

Systematics of (n,g) excitation function

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- ❖ **The status of neutron capture radioactive systematics**

- ❖ **The systematics of (n,g) excitation function**
 - **How to use the EXFOR database in this work**
 - **The formula of (n,g) excitation function**

- ❖ **Summary**

- ❖ **The status of neutron capture radioactive systematics**

- ❖ **The systematics of (n,g) excitation function**
 - How to use the EXFOR database in this work
 - The formula of (n,g) excitation function

- ❖ **Summary**

The status of (n,g) systematics

❖ Cross section of specific energy

- 1982 K. Nedvediuk 30keV
- 1989 Zhixiang Zhao 25keV
- 1989 Kopecky 30keV 14.5MeV
- 1994 Jun Cheng, Woosley 30keV

❖ Excitation function

- 1975 Howerton, an empirical formula for $A > 20$ and $5 < E_n < 15 \text{ MeV}$
- 1989 Zhixiang Zhao, two systematics formulas for 1keV-4MeV ($A=60-200$) and 4-20MeV ($A=30-240$)

❖ Energy spectrum

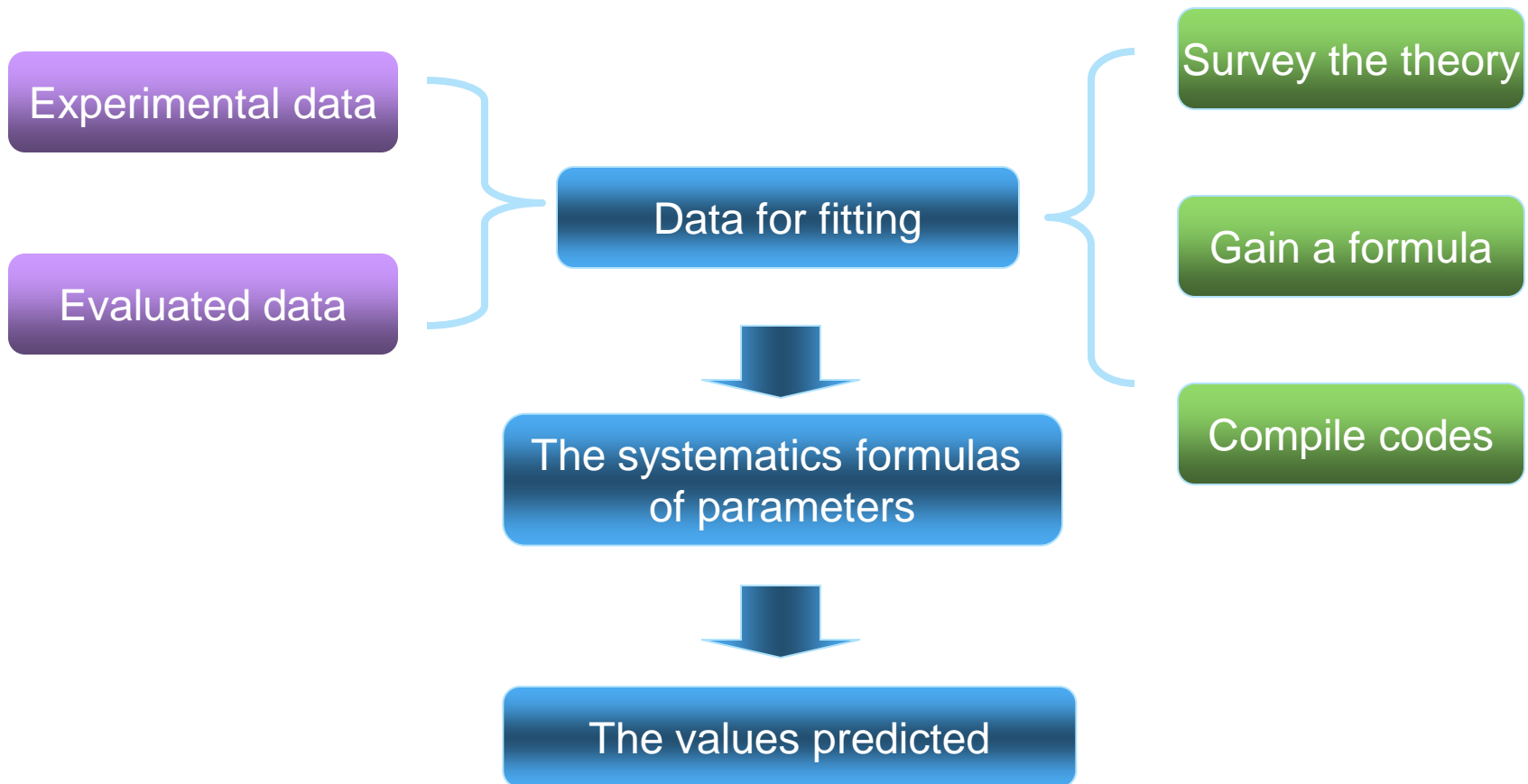
- 1996 Sheng Fan, a semi-empirical formula for neutron capture radioactive spectrum

- ❖ The status of neutron capture radioactive systematics

- ❖ **The systematics of (n,g) excitation function**
 - How to use the EXFOR database in this work
 - The formula of (n,g) excitation function

- ❖ Summary

Process of (n,g) systematics



- ❖ The status of neutron capture radioactive systematics

- ❖ The systematics of (n,g) excitation function
 - How to use the EXFOR database in this work
 - The formula of (n,g) excitation function

- ❖ Summary

Experimental data



International Atomic Energy Agency
Nuclear Data Services
 Sección Datos Nucleares, OIEA

Hot Topics » ENDF/B-VII.0 • Safeguards data • WIMS-D Library • Fission Yields • ADS **News** » June 2009, POINT2009 Released

Request







CD/DVD with documentation, data, codes, etc.

- Quick Links
- ADS-Lib
 - Atomic Mass Data Centre
 - CINDA
 - Charged particle reference cross section
 - DROSG-2000
 - EMPIRE-II
 - ENDF
 - ENDF Archive
 - ENDF Utility Codes
 - ENDVER
 - ENSDF
 - ENSDF ASCII Files
 - ENSDF programs
 - EXFOR
 - FENDL-2.1
 - Fission Yields
 - GANDR
 - IBANDL
 - INDL/TSL
 - POINT2009

NEW

EAF-2010 European Activation File (816 materials/60MeV), UK [\[list\]](#)
RIPL-3 reference parameters for nuclear model calculations, 2010 [\[page\]](#)
JENDL-4.0 Japanese evaluated nuclear data library, 2010 [\[page\]](#) [\[list\]](#)

Main All Reaction Data Structure & Decay by Applications Doc & Codes Index Events

 <p>EXFOR Experimental nuclear reaction data</p>	 <p>LiveChart of Nuclides Interactive Chart of Nuclides</p>	
 <p>ENDF Evaluated nuclear reaction libraries</p>	 <p>ENSDF evaluated nuclear structure and decay data (+XUNDL)</p>	
<p>NuDat 2.5 selected evaluated nuclear structure data <small>**</small></p>	<p>RIPL reference parameters for nuclear model calculations</p>	<p>IBANDL Ion Beam Analysis Nuclear Data Library</p>
<p>PGAA Prompt gamma rays from neutron capture</p>	<p>FENDL-2.1 Fusion Evaluated Nuclear Data Library, Version 2.1</p>	<p>Photonuclear cross sections and spectra up to 140MeV</p>
<p>NGATLAS atlas of neutron capture cross sections</p>	<p>Safeguards Data recommendations, August 2008</p>	<p>Medical Portal Data for Medical Applications</p>

*Database at the IAEA, Vienna **Database at the US NNDC

IAEA Nuclear Data Section

IAEA-NDS Mission, Staff and more	Atomic and Molecular Data	Meetings Workshops	Newsletters	Coordinated Research Projects	Nuclear Reaction Data Center Network	Nuclear Structure & Decay Data Network	Technical Information Reports, TECDOCs
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Request Examples:

Target

Reaction

Quantity

Product

Energy from

Author(s)

Publication year

Accession #

Options
 Exclude superseded data
 No reaction combinations (ratios,...)

Tip of the day

x 25-Manganese Element → Isotope

Mn-52	1																	2				
Mn-53	3	4															5	6	7	8	9	10
Mn-54	11	12															13	14	15	16	17	18
Mn-55	Na	Mg															Al	Si	P	S	Cl	Ar
Mn-56	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
Mn-CMP	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
	55	56	57*	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86				
	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
	87	88	89#	104	105	106	107	108	109	110	111	112										
	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	*										
	* Lanthanides				58	59	60	61	62	63	64	65	66	67	68	69	70	71				
	# Actinides				90	91	92	93	94	95	96	97	98	99	100	101	102	103				
					Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr				

Request

Examples: [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) ▾

Submit Reset Help

Target Mn-55 >

Reaction >

Quantity

Product

Energy from

Author(s)

Publication year

Accession #

Options

Exclude superseded data

No reaction combinations (ratios,...)

Enhanced search of Products

Retrieve listing only

Reaction [Disable me]

Neutron Induced Reactions n,*

n,0	n,2n	n,3n	n,a	n,a+2n
n,a+n	n,a+x	n,abs	n,d	n,el
n,f	n,g	n,g+n	n,g+p	n,g+x
n,he3	n,inl	n,inl+f	n,n+a	n,n+d
n,n+g	n,n+he3	n,n+nl	n,n+x	n,non
n,p	n,p	n,p+n	n,p+n	n,p+t
n,p+x	n,sct	n,t	n,t+a	n,t+n
n,t+p	n,ths	n,tot	n,x	n,x+a
n,xn				

Proton Induced Reactions p,*

p,0	p,2a	p,2n	p,2p	p,a
p,a+x	p,abs	p,d	p,el	p,f

Extend Keyword Expert

Submit Reset

Note:

Data Selection

Retrieve Selected Unselected All

Output: EXFOR EXFOR+ Bibliography TAB C4 PlotC4

Plot: Quick-plot (cross-sections only) Advanced plot [how-to] Convert ratios (if any) to cross sections using [IAEA

Narrow Energy (optional), eV: Min: Max:

∨ Data re-normalization (for advanced users, results in: C4, TAB and Plots)

n	Display	Year	Author-1	Energy range,eV	Points	Reference	Accession#E
1)	(1-H-1 (N,G) 1-H-2,, SIG) / (25-MN-55 (N,G) 25-MN-56,, SIG)				C4: MF=3	MT=?	
2)	(1-H-1 (N,G) 1-H-2,, SIG,, MXW) / (25-MN-55 (N,G) 25-MN-56,, SIG,, MXW)				C4: MF=3	MT=?	
3)	(5-B-0 (N,ABS) ,, SIG) / (25-MN-55 (N,G) 25-MN-56,, SIG)				C4: MF=3	MT=?	
4)	25-MN-55 (N,G) ,, ARE				C4: MF404	MT6001	
5)	25-MN-55 (N,G) ,, SIG,, MXW				C4: MF3	MT102	
6)	25-MN-55 (N,G) ,, WID				C4: MF402	MT6031	
7)	25-MN-55 (N,G) ,, WID,, AV				C4: MF405	MT6001	
8)	25-MN-55 (N,G) ,, WID/STR				C4: MF=?	MT=?	
9)	25-MN-55 (N,G) 25-MN-56,, DE				C4: MF=5	MT=?	
10)	25-MN-55 (N,G) 25-MN-56,, RI				C4: MF213	MT102	
11)	25-MN-55 (N,G) 25-MN-56,, RI,, DERIV				C4: MF213	MT102	
12)	25-MN-55 (N,G) 25-MN-56,, RI,, RNV				C4: MF=?	MT=?	
13)	25-MN-55 (N,G) 25-MN-56,, RI,, RNV, DERIV				C4: MF=?	MT=?	
14)	25-MN-55 (N,G) 25-MN-56,, RI,, RV				C4: MF=?	MT=?	
15)	25-MN-55 (N,G) 25-MN-56,, RI,, RV, DERIV				C4: MF=?	MT=?	
16)	<u>25-MN-55 (N,G) 25-MN-56,, SIG</u>				C4: MF3	MT102	
17)	25-MN-55 (N,G) 25-MN-56,, SIG,, EVAL				C4: MF3	MT102	
18)	Search data with the Reaction-code...				C4: MF3	MT102	
19)	25-MN-55 (N,G) 25-MN-56,, SIG,, FIS				C4: MF223	MT102	
20)	25-MN-55 (N,G) 25-MN-56,, SIG,, MXW				C4: MF3	MT102	
21)	25-MN-55 (N,G) 25-MN-56,, SIG,, SPA				C4: MF=3	MT=?	
22)	25-MN-55 (N,G) 25-MN-56,, SPC				C4: MF=?	MT=?	
23)	25-MN-55 (N,G) 25-MN-56,, SPC,, MXW				C4: MF=?	MT=?	

Quantity: [CS] Cross section

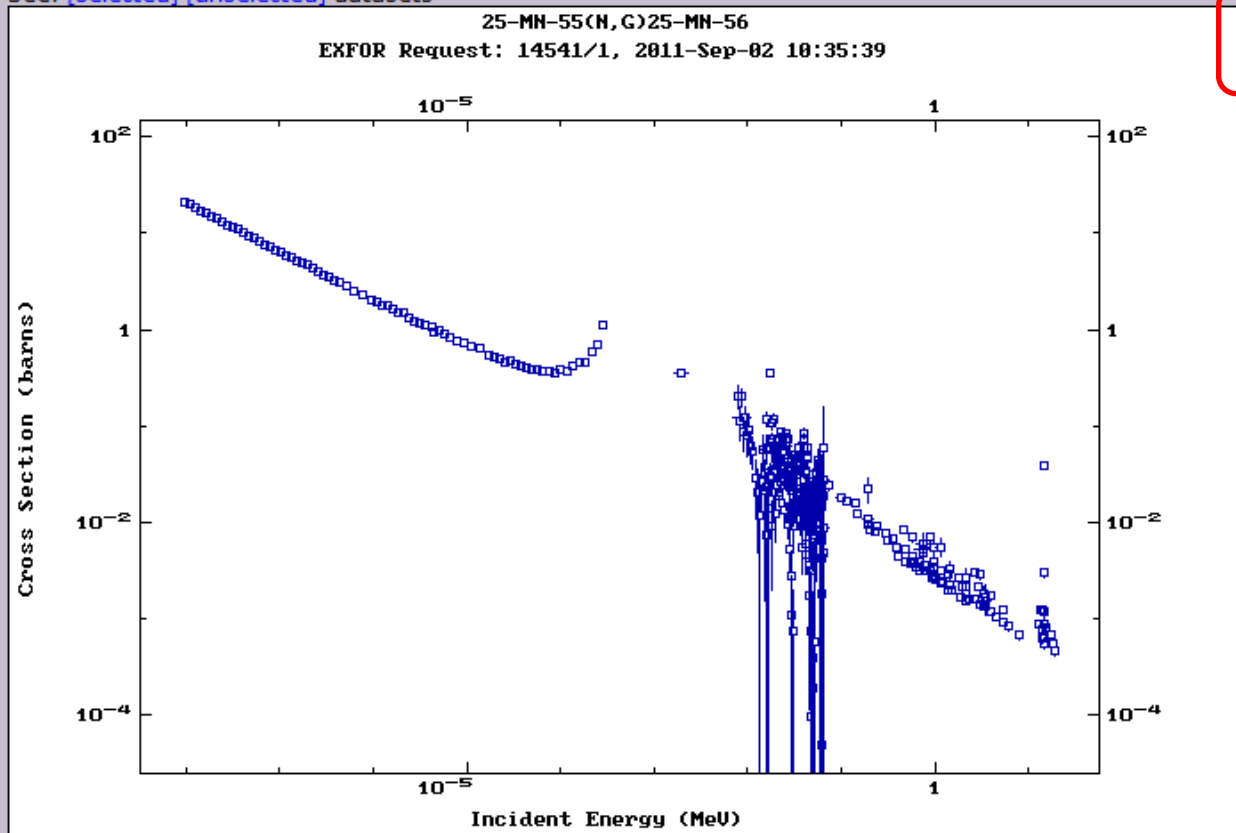
f	Info	X4	X4±	X4±	T4	1990 R.P.Gautam+	4.60e5	3.43e6	10	T4	+ J,IPA,28,235,199005	30942002
41	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1990 R.P.Gautam+	4.60e5	3.43e6	9	+ J,IPA,28,(5),235,199005	30982002
42	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1987 Yu.N.Trofimov	2.00e6		1	+ J,YK,1987,(4),10,1987	40975011
43	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1987 Yu.N.Trofimov	1.00e6		1	+ C,87KIEV,3,331,198709	41001002
44	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1986 A.Arbligo+	2.53e-2		1	+ J,ANE,13,679,8612	12819003
45	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1985 B.M.Bahal+	1.47e7		1	+ R,GKSS-85-E-11,1985	21936009
46	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1980 G.Magnusson+	1.47e7		1	+ J,PS,21,(1),21,8001	21004002 1980MA02
47	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1979 M.Budnar+	1.41e7		1	+ R,INDC(YUG)-6,197912	30532020 1979BUZS
48	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1977 Manjushree Majumder+	1.48e7		1	+ J,BOS,40,(3),81,1977	30296008
49	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1976 C.Le Rigoleur+	1.51e4	6.49e4	200	+ R,CEA-R-4788,7610	20572005
50	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1976 O.Schwerer+	1.46e7		1	+ J,NP/A,264,105,760621	20670006 1976SC16
51	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1975 F.Widder	9.93e-3	2.84e2	261	+ R,EIR-217,,7504	20437003
52	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1974 J.Vuletin+	1.44e7		1	+ J,NCL,10,1,197405	30314005 1974VU01
53	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1970 R.P.Schuman+	2.00e3		1	+ P,IN-1317,39,1970	14080010
54	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1970 S.N.Chaturvedi+	2.40e4		1	+ C,70MADURAI,2,615,197012	30493002
55	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1969 E.K.Sokolowski+	2.53e-2		1	+ R,AE-351,196902	22615003
56	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1969 A.G.Dovbenko+	4.18e5	3.43e6	22	+ J,AE,26,(1),67,6901	40001002
57	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1968 D.C.Stupegia+	9.00e3	5.39e5	11	+ J,JNE,22,267,6805	11624003
58	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1968 J.Colditz+	2.90e6		1	+ J,OSA,105,236,6806	20092006
59	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1968 L.M.Spitz+	8.12e3	4.55e4	29	+ J,NP/A,121,655,196812	30114006
60	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1967 H. Search data of given author...	94e7		17	+ J,PR,163,1299,67	11420003
61	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1967 G.Peto+	3.00e6		1	+ J,JNE,21,797,1967	30031003
62	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1967 J.Csikai+	1.47e7		1	+ J,NP/A,95,229,196703	30067010 1967CS01
63	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1967 J.Csikai+	1.34e7	1.50e7	7	+ J,NP/A,95,229,196703	30074003 1967CS01
64	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1966 J.C.Carre+	2.53e-2		1	+ C,66PARIS,1,479,6610	20658004
65	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1965 A.K.Chaubey+	2.40e4		1	+ J,NP,66,267,196505	30063002
66	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1963 R.L.Macklin+	3.00e4	6.50e4	2	+ J,PR,129,2695,63	11331013
67	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1961 J.W.Meadows+	2.53e-2		1	+ J,NSE,9,132,6102	11028009 1961ME02
68	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1961 Ju.Ya.Stavisskiy+	2.30e4	1.66e6	21	+ J,AE,10,(5),508,196105	40642002
69	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1960 R.B.Tattersall+	2.53e-2		1	+ J,JNE/A,12,32,196005	20638008
70	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1959 N.A.Bostrom+	4.00e4	3.50e6	2	+ R,WADC-TN-59-107,59	11130008
71	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1959 W.S.Lyon+	1.95e5		1	+ J,PR,114,1619,1959	11407004 1959LY69
72	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1959 A.E.Johnsrud+	1.47e5	5.50e6	18	+ J,PR,116,927,1959	11675003 1959JO33
73	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1958 R.Booth+	2.40e4		1	+ J,PR,112,226,1958	11429006
74	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1958 J.L.Perkin+	1.45e7		1	+ J,PPS,72,505,58	21438008 1958PE19
75	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1958 A.I.Leipunskiy+	2.70e6	4.00e6	2	+ C,58GENEVA,15,50(2219),195809	40244091
76	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4		2.00e5		1		105
77	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1958 V.N.Kononov+	2.40e4		1	+ J,AE,5,564,1958	40421011
78	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1957 R.L.Macklin+	2.40e4		1	+ J,PR,107,504,57	11399009 1957MA16
79	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1952 B.Grimeland+	2.53e-2		1	+ J,CR,232,2089,52	21395017
80	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1951 V.Hummel+	2.40e4		1	+ J,PR,82,67,5104	11010004
81	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4	1949 L.E.Beghian+	9.00e5		1	+ J,NAT,163,366,194903	22580003
82	<input checked="" type="checkbox"/>	Info	X4	X4±	X4±	T4						

17) 25-MN-55 (N,G) 25-MN-56,,SIG,,EVAL C4: MF3 MT102
 18) 25-MN-55 (N,G) 25-MN-56,,SIG,,AV C4: MF3 MT102
 19) 25-MN-55 (N,G) 25-MN-56,,SIG,,FIS C4: MF223 MT102
 20) 25-MN-55 (N,G) 25-MN-56,,SIG,,MXW C4: MF3 MT102

Output Data

Format	Data (Size)
EXFOR	Text (256Kb) ZIP (53Kb) Generate: X4± X4s C5
Bibliography	html (80Kb) BibTeX (23Kb)

See: [\[selected\]](#) [\[unselected\]](#) datasets



ENDF Find and add to the plot evaluated data

1) 25-MN-55(N,G)25-MN-56_SIG

2) Use my data [\[example\]](#)

See: [plotted data](#) (60Kb)

Log: [XY](#) [X](#) [Y](#) Lin: [XY](#) [X](#) [Y](#) Auto-range: [XY](#) [X](#) [Y](#) Page: [>>](#) [<<](#) Zoom: [<>](#) [>>](#) Grid: [VH](#) [0](#) [V](#) [H](#) Pts: [Txt](#) [Box](#) [PL](#) [Print](#)

[Reset](#) [Repaint](#) Legend Authors Info+ [PostScript](#) Manual options:[\[+\]](#)


Data for plotting: [ZVD](#) (57Kb), [send](#) to ZVview; [download](#) ZVview; [upload](#) and plot your ZVD file


Note. Zoom and other interactive plotting features were tested under Web-browsers:
MS-Internet Explorer 5.5, Firefox 2.0, Safari, Opera 9.1, Netscape v-7.2

ENDF Data Selection (Plot for EXFOR Request #14541)

Selected
 Unselected
 All

Plotting options: Quick plot (cross-sections only: σ)

 Sorted by: [Reactions] Reorder by: [Libraries] View: basic extended

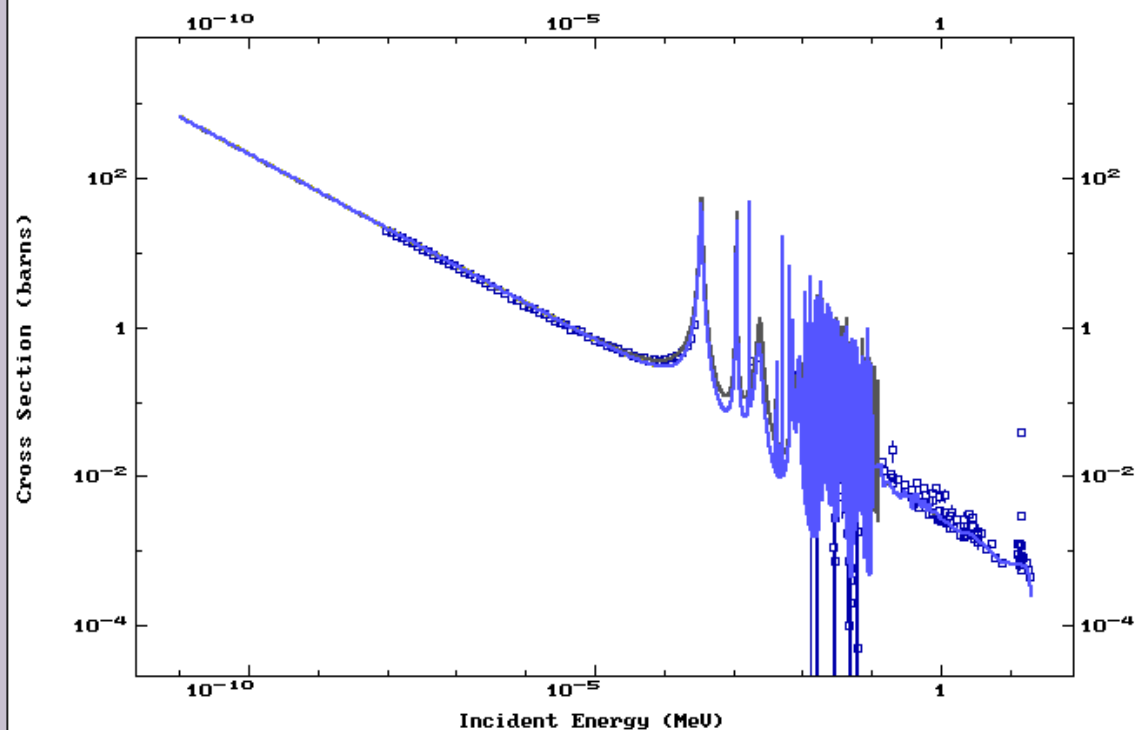
 1) MN-55 (N, G), SIG MT=102 MF=3 NSUB=10

MF3: [SIG] Cross sections MT102: [N,G] Radiative capture.

	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot			
1	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	ENDF/B-VII.0	E=20MeV Lab=JAERI, ORNL Date=DIST-DEC06	K. Shibata
2	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JEFF-3.1	E=20MeV Lab=JAERI, MAPI Date=090105	K. SHIBATA, T. HOJUYAMA
3	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JENDL-4.0	E=20MeV Lab=JAERI, MAPI Date=20100121	K. Shibata, T. Hojuyama
4	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JENDL-3.3	E=20MeV Lab=JAERI, MAPI Date=20020214	K. SHIBATA, T. HOJUYAMA
5	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JENDL-3.3	E=20MeV Lab=JAERI, MAPI Date=20020214 T=300	K. SHIBATA, T. HOJUYAMA
6	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	ENDF/B-VI	E=20MeV Lab=JAERI, ORNL Date=20011108	K. SHIBATA
7	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	ENDF/B-VI	E=20MeV Lab=JAERI, ORNL Date=20010926 T=300	K. SHIBATA
8	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	ROSPOND-2010	E=20MeV Lab=IPPE Date=DIST-JAN06	M. N. NIKOLAEV, ZABRODSKAYA S. V.
9	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	ROSPOND-2008	E=20MeV Lab=IPPE Date=DIST-JAN06	M. N. NIKOLAEV, ZABRODSKAYA S. V.
10	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	CENDL-3.1	E=20MeV Lab=CNDC, JNDC Date=950817	B. S. YU, K. SHIBA, K. SHIBATA, +
11	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JEFF-3.1/A	E=20MeV Lab=UKAEA Date=DIST-JUL03 T=293	Forrest, Kopecky, Sublet, Koning
12	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	IRDF-2002	E=20MeV Lab=JAERI, ORNL Date=4 T=300	K. SHIBATA
13	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	IRDF-2002G	E=20MeV Lab=JAERI, ORNL Date=4 T=300	K. SHIBATA
14	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JEFF-3.0	E=20MeV Lab=JAERI, MAPI Date=DIST-APR02	K. SHIBATA, T. HOJUYAMA
15	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JEF-2.2	Lab=NEA Date=920101	SCIENTIFIC CO-ORDINATION GROUP
16	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JENDL/HE-2007	E=3000MeV Lab=SAEI Date=REV1-	K. Kosako
17	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	JENDL/HE-2004	E=3000MeV Lab=SAEI Date=REV1-	K. Kosako
18	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	EAF-2010	E=60MeV Lab=CCFE, NRG Date=DIST-NOV10 T=293	
19	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	FENDL/E-2.1	E=20MeV Lab=JAERI, MAPI Date=20020214	K. SHIBATA, T. HOJUYAMA
20	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	TENDL-2010	E=200MeV Lab=NRG Date=REV1-	A. J. Koning and D. Rochman
21	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	TENDL-2009	E=200MeV Lab=NRG Date=REV1-	A. J. Koning and D. Rochman
22	<input type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	TENDL-2008	E=20MeV Lab=NRG Date=REV1-	A. J. Koning and D. Rochman
23	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	σ	Plot	CENDL-2	Lab=CNDC/JAERI Date=950817	B. YU, K. SHIBA, K. SHIBATA ET AL

Cross Section

ENDF Request 7811, 2011-Sep-02, 10:38:13
EXFOR Request: 14541/1, 2011-Sep-02 10:35:39



- 1) 25-MN-55(N,G)25-MN-56,,SIG
- 2) ENDF/B-VII.0: MN-55(N,G)MN-56
- 3) JEFF-3.1: MN-55(N,G)MN-56
- 4) JENDL-4.0: MN-55(N,G)MN-56
- 5) JENDL-3.3: MN-55(N,G)MN-56
- 6) CENDL-3.1: MN-55(N,G)MN-56
- 7) CENDL-2: MN-55(N,G)MN-56
- 8) Use my data [\[example\]](#)

See: [plotted data \(3180Kb\)](#)

Log: [XY](#) [X|Y](#) Lin: [XY](#) [X|Y](#) Auto-range: [XY](#) [X|Y](#) Page: [>>](#) [<<](#) Zoom: [<>](#) [>>](#) Grid: [VH](#) [0](#) [V](#) [H](#) Pts: [Txt](#) [Box](#) [PL](#) [Print](#)

[Reset](#)

[Repaint](#)

Legend

Authors

Info+

[PostScript](#)

Manual options: [\[+\]](#)

Data for plotting: [ZVD \(3066Kb\)](#) [send to ZView](#); [download ZView](#); [upload](#) and plot your ZVD file

Note. Zoom and other interactive plotting features were tested under Web-browsers:
MS-Internet Explorer 5.5, Firefox 2.0, Safari, Opera 9.1, Netscape v-7.2

- ❖ **ZVD is a type of file, which can content experimental data and evaluated data. ZVView**
- ❖ **GETZVD0.5C: a code can translate the zvd file to the file which can be recognized by Gnuplot. The data is separated by different refference.**
- ❖ **Gnuplot: a software is used to draw graphs under windows and linux. File types of output are ps, eps, jpg, gif.**

File of experimental data



	0	10	20	30	40	50	60	70	80	90	100	110
1 # index	0	25-MN-55 (N,G)	25-MN-56,,SIG			2.4+04	2.4+04	1	1USAANL	J,PR,82,67,5104		510
2 # index	1	25-MN-55 (N,G)	25-MN-56,,SIG			2.5-02	2.5-02	1	1USAANL	J,NSE,9,132,6102		610
3 # index	2	25-MN-55 (N,G)	25-MN-56,,SIG			4.0+04	3.5+06	2	1USATNC	R,WADC-TN-59-107,59		590
4 # index	3	25-MN-55 (N,G)	25-MN-56,,SIG			3.0+04	6.5+04	2	1USAORL	J,PR,129,2695,63		630
5 # index	4	25-MN-55 (N,G)	25-MN-56,,SIG			2.4+04	2.4+04	1	1USAORL	J,PR,107,504,57		570
6 # index	5	25-MN-55 (N,G)	25-MN-56,,SIG			2.0+05	2.0+05	1	1USAORL	J,PR,114,1619,59		590
7 # index	6	25-MN-55 (N,G)	25-MN-56,,SIG			9.7+05	1.9+07	17	1USALOK	J,PR,163,1299,67		670
8 # index	7	25-MN-55 (N,G)	25-MN-56,,SIG			2.4+04	2.4+04	1	1USALRL	J,PR,112,226,58		580
9 # index	8	25-MN-55 (N,G)	25-MN-56,,SIG			9.0+03	5.4+05	11	1USAANL	J,JNE,22,267,6805		680
10 # index	9	25-MN-55 (N,G)	25-MN-56,,SIG			1.5+05	5.5+06	18	1USAWIS	J,PR,116,927,59		590
11 # index	10	25-MN-55 (N,G)	25-MN-56,,SIG			2.5-02	2.5-02	1	1USANMX	J,ANE,13,679,8612		860
12 # index	11	25-MN-55 (N,G)	25-MN-56,,SIG			2.0+03	2.0+03	1	1USAMTR	P,IN-1317,39,1970		700

.....

45 #index	0											
46 #1951 V.Hummel												
47	2.4000E-02	0.0000E+00	0.0000E+00	7.8000E-02	9.3600E-03	9.3600E-03		1	1	1		
48												
49												
50 #index	1											
51 #1961 J.W.Meadows												
52	2.5300E-08	0.0000E+00	0.0000E+00	1.3200E+01	1.0000E-01	1.0000E-01		1	1	2		
53												
54												
55 #index	2											
56 #1959 N.A.Bostrom												
57	4.0000E-02	4.0000E-03	4.0000E-03	3.9000E-02	1.0000E-02	1.0000E-02		1	1	3		
58	3.5000E+00	2.0000E-01	2.0000E-01	1.7000E-03	6.0000E-04	6.0000E-04		1	1	3		
59												
60												
61 #index	3											

.....

File of evaluated data

```

0 10 20 30 40 50
1 #index 0 this work #data num is 47
2 #index 1 ENDF/B-VII.0: MN-55 (N, G) MN-56
3 #index 2 JENDL-3.3: MN-55 (N, G) MN-56
4 #index 3 ENDF/B-VI: MN-55 (N, G) MN-56
5 #index 4 CENDL-2: MN-55 (N, G) MN-56
6 #index 0
7 #
8 # this work
9 #data num is 47
10 1.0000E-03 4.6520E-01
11 2.0000E-03 2.9320E-01
12 3.0000E-03 2.1750E-01
13 4.0000E-03 1.7390E-01
14 5.0000E-03 1.4540E-01
15 6.0000E-03 1.2520E-01
16 7.0000E-03 1.1030E-01
17 8.0000E-03 9.8850E-02
  
```

Input file of Gnuplot

```

1 set terminal postscript enhance color solid
2 set output '25055.zvd.eps'
3 set log y
4 set log x
5 set xrange[0.001:20]
6 set yrange[1e-004:1e1]
7 plot '25055.zvd.exp' index 0 using 1:4:5 title'          1951 V.Hummel'with yerrorbars 1 1,\
8 '25055.zvd.exp' index 1 using 1:4:5 title'          1961 J.W.Meadows'with yerrorbars 2 2,\
9 '25055.zvd.exp' index 2 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1959 N.A.Bostrom'with xyerrorbar
10 '25055.zvd.exp' index 3 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1963 R.L.Macklin'with xyerrorbar
11 '25055.zvd.exp' index 4 using 1:4:5 title'          1957 R.L.Macklin'with yerrorbars 5 5,\
12 '25055.zvd.exp' index 5 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1959 W.S.Lyon'with xyerrorbar
13 '25055.zvd.exp' index 6 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1967 H.O.Menlove'with xyerrorbar
14 '25055.zvd.exp' index 7 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1958 R.Booth'with xyerrorbar
15 '25055.zvd.exp' index 8 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1968 D.C.Stupegia'with xyerrorbar
16 '25055.zvd.exp' index 9 using 1:4:5 title'          1959 A.E.Johnsrud'with yerrorbars 10 10,\
-----
      . . . . .
40 '25055.zvd.exp' index 33 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1990 R.P.Gautam'with xyerrorbar
41 '25055.zvd.exp' index 34 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1969 A.G.Dovbenko'with xyerrorbar
42 '25055.zvd.exp' index 35 using 1:4:5 title'          1958 A.I.Leipunskij'with yerrorbars 36 36,\
43 '25055.zvd.exp' index 36 using 1:4:5 title'          1958 A.I.Leipunskij'with yerrorbars 37 37,\
44 '25055.zvd.exp' index 37 using 1:4:5 title'          1958 V.N.Kononov'with yerrorbars 38 38,\
45 '25055.zvd.exp' index 38 using 1:4:($1-$2):($1+$3):($4-$5):($4-$6) title'          1961 Ju.Ja.Stavisskij'with xyerrorbar
46 '25055.zvd.exp' index 39 using 1:4:5 title'          1987 Yu.N.Trofimov'with yerrorbars 40 40,\
47 '25055.zvd.exp' index 40 using 1:4:5 title'          1987 Yu.N.Trofimov'with yerrorbars 41 41,\
48 '25055.zvd.eval' index 0 using 1:2 title'this work          'with l lt 1 lw 6,\
49 '25055.zvd.eval' index 1 using 1:2 title'ENDF/B-VII.0: MN-55(N,G'with l lt 2 lw 2,\
50 '25055.zvd.eval' index 2 using 1:2 title'JENDL-3.3: MN-55(N,G)MN'with l lt 3 lw 2,\
51 '25055.zvd.eval' index 3 using 1:2 title'ENDF/B-VI: MN-55(N,G)MN'with l lt 4 lw 2,\
52 '25055.zvd.eval' index 4 using 1:2 title'CENDL-2: MN-55(N,G)MN-5'with l lt 5 lw 2

```

- ❖ The status of neutron capture radioactive systematics

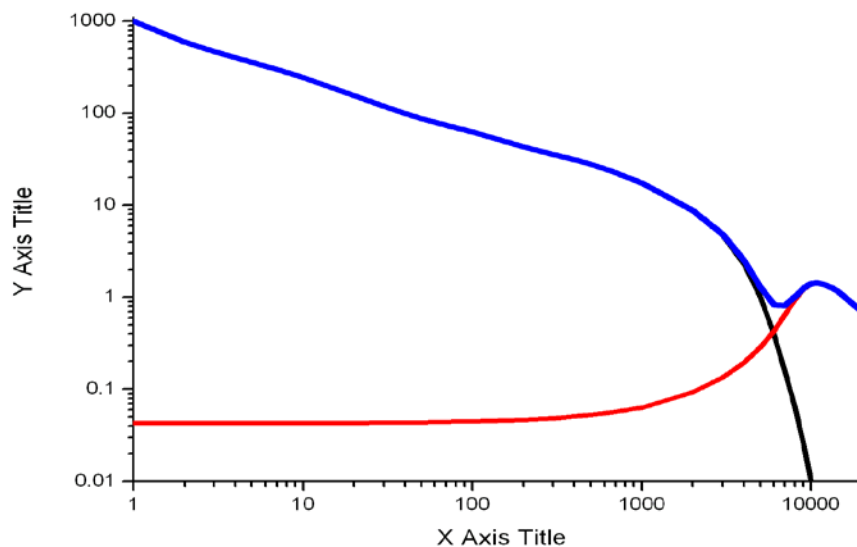
- ❖ The systematics of (n,g) excitation function
 - How to use the EXFOR database in this work
 - The formula of (n,g) excitation function

- ❖ Summary

❖ Systematics formula

$$\sigma_{n,r} = \{640\alpha \cdot f_1(\beta, E_n) \cdot g(T)\} + \gamma \cdot f_2(E_n)$$

3 parameters



Code for systematics

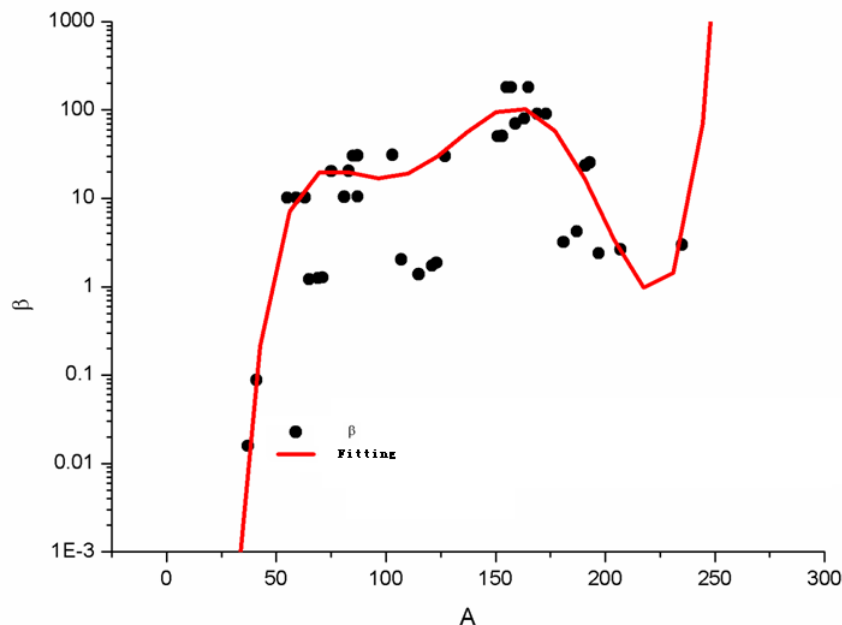
- **25KFIT** Calculating and fitting the cross section of 25keV
- **FEX** Calculating and fitting the excitation function
- **GGAM-TH** Calculating and fitting the cross section of thermal energy

- **FITA** Calculating and fitting level destines
- **THEMAU** Calculating level destines and excitation energies

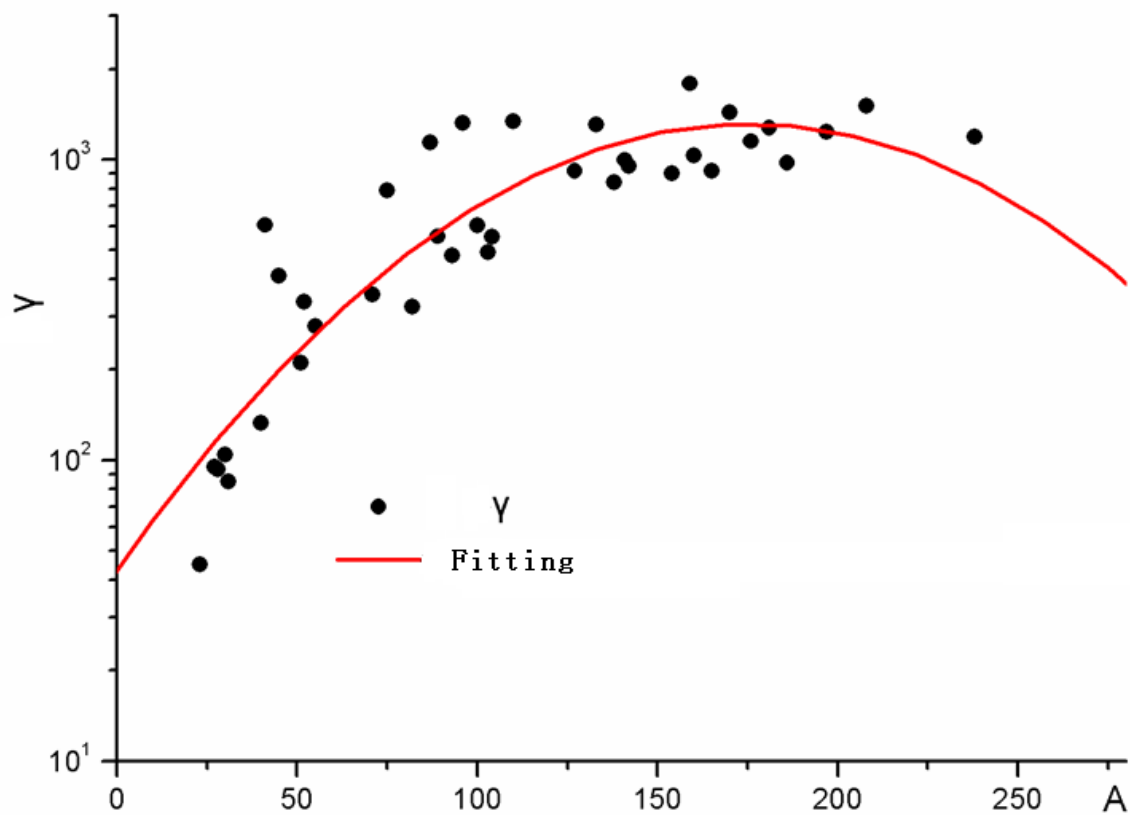
- **GETZVD0.5C** Translating the zvd file to dat

β paramater

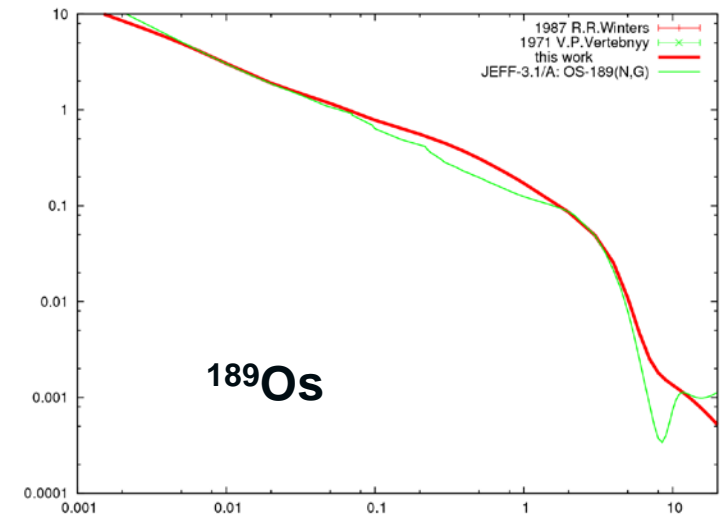
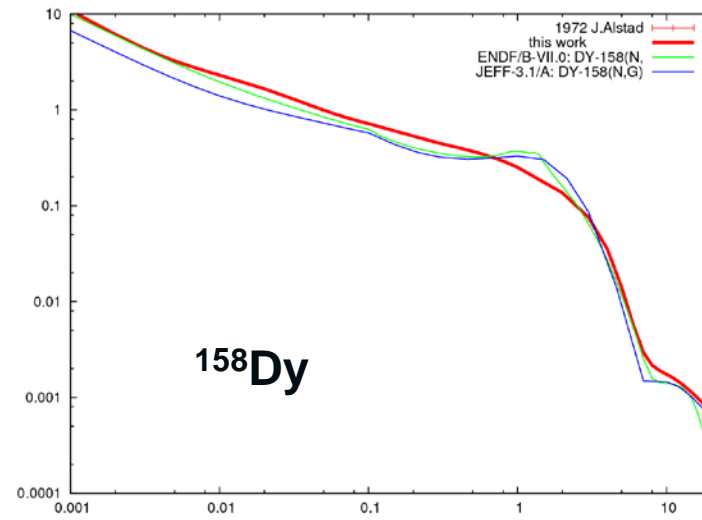
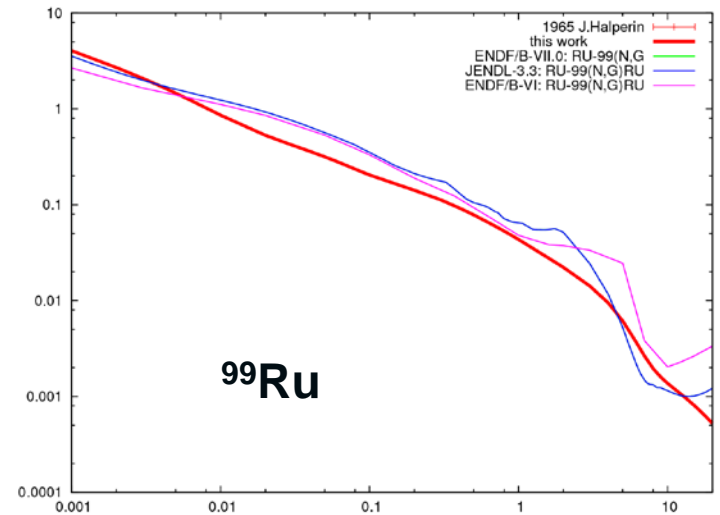
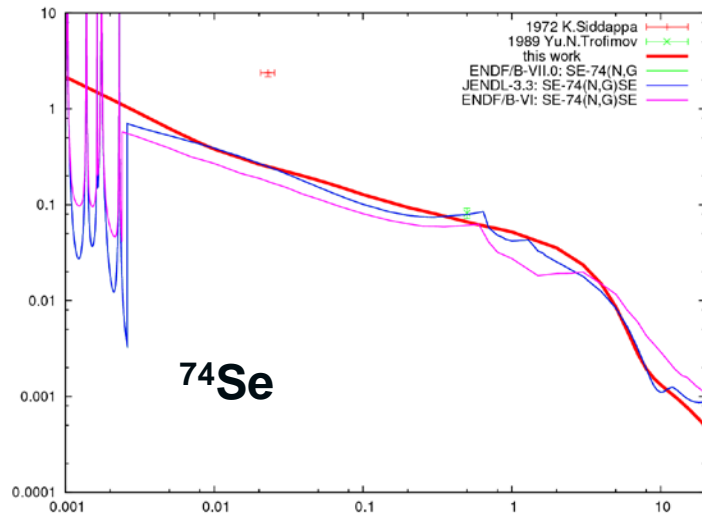
Z	A	α	β	Z	A	α	β
17	37	0.09	0.02	53	127	7.58	30.17
19	41	0.75	0.09	63	151	52.85	50.29
25						26.06	50.70
27						23.82	180.15
29						11.84	180.62
29						13.56	70.13
31						12.52	1410.68
31						9.00	80.28
33						9.66	180.92
35						8.93	90.35
36						6.66	90.02
37						12.83	3.19
37						14.99	4.24
38						20.06	23.49
45						12.02	25.31
47						10.29	2.38
49	115	24.98	1.39	82	207	0.29	2.64
51	121	17.92	1.73	92	235	11.11	2.99
52	123	18.03	1.87				



Fitting of paramatery:



The predict of nuclei with no experiment data



- ❖ The status of neutron capture radioactive systematics

- ❖ The systematics of (n,g) excitation function
 - How to use the EXFOR database in this work
 - The formula of (n,g) excitation function

- ❖ Summary

Summary

- ❖ **The status of (n,g) systematics**
- ❖ **Introduction of (n,g) excitation function systematics.**
- ❖ **The application of EXFOR database in the systematics work.**
 - **How to use the experimental data in EXFOR and evaluated data**
 - **Easily and quickly translate the data to format in two columns**

THANKS!!!