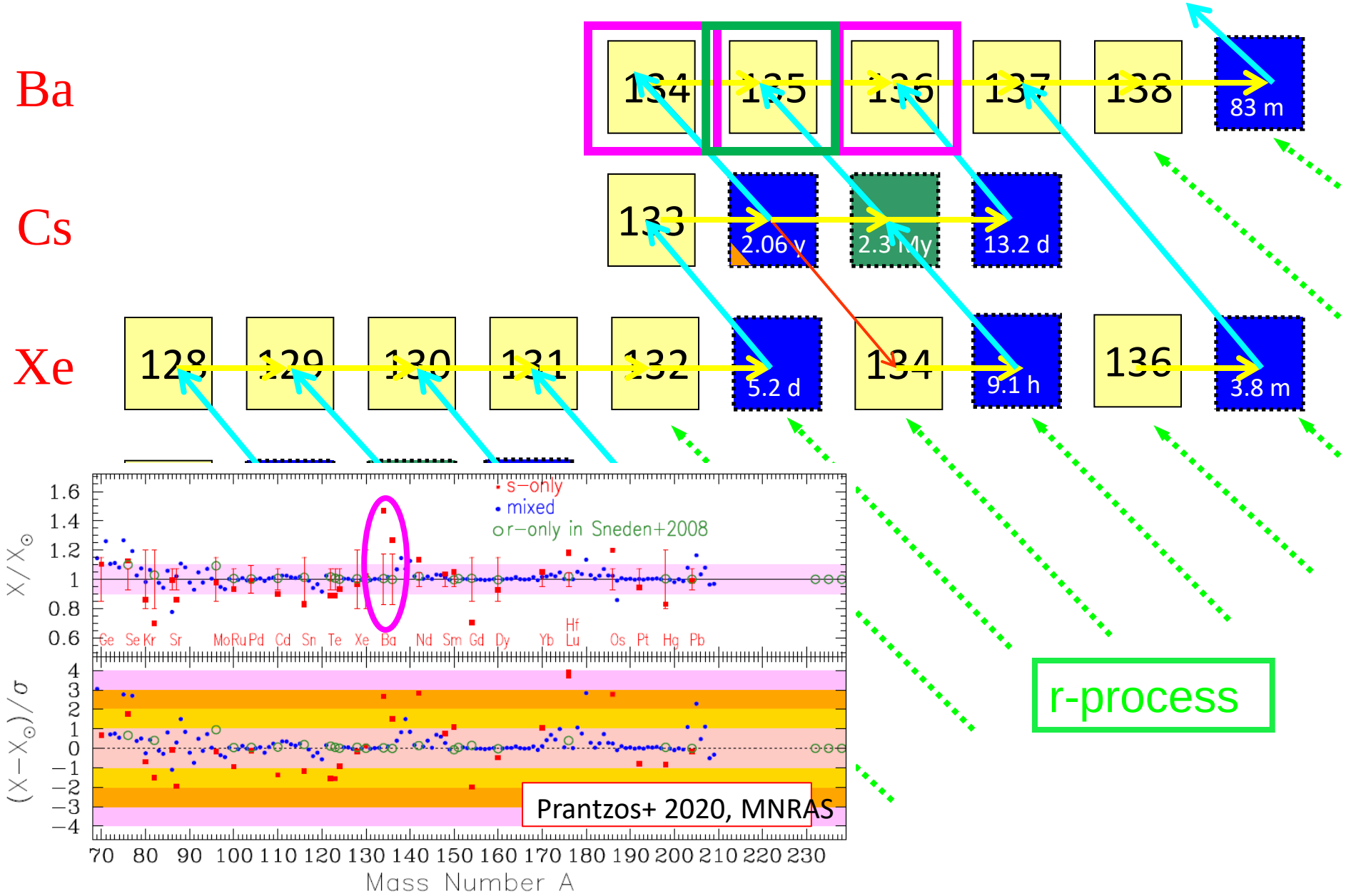
Basunia 2009

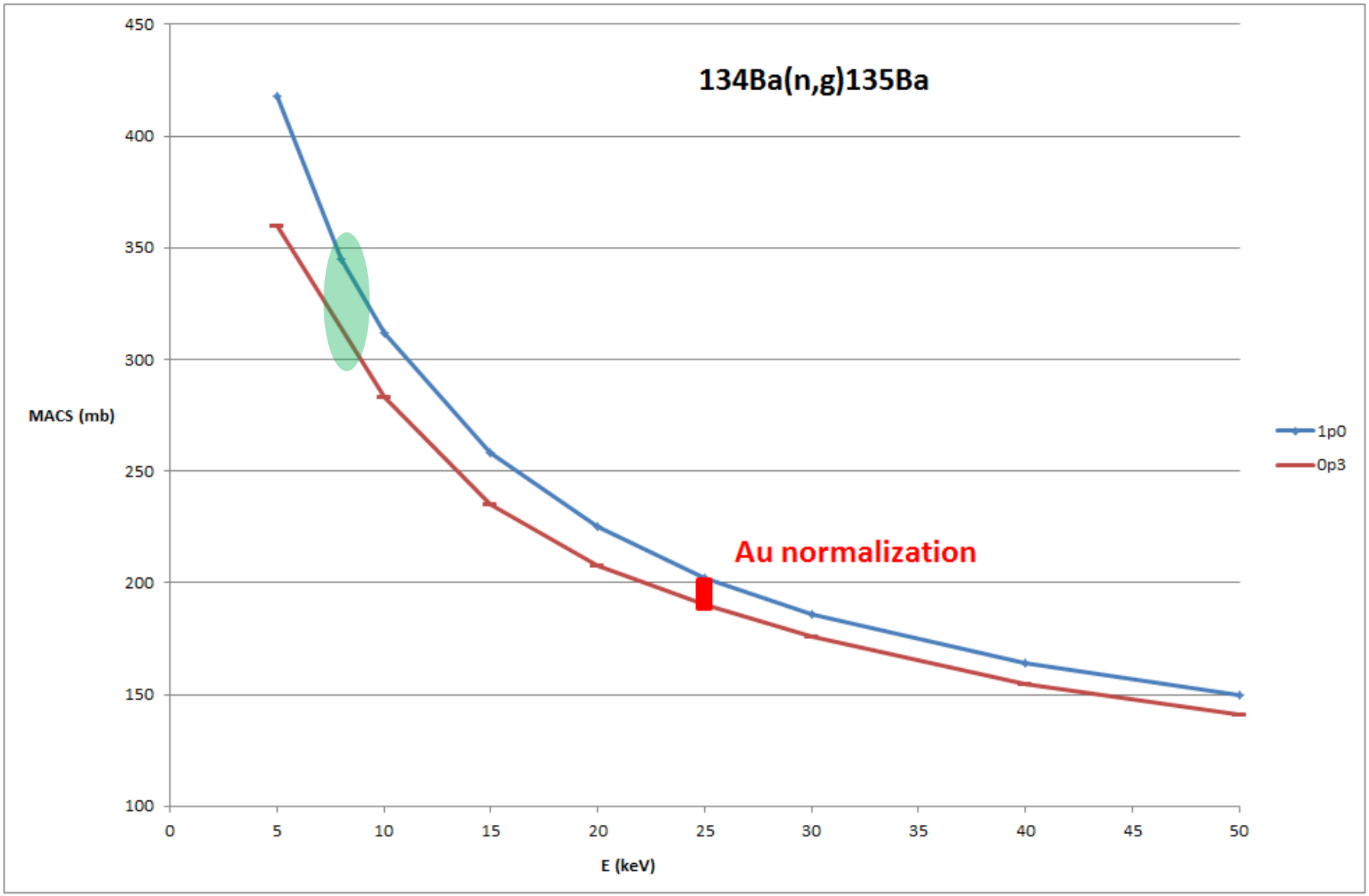

W186 (N .G)W187 kad1
W186 (N .G)W187 astr
W186 (N .G)W187 marg
8.0
7.8
7.6
7.4
7.2
7.0
log $N_A < \sigma v >$ [cm^{3}mol^{-1}s^{-1}]
7.6
7.8
8.0
8.2
8.4
8.6
8.8
9.0
log T [K]

Barium isotopes



Barium isotopes




134Ba(n,g)135Ba
MACS (mb)
E (keV)
Au normalization
1p0
0p3
450
400
350
300
250
200
150
100
0
5
10
15
20
25
30
35
40
45
50

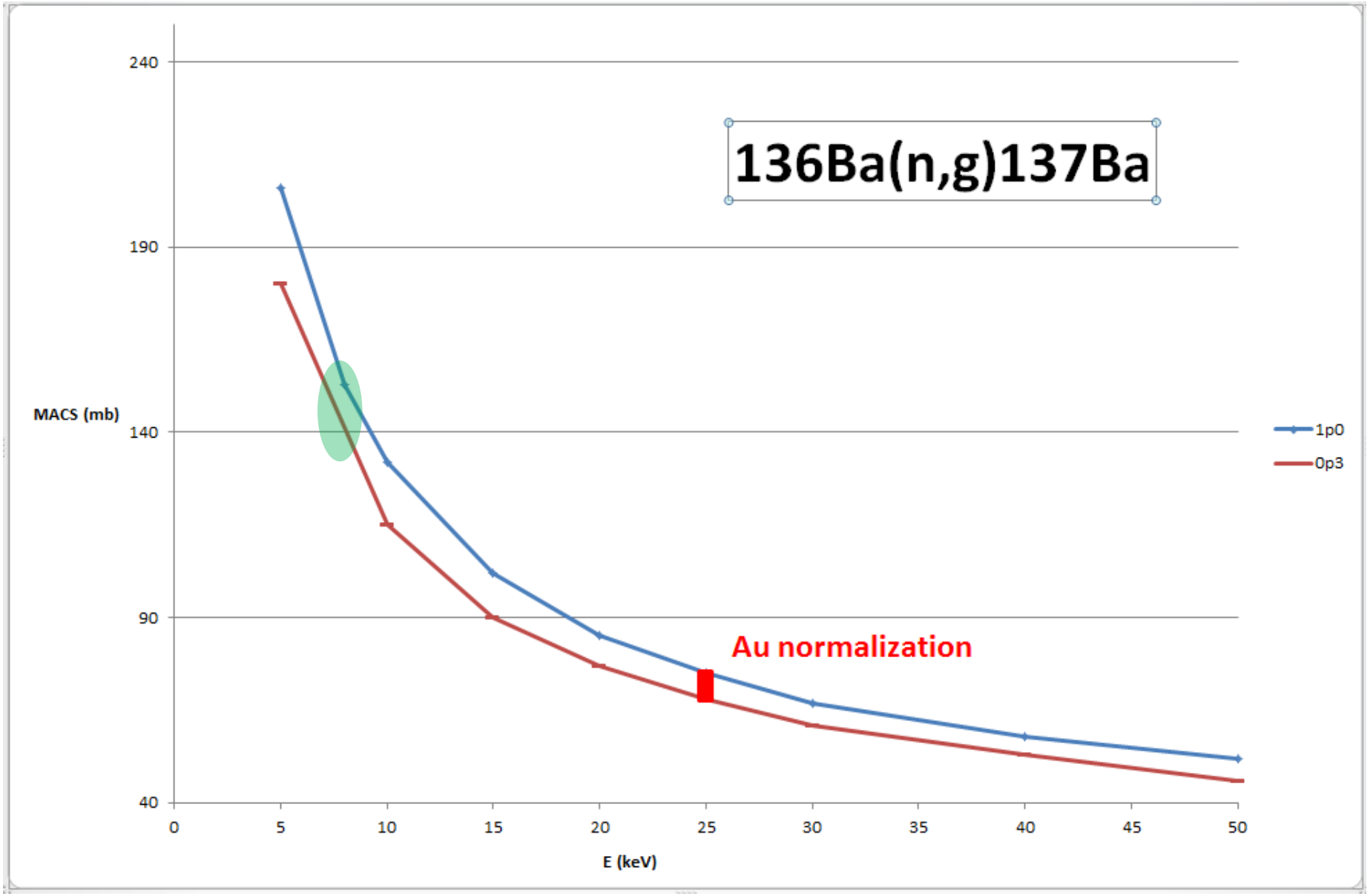
Literature

List of all available values

original	renorm.	year	type	Comment	Ref
173.6 ± 5.6		1999	c	VWG94 and KSW96 below 5 keV	Kae99
179.0 ± 5.7		1996	c	Linac, TOF, ^{6}Li, Au:Sat.	KSW96
176.3 ± 5.6		1994	c	VdG, TOF, Au:RaK88,Mac82e	VWG94
221 ± 35		1978	c,2	Linac, TOF, ^{6}Li, Au:Sat., k=0.9833	MAM78a
225 ± 35		1976	c	Linac, TOF, ^{6}Li+^{235}U, Au:Sat.	MAB76a
227.5		2011	e	ENDF/B-VII.1	endfb71
230.1		2011	e	JENDL-4.0	jendl40
232.5		2004	e	JEFF-3.1	jeff31
232.5		2002	e	JENDL-3.3	jendl33
155		1971	s		AGM71
117		2005	t	MOST 2005	Gor05
128		2002	t	MOST 2002	Gor02
199		2000	t	NON-SMOKER	RaT99
123		1981	t		Har81
180		1976	t		HWF76

KSW96 = P. Koehler *et al.*, Phys. Rev. C **54**, 1463 (1996).

VWG94 = F. Voss *et al.*, Phys. Rev. C **50**, 2582 (1994).


136Ba(n,g)137Ba
MACS (mb)
240
190
140
90
40
0
5
10
15
20
25
30
35
40
45
50
E (keV)
Au normalization
1p0
0p3

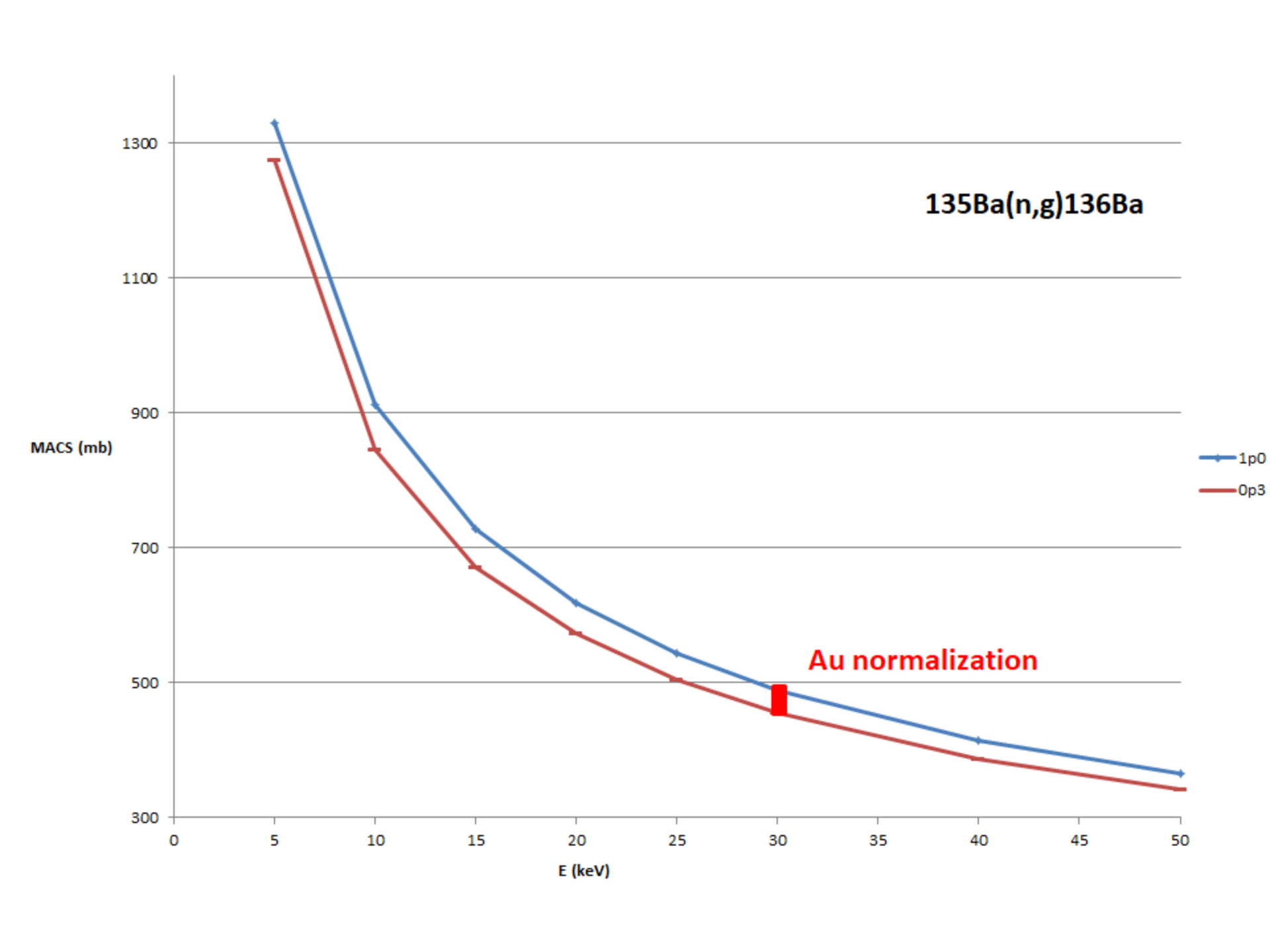
Literature

▼ **List of all available values**

original	renorm.	year	type	Comment	Ref
61.2 ± 2.0		1999	c	VWG94 and KSW96 below 5 keV	Kae99
60.4 ± 2.9		1997	c	Linac, TOF, ^{10}B, Ag:Sat.	MCA97a
62.0 ± 2.0		1996	c	Linac, TOF, ^{6}Li, Au:Sat.	KSW96
60.6 ± 2.1		1995	c	VdG, TOF, Au:RaK88,Mac82e	VWK95
62.0 ± 2.1		1994	c	VdG, TOF, Au:RaK88,Mac82e	VWG94
69 ± 10		1978	c,2	Linac, TOF, ^{6}Li, Au:Sat., k=0.9833	MAM78a
61 ± 10		1976	c	Linac, TOF, ^{6}Li+^{235}U, Au:Sat.	MAB76a
90 ± 20 E(n)= 30 keV		1972	c	VdG, Indium:763mb	Str72
70.1		2011	e	ENDF/B-VII.1	endfb71
70.7		2011	e	JENDL-4.0	jendl40
66.7		2004	e	JEFF-3.1	jeff31
66.7		2002	e	JENDL-3.3	jendl33
37		1971	s		AGM71
49.4		2005	t	MOST 2005	Gor05
53.1		2002	t	MOST 2002	Gor02
108		2000	t	NON-SMOKER	RaT99
42		1981	t		Har81
88		1976	t		HWF76

MCA97a = P. Mutti, F. Corvi, K. Athanassopoulos, and H. Beer, Nucl. Phys. **A621**, 262c (1997).

KSW96 = P. Koehler *et al.*, Phys. Rev. C **54**, 1463 (1996).


135Ba(n,g)136Ba
MACS (mb)
1300
1100
900
700
500
300
0
5
10
15
20
25
30
35
40
45
50
E (keV)
Au normalization
1p0
0p3

Literature

List of all available values

original	renorm.	year	type	Comment	Ref
455 ± 15		1994	c	VdG, TOF, Au:RaK88,Mac82e	VWG94
457 ± 80		1978	c,2	Linac, TOF, ^{6}Li, Au:Sat., k=0.9833	MAM78a
300 ± 60		1976	c	Linac, TOF, ^{6}Li+^{235}U, Au:Sat.	MAB76b
485.1		2011	e	ENDF/B-VII.1	endfb71
499.1		2011	e	JENDL-4.0	jendl40
500.8		2004	e	JEFF-3.1	jeff31
500.8		2002	e	JENDL-3.3	jendl33
315		1971	s		AGM71
259		2005	t	MOST 2005	Gor05
282		2002	t	MOST 2002	Gor02
518		2000	t	NON-SMOKER	RaT99
687		1981	t		Har81
472		1976	t		HWF76

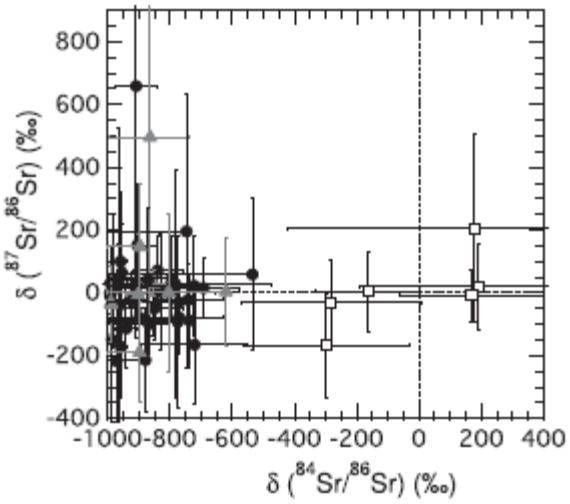
VWG94 = F. Voss *et al.*, Phys. Rev. C **50**, 2582 (1994).

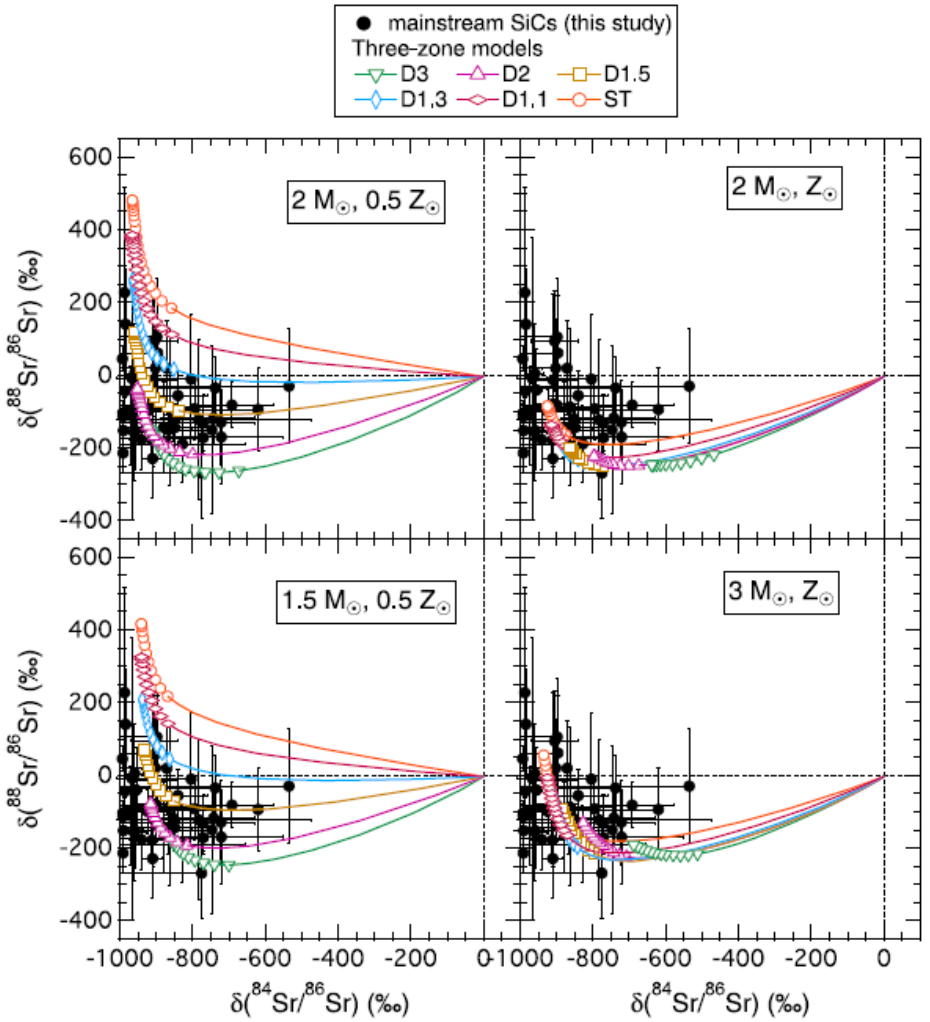
Strontium isotopic ratios

40	Zr80 3.9 S	Zr81 5.3 S	Zr82 32 S	Zr83 44 S	Zr84 25.9 M	Zr85 7.86 M	Zr86 16.5 H	Zr87 1.68 H	Zr88 83.4 D	Zr89 78.41 H	Zr90 51.45	Zr91 11.22
39	Y79 14.8 S	Y80 30.1 S	Y81 70.4 S	Y82 8.3 S	Y83 7.08 M	Y84 4.6 S	Y85 2.68 H	Y86 14.74 H	Y87 79.8 H	Y88 106.65 D	Y89 100	Y90 64.00 H
38	Sr78 2.5 M	Sr79 2.25 M	Sr80 106.3 M	Sr81 22.3 M	Sr82 25.55 D	Sr83 32.41 H	Sr84 0.56	Sr85 64.84 D	Sr86 9.86	Sr87 7.00	Sr88 82.58	Sr89 50.53 D
37	Rb77 3.77 M	Rb78 17.66 M	Rb79 22.9 M	Rb80 33.4 S	Rb81 4.576 H	Rb82 1.273 M	Rb83 86.2 D	Rb84 32.77 D	Rb85 72.17	Rb86 18.631 D	Rb87 27.83	Rb88 17.78 M
36	Kr76 14.8 H	Kr77 74.4 M	Kr78 0.35	Kr79 35.04 H	Kr80 2.28	Kr81 229000 Y	Kr82 11.58	Kr83 11.49	Kr84 57.00	Kr85 3934.4 D	Kr86 17.30	Kr87 76.3 M

^{86}Sr reference term for strontium pre-solar grain measurements

Strontium isotopic ratios





$^{86,87}Sr(n,\gamma)$

Liu+ 2015

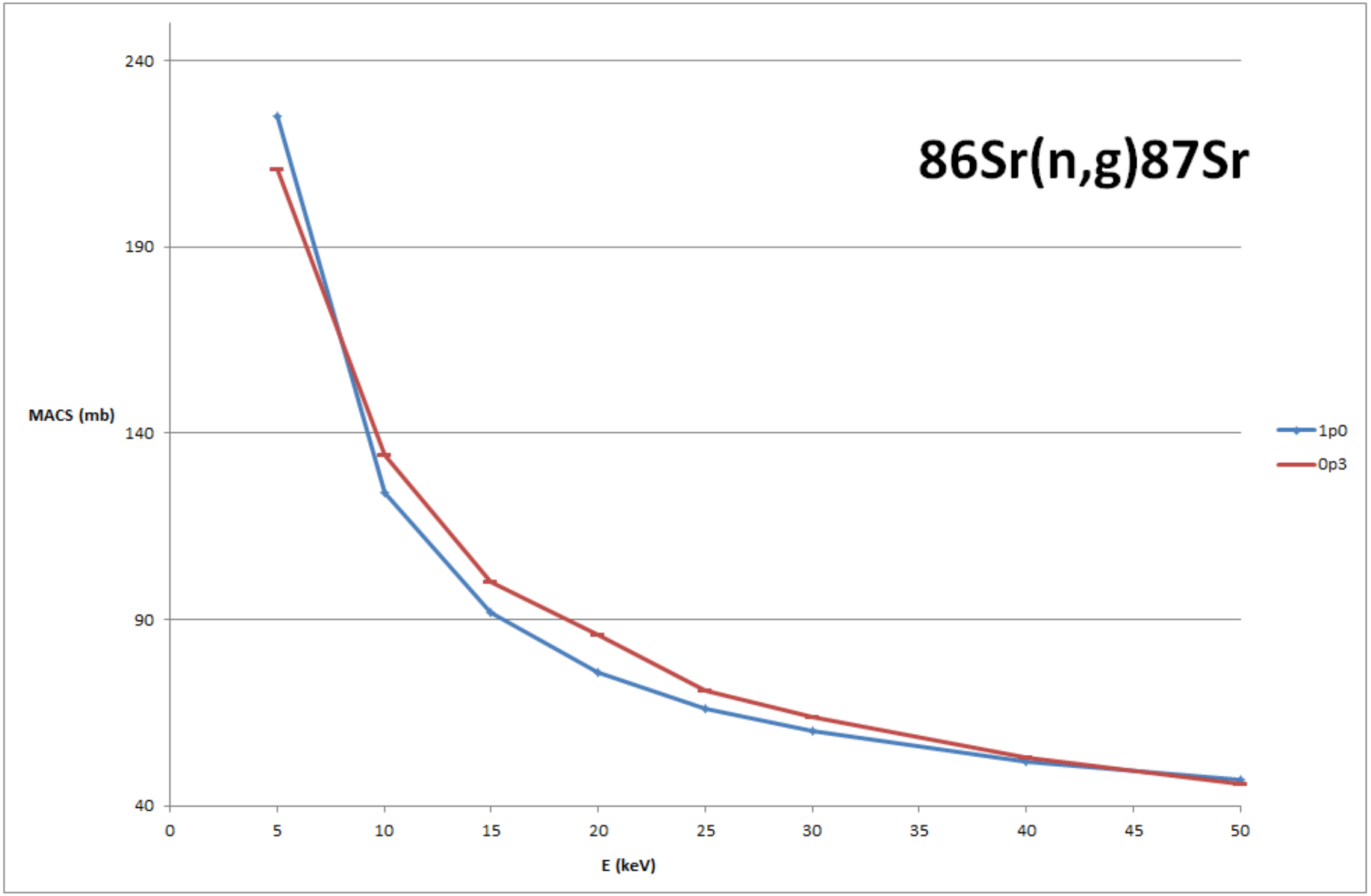
Literature

▼ **List of all available values**

original	renorm.	year	type	Comment	Ref
70 ± 4		1991	c	Linac, TOF, ^{6}Li, Au:YoA85	BBB91
63.9 ± 2.6		1989	c	Linac, TOF, ^{6}Li, Au:Sat.	Mac89
74 ± 5	75.5 ± 5.1	1985	c	VdG, TOF, Au:endfb52 norm. by 613/601= 1.02	WaB85
70 ± 8		1982	c	Linac, TOF, ^{6}Li+^{235}U, Au:Sat.	HAM82
109 ± 30 E(n)= 24 (5) keV		1973	c	Sb-Be, Act., 1/v(E), ^{127}I: 832 mb (24keV)	MSR73
75 ± 15		1967	c	VdG, TOF, ^{181}Ta: 762 mb	MaG67b
57.2		2015	e	TENDL-2015 using the TALYS code	tendl15
55.8		2014	e	JEFF-3.2 using calculations from TENDL-2012	jeff32
61.6		2011	e	ENDF/B-VII.1	endfb71
65.8		2011	e	JENDL-4.0	jendl40
57.2		2004	e	JEFF-3.1	jeff31
68.4		2002	e	JENDL-3.3	jendl33
74 ± 7		1971	e		AGM71
51.0		2005	t	MOST 2005	Gor05
56.9		2002	t	MOST 2002	Gor02
209		2000	t	NON-SMOKER	RaT99
57		1981	t		Har81
87		1976	t		HWF76

BBB91 = R. Bauer *et al.*, Phys. Rev. C **43**, 2004 (1991).

Mac89 = R. Macklin, private communication to H. Beer.


86Sr(n,g)87Sr
MACS (mb)
240
190
140
90
40
0
5
10
15
20
25
30
35
40
45
50
E (keV)
1p0
0p3

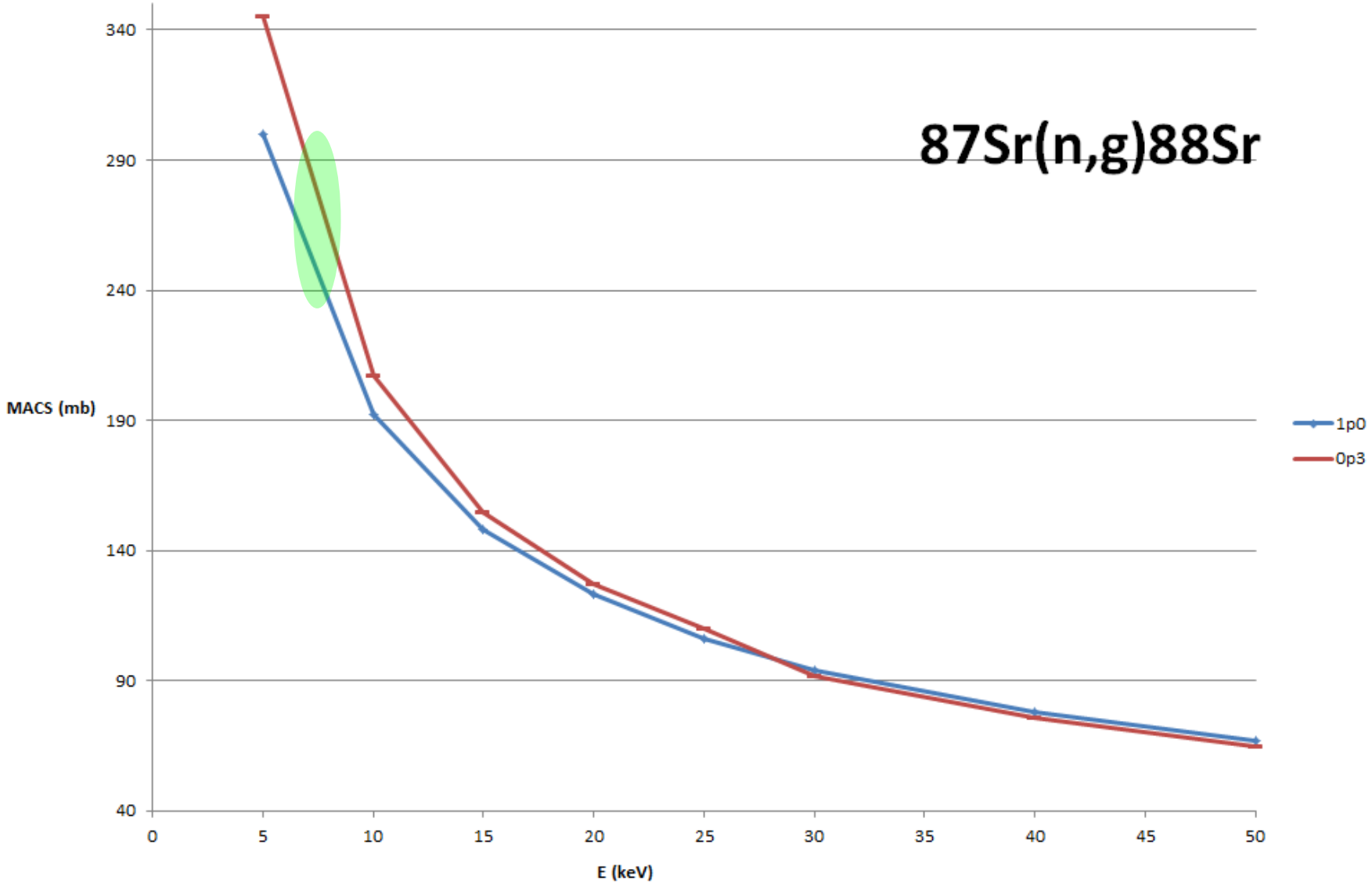
Literature

▼ **List of all available values**

original	renorm.	year	type	Comment	Ref
97 ± 5		1991	c	Linac, TOF,^{6}Li, Au:YoA85	BBB91
92.1 ± 3.7		1989	c	Linac, TOF, ^{6}Li, Au:Sat.	Mac89
100 ± 7	102 ± 7	1985	c	VdG, TOF, Au:endfb52 norm. by 613/601= 1.02	WaB85
74 ± 10		1982	c	Linac, TOF, ^{6}Li+^{235}U, Au:Sat.	HAM82
108 ± 20		1967	c	VdG, TOF, ^{181}Ta:762mb	MaG67b
74.5		2015	e	TENDL-2015 using the TALYS code	tendl15
83.1		2014	e	JEFF-3.2 using calculations from TENDL-2012	jeff32
80.7		2011	e	ENDF/B-VII.1	endfb71
84.8		2011	e	JENDL-4.0	jendl40
119.8		2004	e	JEFF-3.1	jeff31
80.7		2002	e	JENDL-3.3	jendl33
109 ± 9		1971	e		AGM71
72.2		2005	t	MOST 2005	Gor05
73.3		2002	t	MOST 2002	Gor02
330		2000	t	NON-SMOKER	RaT99
90		1981	t		Har81
222		1976	t		HWF76

BBB91 = R. Bauer *et al.*, Phys. Rev. C **43**, 2004 (1991).

Mac89 = R. Macklin, private communication to H. Beer.


87Sr(n,g)88Sr
MACS (mb)
340
290
240
190
140
90
40
0
5
10
15
20
25
30
35
40
45
50
E (keV)
1p0
0p3