VALIDATION OF EAF-2010 (N,G) AND (N,F) REACTIONS

1. INTEGRAL ACTIVATION DATA BASE FOR (N,G) AND (N,F) REACTIONS

Table 1. Summary of neutron spectra

ID	Name	Groups	Original description	Reference
1	am-be_flux	175	Standard (IAEA) spectrum from Am-Be	FO97
2	cf252_flux	175	Standard (IAEA) Cf-252 spontaneous fission spectrum	FO97
3	fission_flux	172	PWR spectrum used in FISPACT test cases	FO97
4	fusion_flux	175	EFF first wall spectrum used in FISPACT test cases	FO97
5	fng_sic.asc	175	Contains the flux FLUSSO NELL IRRAGIAMENTO SIC A FNG, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E weighting].	UKAEA-FUS-547
6	fng_f82h.asc	175	Contains the flux F82H cavity 9 foils unfol tot=2.59e-2, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E weighting].	UKAEA-FUS-547
7	fng_tung.asc	175	Contains the flux flusso per il tungsteno tot=2.74e+08, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E weighting].	UKAEA-FUS-547
8	fng_vanad.asc	175	Contains the FLUX IN VANADIUM IRRADIATION TOT=6.07E+08, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E weighting].	UKAEA-FUS-547
9	Maxwell_300K.asc	172	Maxwellian spectrum at 300 K, supplied by C. Dean using NJOY97	UKAEA-FUS-547
10	sneg_1	175	Contains the neutron spectrum at sample position 1 (4 deg), measured by TUD, supplied by K Seidel	SE98
11	sneg_2	175	Contains the neutron spectrum at sample position 2 (73 deg), measured by TUD, supplied by K Seidel	SE98
12	fzk_1	175	Contains the flux used at Karlsruhe d-Be source, supplied by U von Mollendorff at FZK for integral exps spectrum # 1 [175 group flat].	MO00
13	fzk_2	175	Contains the flux used at Karlsruhe d-Be source, supplied by U von Mollendorff at FZK for integral exps spectrum # 2 [175 group flat].	MO00
14	fng_eurofer.asc	175	Contains the flux flusso in esperimento decay-heat eurofer nuovo modello tot=2.855E+08, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E weighting].	UKAEA-FUS-547
15	fng_chromium.asc	175	Contains the flux FLUSSO CROMO LOW TOT=3.31E+08, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E	UKAEA-FUS-547
16	fng_hafnium.asc	175	Contains the flux FLUSSO CROMO HIGH TOT=4.10E+08, supplied by M Pillon used at FNG for integral exps [175 group Vitamin-E]	UKAEA-FUS-547
17	fns_7hour	175	Supplied by J-Ch Sublet from the JAERI 1996 FNS 7 hour irradiation.	SUB98
18	fns_5min	175	Supplied by J-Ch Sublet from the JAERI 1999 FNS 5 min irradiation.	SUB98
19	fng_heat	175	Contains the FLUSSO NUOVI MATERIALI TOT=9.32539E-03, supplied by M Pillon used at FNG for integral exps - decay heat measurements [175 group Vitamin-E weighting]	UKAEA-FUS-547

20	fng_cucrzr	175	Contains the Flusso CuCrZr D-T, supplied by M Pillon used at FNG for integral exps - CuCrZr measurements [175 group Vitamin-E weighting]	UKAEA-FUS-547
21	tud_cucrzr	175	Contains the spectrum used for CuCrZr used at TUD for integral exps supplied by Klaus Seidel [175 group Vitamin-E weighting]	EI02
22	cf252_flux_1	175	Extracted from ENDF-B/VI	MA89
23	fng_ScSmGd	175	Contains the FLUSSO new decay heat med=6.88E+08, supplied by M Pillon used at FNG for integral exps - decay heat measurements on Sc, Sm, Gd [175 group Vitamin-E weighting]	UKAEA-FUS-547
24	fng_Dy	175	Contains the FLUSSO new decay heat med=9.18E+08, supplied by M Pillon used at FNG for integral exps - decay heat measurements on Dy [175 group Vitamin-E weighting]	UKAEA-FUS-547
25	fzk_ss316	211	Spectrum for the SS-316 cyclotron irradiation experiment of Ulrich von Moellendorff	FI03
26	fng_Y	175	Contains the FLUSSO ITTRIO med=1.307E+08, supplied by M Pillon used at FNG for integral exps - decay heat measurements on Y [175 group Vitamin-E weighting].	UKAEA-FUS-547
27	tud_Y	175	Contains the neutron spectrum qypvij, supplied by K Seidel used at TUD for integral exps - activation measurements on Y [175 group Vitamin-E weighting].	UKAEA-FUS-547
28	fng_Ta	175	Contains the flusso tantalio secondo run =2.164e+08, supplied by M Pillon used at FNG for integral exps - measurements on Ta [175 group Vitamin-E weighting].	UKAEA-FUS-547
29	Rez_foils	211	Contains the spectrum for the Rez p+D2O cyclotron irradiation experiment described in report NPI ASCR Rez: EXP(EFDA)-08/2004 supplied by P Bem [211 group flat weighting].	BE04
30	d-Be	211	Contains the spectrum of n produced by bombarding Be with 53 MeV d. Fit to data from Schweimer, Nuc. Phys. A100, 537-544, 1967 and used by Qaim. [211 group flat weighting].	SCH67
31	d-Be2	211	Contains the spectrum of n produced by bombarding Be with 53 MeV d. Fit as in d-Be but peak at 22.5 MeV and data down to 4 MeV. ME75. Used by Qaim. [211 group flat weighting].	ME75
32	d-Be3	211	Contains the spectrum of n produced by bombarding Be with 30 MeV deuterons. Analytical fit based on Nethaway, Used by Qaim in several papers in 1980s. [211 group flat weighting].	NE77
33	fission_PARR	175	Contains the spectrum of research reactor PARR-I produced by Mannan et al in Radiochimica Acta 51, 49-53, 1990. Used by Qaim. [175 group flat weighting].	MAN90
34	tud_Pb	175	Contains the neutron spectrum in TUD-IKTP/01-04 used at TUD for integral exps - activation measurements on Pb [175 group Vitamin-E weighting]	EI04
35	fng_Mo	175	Contains the flusso molibdeno =3.993E+08, supplied by M Pillon used at FNG for integral exps - measurements on Mo (orig 211, changed to 175) [175 group Vitamin-E weighting].	UKAEA-FUS-547
36	d-Be2a	211	This is d-Be2 / 2.15, renormalised by J Kopecky based on six well measured (n,a) reactions.	ME75
37	tud_Ta	175	Contains the neutron spectrum in TUD-IKTP/01-05 used at TUD for integral exps - activation measurements on Ta	EI05
38	rez_NE	211	Contains the spectrum for the Rez p+D2O cyclotron irradiation experiment supplied by Simakov for Eurofer exp (Foil #3, dia.10mm, 947.4mg, at 1.7mm)	BE04A

39	rez_DF	211	Contains the spectrum for the Rez p+D2O cyclotron irradiation experiment supplied by Simakov. Obtained by SAND code analysis of dosimetry foils.	BE04A
40	fng_Sn	175	Contains the flusso stagno =7.953E+08, supplied by M Pillon used at FNG for integral exps measurements on Sn	UKAEA-FUS-547
41	fng_Re	175	Contains the flusso renio = 4.534E+08, supplied by M Pillon used at FNG for integral exps - measurements on Re	UKAEA-FUS-547
42	tud_Er	175	Contains the neutron spectrum dtraErvij, supplied by A Klix used at TUD for integral exps - activation measurements on Er [175 group Vitamin-E weighting].	UKAEA-FUS-547
43	Maxwell_30 keV	175	30 keV spectrum calculated with MCNPX by Lee Packer	[43]
44	Maxwell_theory_30 keV	175	Contains a theoretical version of the 30 keV neutron spectrum, calculated by R.A. Forrest	[43]
45	Res_ Int	Anal. Calcul.	Contains experimental resonance integrals from BNL book 2006	MU06
46	Fission_WIMS	172	Fission spectrum as given on the IAEA WIMS page (www-nds.iaea.org/wimsd/fisspe.htm)	LE07

References in Table 1

FO97 - Forrest R.A. and Simpson J.A., SAFEPAQ: User manual UKEA FUS 355, 1997.

SE96 - Seidel K. et al., EFF-DOC-683 (1998).

MO00 - Mollendorff v U. and Giese H.,EFF-DOC-728 (2000).

SUB98 - Sublet J-Ch., UKAEA FUS 390 (1998).

EI02 - Eichin R. Et al., TUD report, TTMN-002-D-10 (2002).

MA89 - Mannhart W., INDC(NDS)-220/L (1989) 305.

FI03 - Fischer U., Mollendorff v U. and Simakov S.P., EFF-DOC-859 (2003).

BE04 - Bem P. et al., NPI ASCR Rez, EXP(EFDA) –XX/ 2004.

SCH67 - Schweimer G.W., Nucl. Phys. A100 (1967) 537.

ME75 - Meulders J.P. et al., Phys. Med. Biol. 20 (1975) 235.

NE77 - Nethaway D.R. et al., BNL-NCS-50681 (1977) 135.

MAN90 - Makarov S.P. et al., Vop. At. Nauki i Techn., Yad. Konst. 3 (1990) 39.

EI04 - Eichin R. Et al., TUD report, TUD-IKTP/01-04 (2004).

BEO4A - Bem P. Et al., EXP(EFDA)-04/2004.

MU06 - Mughabghab S.F., ‘Atlas of Neutron Resonances’ Elsevier (2006).

Table 2. Summary of reactions with experimental integral data and C/E(EAF2010)

(Only experimental values of Resonance Integrals and MACS are used, no calculated data considered)

QS - the Quality Score, scores in (brackets) are not used as the total cross section (FS=99) is measured in the integral experiment and only partial data (FS=0,1or 2) exist in the EAF data file. QS* indicates that the score differs from the value given in the distributed EAF-2007 file due to new experimental data obtained after the library release or errors in EAF-2007.

Comments on QS = 5 assignments: [5_0] = differential data are missing and unsatisfactory agreement with integral data. [5_1] = unsatisfactory agreement with differential and integral data. [5_2] = satisfactory agreement with differential and unsatisfactory agreement with integral data. [5_3] = differential data are missing and satisfactory agreement with integral data. [5_4] = unsatisfactory agreement with differential data and satisfactory agreement with integral data.
Comments on QS = 6 assignments: [6] = differential data are in satisfactory agreement with integral data.
Spectrum - the irradiation spectrum.

- **d_Be2a data** - Cross sections measured with d_Be2 spectrum have been increased by a factor of 2.15, as described in the text.

- **Energy classification of neutron spectra** – range Φ(max) in <energy> and E[Φ(max)]

	RANGE	E[Φ(max)]
Maxw_300K-	thermal spectrum	2.5E-5 MeV
MACS_theory_30keV	<0.01 MeV – 0.5 MeV>	0.03 MeV
1/E spectrum	<0.5 eV – 100 keV>	0.5 eV
Sneg – (d,He3) monoenergetic source	<14 MeV – 14.5MeV>	14 MeV
Fzk – (p,D2O) reaction	<0.01 MeV – 18 MeV>	14 MeV
Rez DF - (p,D2O) reaction (p,D)	<0.004 MeV – 30 MeV>	20 MeV
Rez foils - (p,D2O) reaction (p,O16)	<1.5 MeV – 30 MeV>	flat curve
Spectra Cf252 - spontaneous fission -	<0.2 – 8 MeV>	2 MeV
Fission spectrum (U235)	<0.2 – 8 MeV>	2 MeV
Spectra fng, fns, tud – (d,T) reaction -	<3 MeV – 14.5 MeV>	14 MeV
Spectra d-Be - (d,Be) reaction -	<10 – 40 MeV>	22.5 MeV

MACS_theory_30keV is in the table denoted as **MACS_30keV**

C/E if the C/E value is either to large or small compared to other results (spectra) it indicates that this integral data should be disregarded

C/E in green, ng and nf reactions with |C/E | > 3

Fission spectra (added recently) Cf-252
Fission spectra (added recently) U-235

Comment -
- The earlier C/E values (from EAF-2005 or 2007) are shown in the Comment, as C/E(5) or C/E(7), only if they are better then the present value.

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
H-1(n,γ)	6	Maxw_300K MACS_30keV	3.28E-01 2.54E-04	4.00E-03 2.00E-05	0.897 0.848	
H-2(n,γ)	6	Maxw_300K MACS_30keV	5.08E-04 3.00E-06	1.50E-05 2.00E-07	0.883 0.498	
He-3(n,γ)	6	Maxw_300K MACS_30keV	5.50E-05 7.60E-06	3.00E-06 6.00E-7	0.870 1.694	
Li-7(n,γ)	6	MACS_30keV	4.20E-05	3.00E-06	1.051	
Be-9(n,γ)	5_3	MACS_30keV	1.04E-05	1.60E-06	0.939	
C-12(n,γ)	6	MACS_30keV	1.54E-05	1.00E-06	0.847	
C-13(n,γ)	5_1	MACS_30keV	2.10E-05	4.00E-06	8.404	
C-14(n,γ)	5_1	MACS_30keV	8.48E-06	5.70E-06	0.295	
N-14(n,γ)	5_2	MACS_30keV	4.10E-05	6.00E-05	1.495	
N-15(n,γ)	5_3	MACS_30keV	5.80E-06	6.00E-07	1.078	
O-16(n,γ)	5_3	MACS_30keV	3.80E-05	4.00E-06	0.809	
O-18(n,γ)	5_2	MACS_30keV Res_Int	8.89E-06 8.10E-04	8.00E-07 4.00E-05	0.274 0.100	
F-19(n,γ)	5_2	MACS_30keV Res_Int	3.20E-03 2.00E-02	1.00E-04 3.00E-03	1.749 0.990	
Na-22(n,γ) Na-23(n,γ)	5 (6)	Maxw_300K cf252_flux_1 fns_7hour fns_5min MACS_30keV Res_Int	1.98E+02 3.35E-04 3.09E-04 2.92E-04 2.10E-03 3.11E-01	2.24E+02 1.50E-05 4.01E-05 1.17E-04 2.00E-04 1.00E-02	1.131 0.639 1.033 1.352 0.603 0.790	
Mg-24(n,γ)	5_3	MACS_30keV	3.30E-03	4.00E-04	0.991	
Mg-25(n,γ)	5_3	MACS_30keV	6.50E-03	4.00E-04	0.723	
Mg-26(n,γ)	5_1	MACS_30keV Res_Int fission_WIMS fng_heat	1.26E-04 2.40E-02 6.00E-04 8.69E-02	9.00E-05 2.00E-03 9.56E-03	0.578 0.720 0.606 0.622	
Al-27(n,γ)	6	MACS_30keV Res_Int fission_WIMS	3.74E-03 1.70E-01 3.70E-04	3.00E-04 1.00E-02	0.802 0.750 1.450	
Si-28(n,γ)	6	MACS_30keV	6.40E-03	1.30E-04	1.063	
Si-29(n,γ)	6	MACS_30keV	6.58E-03	1.60E-04	0.828	
Si-30(n,γ)	5_1	MACS_30keV Res_Int fission_WIMS	1.82E-03 6.30E-01 1.10E-03	3.30E-04 3.00E-02	2.900 1.120 0.599	
P-31(n,γ)	5_4	MACS_30keV Res_Int	1.74E-03 7.90E-02	9.00E-05 2.00E-03	0.824 0.960	
S-32(n,γ)	5_3	MACS_30keV	4.10E-03	2.00E-04	1.224	
S-33(n,γ)	5_0	MACS_30keV	7.40E-03	1.50E-03	0.282	
S-34(n,γ)	5_3	MACS_30keV	2.26E-04	1.00E-05	0.853	
S-36(n,γ)	5_3	Res_Int	1.70E-01	6.00E-03	0.720	
Cl-35(n,γ)	5_2	MACS_30keV Res_Int	9.68E-03 1.80E+01	2.10E-04 2.00E+00	0.559 1.010	
Cl-36(n,γ)	5_3	MACS_30keV Res_Int	1.20E-02 3.80E+00	1.00E-03	0.926 1.260	
Cl-37(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	2.12E-03 3.00E-01 7.40E-04	7.00E-05 4.00E-02	1.062 0.670 0.738	
Ar-40(n,γ)	5_1	MACS_30keV Res_Int fission_WIMS	2.54E-03 4.10E-01 9.30E-04	1.00E-04 3.00E-02	1.449 0.780 0.961	
K-39(n, γ)	5_3	Res_Int	1.10E+00	1.00E-01	0.970	
K-40(n,γ)	5_3	Res_Int	1.30E+01	4.00E+00	1.110	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
K-41(n,γ)	6	fns_7hour	9.95E-04	2.09E-04	0.794	
		MACS_30keV	2.54E-04	2.00E-05	0.848	
		Res_Int	1.42E+00	6.00E-02	1.090	
		fission_WIMS	2.90E-03		1.993	
Ca-40(n,γ)	6	MACS_30keV	5.73E-03	3.40E-04	0.804	
Ca-42(n,γ)	5_2	MACS_30keV	1.56E-02	2.00E-03	0.722	
Ca-43(n,γ)	6	MACS_30keV	5.10E-02	6.00E-03	0.609	
Ca-44(n,γ)	6	MACS_30keV	9.40E-03	1.30E-03	0.796	
		Res_Int	5.60E-01	1.00E-02	0.750	
Ca-46(n,γ)	5_1	MACS_30keV	5.30E-03	5.00E-04	1.347	
		Res_Int	9.60E-01	1.00E-01	0.350	
Ca-48(n,γ)	5_1	MACS_30keV	8.70E-04	9.00E-05	0.114	
		Res_Int	8.90E-01	1.80E-01	0.540	
		fission_WIMS	1.90E-03		0.104	
Sc-45(n,γ)	(6)	MACS_30keV	6.90E-02	5.00E-03	0.852	
		Res_Int	1.21E+01	5.00E-01	0.980	
		fission_WIMS	7.73E-03		0.779	
Sc-45(n,γ)m	5_3	Res_Int	5.40E+00	6.00E-01	0.970	
Ti-46(n,γ)	5_2	MACS_30keV	2.68E-02	3.20E-03	0.686	
Ti-47(n,γ)	5_2	MACS_30keV	6.44E-02	7.70E-03	0.636	
		cf252_flux_1	2.16E-02	1.18E-03	0.949	
Ti-48(n,γ)	6	MACS_30keV	3.18E-02	5.10E-03	0.938	
		d-Be3	7.03E-05	2.05E-05	2.896	/2.911
Ti-49(n,γ)	5_2	MACS_30keV	2.21E-02	2.10E-03	0.518	
Ti-50(n,γ)	6	MACS_30keV	3.60E-03	4.00E-04	0.769	
		fission_WIMS	1.90E-03		0.242	
		rez_DF	4.58E-03	6.01E-05	1.300	
V-51(n,γ)	6	fng_vanad	6.53E-02	3.98E-03	1.045	
		sneg_1	1.60E-03	2.40E-04	0.376	
		cf252_flux_1	2.80E-03	3.00E-04	0.748	
		MACS_30keV	3.80E-02	4.00E-03	0.746	
		Res_Int	2.70E+00	1.00E-01	0.940	
		fzk_ss316	6.66E-04	2.38E-05	0.720	
		rez_DF	5.47E-05	4.38E-06	2.461	
Cr-50(n,γ)	5_2	MACS_30keV	4.90E-02	1.30E-02	0.521	
		Res_Int	1.17E+01	2.00E-01	0.630	
		fng_Cr	3.38E-01	3.05E-02	1.044	
		fng_cucrzr	4.62E-01	3.69E-02	0.760	
		tud_ cucrzr	3.27E-01	3.53E-02	1.160	
		fng_vanad	2.76E-01	2.27E-02	1.042	
		fng_f82h	3.25E-01	4.12E-02	1.024	
		fng_eurofer	3.18E-01	2.26E-02	0.977	
		sneg_1	5.18E-01	1.26E-02	0.812	
		fzk_ss316	1.79E-01	4.00E-03	1.003	C/E(5)=0.996
		fzk_ss316	1.77E-01	3.76E-03	1.015	C/E(5)=1.008
		fzk_ss316	1.98E-01	6.02E-03	0.908	
		rez_DF	1.31E-01	9.71E-04	1.108	
		rez_DF	1.22E-01	2.44E-03	1.185	
		rez_DF	1.40E-01	2.81E-03	1.032	
Cr-52(n,γ)	6	MACS_30keV	8.80E-03	2.00E-03	0.840	
		d-Be3	1.65E-04	3.35E-05	1.341	/1.372
Cr-53(n,γ)	5_2	MACS_30keV	5.80E-02	1.00E-02	0.489	
Cr-54(n,γ)	5_2	MACS_30keV	6.70E-03	1.60E-03	0.588	
Mn-52(n,γ)	6	Maxw_300K	6.00E+01	7.00E+00	0.806	
Mn-53(n,γ)	6	Res_Int	3.00E+01	5.00E+00	1.180	
Mn-54(n,γ)	5_3	Res_Int	1.70E+01	0.00E+00	0.690	
		cf252_flux_1	5.80E-04	1.40E-04	0.977	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
		cf252_flux_1	4.08E-04	9.00E-06	1.390	C/E(5)=1.273
Mn-55(n,γ)	6	fns_7hour fns_5min MACS_30keV Res_Int cf252_flux_1	8.32E-04 3.97E-03 3.96E-02 1.34E+01 2.96E-03	4.16E-05 2.38E-04 3.00E-03 5.00E-01 2.10E-04	0.980 1.010 0.648 0.880 0.951	
Fe-54(n,γ)	6	MACS_30keV	2.94E-02	1.30E-03	0.659	
Fe-55(n,γ)	5_0	MACS_30keV	7.50E-02	1.50E-02	0.484	
Fe-56(n,γ)	6	MACS_30keV	1.17E-02	5.00E-04	0.863	
Fe-57(n,γ)	5_2	MACS_30keV	4.00E-02	4.00E-03	0.643	
Fe-58(n,γ)	6	fng_SiC fng_eurofer fng_f82h rez_DF MACS_30keV Res_Int	1.26E-03 2.48E-02 5.98E-03 1.78E-03 1.35E-02 1.50E+00	6.30E-05 4.27E-03 5.14E-04 6.18E-05 7.00E-03 7.00E-02	1.145 0.776 0.920 1.027 1.292 0.990	
Fe-59(n,γ)	5_0	MACS_30keV	1.90E-02	5.00E-03	0.762	
Co-57(n,γ)	5_3	Res_Int	2.00E+01	1.90E+00	1.430	
Co-58(n,γ)	5_3	Res_Int	7.00E+03	1.00E+03	0.080	
Co-58m(n,γ)	5_3	Res_Int	1.40E+05	1.00E+04	0.910	
Co-59(n,γ)	(6)	cf252_flux_1 fng_eurofer MACS_30keV Res_Int	6.97E-03 7.25E-01 3.96E-02 7.40E+01	3.40E-04 1.22E-01 2.70E-03 2.00E+00	0.685 0.863 0.648 1.020	
Co-59(n,γ)m Co-60(n,γ)	5_4 5_3	Res_Int Res.Int	3.90E+01 4.30E+00	2.00E+00 9.00E-01	1.080 0.770	
Co-60m(n,γ)		Res_Int	2.30E+02	5.00E+01		No EAF
		rez_DF	2.13E-01	4.02E-03	0.957	/1.005 C/E(5)=0.961
Ni-58(n,γ)	6	MACS_30keV	3.87E-02	1.50E-03	0.916	
		rez_DF	3.39E-03	8.25E-05	0.091	/1.604
Ni-60(n,γ)	6	MACS_30keV	2.99E-02	7.00E-03	0.847	
Ni-61(n,γ)	5_3	MACS_30keV	8.28E-02	8.00E-03	0.847	
Ni-62(n,γ)	5_3	MACS_30keV	2.23E-02	1.60E-03	0.778	
Ni-64(n,γ)	5_2	MACS_30keV Res_Int fission_WIMS	8.00E-03 1.07E+00 5.10E-03	7.00E-04 1.50E-01	2.276 0.750 0.544	
Cu-63(n,γ)	5_2	cf252_flux_1 MACS-30keV Res_Int cf252_flux_1	1.76E-02 5.56E-02 4.97E+00 6.65E-04	1.40E-03 2.20E-03 9.00E-02 2.30E-05	0.594 1.152 1.140 1.088	C/E(7)=0.591 C/E(5)=1.088
Cu-65(n,γ)	6	cf252_flux_1 MACS_30keV Res_Int	8.00E-03 2.98E-02 2.19E+00	1.20E-03 1.30E-03 7.00E-02	0.863 1.176 1.000	
Zn-64(n,γ)	6	MACS_30keV Res_Int	5.90E-02 1.37E+00	5.00E-03 6.00E-02	0.940 0.980	
Zn-66(n,γ)	6	MACS_30keV	3.50E-02	3.00E-03	0.830	
Zn-67(n,γ)	5_3	MACS_30keV	1.53E-01	1.50E-02	0.873	
Zn-68(n,γ)m	5_1 5_1	cf252_flux_1 MACS_30keV Res.Int	1.85E-03 3.40E-03 2.06E-01	1.20E-04 1.00E-03 1.20E-02	0.246 0.388 1.190	
Zn-68(n,γ)	(6)	MACS_30keV Res_Int	1.92E-02 3.50E+00	2.40E-03 1.50E-01	0.831 0.850	
Zn-70(n,γ)	5_3	Res_Int	8.60E-01	6.00E-02	0.130	
Ga-69(n,γ)	6	MACS_30keV Rers_Int fission_WIMS	1.39E-01 1.56E+01 2.09E-02	6.00E-03 1.20E+00	0.926 1.050 0.839	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
Ga-71(n,γ)	(6)	MACS_30keV Res_Int	1.22E-01 3.11E+01	8.00E-03 1.90E+00	0.908 1.110	
Ge-70(n,γ)	(5_2)	MACS_30keV	8.80E-02	5.00E-03	0.493	
Ge-74(n,γ)	(5_2)	MACS_30keV Res_Int fission_WIMS	3.76E-02 1.00E+00 1.20E-02	3.90E-03 2.00E-01	0.334 0.420 0.448	
Ge-74(n,γ)m	5_4	Res_Int	4.10E-01	7.00E-02	0.340	
Ge-76(n,γ)	(5_0)	MACS_30ke	2.15E-0	1.80E-0	0.710	
		Res_Int	1.86E+00	2.40E-01	0.710	
Ge-76(n,γ)g	5_4	Res_Int	6.60E-01	4.00E-02	0.800	
Ge-76(n,γ)m	5_4	Res_Int	1.20E+00	2.00E-01	0.660	
As-75(n,γ)	6	MACS_30keV Res_Int fission_WIMS	3.62E-01 6.20E+01 1.15E-02	1.90E-02 2.00E+00	1.109 1.030 1.352	
Se-74 (n,γ)	5_0	MACS_30keV	2.71E-01	1.50E-02	0.723	
Se-76 (n,γ)	(5_3)	MACS_30keV	1.64E-01	8.00E-03	0.842	
Se-76 (n,γ)m	5_3	Res_Int	1.70E+01	2.00E+00	0.680	
Se-78 (n,γ)	(5_3)	MACS_30keV	6.01E-02	9.60E-03	0.999	
Se-78 (n,γ)m	6	Res_Int	3.70E+00	6.00E-01	1.008	
Se-80 (n,γ)	(6)	MACS_30keV	4.20E-02	3.00E-03	0.866	
Se-80 (n,γ)g	5_3	Res_Int	9.94E-01	7.10E-02	0.780	
Se-80 (n,γ)m	6	Res_Int	1.47E-01	5.00E-03	0.950	
Br-79(n,γ)g	6	Res_Int	9.50E+01	1.10E+01	1.060	
Br-79(n,γ)m	6	MACS_30keV Res_Int fission_WIMS	1.71E-01 3.20E+01 1.35E-02	1.70E-02 9.00E+00	0.835 0.950 1.150	
Br-79(n,γ)	6	MACS_30keV Res_Int fission_WIMS	6.22E-01 1.27E+01 2.90E-02	3.40E-02 1.40E+00	0.987 1.030 2.163	
Br-81(n,γ)	(5_2)	MACS_30keV Res_Int fission_WIMS	2.39E-01 4.40E+01 1.70E-02	7.00E-03 5.00E+00	1.508 1.230 1.349	
Kr-78(n,γ)m		MACS_30keV	9.32E-02	6.20E-03	0.077	
Kr-78(n,γ)	(5_2)	MACS_30keV	3.21E-01	2.60E-02	0.748	
Kr-79(n,γ)	5_0	MACS_30keV	9.59E-01	1.62E-01	0.308	
Kr-80(n,γ)m	5_3	MACS_30keV	8.82E-02	3.50E-03	0.767	
Kr-80(n,γ)	(5_2)	MACS_30keV Res_Int	2.67E-01 5.61E+01	1.40E-02 5.60E+00	0.631 1.210	
Kr-82(n,γ)	5_2	MACS_30keV	9.20E-02	6.00E-03	0.779	
Kr-82(n,γ)	6	Res_Int	1.56E+02	2.00E+01	0.820	
Kr-83(n,γ)	6	MACS_30keV	2.43E-01	1.50E-02	1.009	
Kr-84(n,γ)m	5_3	MACS_30keV fission_WIMS	1.78E-02 1.90E-03	8.00E-04	1.456 2.681	
Kr-84(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	3.80E-02 2.43E+00 8.00E-03	4.00E-03 2.00E-01	0.835 0.910 0.832	
Kr-86(n,γ)	5_2	MACS_30keV fission_WIMS	3.40E-03 8.00E-03	3.00E-04	1.493 0.159	
Rb-85(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	2.34E-01 1.80E+00 2.31E-02	7.00E-03 1.00E+00	0.997 0.910 1.168	
Rb-87(n,γ)	6	MACS_30keV Res_Int fission_WIMS	1.57E-02 2.38E+00 1.80E-03	8.00E-04 1.20E-01	1.144 0.870 1.372	
Sr-84(n,γ)g	5_3	Res_Int	7.40E-01	2.00E-01	3.450	
Sr-84(n,γ)m	6	cf252_flux_1	2.42E-01	2.70E-02	0.192	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
	5_3	cf252_flux_1 MACS_30keV Res_Int	3.54E-02 1.90E-01 8.57E+00	2.34E-03 1.00E-02 4.20E-01	1.312 0.821 0.890	
Sr-84(n,γ)	(5_0)	MACS_30keV Res_Int	3.00E-01 9.31E+00	1.70E-02 4.70E-01	0.694 1.100	
Sr-86(n,γ)m	5_2	cf252_flux_1 Res_Int	1.82E-01 4.80E+00	2.20E-02 2.40E-01	0.093 0.790	
Sr-86(n,γ)	(6)	MACS_30keV	6.40E-02	3.00E-03	0.951	
Sr-87(n,γ)	6	MACS_30keV	9.20E-02	4.00E-03	0.933	
Sr-88(n,γ)	6	MACS_30keV fission_WIMS	6.13E-03 2.10E-03	1.10E-04	0.918 1.111	
Sr-90(n,γ)	5_3	Res_Int	1.04E-01	1.60E-02	0.960	
Y-89(n,γ)m	6	tud_Y fng_Y	3.82E-04 3.57E-04	1.96E-04 1.07E-05	1.137 1.239	C/E(5)=1.140 C/E(5)=1.229
Y-89(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS cf252_flux_1 rez_DF fng_Y	1.90E-02 9.60E-01 7.00E-03 2.21E-04 1.86E-01 6.07E-01	6.00E-04 6.00E-02 6.00E-06 5.57E-03 7.28E-02	1.024 0.960 0.765 0.985 1.504 1.133	 C/E(5)=1.493 C/E(5)=1.131
Zr-90(n,γ)	6	MACS_30keV	1.93-02	9.00E-04	0.999	
Zr-91(n,γ)	6	MACS_30keV Res_Int	6.20E-02 5.76E+00	3.40E-03 4.00E-01	0.985 0.840	
Zr-92(n,γ)	6	MACS_30keV	3.01E-02	1.70E-03	1.225	
Zr-93(n,γ)	6	MACS_30keV Res_Int	9.50E-02 1.75E+01	1.00E-02 5.00E+00	0.944 1.040	
Zr-94(n,γ)	6	cf252_flux_1 MACS_30keV Res_Int	8.75E-03 2.60E-02 2.80E-01	6.50E-04 1.00E-03 1.00E-02	0.722 1.134 1.000	
Zr-96(n,γ)	5_2	cf252_flux_1 MACS_30keV Res_Int	4.17E-03 1.07E-02 5.28E+00	2.10E-04 5.00E-04 1.10E-01	3.447 1.313 1.060	
Nb-93(n,γ)m	6	fns_5min fng_heat fission_WIMS	4.65E-03 1.24E-02 4.10E-02	2.79E-04 2.10E-03	1.042 0.199 0.444	
Nb-93(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	2.66E-01 8.30E+00 5.20E-02	5.00E-03 4.00E-01	0.893 1.170 0.508	
Nb-94(n,γ)	5_3	Res_Int	1.52E+02	8.00E+00	0.930	
Mo-92(n,γ)	(6)	MACS_30keV	7.20E-02	1.00E-02	0.844	
Mo-94(n,γ)	6	MACS_30keV	1.04E-01	2.00E-02	0.844	
Mo-95(n,γ)	6	MACS_30keV	2.90E-01	1.20E-02	1.116	
Mo-96(n,γ)	6	MACS_30keV	1.12E-01	8.00E-03	0.834	
Mo-97(n,γ)	6	MACS_30keV	3.39E-01	1.40E-02	0.946	
Mo-98(n,γ)	6	cf252_flux_1 Res_Int fzk_ss316 fzk_ss316 fng_Mo	2.63E-02 6.70E+00 4.13E-01 3.28E-01 1.29E+0	1.30E-03 5.00E-01 9.55E-03 1.31E-01 4.04E-02	1.045 1.040 1.063 1.337 1.086	 C/E(5)=1.082
Mo-100(n,γ)	6	cf252_flux_1 MACS_30keV Res_Int	1.48E-02 1.08E-01 3.76E+00	1.11E-03 1.40E-02 1.50E-01	0.956 0.655 1.030	
Tc-99(n,γ)	5_2	MACS_30keV Res_Int	9.33E-01 3.58E+02	4.70E-02 2.00E+01	0.744 0.870	
Ru-96(n,γ)	6	MACS_30keV Res_Int	2.07E-01 6.36E+00	8.00E-03 2.30E-01	1.107 1.070	
Ru-100(n,γ)	6	MACS_30keV	2.06E-01	1.30E-02	0.886	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
		Res_Int	1.12E+01	1.10E-02	1.000	
Ru-101(n,γ)	6	MACS_30keV Res_Int	9.90E-01 1.02E+02	4.00E-02 1.00E+01	0.813 1.080	
Ru-102(n,γ)	6	MACS_30keV Res_Int fission_WIMS	1.51E-01 4.90E+00 3.00E-02	7.00E-03 7.00E-03	1.129 1.070 1.374	
Ru-104(n,γ)	6	MACS_30keV Res_Int fission_WIMS	1.54E-01 6.30E+00 3.10E-02	6.00E-03 2.00E-01	0.963 1.020 0.934	
Ru-106(n,γ)	5_3	Res_Int	2.00E+00	6.00E-01	1.010	
Rh-103(n,γ)	(5_2)	fns_5min MACS_30keV Res_Int fission_WIMS	2.68E-02 8.11E-01 1.01E+03 9.40E-02	2.15E-03 1.40E-02 5.00E+01	2.504 0.957 1.020 0.865	
Rh-103(n,γ)m	5_3	Res_Int fission_WIMS	7.50E+01 1.54E-02	5.00E+00	1.050 0.561	
Rh-103(n,p)	5_2	rez_DF	4.75E-03	1.90E-04	1.910	
Rh-105(n,γ)	5_3	Res_Int	1.7oE+04	3.00E+03	0.190	
Pd-102(n,γ)	5_0	MACS_30keV	3.69E-01	1.70E-02	0.408	
Pd-104(n,γ)	5_3	MACS_30keV	2.89E-01	2.90E-02	0.867	
Pd-105(n,γ)	6	MACS_30keV	1.20E+00	6.00E-02	0.891	
Pd-106(n,γ)	(6)	MACS_30keV Res_Int	2.52E-01 6.65E+00	2.50E-02 2.00E-01	0.767 0.890	
Pd-107(n,γ)	6	MACS_30keV	1.34E+00	6.00E-02	0.905	
Pd-108(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	2.03E-01 2.44E+02 1.08E-01	2.00E-02 4.00E+00	0.983 0.710 0.243	
Pd-110(n,γ)	(5_2)	MACS_30keV	1.46E-01	2.00E-02	0.679	
Pd-110(n,γ)g	5_3	Res_Int	2.30E+00	3.00E-01	0.850	
Pd-110(n,γ)m	5_2	Res_Int	6.60E-01	7.00E-02	0.510	
Ag-107(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	7.92E-01 1.07E+02 8.50E-02	3.00E-02 5.00E+00	1.020 1.000 1.027	
Ag-109(n,γ)m	6	Res_Int	6.51E+02	2.90E+00	1.040	
Ag-109(n,γ)	(6)	MACS_30keV fission_WIMS	7.88E-01 1.78E-01	3.00E-02	0.961 0.471	
Ag-111(n,γ)	5_3	Res_Int	1.05E+02	2.00E+01	0.710	
Cd-106(n,γ)	5_2	MACS_30keV	3.02E-01	2.40E-02	1.470	
Cd-108(n,γ)	5_4	MACS_30keV	2.02E-01	9.00E-03	0.991	
Cd-110(n,γ)m	5_1	MACS_30keV Res_Int	1.32E-02 3.90E+00	1.00E-03 1.00E-01	0.094 0.060	
Cd-110(n,γ)	(5_2)	cf252_flux_1 MACS_30keV	2.04E-01 2.37E-01	7.00E-03 2.00E-03	0.194 0.815	
Cd-111(n,γ)	5_2	MACS_30keV fng_heat	7.54E-01 6.89E-01	1.20E-02 2.07E-02	0.733 0.835	
Cd-112(n,γ)	(5_2)	MACS_30keV	1.88E-01	1.70E-02	0.719	
Cd-113(n,γ)	6	MACS_30keV	6.67E-01	1.10E-02	0.974	
Cd-113m(n,γ)	5_0	MACS_30keV	6.82E-01	3.41E-01	0.548	
Cd-114(n,γ)g	6	MACS_30keV	1.18E-01	4.00E-03	1.074	
Cd-114(n,γ)m	5_3	MACS_30keV	9.00E-03	3.00E-03	1.892	
Cd-114(n,γ)	(6)	MACS_30keV Res_Int	1.29E-01 1.26E+01	1.30E-03 1.00E+00	1.112 1.290	
Cd-116(n,γ)g	5_3	MACS_30keV	5.98E-02	3.30E-03	0.765	
Cd-116(n,γ)m	6	MACS_30keV	1.50E-02	8.00E-03	1.527	
Cd-116(n,γ)	(5_2)	cf252_flux_1 MACS_30keV	3.80E-02 7.48E-02	1.40E-02 9.00E-04	0.261 0.920	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
In-113(n,γ)m	6	MACS_30keV Res_Int	4.80E-01 2.20E+02	1.60E-01 1.50E+01	0.856 0.850	
In-113(n,γ)	(6)	MACS_30keV	7.87E-01	7.00E-02	0.903	
In-114m(n,γ)	5_3	MACS_30keV	2.60E+00	1.30E+00	0.907	
In-115(n,γ)g	5_3	Res_Int	6.50E+02	3.00E+01	1.080	
In-115(n,γ)m	5_1	cf252_flux_1 cf252_flux_1 MACS_30keV Res_Int	1.24E-01 1.39E-01 6.89E-01 2.65E+03	3.60E-03 6.00E-02 1.70E-02 1.00E+02	0.612 0.546 0.633 0.440	
In-115(n,γ)n	5_3	MACS_30keV	3.76E-01		0.331	
In-115(n,γ)	(5_2) (6)	fns_5min MACS_30keV Res_Int	5.18E-02 7.06E-01 3.30E+03	2.59E-03 7.00E-02 1.00E+02	3.328 0.942 0.990	
		fng_Sn	1.17E+0	1.05E-01	0.947	
Sn-112(n,γ)	(6)	MACS_30keV Res_Int	2.10E-01 2.90E+01	1.20E-02 2.00E+00	0.865 1.030	
Sn-114(n,γ)	6	MACS_30keV	1.34E-01	1.80E-03	0.937	
Sn-115(n,γ)	6	MACS_30keV	3.42E-01	8.70E-03	1.021	
Sn-116(n,γ)	(6)	MACS_30keV Res_Int	9.16E-02 4.90E-01	6.00E-04 1.60E-01	0.915 1.000	
Sn-117(n,γ)	(6)	MACS_30keV	3.19E-01	4.80E-03	0.981	
Sn-118(n,γ)	(6)	MACS_30keV	6.21E-02	6.00E-04	0.958	
Sn-119(n,γ)	6	MACS_30keV	1.80E-01	1.00E-02	1.128	
Sn-120(n,γ)m	5_3	MACS_30keV	5.20E-04	1.80E-04	0.530	
Sn-120(n,γ)	(6)	MACS_30keV fission_WIMS	3.60E-02 1.40E-02	5.00E-04	0.900 1.213	
Sn-122(n,γ)m	6	MACS_30keV fission_WIMS	1.80E-02 1.20E-02	1.00E-02	0.641 0.491	
Sn-122(n,γ)	(5_1)	MACS_30keV Res_Int	2.19E-02 8.10E-01	1.50E-03 4.00E-02	0.535 0.830	
		fng_Sn	5.60E-01	1.71E-02	0.881	
Sn-124(n,γ)	(5_2)	MACS_30keV fission_WIMS	1.20E-02	1.20E-03	1.389 0.345	Sum of g + m
Sn-124(n,γ)g	5_3	Res_Int fission_WIMS	8.30E-05 4.00E-03	2.50E-05	3.250	
Sn-124(n,γ)m	6	Res_Int fission_WIMS	7.80E+00 1.50E-02	2.00E-01	0.900	
Sb-121(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	5.32E-01 2.02E+02 9.00E-01	1.60E-02 2.00E+01	0.948 1.020 1.149	
Sb-121(n,γ)m	5_3	Res_Int	1.30E+01	1.00E+00	1.010	
Sb-122(n,γ)	5_3	MACS_30keV	9.94E-01	1.62E-01	0.789	
Sb-123(n,γ)	(6)	MACS_30keV Res_Int	3.03E-01 1.26E+02	9.00E-03 2.00E+01	1.156 0.950	
Te-120(n,γ)m	5_3	MACS_30keV	6.76E-02	6.40E-03	0.604	
Te-120(n,γ)	(5_0)	MACS_30keV	5.38E-01	2.60E-02	0.676	
Te-122(n,γ)	(6)	MACS_30keV	2.95E-01	3.00E-02	0.958	
Te-123(n,γ)	(6)	MACS_30keV	8.32E-01	8.00E-02	0.756	
Te-124(n,γ)	(6)	MACS_30keV	1.55E-01	2.00E-03	0.885	
Te-125(n,γ)	6	MACS_30keV	4.31E-01	4.00E-03	0.861	
Te-126(n,γ)	(6)	MACS_30keV Res_Int	8.13E-02 8.00E+00	1.40E-03 6.00E-01	1.014 1.130	
Te-128(n,γ)g	5_3	Res_Int	1.58E+00	6.00E-02	1.000	
Te-128(n,γ)m	5_3	MACS_30keV Res_Int	4.94E-03 7.75E-02	2.10E-04 5.00E-03	0.440 1.630	
Te-128(n,γ)	(5_2)	MACS_30keV	4.44E-02	1.30E-03	0.654	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
Te-130(n,γ)	(6)	MACS_30keV	1.47E-02	2.80E-03	0.950	
I-125(n,γ)	5_1	Res_Int	1.37E+04	2.00E+03	0.040	
I-126(n,γ)	5_3	Res_Int	4.06E+04	0.00E+00	1.010	
I-127(n,γ)	5_2 6	fns_5min MACS_30keV Res_Int	1.93E-02 6.35E-01 1.55E+02	1.16E-03 3.00E-02 6.00E+00	1.695 0.965 0.930	C/E(5)=1.666
I-129(n,γ)	(6)	MACS_30keV Res_Int	4.41E-01 3.38E+01	2.20E-02 1.40E+00	0.823 0.900	
I-129(n,γ)g	5_3	Res_Int	1.82E+01	8.00E-01	0.690	
I-129(n,γ)m	5_3	Res_Int	1.56E+01	7.00E-01	1.140	
Xe-124(n,γ)m	5_3	MACS_30keV Res_Int	1.31E-01 6.00E+02	1.70E-02 1.00E+02	0.510 0.860	
Xe-124(n,γ)	(5_0)	MACS_30keV Res_Int	6.44E-01 3.60E+03	8.30E-02 7.00E+02	0.607 0.850	
Xe-126(n,γ)m	6 5_0	MACS_30keV Res_Int	4.00E-02 8.00E+00	6.00E-03 2.00E+00	0.864 0.120	
Xe-126(n,γ)	(5_0)	MACS_30keV Res_Int	3.59E-01 6.10E+01	5.10E-02 6.00E+00	0.760 0.120	
Xe-128(n,γ)m	5_1	MACS_30keV	2.58E-02	2.10E-02	0.405	
Xe-128(n,γ)	(5_2)	MACS_30keV	2.63E-01	3.70E-03	0.651	
Xe-129(n,γ)	5_2	MACS_30keV Res_Int	6.17E-01 2.52E+02	1.20E-02 1.50E+01	0.724 1.010	
Xe-130(n,γ)m	6	MACS_30keV	1.23E-02	1.00E-03	0.916	
Xe-130(n,γ)	(6)	MACS_30keV	1.32E-01	2.10E-02	1.021	
Xe-131(n,γ)	5_3	Res_Int	8.90E_02	5.00E+01	1.000	
Xe-132(n,γ)m	6	MACS_30keV Res_Int	4.70E-03 9.00E-01	4.00E-04 2.00E-01	1.009 15.11	
Xe-132(n,γ)	(5_0)	MACS_30keV Res_Int	6.46E-02 5.00E+00	5.30E-03 6.00E-01	0.655 3.640	
Xe-134(n,γ)m	5_1	MACS_30keV	5.90E-04	5.00E-05	0.440	
Xe-134(n,γ)	(5_3)	MACS_30keV	2.02E-02	1.70E-03	1.000	
Xe-136(n,γ)	5_0	MACS_30keV Res_Int fission_WIMS	9.10E-04 7.40E-01 1.00E-03	8.00E-05 2.10E-01	0.846 0.190 0.534	
Cs-133(n,γ)m	6	MACS_30keV Res_Int	4.30E-02 2.90E+01	1.40E-02 1.10E+00	0.402 1.400	
Cs-133(n,γ)	(6)	MACS_30keV Res_Int	5.09E-01 4.37E+02	2.10E-02 2.60E+01	0.915 1.000	
Cs-134(n,γ)	(6)	MACS_30keV	7.24E-01	6.50E-02	0.764	
Cs-135(n,γ)	(6)	MACS_30keV	1.60E-01	1.00E-02	1.127	
Ba-130(n,γ)	(5_2)	MACS_30keV Res_Int	7.46E-01 1.76E+02	3.40E-02 7.00E+00	0.877 0.990	
Ba-130(n,γ)g	5_1	Res_Int	1.53E+02	7.00E+00	5.720	
Ba-130(n,γ)m	5_1	Res_Int	2.30E+01	1.00E+00	0.290	
Ba-132(n,γ)m	5_3	MACS_30keV Res_Int	3.57E-02 2.80E+00	3.60E-03	0.060 1.370	
Ba-132(n,γ)	(5_0)	MACS_30keV	3.97E-01	1.60E-01	0.591	
Ba-134(n,γ)	(5_2) (6)	cf252_flux_1 MACS_30keV	2.55E-01 1.76E-01	2.80E-02 5.60E-03	0.197 1.139	
Ba-134(n,γ)m		Res_Int	2.39E+01	3.80E+00	0.070	
Ba-135(n,γ)		MACS_30keV	4.55E-01	1.50E-02	0.731	
Ba-135(n,γ)m		Res_Int	4.65E-01	7.00E-02	0.520	
Ba-136(n,γ)	(5_2)	cf252_flux_1 MACS_30keV	2.93E-01 6.12E-02	2.90E-02 2.00E-03	0.049 0.812	C/E(5)=0.197
Ba-137(n,γ)	6	MACS_30keV	7.63E-02	2.40E-02	0.846	
Ba-138(n,γ)	6*	cf252_flux_1	3.80E-03	4.00E-04	0.416	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
	 6	cf252_flux_1 MACS_30keV	1.30E-03 4.00E-0	2.60E-04 2.00E-04	1.216 0.920	
Ba-140(n,γ)		Res_Int	1.36E+01	1.40E+00	1.050	
La-138(n,γ)	5_0	MACS_30keV	4.19E-01	5.90E-02	0.669	
La-138(n,γ)		Res_Int	4.09E+02	9.00E+01	0.890	
La-139(n,γ)	6	tud_Er Res_Int fission_WIMS tud_Er	2.48E-03 1.21E+01 5.00E-03 2.05E-03	1.56E-04 6.00E-01 2.05E-03	0.950 0.990 1.140 1.090	
La-140(n,γ)		Res_Int	6.90E+01	4.00E+00	0.540	
Ce-136(n,γ)m		MACS_30keV	2.82E-02	1.63E-03	2.235	
Ce-136(n,γ)	(5_3)	MACS_30keV	3.28E-01	2.10E-02	1.431	
Ce-138(n,γ)	(5_3)	MACS_30keV	1.79E-01	5.00E-03	0.530	
Ce-138(n,γ)		Res_Int	6.70E+00	3.40E+00	0.860	
Ce-140(n,γ)	6	MACS_30keV Res_Int fission_WIMS	1.00E-02 5.40E-01 5.40E-03	4.00E-04 5.00E-02	0.810 0.490 1.381	
Ce-141(n,γ)	6	MACS_30keV	7.60E-02	3.30E-02	1.055	
Ce-142(n,γ)	5_1	MACS_30keV Res_Int fission_WIMS	2.80E-02 1.15E+00 4.20E-03	1.00E-03 5.00E-02	0.623 0.780 1.780	
Ce-144(n,γ)		Res_Int	2.60E+00	3.00E-01	1.080	
Pr-141(n,γ)	(6)	MACS_30keV Res_Int fission_WIMS	1.11E-01 1.74E+01 1.10E-02	1.40E-03 2.00E+00	0.946 1.030 1.370	
Nd-142(n,γ)	6	MACS_30keV Res_Int	3.50E-02 3.40E+02	7.00E-04 1.10E+01	1.274 0.180	
Nd-143(n,γ)	6	MACS_30keV	2.45E-01	3.00E-03	0.996	
Nd-144(n,γ)	5_2	MACS_30keV	8.13E-02	6.50E-03	0.691	
Nd-145(n,γ)	6	MACS_30keV Res_Int	4.25E-01 2.30E+02	5.00E-03 2.50E+01	0.910 1.000	
Nd-146(n,γ)	6	MACS_30keV Res_Int fission_WIMS	9.12E-02 2.57E+00 4.00E-02	1.00E-03 1.40E-01	1.016 1.040 0.715	
Nd-147(n,γ)	5_3	MACS_30keV	5.44E-01	9.00E-02	0.828	
Nd-148(n,γ)	6	MACS_30keV Res_Int fission_WIMS	1.47E-01 1.55E+01 8.00E-02	2.00E-03 1.50E+00	0.813 1.270 0.438	
Nd-150(n,γ)	6	MACS_30keV	1.59E-01	1.00E-02	0.873	
Nd-150(n,γ)		Res_Int	1.52E+01	8.00E-01	1.030	
Pm-147(n,γ)g		MACS_30keV Res_Int	3.13E-01 1.28E+03	6.00E-02 6.60E+01	2.572 0.890	
Pm-147(n,γ)m		MACS_30keV Res_Int	3.95E-01 7.90E+02	5.50E-02 1.00E+00	0.393 1.240	
Pm-147(n,γ)	(5_3)	MACS_30ke	7.09E-01	1.00E-0	1.355	
Pm-148m(n,γ)		Res_Int	3.60E+03	.40E+03		No EAF
Sm-144(n,γ)	6	MACS_30keV Res_Int	9.20E-02 2.38E+00	6.00E-03 1.70E-01	0.951 0.730	
Sm-145(n,γ)		Res_Int	6.00E+02	9.00E+01	0.900	
Sm-147(n,γ)	6	MACS_30keV Res_Int	9.74E-01 7.77E+02	1.00E-02 3.00E+01	1.061 1.020	
Sm-148(n,γ)	6	MACS_30keV Res_Int	2.41E-01 2.70E+01	2.00E-03 1.40E+01	0.902 1.330	
Sm-149(n,γ)	6	MACS_30keV	1.82E+00	1.70E-02	1.034	
Sm-150(n,γ)	6	MACS_30keV Res_Int	4.22E-01 3.58E+02	4.00E-03 5.00E+01	0.989 0.950	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
Sm-151(n,γ)	5_0	MACS_30keV	3.03E+00	6.80E-02	0.723	
Sm-152(n,γ)	6	MACS_30keV Res_Int	4.73E-01 2.97E+03	4.00E-03 1.00E+02	0.929 1.000	
Sm-153(n,γ)	5_3	MACS_30keV	1.10E+00	1.75E-01	0.975	
Sm-154(n,γ)	6	MACS_30keV Res_Int	2.06E-01 3.60E+01	1.20E-02 4.00E+00	1.101 0.930	
Eu-151(n,γ)g		Res_Int	1.51E+03	3.30E+02	1.450	
Eu-151(n,γ)m	5_2	fns_5min MACS_30keV Res_Int	1.01E-01 1.56E+00 1.79E+03	1.51E-02 1.24E-01 1.40E+02	3.452 0.852 0.640	C/E(5)=2.609
Eu-151(n,γ)	(6)	MACS_30keV Res_Int	3.48E+00 3.30E+03	7.70E-02 3.00E+02	1.110 1.020	
Eu-153(n,γ)	(6)	MACS_30keV Res_Int	2.26E+00 1.42E+02	4.60E-02 1.00E+02	1.158 1.020	
Eu-154(n,γ)	5_0	MACS_30keV	4.42E+00	6.70E-01	0.617	
Eu-155(n,γ)	5_3	MACS_30keV	1.32E+00	8.40E-02	0.767	
Gd-152(n,γ)	6	MACS_30keV Res_Int	1.05E+00 2.02E+03	1.70E-02 1.60E+02	0.845 0.490	
Gd-153(n,γ)	5_0	MACS_30keV	4.55E+00	7.00E-01	0.555	
Gd-154(n,γ)	5_2	MACS_30keV Res_Int	1.03E+00 2.45E+02	1.20E-01 3.00E+01	0.677 1.010	
Gd-155(n,γ)	6	MACS_30keV	2.65E+00	3.00E-01	1.020	
Gd-156(n,γ)	6	MACS_30keV Res_Int	6.15E-01 1.04E+02	5.00E-03 1.50E+01	0.834 0.980	
Gd-157(n,γ)	6	MACS_30keV	1.37E+00	1.50E-01	1.022	
Gd-158(n,γ)	6	MACS_30keV Res_Int	3.24E-01 7.30E+01	3.00E-03 7.00E+00	0.808 0.860	
		fng_ScSmGd	1.96E+0	6.08E-02	0.779	
Gd-160(n,γ)	6 5_2	fns_5min MACS_30keV	3.28E-03 1.54E-01	6.23E-04 2.00E-02	4.106 1.326	C/E(5)=1.563 C/E(7)=1.818
Tb-159(n,γ)	6	MACS_30keV Res_Int	1.58E+00 4.18E+02	1.50E-01 2.00E+01	1.010 0.990	
Tb-160(n,γ)	5_0	MACS_30keV	3.24E+00	5.10E-01	0.586	
Dy-156(n,γ)	6	MACS_30keV Res_Int	1.61E+00 8.70E+02	9.30E-02 8.00E+01	0.854 1.100	
Dy-158(n,γ)		Res_Int	1.20E+02	2.00E+01	1.520	
Dy-160(n,γ)	6	MACS_30keV Res_Int	8.90E-01 1.12E+03	1.20E-02 9.00E+01	0.918 1.420	
Dy-161(n,γ)	6	MACS_30keV Res_Int	1.96E+00 1.08E+03	1.90E-02 8.00E+01	0.896 1.130	
Dy-162(n,γ)	6	MACS_30keV	4.96E-01 2.74E+03	4.00E-03 2.70E+02	0.827 1.010	
Dy-163(n,γ)		MACS_30keV Res_Int	1.11E+00 1.47E+03	1.10E-02 1.00E+02	0.666 1.000	
Dy-164(n,γ)g	5_4	fng_Dy	2.97E-02	1.34E-03	0.752	
Dy-164(n,γ)m	6	fns_5min	8.89E-02	1.24E-02	1.351	C/E(5)=0.852
Dy-164(n,γ)	(5_2)	fns_5min MACS_30keV Res_Int fission_WIMS	6.89E-02 2.12E-01 3.42E+02 2.33E-02	1.52E-02 3.00E-03 2.00E+01 2.50E-03	86.629 0.852 1.010 1.261	C/E(5)=2.767 C/E(7)=2.783
Dy-165(n,γ)		Res_Int	2.20E+04	3.00E+03	0.950	
Ho-163(n,γ)	(5_0)	MACS_30keV	2.13E+00	9.50E-02	0.643	
Ho-165(n,γ)g		Res_Int	6.50E+02	2.20E+01	0.990	
Ho-165(n,γ)m		MACS_30keV	7.98E-01	1.20E-01	1.660	
Ho-165(n,γ)	(5_2)	MACS_30keV	1.18E+00	1.00E-01	1.315	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
		Res_Int	6.65E+02	2.00E+01	1.020	
Ho-166m(n,γ)		Res_Int	1.00E+04	2.700E+03		No EAF
Er-162(n,γ)	5_3	MACS_30keV Res_Int	6.63E+00 4.80E+02	1.24E-01 5.00E+01	0.785 0.960	
Er-164 (n,γ)	5_0	MACS_30keV Res_Int	1.08E+00 1.05E+02	5.10E-02 1.00E+01	0.590 1.350	
Er-166(n,γ)	(6)	MACS_30keV Res_Int	5.36E-01 9.50E+01	5.60E-02 7.00E+00	1.170 1.180	
Er-167(n,γ)	6	MACS_30keV Res_Int	1.43E+00 2.97E+03	1.43E-01 7.00E+01	0.942 1.030	
Er-168(n,γ)	6	MACS_30keV Res_Int tud_Er	3.38E-01 3.70E+01 2.39E-03	4.40E-02 5.00E+00 1.79E-04	0.927 1.010 0.970	
Er-169(n,γ)	5_0	MACS_30keV	6.53E-01	1.14E-01	0.493	
Er-170(n,γ)g		Res_Int	3.54E+01	5.90E+00	1.280	
Tm-169(n,γ)	5_0	MACS_30keV Res_Int	4.86E-01 1.66E+03	1.44E-01 5.00E+01	1.481 1.030	
Tm-171(n,γ)		Res_Int	1.18E+01	6.00E+00	3.990	
Yb-168(n,γ)	(5_0)	MACS_30keV	1.21E+00	4.90E-02	0.689	
Yb-170(n,γ)	6	MACS_30keV Res_Int	7.18E-01 3.10E+02	7.00E-03 3.00E+01	0.857 1.050	
Yb-171(n,γ)	6	MACS_30keV Res_Int	1.21E+00 3.18E+02	1.20E-02 3.00E+01	1.005 1.030	
Yb-172(n,γ)	6	MACS_30keV Res_Int	3.41E-01 2.50E+01	3.00E-03 3.00E+00	1.033 1.080	
Yb-173(n,γ)	6	MACS_30keV Res_Int	7.57E-01 3.80E+02	7.00E-03 3.00E+01	1.011 1.010	
Yb-174(n,γ)	6	MACS_30keV Res_Int	1.51E-01 2.70+01	2.00E-03 3.00E+00	1.003 1.020	
Yb-176(n,γ)	(6)	MACS_30keV Res_Int	1.16E-01 6.90E+00	2.00E-03 6.00E-01	0.836 0.990	
Lu-175(n,γ)m	6	fns_5min MACS_30keV Res_Int fission_WIMS	5.01E-02 1.04E+00 6.20E+02 1.85E-01	1.00E-02 3.00E-02 5.00E+01 1.00E-02	1.220 0.753 0.750 0.544	C/E(5)=1.203
Lu-175(n,γ)	(6)	MACS_30keV Res_Int	1.22E+00 5.50E+02	3.00E-02 3.00E+01	0.961 1.000	
Lu-176(n,γ)	(6)	MACS_30keV fission_WIMS	1.64E+00 1.58E-01	1.40E-02	0.837 1.230	
Lu-176(n,γ)g		Res_Int	1.09E+03	4.00E+01	0.200	
Lu-176(n,γ)n		Res_Int	4.70E+00	1.40E+00	0.000	
Hf-174(n,γ)	6	MACS_30keV Res_Int	9.84E-01 3.07E+02	4.60E-02 1.50E+01	0.807 1.050	
Hf-176(n,γ)	(6)	MACS_30keV Res_Int	6.26E-01 7.08E+02	1.10E-02 1.50E+01	0.712 0.860	
Hf-177(n,γ)	(6)	MACS_30keV Res_Int	1.54E+00 7.20E+03	1.20E-02 2.00E+02	0.802 1.000	
Hf-178(n,γ)	(6)	MACS_30keV Res_Int	3.19E-01 1.88E+03	3.00E-03 2.00E+01	0.845 1.020	
Hf-178n(n,γ)		Res_Int	8.00E+02	1.00E+02	2.400	
Hf-179(n,γ)m		MACS_30keV Res_Int	11.14-02 5.27E+02	6.00E-04 3.00E+01	0.744 0.730	
Hf-179(n,γ)	(6)	MACS_30keV Res_Int	9.22E-01 6.30E+02	8.00E-03 3.00E+01	0.962 0.860	
		fng_heat	6.29E-01	1.01E-01	0.868	
Hf-180(n,γ)	5_2	fng_hafnium MACS_30keV	9.28E-03 1.57E-01	1.51E-03 2.00E-03	0.507 0.897	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
		Res_Int	3.30E+01		1.070	
		fng_heat	3.85E-03	6.16E-04	0.640	
Hf-182(n,γ)	5_3	MACS_30keV	1.41E-01	8.00E-03	0.908	
Ta-180m(n,γ)	(6)	MACS_30keV	1.47E+00	1.10E-01	1.444	
Ta-181(n,γ)n	6*	fng_Ta	1.20E-04	4.13E-05	0.521	
		Res_Int	4.15E-01	1.10E-01	0.020	
Ta-181(n,γ)	(6)	fng_eurofer	1.19E+0	1.79E-01	1.118	
		cf252_flux_1	1.20E-01	6.50E-03	0.835	
		cf252_flux_1	8.92E-02	1.07E-03	1.122	
		fng_Ta	4.21E-02	2.90E-03	0.876	C/E(5)=0.882
		rez_DF	2.30E-01	3.27E-03	0.296	
		rez_DF	3.38E-02	2.91E-04	2.018	
		fns_7hour	1.36E-02	2.85E-03	0.803	C/E(7)=0.734
		Res_Int	6.55E+02	2.00E+01	1.130	
W-180(n,γ)	6	MACS_30keV	6.60E-01	5.30E-02	0.903	
		fng_tung	1.37E+0	1.75E-01	1.153	
		fzk_2	5.39E-01	7.24E-02	0.750	
		fng_eurofer	1.44E+0	1.66E-01	1.106	
W-182(n,γ)	(6)	MACS_30keV	2.74E-01	8.00E-02	0.960	
W-183(n,γ)	6	MACS_30keV	5.15E-01	1.50E-02	0.931	
W-184(n,γ)	(6)	MACS_30keV	2.23E-01	5.00E-02	0.898	
		Res_Int	1.47E+01	1.5E+00	1.150	
		sneg_2	5.35E-04	9.64E-05	1.491	
		rez_DF	3.33E-04	1.51E-05	2.015	C/E(5)=1.927
W-185(n,γ)	5_0	MACS_30keV	5.84E-01	5.30E-02	0.422	
W-186(n,γ)	6	fng_f82h	3.48E-01	2.46E-02	0.918	C/E(7)=0.926
		fng_tung	1.29E+0	8.29E-02	1.010	C/E(7)=1.011
		sneg_1	4.34E-03	3.90E-04	11.835	C/E(7)=0.931
						PEQ changed
		rez_DF	1.32E-01	1.13E-03	0.167	C/E(7)=0.179†
		rez_DF	3.10E-02	9.30E-04	0.709	C/E(7)=0.762
		fzk_ss316	2.28E-02	1.48E-03	0.571	C/E(7)=0.668
		MACS_30keV	2.35E-01	9.00E-03	0.842	
		Res_Int	4.80E+02	1.50E+01	1.080	
		fission_WIMS	7.10E-02		0.450	
W-187(n,γ)		Res_Int	2.76E+03	5.50E+02	0.600	
Re-185(n,γ)	(5_2)	MACS_30keV	1.53E+00	6.20E-02	0.610	
		Res_Int	1.73E+03	5.00E+01	0.990	
		fission_WIMS	1.80E-01		0.967	
		fng_heat	2.00E+0	2.59E-01	0.768	C/E(7)=0.767
		fng_Re	1.86E+0	2.64E-01	0.836	C/E(7)=0.885
Re-187(n,γ)m	6	fng_heat	3.64E-03	5.46E-04	0.500	
		fng_Re	7.02E-03	4.46E-03	0.948	
Re-187(n,γ)	(6)	fng_Re	3.19E-01	6.93E-02	0.635	
		MACS_30keV	1.16E+00	5.70E-02	0.788	
		Res_Int	3.00E+02	2.00E+01	0.960	
		fission_WIMS	1.65E-01		0.700	
Os-184(n,γ)	5_3	MACS_30ke	5.90E-01	3.90E-02	1.123	
		Res_Int	6.01E+02	5.10E+01	2.420	
Os-186n,γ)	6	MACS_30keV	4.10E-01	1.70E-02	0.961	
Os-187(n,γ)	6	MACS_30keV	9.66E-01	3.10E-02	0.866	
Os-188(n,γ)	5_2	MACS_30keV	2.93E-01	1.40E-02	1.304	
Os-189(n,γ)	(6)	MACS_30keV	1.17E+00	4.70E-02	0.843	
Os-189(n,γ)m		Res_Int	1.30E+01	1.00E+00	0.400	
Os-190(n,γ)	5_2	MACS_30keV	2.74e-01	1.20E-03	1.361	
Os-190(n,γ)m		Res_Int	2.21E+01	1.70E+00	0.780	
Os-191(n,γ)	5_3	MACS_30keV	1.29E+00	2.80E-01	0.954	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
Os-192(n,γ)	6	MACS_30keV Res_Int	1.55E-01 7.00E+00	7.00E-03 4.00E-01	1.224 1.480	
Ir-191(n,γ)	(6)	MACS_30keV Res_Int	1.35E+00 3.35E+03	4.3E0-02 1.00E+00	0.888 1.000	
Ir-193(n,γ)	(6)	MACS_30keV Res_Int	9.94E-01 1.35E+03	7.00E-02 1.00E+02	0.796 1.010	
Pt-190(n,γ)	5_3	MACS_30keV Res_Int	5.08E-01 7.20E+01	4.40E-02 1.00E+01	1.275 2.190	
Pt-194(n,γ)m		Res_Int	1.00E+00	1.00E-01	0.320	
Pt-196(n,γ)m		MACS_30keV Res_Int	1.22E-02 3.50E-01	5.00E-04 7.00E-02	0.408 1.340	
Pt-196(n,γ)	(5_3)	MACS_30keV	1.83E-01	1.60E-02	1.198	
Pt-198(n,γ)m		MACS_30keV Res_Int	3.03E-03 6.00E+00	8.00E-04 7.00E-01	0.429 0.060	
Pt-198(n,γ)	(5_2)	MACS_30keV fission_WIMS	9.22E-02 6.40E-02	4.60E-03	1.691 0.492	
Au-197(n,γ)	(6)	cf252_flux_1 cf252_flux_1 cf252_flux_1 MACS_30keV Res_Int	1.10E-01 7.70E-02 7.80E-02 5.82E-01 1.50E+02	5.00E-03 7.70E-05 3.00E-03 9.00E-03 2.80E+01	0.673 0.962 0.950 0.929 1.000	
Au-198(n,γ)	5_3	MACS_30keV	8.40E-01	1.47E-01	0.768	
Hg-196(n,γ)g		Res_Int	4.13E+02	1.50E+01	1.040	
Hg-196(n,γ)m		MACS_30ke	2.67E-0	1.30E-0	0.800	
		Res_Int	5.89E+01	4.00E+00	0.250	
Hg-196(n,γ)	(5_0)	MACS_30keV	2.04E-01	8.00E-03	3.018	
Hg-198(n,γ)m		Res_Int	1.80E+00	3.00E-01	0.350	
Hg-198(n,γ)	(5_2)	cf252_flux_1 MACS_30keV	1.68E-01 1.73E-01	6.00E-03 1.50E-02	0.143 0.947	
Hg-199(n,γ)	6	MACS_30keV	3.74E-01	2.30E-02	0.768	
Hg-200(n,γ)	6	MACS_30keV	1.15E-01	1.20E-02	0.899	
Hg-201(n,γ)	6	MACS_30keV	2.64E-01	1.400E-02	0.996	
Hg-202(n,γ)	6	MACS_30keV	6.33E-02	1.90E-03	1.075	
Hg-203(n,γ)		MACS_30keV	9.80E-02	1.70E-02	0.347	
Hg-204(n,γ)	6	MACS_30keV fission_WIMS	4.20E-02 1.02E-01	4.00E-03	0.840 0.068	
Tl-203(n,γ)	5_2	MACS_30keV Res_Int	1.24E-01 3.96E+01	8.00E-03 2.00E+00	1.455 1.090	
Tl-205(n,γ)	(6)	fns_5min Res_Int	2.53E-03 6.60E-01	1.27E-04 1.00E_01	11.739 0.960	C/E(5)=0.954 C/E(7)=0.793
		fng_heat tud_Pb	2.41E+0 1.94E+0	1.69E-01 1.67E-01	0.839 0.966	 C/E(5)=0.970
Pb-204(n,γ)	(6)	MACS_30keV	8.10E-02	2.30E-03	0.788	
Pb-205(n,γ)	5_0	MACS_30keV	1.25E-01	2.20E-02	0.388	
Pb-206(n,γ)	(6)	MACS_30keV	1.45E-02	3.00E-04	0.771	
Pb-207(n,γ)	6	MACS_30keV	9.90E-03	5.00E-04	0.740	
Pb-208(n,γ)	5_2	MACS_30keV fission_WIMS	3.60E-04 2.00E-03	3.00E-05	1.472 0.384	
Bi-209(n,γ)m		MACS_30keV	2.23E-03	7.00E-05	0.378	
Bi-209(n,γ)	(6)	MACS_30keV fission_WIMS	2.56E-03 3.00E-03	3.00E-04	1.020 1.080	
Bi-210m(n,γ)		Res_Int	2.00E-01	3.00E-02	0.650	
Ac-227(n,γ)		Res_Int	1.66E+03	3.00E+01	0.890	
Th-230(n,γ)		Res_Int	9.93+02	3.00E+01	1.050	
Th-232(n,f)	6	cf252_flux_1	8.94E-02	2.40E-03	0.915	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
		cf252_flux_1	8.47E-02	4.90E-03	0.965	
Th-232(n,γ)		Res_Int	8.33E+01	3.00E+01	1.030	
		cf252_flux_1	8.78E-2	4.00E-03	1.020	
Th-233(n,γ)		Res_Int	1.70E+03	9.30E+02		No EAF
Pa-231(n,f)	6	cf252_flux_1	9.70E-01	4.50E-02	0.891	
Pa-231(n,γ)		Res_Int	5.25E+02	6.00E+01	1.130	
Pa-232(n,f)		Res_Int	1.08E+03	2.20E+01	0.670	
		cf252_flux_1	7.75E+02	1.90E+02	0.624	
Pa-232(n,γ)		Res_Int	1.17E+02	3.00E+01	2.420	
Pa-233(n,γ)g		Res_Int	4.32E+02	7.00E+01	0.970	
Pa-233(n, γ)m		Res_Int	4.38E+02	3.00E+01	1.010	
Pa-233(n,γ)		Res_Int	8.60E+02	3.50E+01	1.000	
U-232(n,f)		Res_Int	3.50E+02	3.00E+01	1.010	
U-232(n,γ)		Res_Int	2.80E+02	1.50E+01	0.650	
U-233(n,f)	6	cf252_flux_1	1.95E+00	3.12E-02	0.942	
		cf252_flux_1	1.89E+00	4.80E-02	0.969	
		Res_Int	7.75E+02	1.70E+01	0.970	
U-233(n,γ)		Res_Int	1.38E+02	6.00e+01	1.000	
U-234(n,f)	6	cf252_flux_1	1.20E+0	1.40E-02	0.992	
U-235(n,γ)		Res_Int	1.46E+02	6.00E+00	0.900	
U-235(n,f)	6	cf252_flux_1	1.27E+00	1.82E-02	0.962	
		cf252_flux_1	1.21E+00	2.20E-02	1.003	
		cf252_flux_1	1.22E+00	1.90E-02	1.002	
		cf252_flux_1	1.05E+00	3.10E-02	1.158	
		cf252_flux_1	1.23E+00	1.70E-02	0.987	
		Res_Int	2.75E+02	5.00E+00	0.990	
U-236(n,f)	6	cf252_flux_1	6.12E-01	8.00E-03	0.987	
U-236(n,γ)		Res_Int	3.45E+02	1.50E+01	1.000	
U-237(n,γ)		Res_Int	1.20E+03	2.00E+02	0.910	
		cf252_flux_1	1.22E-02	1.50E-03	1.670	C/E(7)= 1.670
U-238(n,f)	6	cf252_flux_1	3.29E-01	1.00E-02	0.960	
		cf252_flux_1	3.24E-01	1.40E-02	0.975	
		cf252_flux_1	2.88E-01	7.00E-03	1.096	
		cf252_flux_1	3.08E-01	1.70E-02	1.025	
		cf252_flux_1	3.32E-01	5.00E-03	0.951	
		cf252_flux_1	3.11E-01	1.40E-02	1.016	
U-238(n,γ)		Res_Int	2.77E+02	3.00E+00	1.000	
		fission_WIMS	8.50E-02	8.00E-03	0.798	
Np-236(n,f)		Res_Int	1.35E+03	8.60E+01	0.950	
Np-237(n,f)	6	cf252_flux_1	1.26E+0	6.00E-02	1.044	
		cf252_flux_1	1.38E+0	1.00E-01	0.953	
		cf252_flux_1	1.37E+0	2.00E-02	0.963	
		cf252_flux_1	1.44E+0	2.29E-02	0.912	
		Res_Int	4.70E+00	2.30E-01	0.040	
Np-237(n,γ)		Res_Int	6.52E+02	4.60E+01	1.010	
Np-238(n,f)		Res_Int	8.83E+02	7.00E+01	1.040	
Pu-236(n,f)		Res_Int	9.90E+02	3.00E+01	0.970	
Pu-238(n,γ)		Res_Int	1.62E+02	1.50E+01	0.940	
Pu-239(n,f)	6	cf252_flux_1	1.80E+0	6.00E-02	0.999	
		cf252_flux_1	1.84E+0	2.40E-02	0.975	
		cf252_flux_1	1.86E+0	3.01E-02	0.966	
		cf252_flux_1	1.79E+0	4.10E-02	1.004	
		Res_Int	3.03E+02	1.00E+01	0.970	
Pu-239(n,γ)		Res_Int	1.80E+02	2.00E+01	1.020	
Pu-240(n,f)	6	cf252_flux_1	1.34E+0	3.20E-02	1.025	
		cf252_flux_1	1.31E+0	3.00E-02	1.046	
Pu-240(n,γ)		Res_Int	8.45E+03	2.00E+02	1.010	

Reaction	QS	Spectrum	σ (b)	Δσ (b)	C/E	Comment
Pu-241(n,f)	6	cf252_flux_1 cf252_flux_1	1.62E+0 1.74E+0	8.00E-02 5.40E-02	1.004 0.930	
Pu-242(n,γ)		fission_WIMS	1.40E-01	1.70E-02	0.617	
Pu-243(n,f)		Res_Int	5.50E+02	8.00E+01	1.010	
Pu-243(n,γ)		Res_Int	2.70E+02	3.50E+01	0.190	
Pu-244(n,γ)		Res_Int	4.06E+01	2.90E+00	0.800	
Pu-245(n,γ)		Res_Int	2.20E+02	4.00E+01	0.170	
Am-241(n,f)		Res_Int	1.44E+01	1.00E+00	0.680	
Am-241(n,γ)g		Res_Int	1.23E+03	1.00E+02	1.090	
Am-241(n,γ)m		Res_Int	1.95E+02	2.00E+01	0.600	
Am-241(n,γ)		Res_Int	1.43E+03	1.00E+02	1.010	
Am-242(n,f)		cf252_flux_1	1.60E+00	2.20e-01	1.100	
Am-242m(n,f)		Res_Int	1.57E+03	8.00E+01	1.040	
Am-243(n,f)	6	cf252_flux_1 Res_Int	1.14E+00 8.50E+00	2.30E-02 5.00E-01	1.001 0.250	
Am-243(n,γ)g		Res_Int	9.40E+01	9.00E+00	1.190	
Am-243(n,γ)		Res_Int	1.82E+03	7.00E+01	0.980	
Cm-242(n,f)		Res_Int	1.29E+01	7.00E-01	0.860	
Cm-242(n,γ)		Res_Int	1.10E+02	2.00E+01	1.050	
Cm-243(n,f)		Res_Int	1.57E+03	1.00E+02	0.980	
Cm-243(n,γ)		Res_Int	2.15E+02	2.00E+01	0.980	
Cm-244(n,f)		Res_Int	1.25E+01	2.50E+00	0.480	
Cm-244(n,γ)		Res_Int	6.55E+02	3.00E+01	1.010	
Cm-245(n,f)		Res_Int	8.40E+02	4.00E+01	0.940	
Cm-245(n,γ)		Res_Int	1.01E+02	8.00E+00	1.040	
Cm-246(n,f)		Res_Int	1.02E+01	4.00E-01	0.410	
Cm-246(n,γ)		Res_Int	1.21E+02	7.00E+00	0.090	
Cm-247(n,f)		Res_Int	7.60E+02	5.00E+01	0.790	
Cm-247(n,γ)		Res_Int	5.30E+02	3.00E+01	1.080	
Cm-248(n,f)		Res_Int	1.31E+01	1.50E+00	0.300	
Cm-248(n,γ)		Res_Int	2.70E+00	6.00E-01	0.990	
Bk-249(n,γ)		Res_Int	1.10E+03	1.00E+02	1.010	
Cf-249(n,f)		Res_Int	2.38E+03	8.50E+01	0.880	
Cf-249(n,γ)		Res_Int	7.65E+02	3.50E+01	0.910	
Cf-250(n,γ)		Res_Int	1.16E+04	5.00E+02	0.730	
Cf-251(n,f)		Res_Int	5.90E+03	1.00E+02	0.830	
Cf-251(n,γ)		Res_Int	1.60E+03	3.00E+01	1.010	
Cf-252(n,f)		Res_Int	1.10E+02	3.00E+01	0.910	
Cf-252(n,γ)		Res_Int	4.35E+01	3.00E+00	1.110	
Cf-253(n,f)		Res_Int	1.30E+01	3.00E+00	0.630	
Cf-253(n,γ)		Res_Int	2.00E+03	4.00E+02	1.730	
Es-253(n,γ) g		Res_Int	1.14E+02	7.00E+00	1.740	
Es-253(n,γ) m		Res_Int	3.75E+03	2.00E+02	1.630	
Es-253(n,γ)		Res_Int	3.86E+03	2.00E+02	1.630	
Es-254(n,f)		Res_Int	1.20E+03	2.50E+02	0.890	
Es-254(n,γ)		Res_Int	1.82E+01	1.50E+00	0.100	
Es-254m(n,γ)		Res_Int	1.00E+03		1.540	

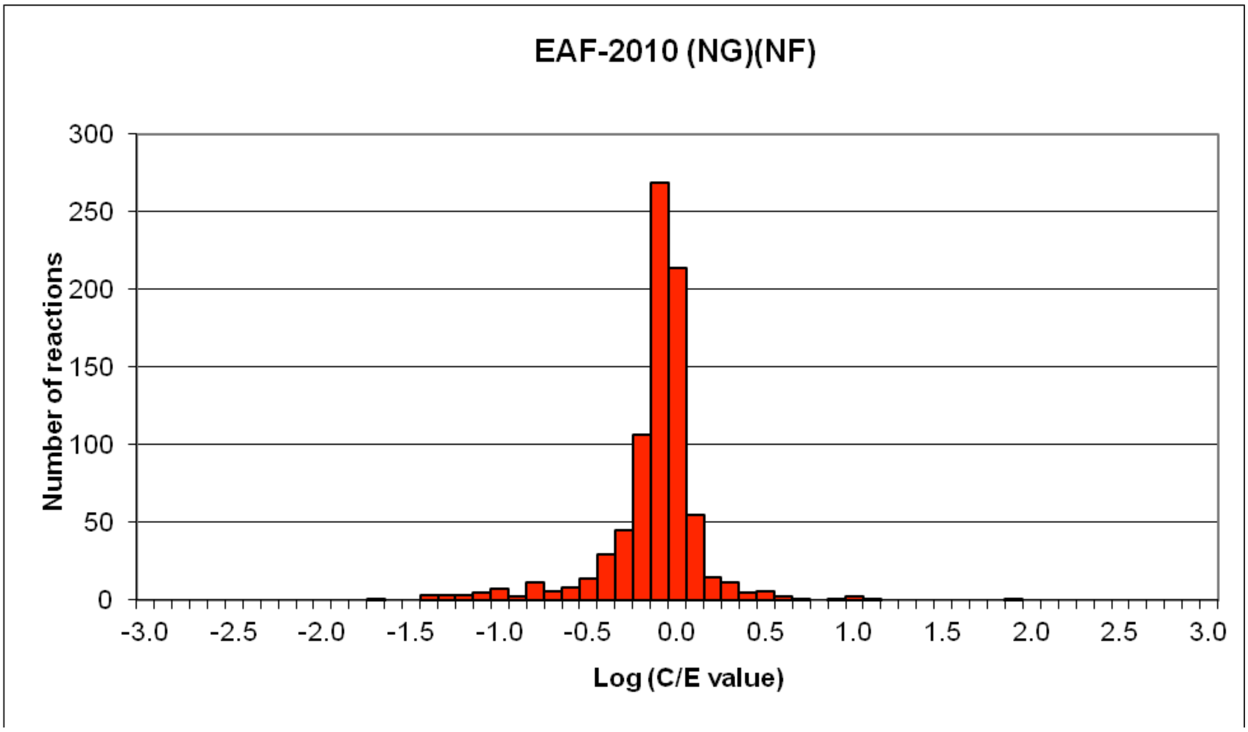
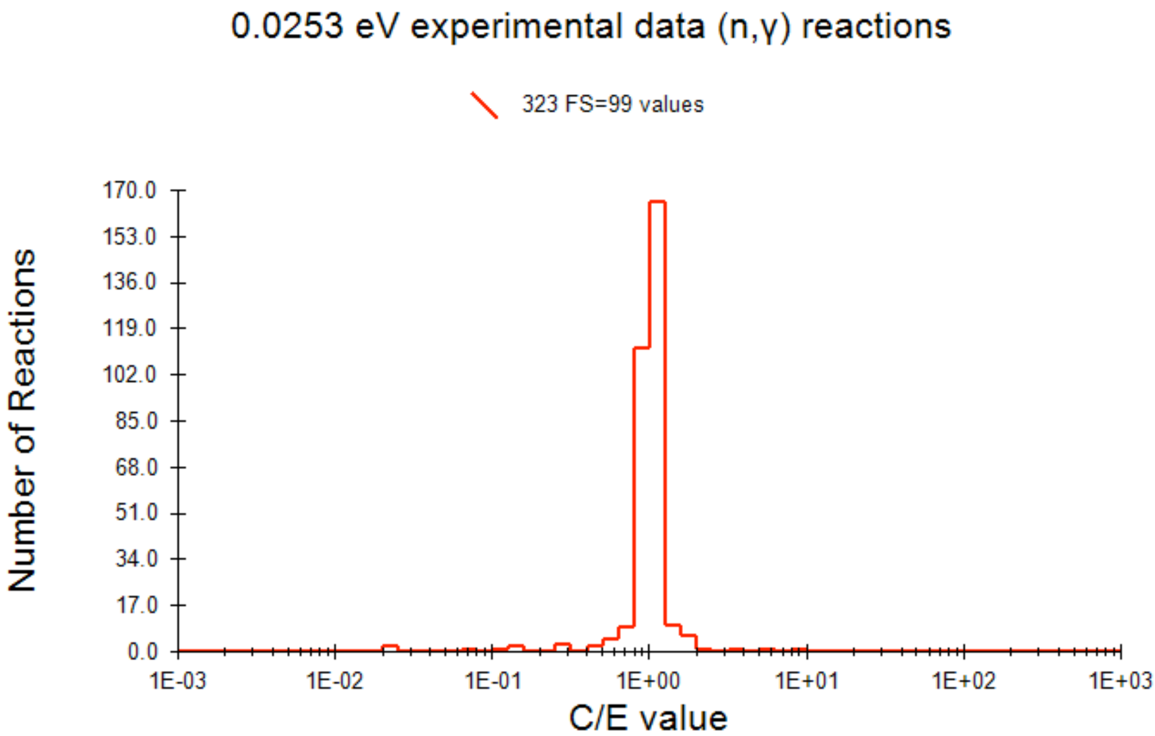


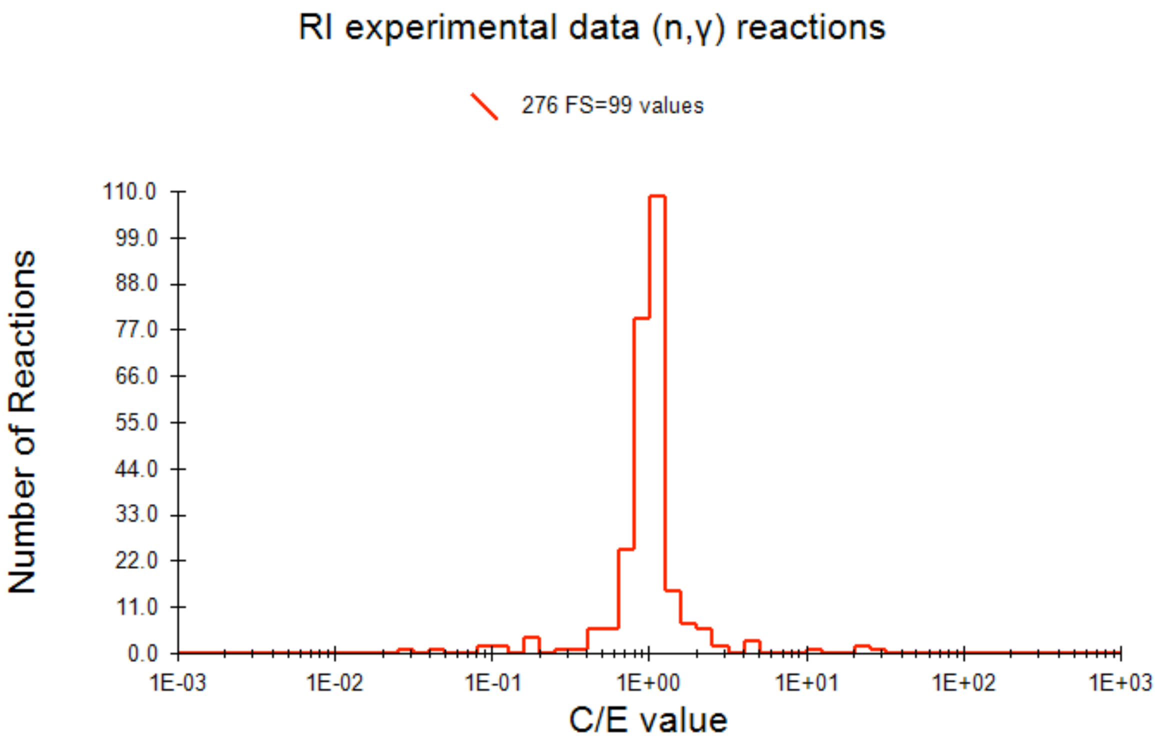
Fig. 1 C/E histogram of (n,g) and (n,f) of combined (I_γ, MACS, fission spectrum and 14 MeV spectra) ntegral data from EAF-2010.

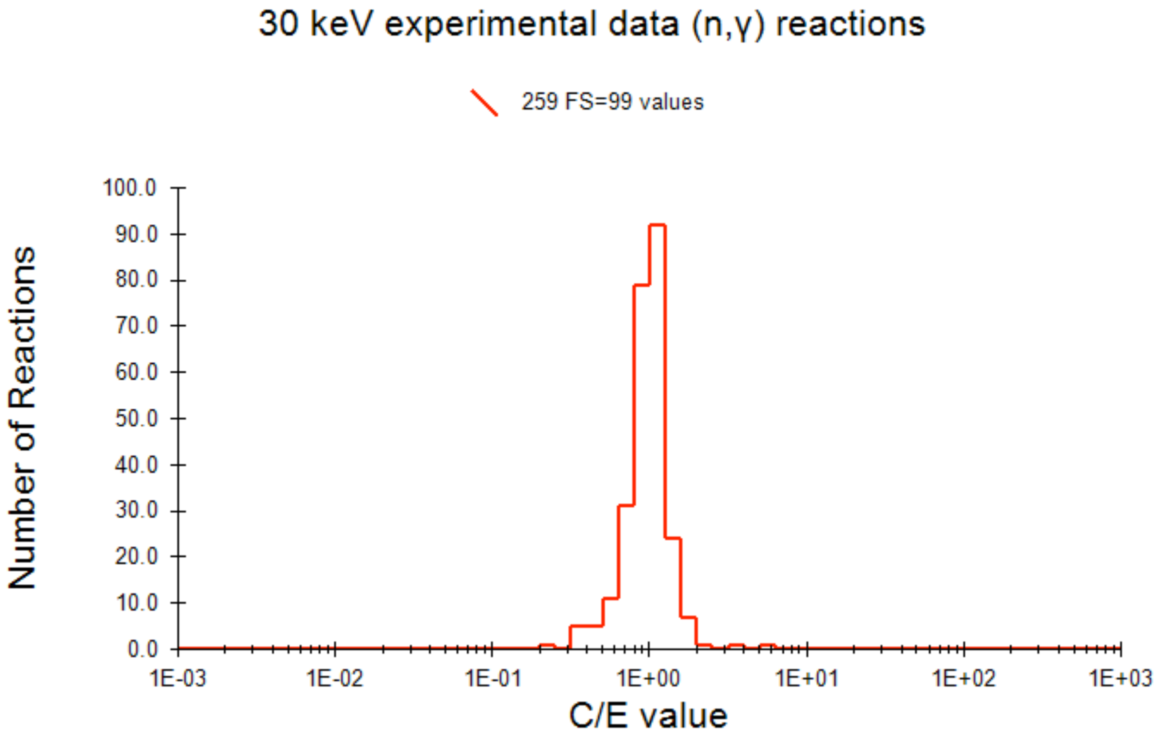
2. HISTOGRAM VALIDATIONS AGAINST SINGLE ENERGY DATA (0.0253 eV, 30 keV and 14.5 MeV) AND RESONANCE INTEGRALS

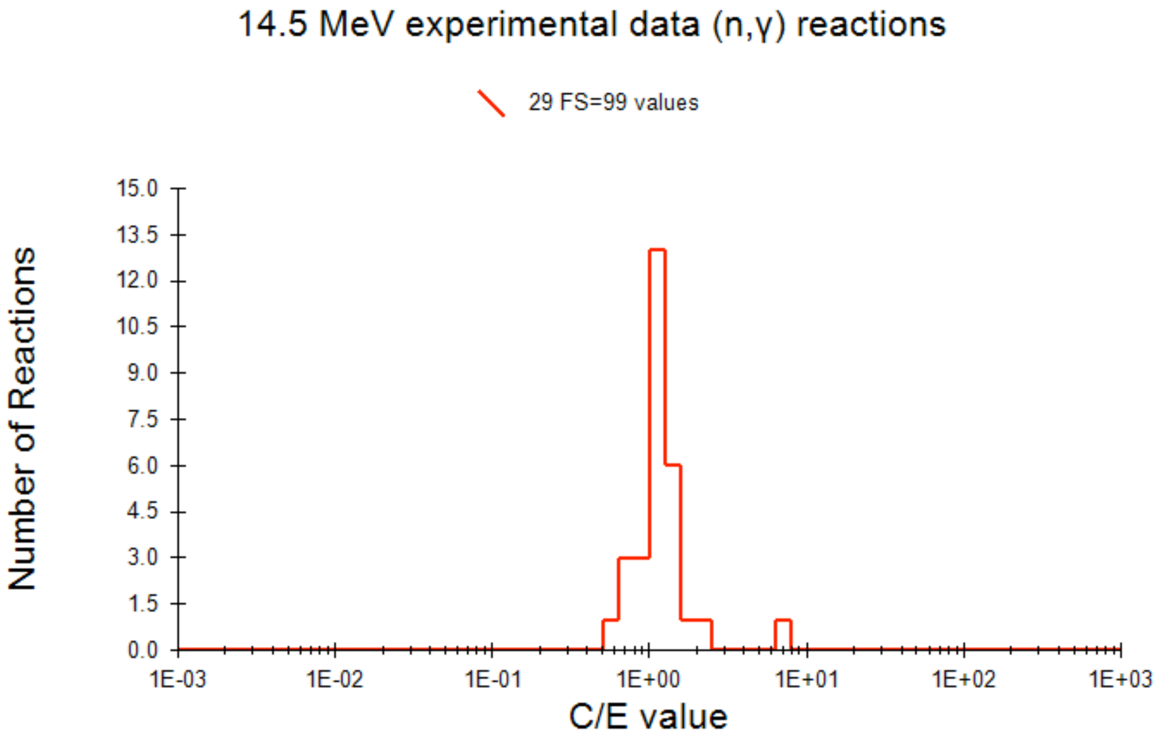
(N,G) REACTION

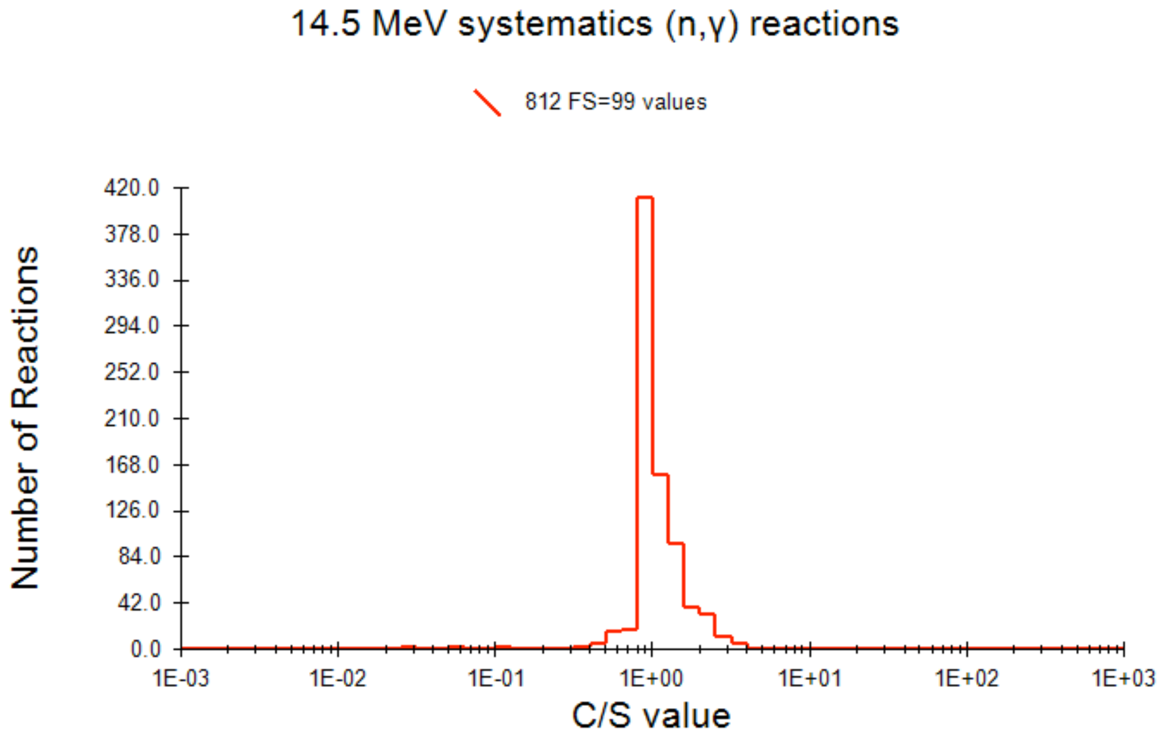
Sheets with tabulated results are available on request.





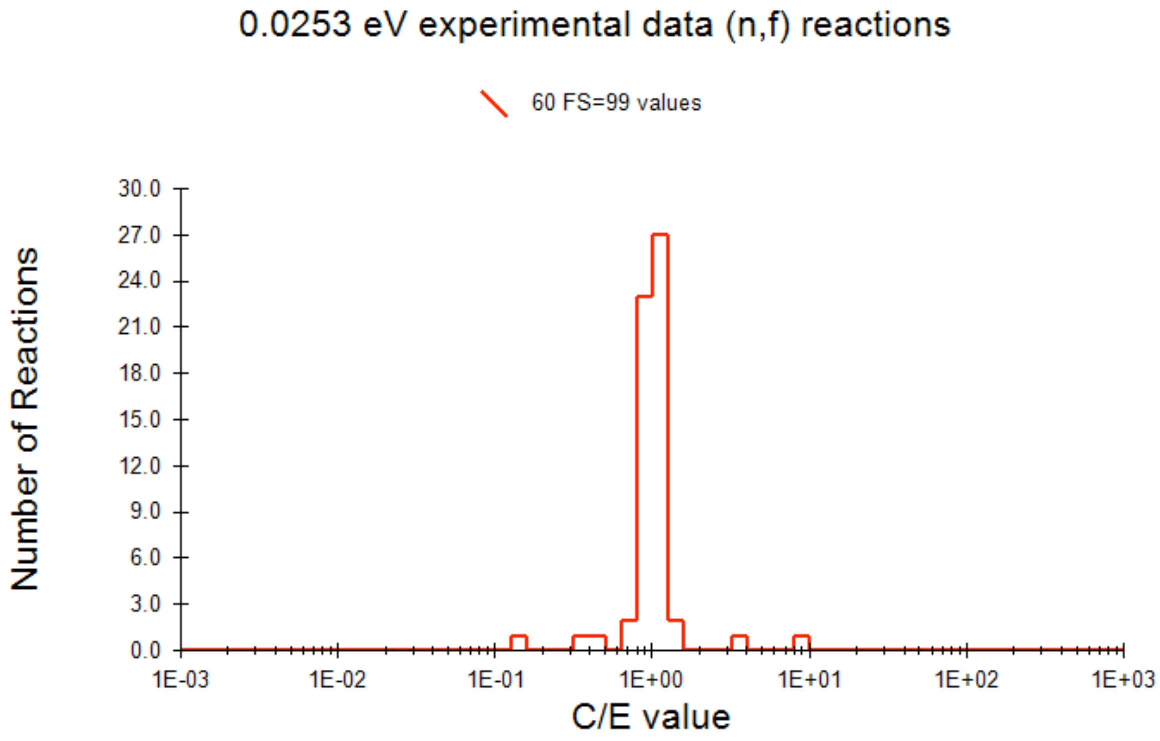

30 keV experimental data (n,γ) reactions
259 FS=99 values
Number of Reactions
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1E-03
1E-02
1E-01
1E+00
1E+01
1E+02
1E+03
C/E value

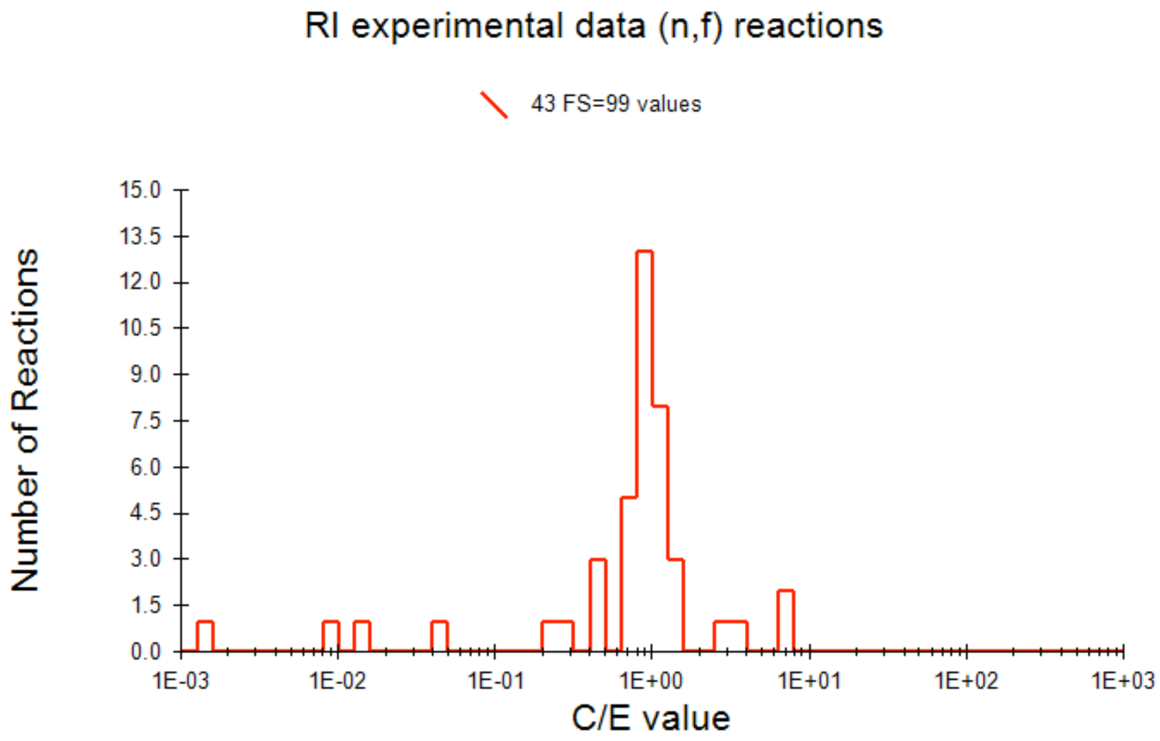

14.5 MeV experimental data (n,γ) reactions
29 FS=99 values
Number of Reactions
15.0
13.5
12.0
10.5
9.0
7.5
6.0
4.5
3.0
1.5
0.0
1E-03
1E-02
1E-01
1E+00
1E+01
1E+02
1E+03
C/E value



14.5 MeV systematics (n,γ) reactions
812 FS=99 values
Number of Reactions
420.0
378.0
336.0
294.0
252.0
210.0
168.0
126.0
84.0
42.0
0.0
1E-03
1E-02
1E-01
1E+00
1E+01
1E+02
1E+03
C/S value

(N,F) REACTION


0.0253 eV experimental data (n,f) reactions
60 FS=99 values
Number of Reactions
30.0
27.0
24.0
21.0
18.0
15.0
12.0
9.0
6.0
3.0
0.0
1E-03
1E-02
1E-01
1E+00
1E+01
1E+02
1E+03
C/E value


RI experimental data (n,f) reactions
43 FS=99 values
Number of Reactions
15.0
13.5
12.0
10.5
9.0
7.5
6.0
4.5
3.0
1.5
0.0
1E-03
1E-02
1E-01
1E+00
1E+01
1E+02
1E+03
C/E value