



Sigma Retrieval System

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Sigma 1.0

- ❖ Released in April 2007, <http://www.nndc.bnl.gov/sigma>.
- ❖ User-friendly access to evaluated and experimental cross sections.
- ❖ Next step: Go be

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NNDC Databases: NuDat | NSR | XUNDL | ENSDF | MIRD | ENDF | CSISRS | CINDA

Retrieval **Sigma** Plotting

Evaluated Nuclear Data File (ENDF)

Periodic Table Browse | Directory Tree Browse | Basic Retrieval | Advanced Retrieval | Plot Cart

Select first a library, then a sublibrary and finally click on a chemical element to obtain results.
Data is available for materials with a cyan background.

Library: ENDF/B-VII.0 (USA, 2006) Sublibrary: Neutron reactions

1	2																	10		
3	4															11	12			
11	12																	17	18	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36			
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54			
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86			
87	88	89	104	105	106	107	108	109	110	111										
																		69	70	71
90	91	92	93	94	95	96	97	98	99	100	101	102	103							

Database Manager: Mike Herman, NNDC, Brookhaven National Laboratory
Web and Programming: B. Pritychenko, A.A. Sonzogni, NNDC, Brookhaven National Laboratory
Data Source: CSEWG and NEA-WPEC.

Results for Z=64

ENDF-6 format	Human-readable
Whole file - 152	
introduction - 153	Interpreted
res. param. - 153	Interpreted
Cross sections:	
(n,total) - 154	Interpreted Plot
(n,elastic) - 155	Interpreted Plot
(n,inelastic) - 156	Interpreted Plot
(n,2n) - 157	Interpreted Plot
(n,3n) - 158	Interpreted Plot
(n,na) - 160	Interpreted Plot
(n,2na) - 160	Interpreted Plot
(n,np) - 160	Interpreted Plot
(n,2np) - 160	Interpreted Plot
(n,n') (click to expand)	
(n,y) - 160	Interpreted Plot
(n,p) - 160	Interpreted Plot
(n,alpha) - 160	Interpreted Plot
(n,palpha) (click to expand)	
Angular distributions:	

Sigma 2.0

- ❖ Released in April 2008.
- ❖ New features:
 - ❖ Angular distributions of emitted neutrons (if available in MF=4).
 - ❖ Energy distributions of emitted neutrons and photons (if available in MF=5).
 - ❖ Web implementation of ENDVER package (Full Spectra).
 - ❖ Computations (mathematical operations) on cross sections (MF=3). (Talk by A. Sonzogni)

Sigma 2.0

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NNDC Databases: NuDat | NSR | XUNDL | ENSDF | MIRD | ENDF | CSISRS | Sigma

Update Plot Reset

2.34 ≤ θ (deg) ≤ 252.0 Log

0.00511 ≤ $d\sigma/d\omega$ (b/sr) ≤ 0.718 Log

View evaluated data
View experimental data

ENDF/B-VII.0 Angular Distribution of Neutrons: 1-H-2(n,elastic)

Normalized Probability $d\sigma/d\omega$ (b/sr)

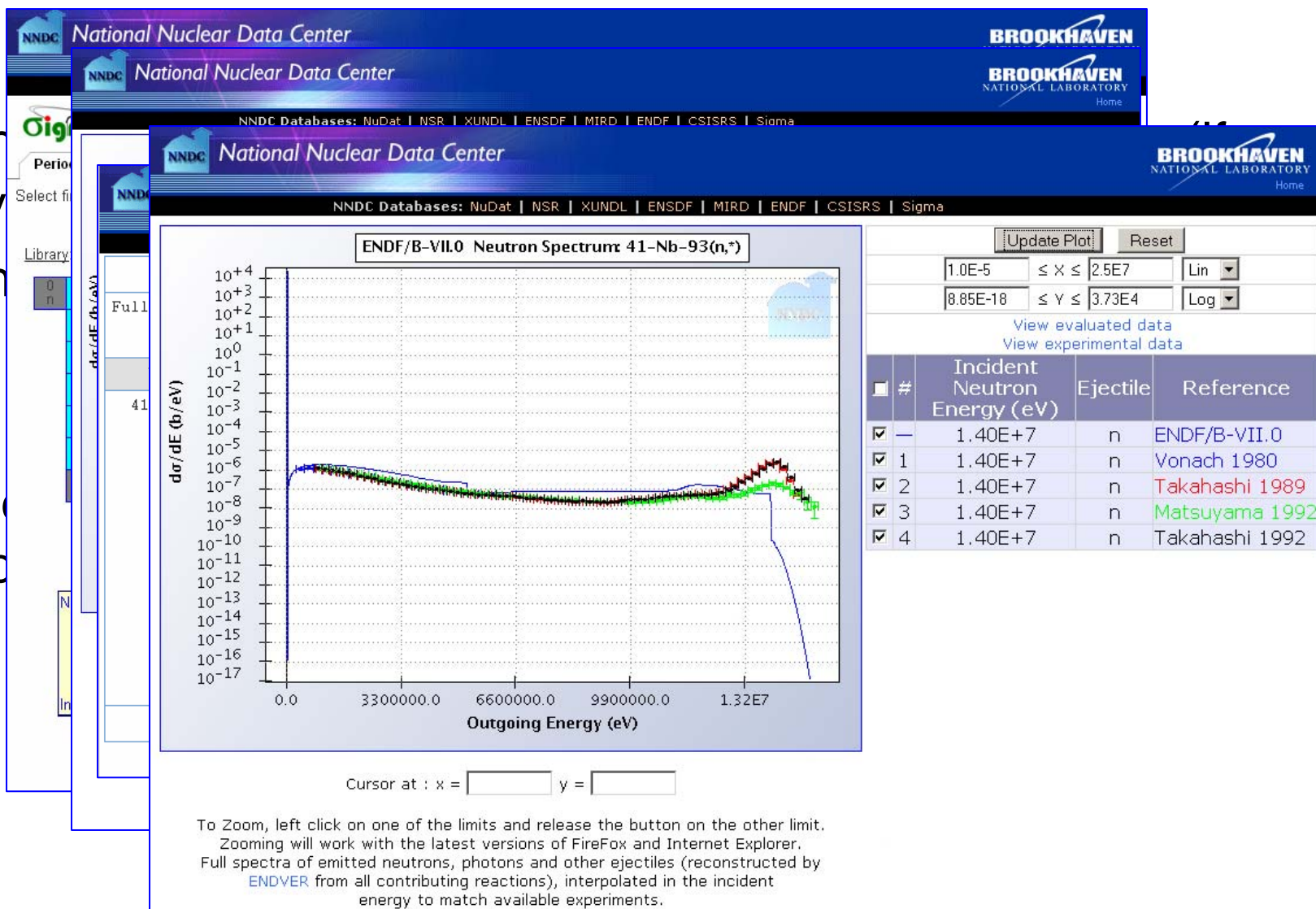
Cursor at : $x =$ (deg) $y =$ (b/sr)

To Zoom, left click on one of the limits and release the button on the other limit.
Zooming will work with the latest versions of FireFox and Internet Explorer.
Angular distribution ($d\sigma/d\omega$) plots are reconstructed from the File 4 using the cross section data from the File 3 at T=300 K.

#	Incident Neutron Energy (eV)	θ	Reference
<input checked="" type="checkbox"/>	1	1.417E7	C.M. ENDF/B-VII.0
<input checked="" type="checkbox"/>	2	1.400E7	C.M. Howell 1994
<input checked="" type="checkbox"/>	3	1.400E7	C.M. Schwarz 1983
<input checked="" type="checkbox"/>	4	1.410E7	C.M. Allred 1953
<input checked="" type="checkbox"/>	5	1.410E7	C.M. Seagrave 1955
<input type="checkbox"/>	6	1.410E7	Lab Shirato 1968
<input checked="" type="checkbox"/>	7	1.410E7	C.M. Shirato 1972
<input type="checkbox"/>	8	1.410E7	Lab Higuchi 1982
<input checked="" type="checkbox"/>	9	1.414E7	C.M. Bruellmann 1968
<input checked="" type="checkbox"/>	10	1.420E7	C.M. Vedrenne 1966
<input checked="" type="checkbox"/>	11	1.430E7	C.M. Berick 1968
<input checked="" type="checkbox"/>	12	1.440E7	C.M. Basar 1967
<input type="checkbox"/>	13	1.470E7	Lab Bai XI-Xiang 1980
<input checked="" type="checkbox"/>	14	1.480E7	C.M. Messelt 1965
<input checked="" type="checkbox"/>	15	1.480E7	C.M. Gul 1979
<input type="checkbox"/>	16	1.558E7	Lab Moore 1973

Sigma 2.0

- ❖ Enter
- ❖ available
- ❖ The
- ❖ Work
- ❖ Sp





Plot selected files

Reset

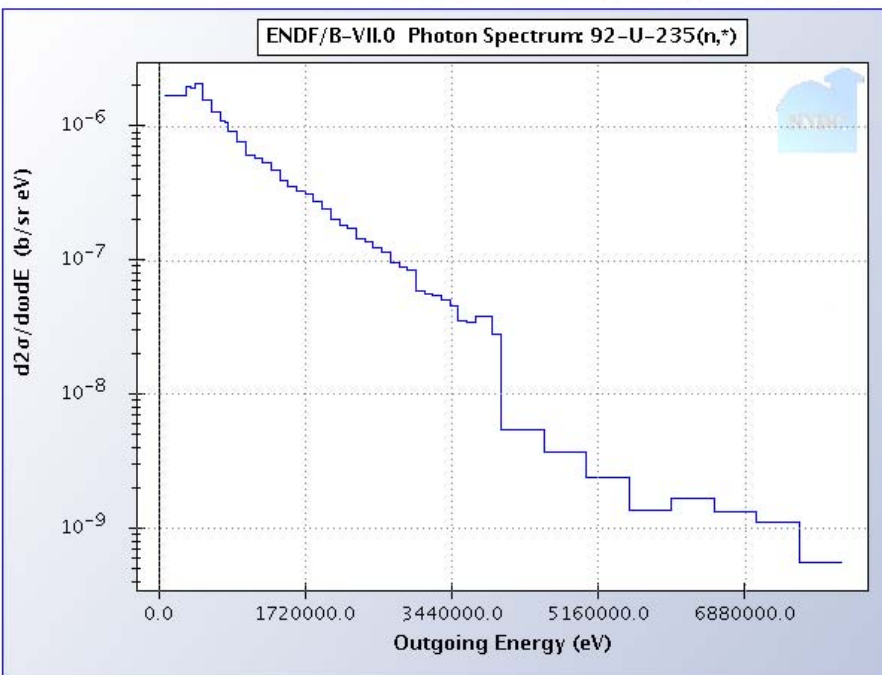
Full sp
from all



Target

92-U -23

d2σ/dωdE (b/sr eV)



Cursor at : x = y =

To Zoom, left click on one of the limits and release the button on the other limit.
 Zooming will work with the latest versions of FireFox and Internet Explorer.
 Full spectra of emitted neutrons, photons and other ejectiles (reconstructed by
[ENDVER](#) from all contributing reactions), interpolated in the incident
 energy to match available experiments.

Update Plot

Reset

1.0E-5 ≤ X ≤ 2.5E7 Lin

3.47E-10 ≤ Y ≤ 3.00E-6 Log

View evaluated data

No Experimental Data Available

#	Incident Neutron Energy (eV)	Ejectile	Angle (deg)	Reference
<input checked="" type="checkbox"/>	1.40E+7	gamma	30	ENDF/B-VII.0



Conclusion & Outlook

- ❖ Sigma 2.0 was released in April 2008.
- ❖ Sigma 3.0 is under development.
- ❖ Sigma article will be published in December 2008 issue of Nuclear Data Sheets
- ❖ Suggestions from the CSEWG?