



# International Atomic Energy Agency

The 9th DAE-BRNS Workshop on

**Nuclear Reaction Data and its Compilation for EXFOR Database**

Department of Physics, Bharathiar University, Coimbatore India

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## EXFOR/ENDF database

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# EXFOR from Various Centres / Medias

The collage displays several key components of the EXFOR ecosystem:

- Search Interfaces:** Screenshots from NNDC, IAEA Nuclear Energy Agency, and JCPDR showing search criteria like target, reaction, energy, and author.
- Data Visualization:** The EE-VIEW tool showing a plot of cross-section (mb) versus incident energy (MeV) for the reaction  $Al-27(n, \alpha)Si$ .
- Database Descriptions:** Text boxes describing EXFOR-CINDA (version 1.96, July 2008) and the EXFOR Master File (2005~).
- Navigation and Resources:** A sidebar with links for 'Links', 'Contacts', 'About', 'Team', 'Publications', 'News', and 'Pages', along with a 'What are you looking for?' section listing various nuclear data parameters.

- Centres may use their own database system.

Example: CSISRS, SIGMA (NNDC), JANIS (NEA-DB), EXFOR (IAEA-NDS)

- However, all centres (should) use the latest EXFOR source files.

( IAEA-NDS maintains “EXFOR Master File” 2005~)



# EXFOR from Various Centres / Medias (cont)

IAEA Nuclear Data Section maintains EXFOR search system:

<http://nds.iaea.org/exfor/>

**NRDC** Experimental Nuclear Reaction Data (EXFOR)  
Database Version of 2019-10-23  
Software Version of 2019-07-19

The EXFOR library contains an extensive compilation of experimental nuclear reaction data. Neutron reactions have been compiled systematically since the discovery of the neutron, while charged particle and photon reactions have been covered less extensively. [EXFOR Reference Paper: Nucl. Data Sheets 120\(2014\)272.](#)

EXFOR Web database retrieval system provides: data search, output to various formats (incl.XML), plotting and comparison to ENDF, re-normalization old data to new standards, calculating data for inverse reactions and kinematics, constructing correlation matrices from partial uncertainties, etc. [EXFOR Web Database & Tools Paper: NIM A 888 \(2018\) 31.](#)

The EXFOR database contains data from **22888** experiments (see [statistics](#) and recent database [updates](#)). [Mirror-sites](#)

Search:

Examples of requests: [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) ...  
[1](#) Cross section  $\sigma(E)$  /updates/ [More examples...](#)

**Request**

Target  ?  
Reaction  ?  
Quantity  ?  
Product  ?  
Energy from  to  eV ?  
Author(s)  ?  
Publication year  ?  
Last modified  ?  
Accession #  ?

**Extended**  
 **Keywords**  
 **Expert**

Go to: [\[upload your data\]](#)

**Options**

- Exclude superseded data
- No reaction combinations (ratios...)
- Exclude evaluated/calculated data
- Enhanced search of Products
- Retrieve listing only
- Disable Prompt-Help

Sort by:  reaction  publication  
View:  basic  extended

**Plotting.** See also: [\[video-guide\]](#)

**Ranges (Z,A)**  
**Reaction Sub-Fields**  
**Feedback and User's Input**

**Clone Request:**

[More Web Tools](#)



# EXFOR Search by Reaction/Quantity

Each EXFOR entry is searchable by Target, Projectile etc. at <http://nds.indcentre.org.in/exfor/> .



The screenshot shows a search interface titled "Request". It includes several search criteria, each with a checkbox and a text input field, and a unit dropdown menu. The criteria are: Target, Reaction, Quantity, Product, Energy from (with a "to" field), Author(s), Publication year, Last modified, and Accession #. Each input field has a small question mark icon to its right. Below the search criteria, there are three expandable sections: "Extended", "Keywords", and "Expert". At the top right of the form are buttons for "Submit", "Reset", and "Help". At the bottom right are buttons for "Submit" and "Reset".

Keyword	Example
Target	O-18
Reaction	"p,n"
Quantity	"CS" (cross section)
Product	F-18



# EXFOR Cross Section Plot

## Data Selection

**Retrieve**  Selected  Unselected  All

**Output:**  X4+  EXFOR  Bibliography  TAB  C4  PlotC4

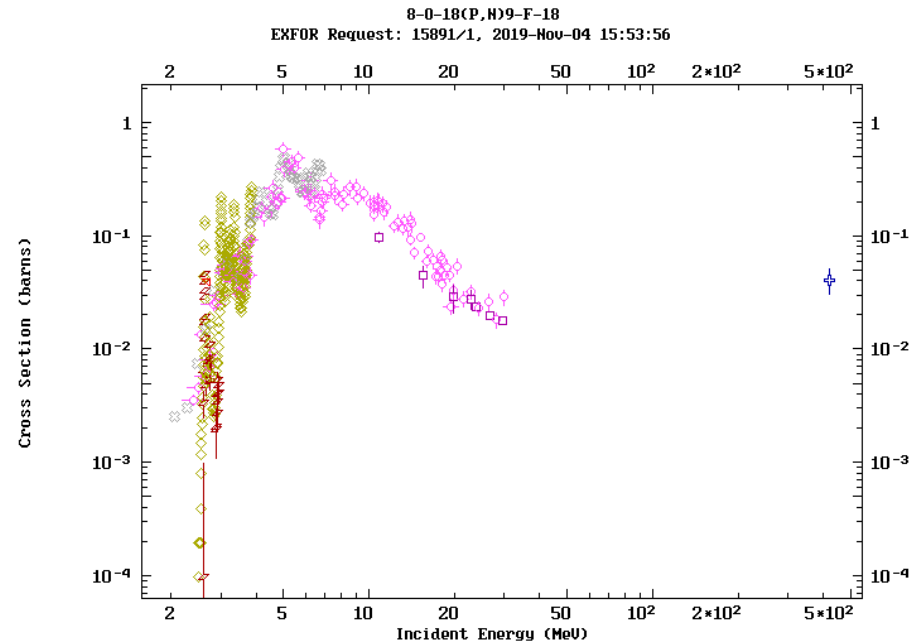
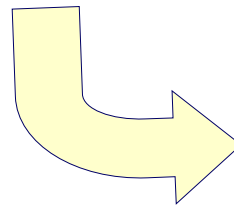
**Plot:**  Quick-plot (cross-sections)  ungroup  Advanced plot [how-to] using

Narrow incident energy (optional), eV: Min:  Max:

Apply  Data re-normalization (for advanced users, results in: C4, T)

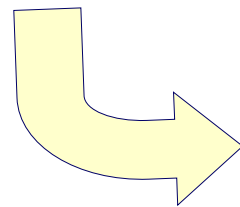
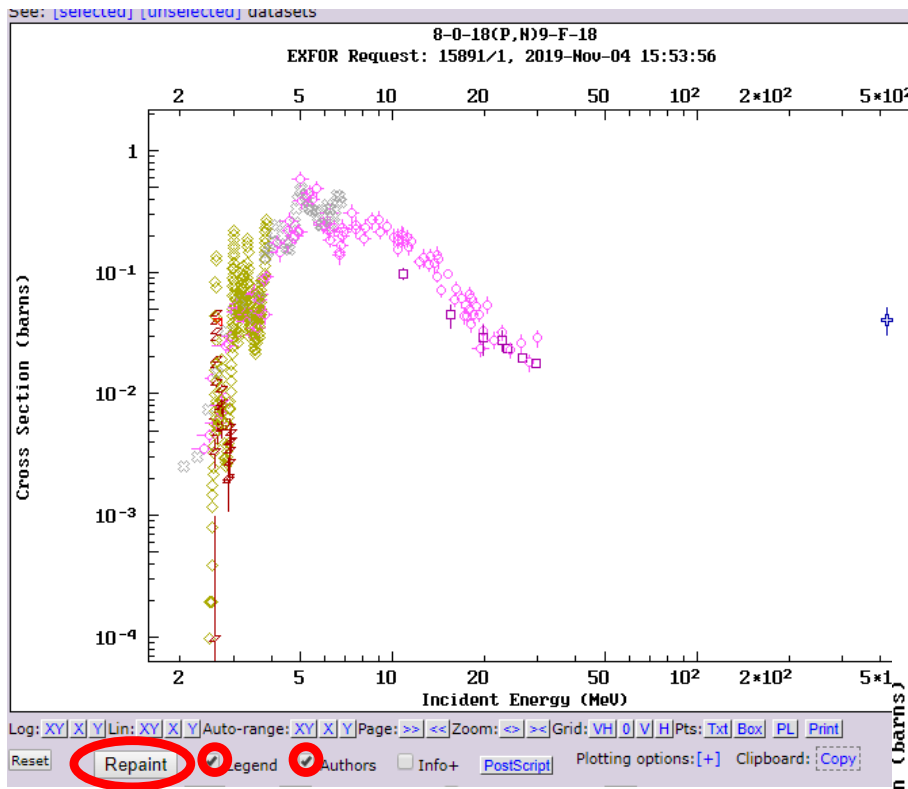
n	Display	Year	Author-1	Energy range, eV
1	8-0-18 (P,N) 9-F-18,,SIG		C4: MF3 MT4	<input type="checkbox"/> Invert data to re
Quantity: [CS] Cross section				
1	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	2001	E.Hess+	2.43e6
2	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1990	S.W.Kitwanga+	1.09e7
3	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1973	J.K.Bair	2.52e6
4	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1967	G.Amsel+	2.70e6
5	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1960	J.M.Blair+	2.63e6
6	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1952	L.Marquez	4.20e8
7	<input checked="" type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1951	J.P.Blaser+	2.08e6
2	8-0-18 (P,N) 9-F-18, IND, SIG,,, EXP		C4: MF=3	MT=?
Quantity: [CS] Independent cross section				
f 8	<input type="checkbox"/> + <input type="button" value="i"/> <input type="button" value="X4"/> <input type="button" value="X4+"/> <input type="button" value="X4±"/> <input type="button" value="T4"/> <input type="button" value="Cov"/>	1979	T.J.Ruth+	2.30e6

Plot of cross section is very easy! (*Quick-plot*)

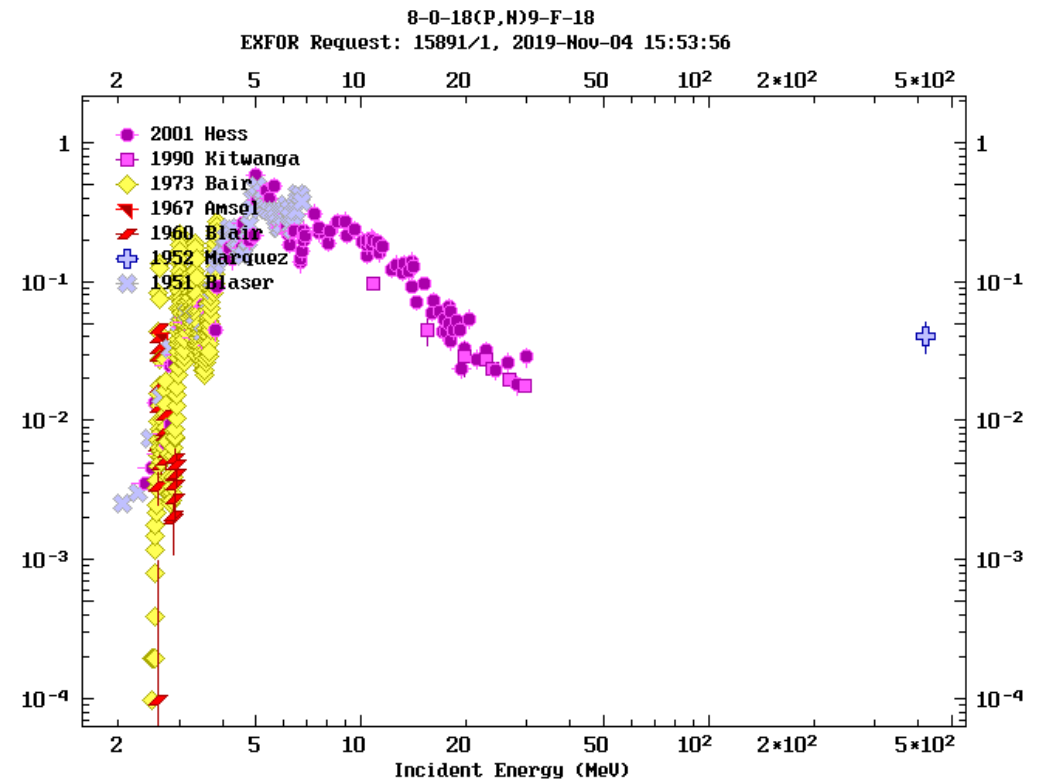




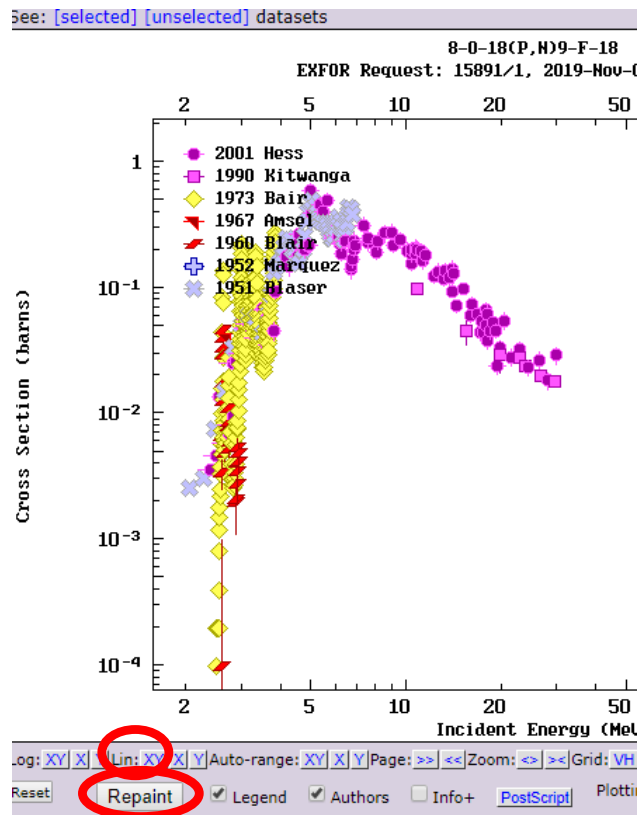
# Adjustment of Plot on Web



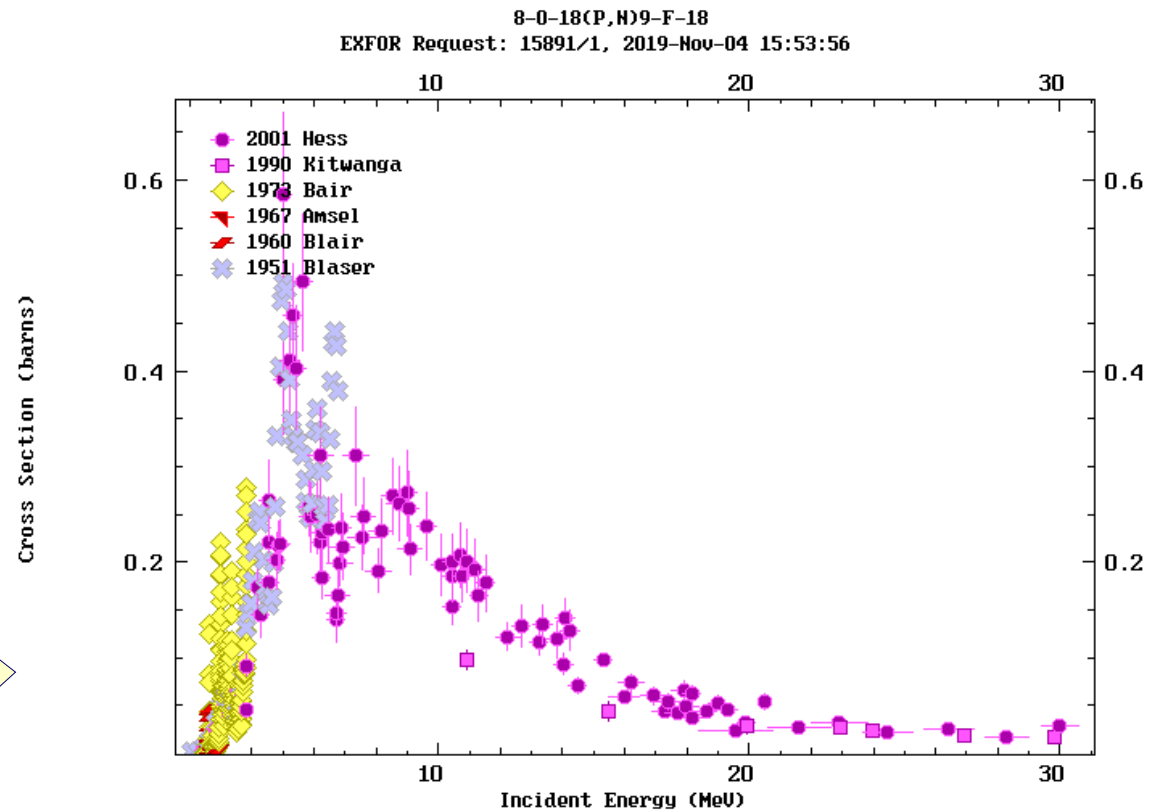
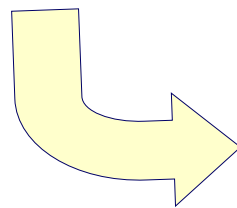
Check “Legend” and “Authors”  
and click “Repaint”.



# Adjustment of Plot on Web (cont)



Select area,  
Click “Lin:XY”  
and click “Repaint”.





# Exercise: $^{233}\text{Pa}(n,f)$

*Exercise:*

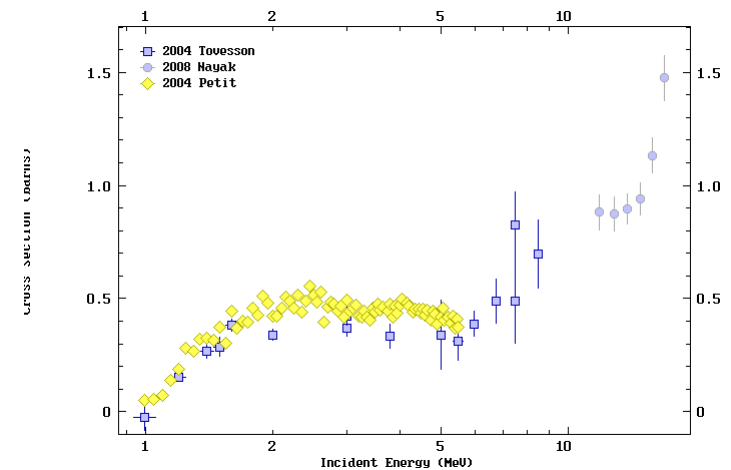
$^{233}\text{Pa}$  neutron-induced fission cross section

- Search  $^{233}\text{Pa}(n,f)$  cross sections in EXFOR at <http://nds.iaea.org/exfor/>

Target: Pa-233

Reaction: n,f

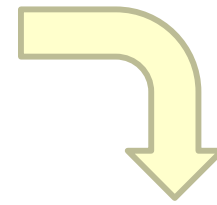
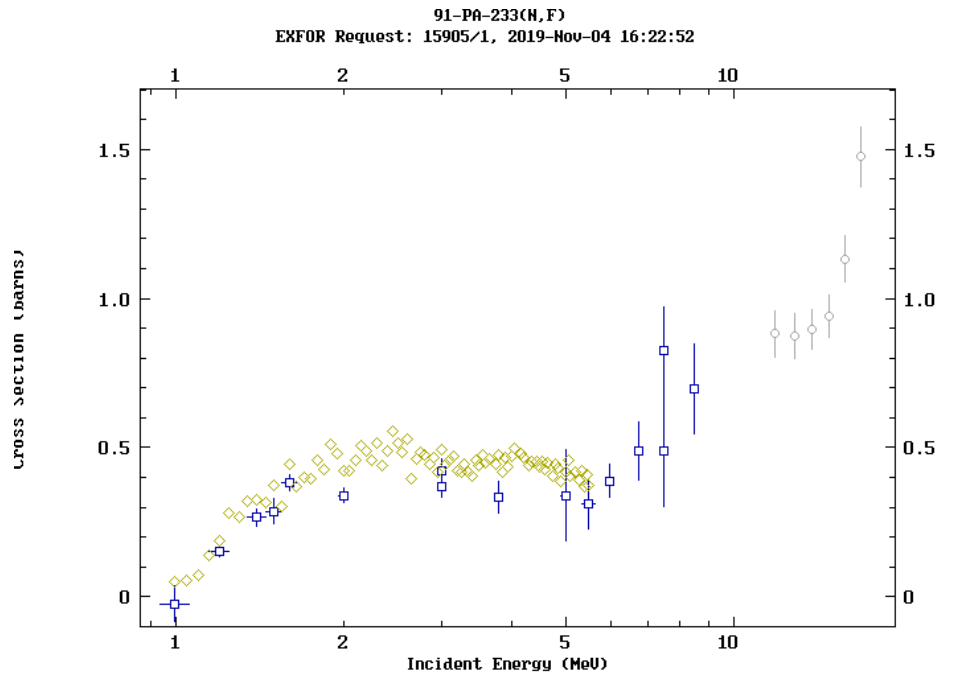
Quantity: cs



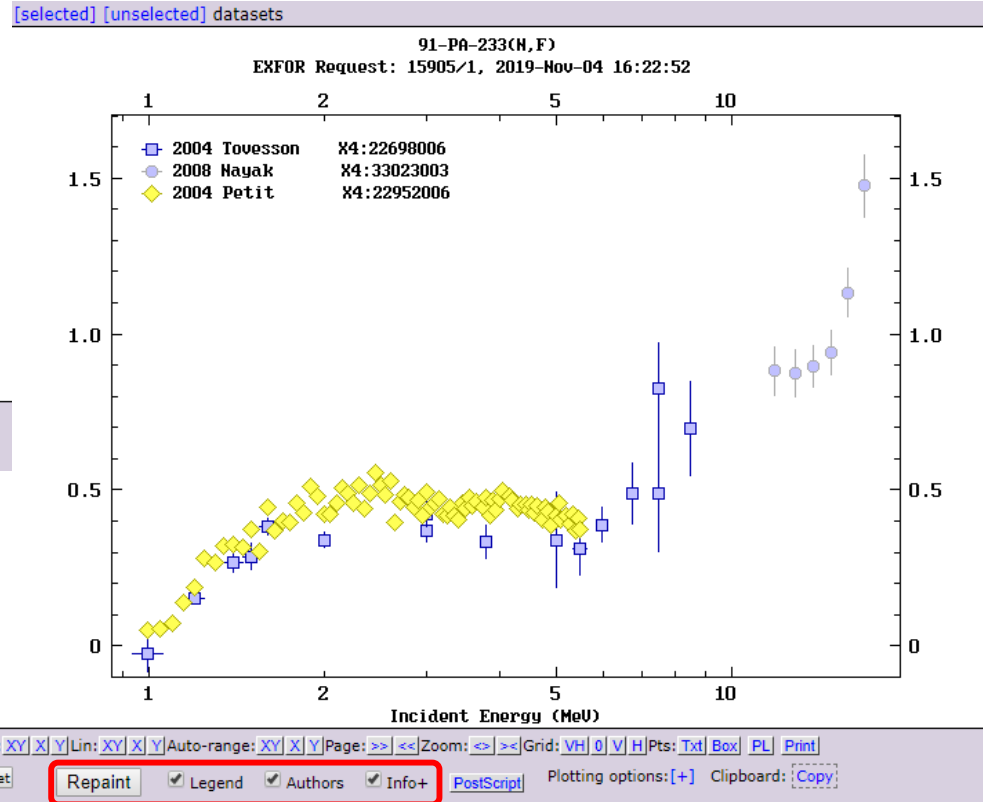
- Select 3 data sets (Nayak, Tovesson, Petit)
- (Quick-)Plot all data sets in (x,y)=(log-lin)



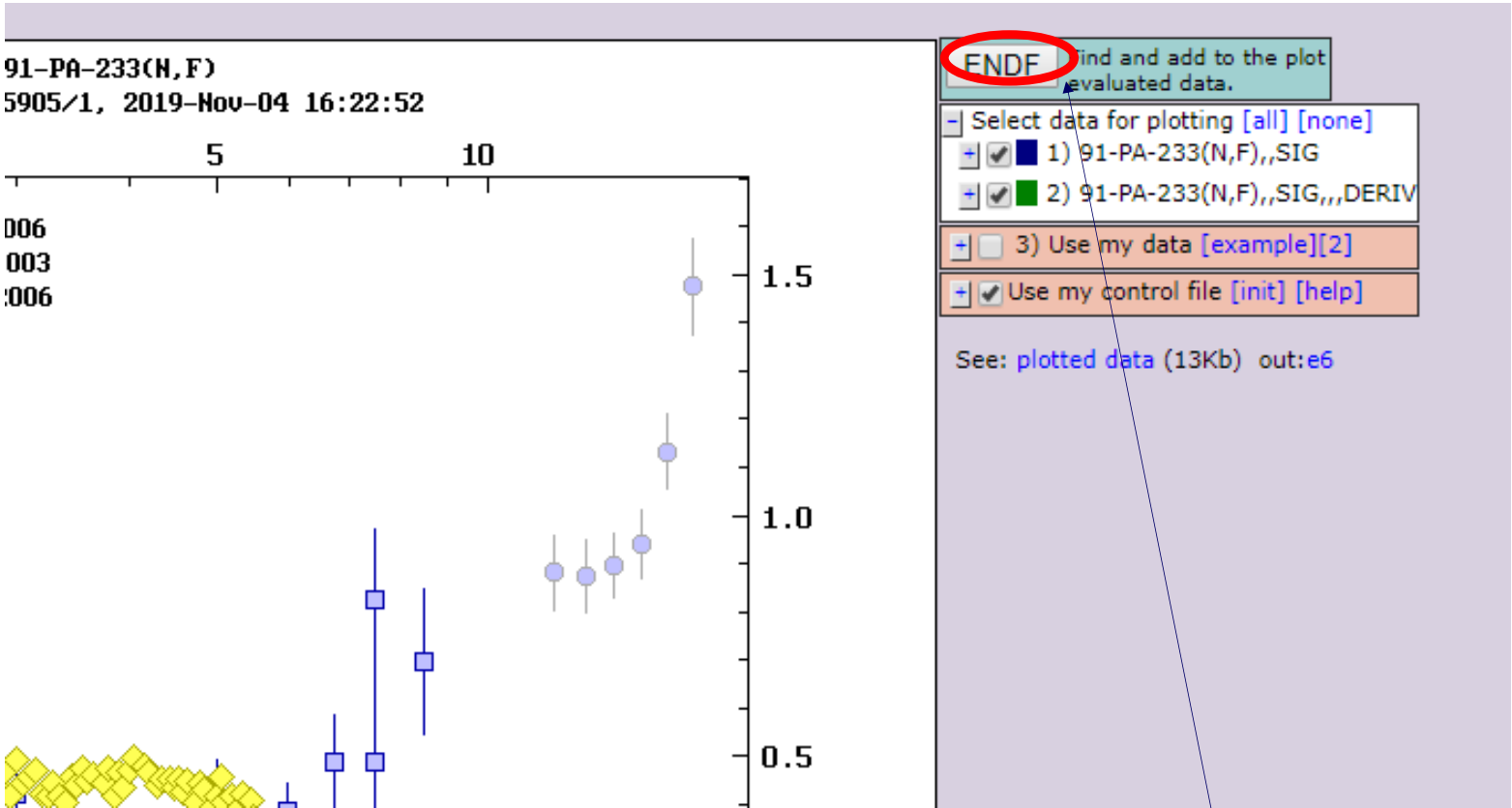
# Exercise: $^{233}\text{Pa}(n,f)$ (cont)



Activate 3 options (Legends, Authors, Info+) and repaint.



# Comparison with Evaluated Data Libraries (ENDF)



Button for comparison with evaluated data libraries

# Comparison with Evaluated Data Libraries (cont)

ENDF Data Selection (Plot for EXFOR Request #16063)

Retrieve  **Plot**  Selected  Unselected  All

Plotting options:  Quick plot (cross-sections only:  $\sigma$ )

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

1) PA-233 (N, F), SIG MT=18 MF=3 NSUB=10

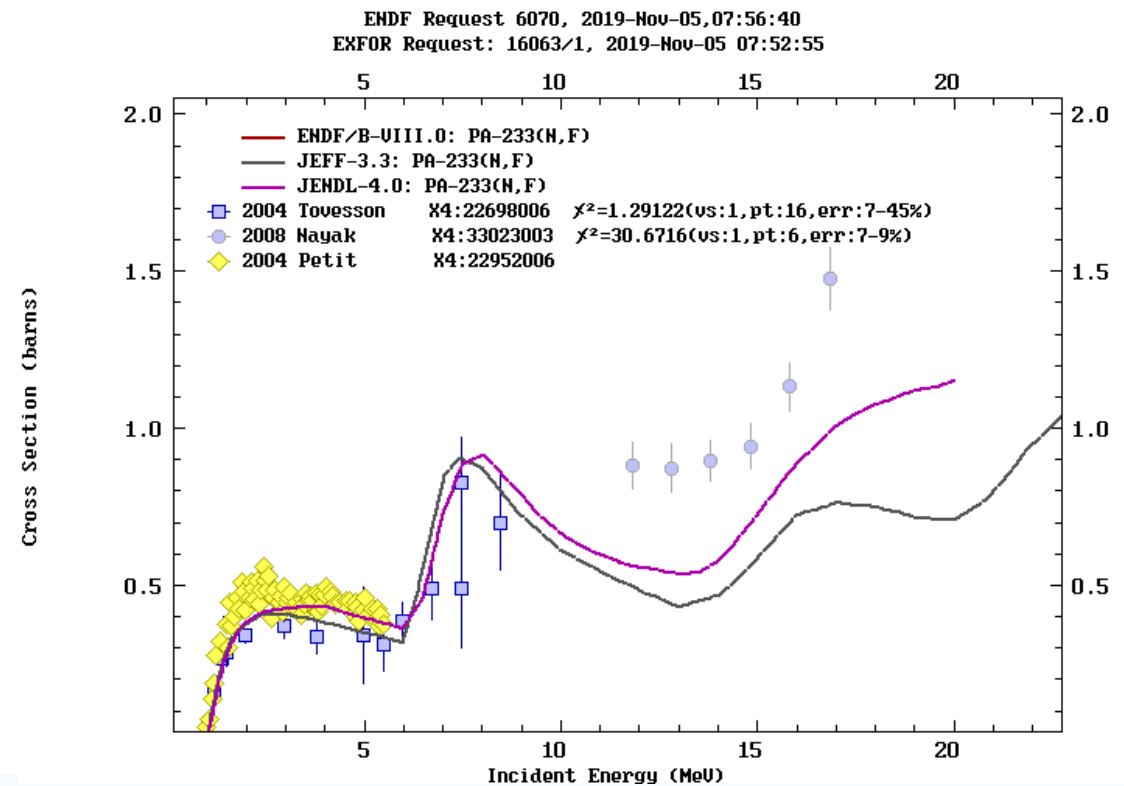
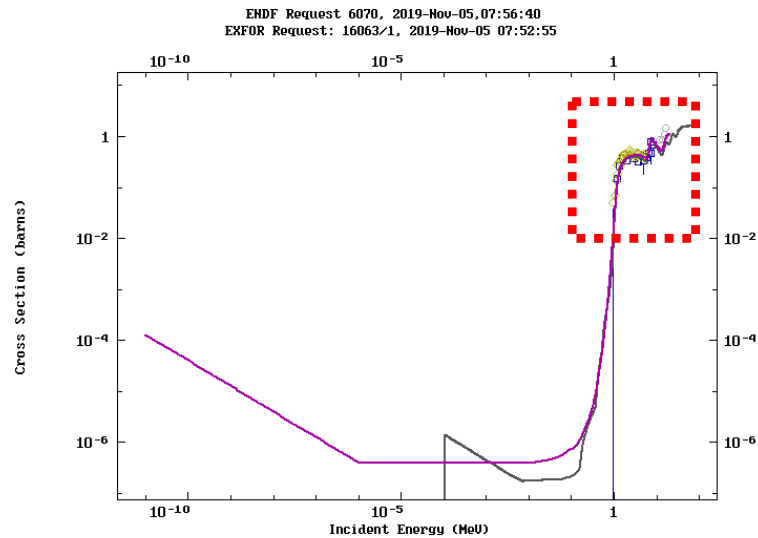
ME3: [SIG] Cross sections MT18: [N,F] Total fission.

<input checked="" type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VIII.0	E=60MeV	Lab=IAEA	Date=20111222
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VII.1	E=60MeV	Lab=IAEA	Date=20111222
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VII.0	E=60MeV	Lab=IAEA	Date=DEC06
<input checked="" type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.3	E=60MeV	Lab=IAEA	Date=20171231
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.2	E=60MeV	Lab=IAEA	Date=Eval-Mar04
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.1.2	E=20MeV	Lab=NEA	Date=090105
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.1	E=20MeV	Lab=NEA	Date=090105
<input checked="" type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JENDL-4.0	E=20MeV	Lab=JAEA+	Date=20100318
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JENDL-3.3	E=20MeV	Lab=KINKI U. +	Date=20020
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JENDL-3.3	E=20MeV	Lab=KINKI U. +	Date=20020
<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VI	E=20MeV	Lab=GA, BNL, LANL	Date=198

Select three libraries (ENDF/B-VIII, JEFF-3.3 and JENDL-4.0) and plot!

# Comparison with Evaluated Data Libraries (cont)

Select area, and use  
(x,y)=(lin,lin) scale;  
Legend & Authors & Info+



# $^{78}\text{Se}(n,p)^{78}\text{As}$ in Common article

*Exercise:*

$^{78}\text{Se}(n,p)^{78}\text{As}$  cross section

- Search  $^{78}\text{Se}(n,p)^{78}\text{As}$  cross sections in EXFOR by <http://nds.iaea.org/exfor/>

Target: Se-78

Reaction: n,p

Quantity: cs

- Select all relevant data
- (Quick-)Plot all data sets in (x,y)=(lin-lin)





# $^{78}\text{Se}(n,p)^{78}\text{As}$ in Common article (cont)

Request

Target  Se-78 ?  
 Reaction  n,p ?  
 Quantity  cs ?  
 Product    
 Energy from  to  eV

Selected  Unselected  All

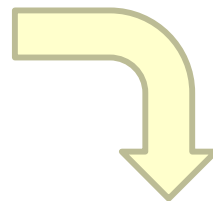
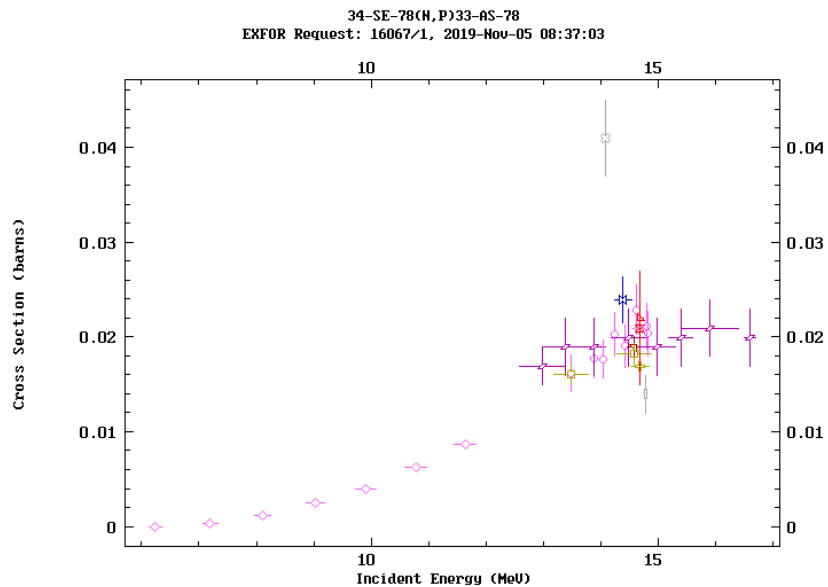
Output:  X4+  EXFOR  Bibliography  TAB  C4  PlotC4  
 Plot:  Quick-plot (cross-sections)  ungroup  Advanced plot [how-to] using  C5 and  converge  
 Narrow incident energy (optional), eV: Min:  Max:   
 Apply(3A)  Data re-normalization (for advanced users, results in: C4, TAB and Pl)

“34-SE-78(N,P)33-AS-78,,SIG” means  $^{78}\text{Se}(n,p)^{78}\text{As}$  cross section.

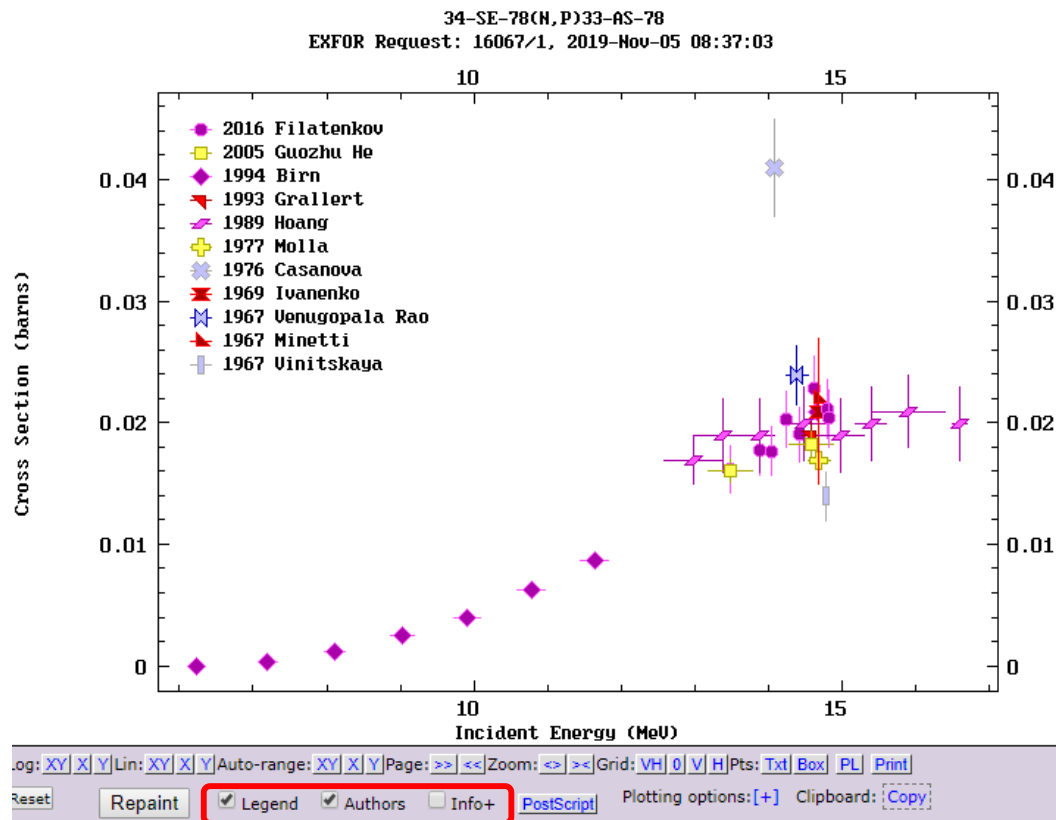
n	Display	Year	Author-1	Energy range, eV	Points
1)	34-SE-78 (N, P) 33-AS-78,, SIG				
Quantity: [CS] Cross section					
1	<input checked="" type="checkbox"/> A+ <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	2016	A.A.Filatkov	1.35e7	1.48e7 8
2	<input type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	2014	F.M.D.Attar+	1.37e7	1.48e7 5
3	<input checked="" type="checkbox"/> - <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	2005	Guozhu He+	1.35e7	1.46e7 2
4	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1994	I.Birn+	6.25e6	1.47e7 8
5	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1993	A.Grallert+	1.46e7	1
6	<input checked="" type="checkbox"/> A+ <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1989	H.M.Hoang+	1.30e7	1.66e7 8
7	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1977	N.I.Molla+	1.47e7	1
8	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1976	J.L.Casanova+	1.41e7	1
9	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1969	V.V.Ivanenko+	1.47e7	1
10	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1967	P.Venugopala Rao+	1.44e7	1
11	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1967	B.Minetti+	1.47e7	1
12	<input checked="" type="checkbox"/> + <input type="checkbox"/> i <input type="checkbox"/> X4 <input type="checkbox"/> X4+ <input type="checkbox"/> X4± <input type="checkbox"/> T4 <input type="checkbox"/> Cov	1967	G.P.Vinituskaya+	1.48e7	1

Check all data sets except for “2014 F.M.D.Attar+”.

# Exercise: $^{78}\text{Se}(n,p)^{78}\text{As}$ in Common article (cont)



Activate 2 options (Legend, Authors) and repaint.



# Exercise: Addition of “my data” to Plot

Add Table II data of the “Common article”, and Repaint.

ENDF Find and add to the plot evaluated data.

Select data for plotting [all] [none]

- 1) 34-SE-78(N,P)33-AS-78,,SIG
- 2) Use my data [example][2]

Columns: x y [dy [dx]]

13.73	15.6	1.5
14.07	17	1.6
14.42	18.6	1.6
14.68	20.4	1.7
14.77	22	1.7

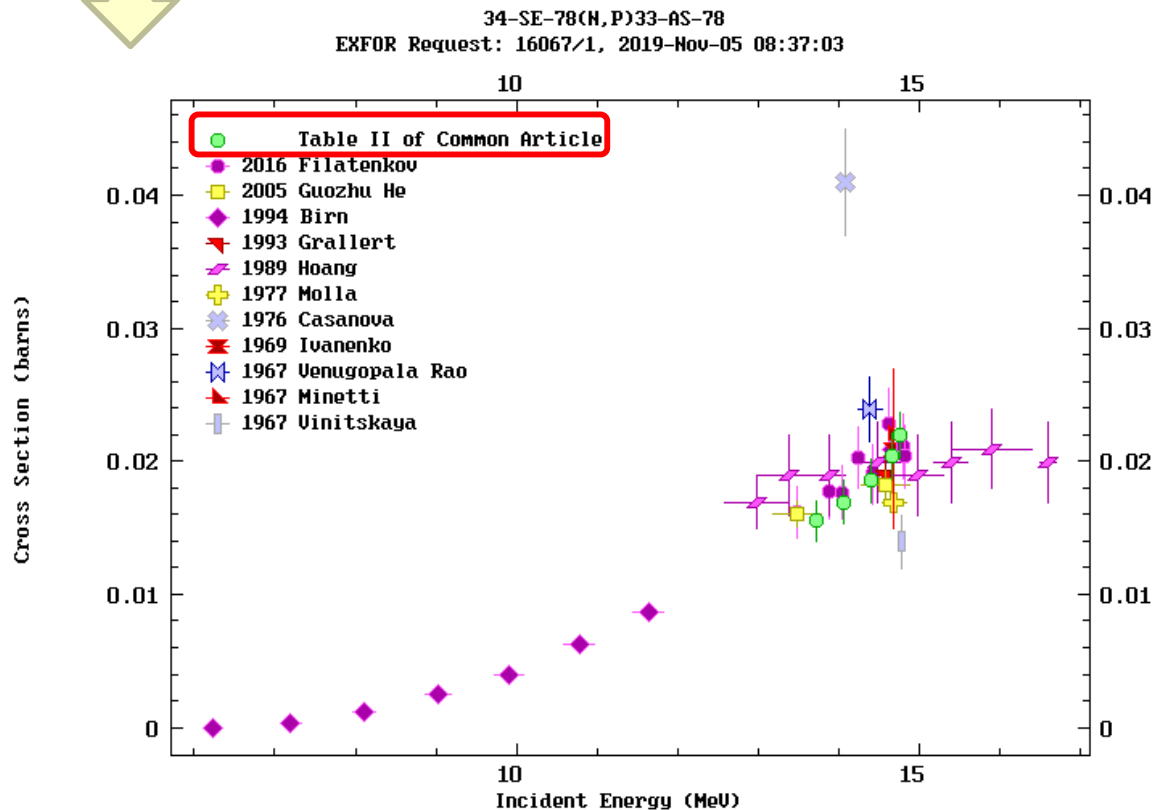
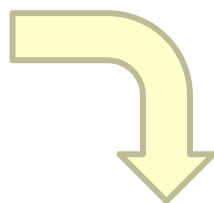
Type:  Curve  Points

Title: Table II of Common Article

Default: basic units! (eV, barn, etc.)

Multiply by: X: 1e+06 Y: 1e-03

Use my control file [init] [help]



To convert units of the Table (MeV, mb) to the “basic units” (eV, b)



# Exercise: Comparison with Evaluated Data Libraries

(cont)

ENDF Find and add to the plot evaluated data.

Select data for plotting [all] [none]

1) 34-SE-78(N,P)33-AS-78,,SIG

2) Use my data [example][2]

Columns: x y [dy [dx]]

13.73	15.6	1.5
14.07	17	1.6
14.42	18.6	1.6
14.68	20.4	1.7
14.77	22	1.7

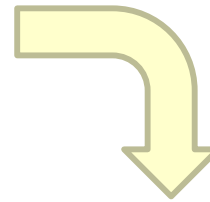
Type:  Curve  Points

Title: Table II of Common Article

Default: basic units! (eV, barn, etc.)

Multiply by: X: 1e+06 Y: 1e-03

Use my control file [init] [help]



Retrieve **Plot** Selected  Unselected  All

Plotting options:  Quick plot (cross-sections only:  $\sigma$ )

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

1) SE-78 (N, P), SIG MT=103 MF=

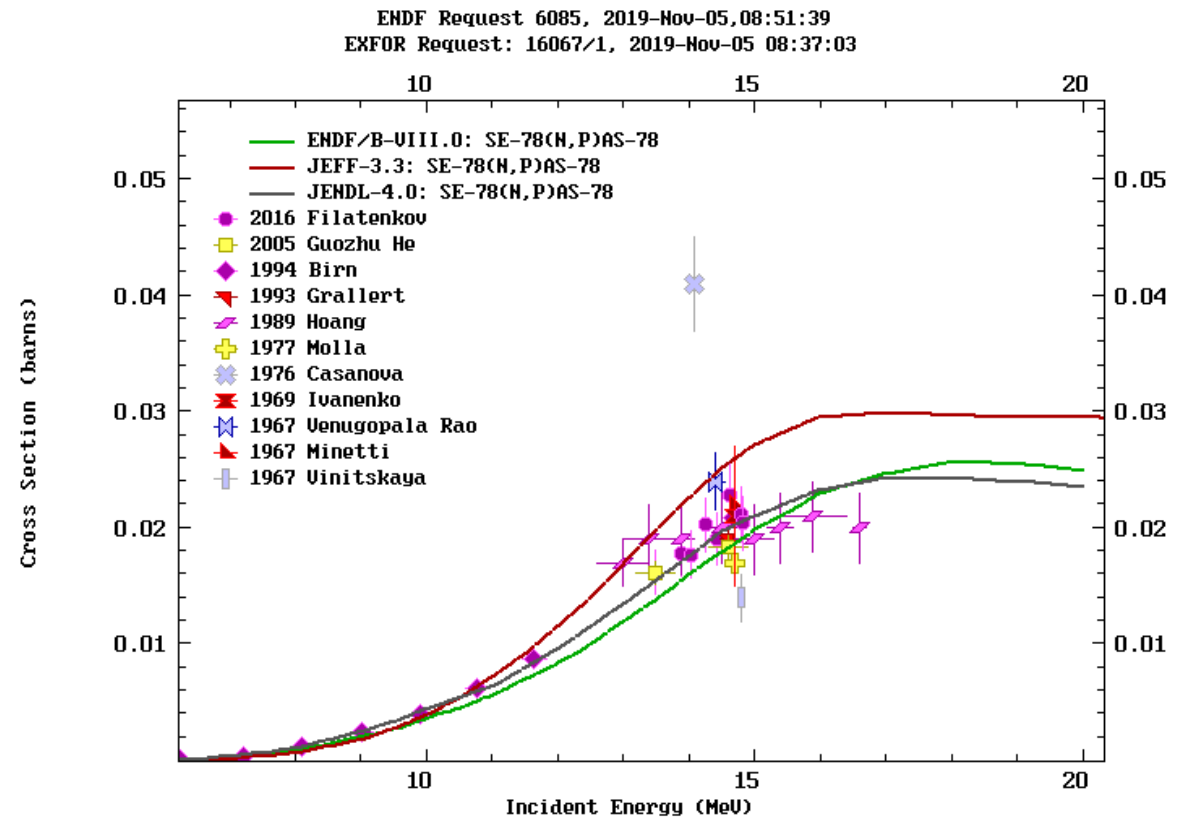
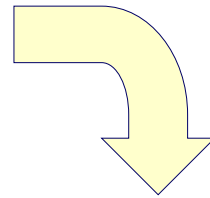
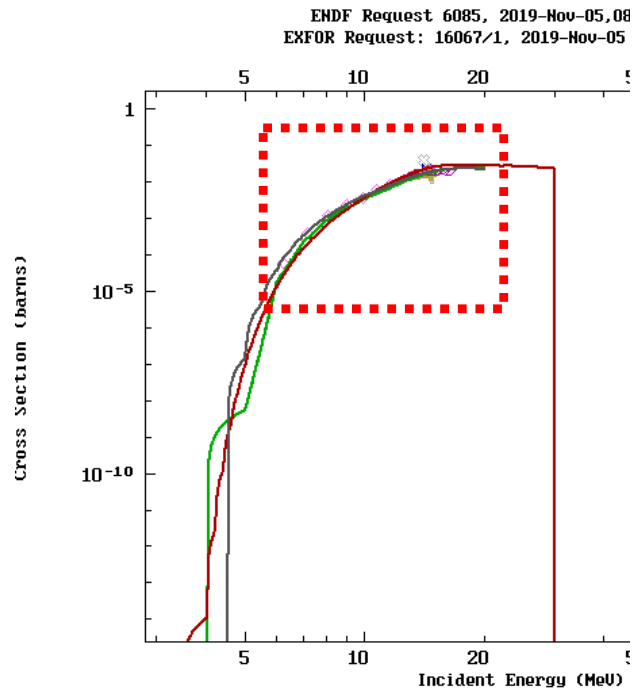
ME3: [SIG] Cross sections MT103: [N,P] Production of a proton, plus a residual. Sum of

1	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VIII.0	E=20MeV	Lab=JND
2	<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VII.1	E=20MeV	Lab=JND
3	<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	ENDF/B-VII.0	E=20MeV	Lab=JND
4	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.3	E=200MeV	Lab=NR
5	<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.2	E=200MeV	Lab=NR
6	<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.1.2	E=20MeV	Lab=NEA
7	<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JEFF-3.1	E=20MeV	Lab=NEA
8	<input checked="" type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JENDL-4.0	E=20MeV	Lab=JAE
9	<input type="checkbox"/>	ENDF-6	Interpreted	$\sigma$	Plot	JENDL-3.3	E=20MeV	Lab=JND

Select three libraries (ENDF/B-VIII.0, JEFF-3.3 and JENDL-4.0) and plot!

# Exercise: Comparison with Evaluated Data Libraries (cont)

Select area and use  
(x,y)=(lin,lin) scale;  
Legend&Authors&Info+



# Exercise: $^{80}\text{Se}(n,p)^{80}\text{As}$ in Common article

Exercise:

$^{80}\text{Se}(n,p)^{80}\text{As}$  cross section

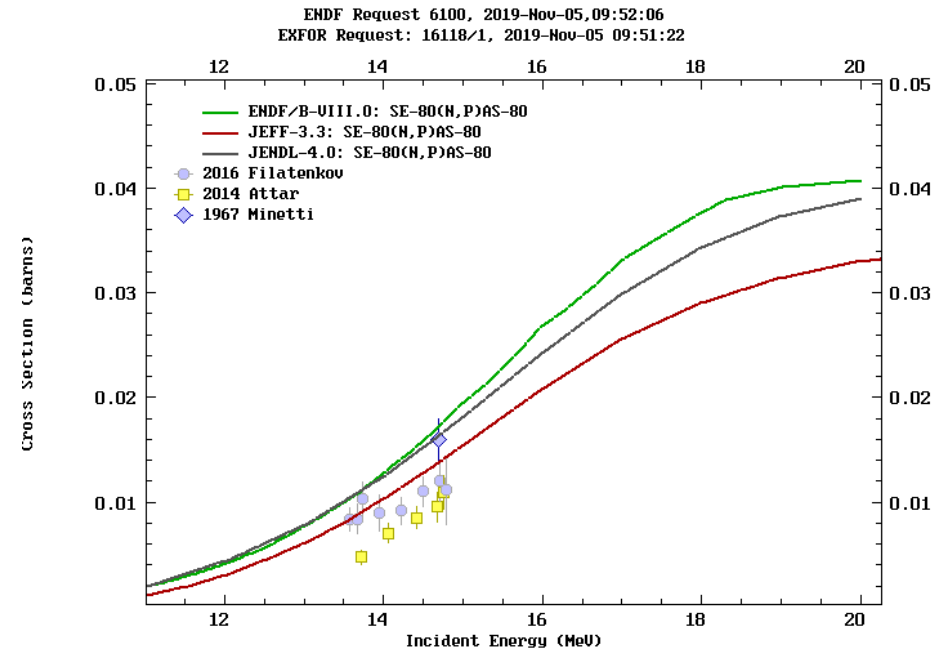
- Search  $^{78}\text{Se}(n,p)^{78}\text{As}$  cross sections in EXFOR by

Target: Se-80

Reaction: n,p

Quantity: cs

- Select all relevant data and plot (but only single point).
- Then plot with ENDF/B-VIII.0, JEFF-3.3 and JENDL-4.0 data.
- Then plot with data in Table II of the “Common article”.



# EE-View – New Retrieval System for Beginners

## EE-VIEW

<https://nds.iaea.org/exfor/eeview.htm>

08:19

Experimental-Evaluated data Viewer //cross sections

/under development by V.Zerkin, IAEA, 2022-2023, ver.2023-02-22/

Projectile Target Emission Libraries Options  
n AI-27 a EXFOR  Evaluated curves with error band  
Get data 3) exp:92/2s eval:6/20s plot/2.5s all/24.5sec

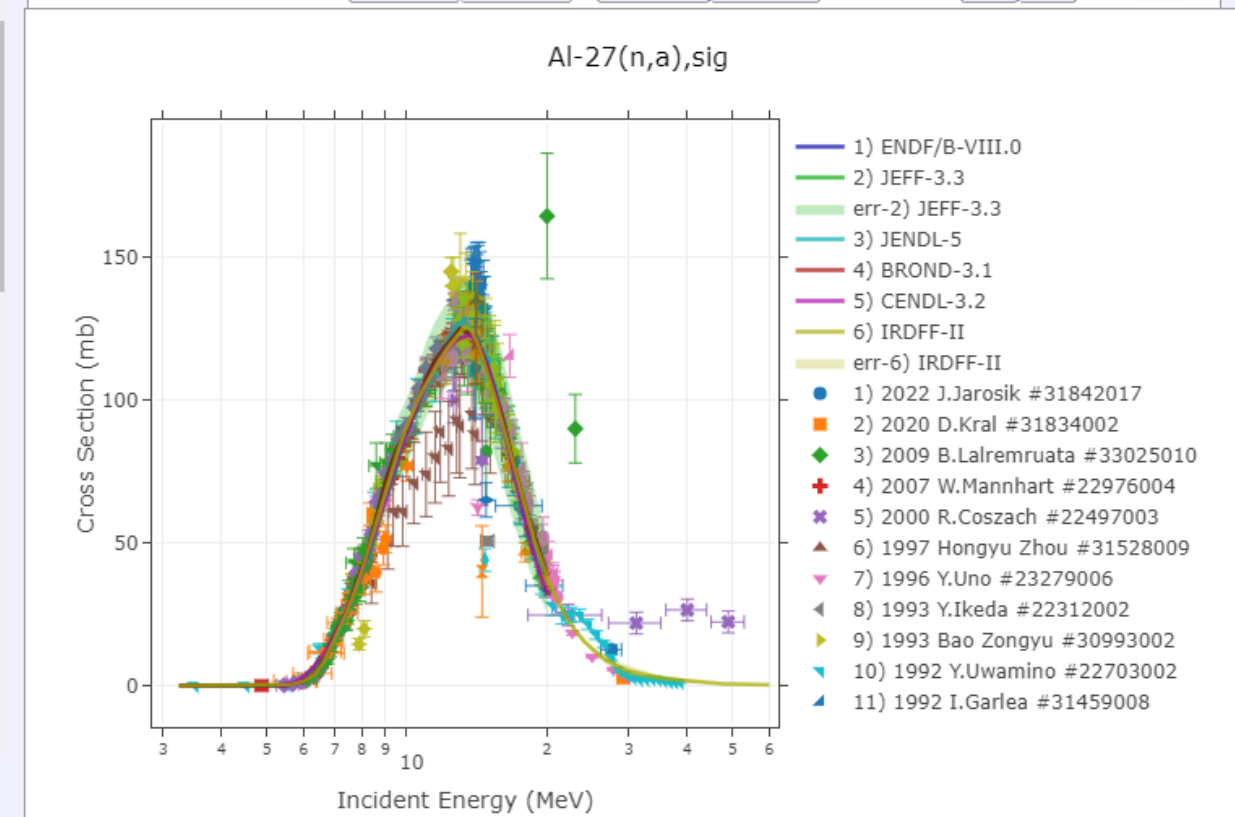
Select

AI-27(n,a) Reset Plot E(MeV)min,max: 3.5,49

- 1) ENDF:AL-27(N,A)NA-24,SIG MF:3 MT:107
- 1) ENDF/B-VIII.0 20111222 M.B.Chadwick+ [53] E:3.25+20
- 2) JEFF-3.3 20171231 M.B.Chadwick+ [53] E:3.25+20
- 3) JENDL-5 20090828 Y.Harima+ [71] E:3.6+20
- 4) BROND-3.1 DEC06 M.B.Chadwick+ [53] E:3.25+20
- 5) CENDL-3.2 20150815 Y.L.Han [109] E:5.3+20
- 6) IRDFF-II Dec15 K.I.Zolotarev [96] E:3.25+60
- 1) EXFOR: 13-AL-27(N,A)11-NA-24,,SIG
- 1) 31842017 2022 J.Jarosik [3] E:17.5+27.5
- 2) 31834002 2020 D.Kral E=29.1
- 3) 33025010 2009 B.Lalremruata E=14.8
- 4) 22976004 2007 W.Mannhart [28] E:8.33+14.7
- 5) 22497003 2000 R.Coszach [4] E:22.2+49
- 6) 31528009 1997 Hongyu Zhou E=14.9
- 7) 23279006 1996 Y.Uno [6] E:17.6+30.1
- 8) 22312002 1993 Y.Ikeda [8] E:13.3+14.9
- 9) 30993002 1993 Bao Zongyu E=14.6
- 10) 22703002 1992 Y.Uwamino [36] E:3.5+38.5
- 11) 31459008 1992 I.Garlea E=14.8
- 12) 22209002 1991 Y.Ikeda [3] E:11+13.2
- 13) 22209009 1991 Y.Ikeda [4] E:9.5+13.2
- 14) 131710032 1989 L.P.Geraldo [10] E:5.87+9.86
- 15) 30523002 1989 Lu Han-Lin E=14.6
- 16) 30523003 1989 Lu Han-Lin [10] E:12.2+18
- 17) 410480022 1989 N.V.Kornilov [23] E:7.13+9.1
- 18) 410480032 1989 N.V.Kornilov [19] E:7.62+9.09
- 19) 410480042 1989 N.V.Kornilov [19] E:7.63+9.1
- 20) 41051002 1989 N.N.Moiseev E=14.8
- 21) 41051003 1989 N.N.Moiseev E=14.8
- 22) 41051004 1989 N.N.Moiseev E=14.8
- 23) 12969003 1987 J.W.Meadows E=14.7
- 24) 12977002 1987 L.R.Greenwood [5] E:14.5+14.9
- 25) 30755002 1987 Zhou Muyao E=14.6
- 26) 30821002 1986 T.Chimoye [5] E:13.8+14.7
- 27) 30933002 1986 J.Csikai [12] E:13.4+14.8
- 28) 22012003 1985 W.Enz [9] E:6.36+8.29
- 29) 21923002 1984 K.Kudo [8] E:14+19.9
- 30) 30813002 1984 I.Garlea E=14.8
- 31) 21941006 1983 S.Firkin [5] E:7.35+14.1

Plot

Axes: x: log y: log. Ranges:x:2.884801 61.77469 y:-13.36204 197.0191 Plot size(px):900 500 Repaint



ENDF: datasets:6, data points:435, Energy(MeV):3.25+60  
EXFOR: reactions:2, datasets:92, points:661, E(MeV):3.5+49  
Download selected EXFOR data: [csv] [csv+]  
Plotted data: Copy Paste Clean

Easy tool for quick plotting (though the functions are rather limited.)





# EE-View – New Retrieval System for Beginners (cont)

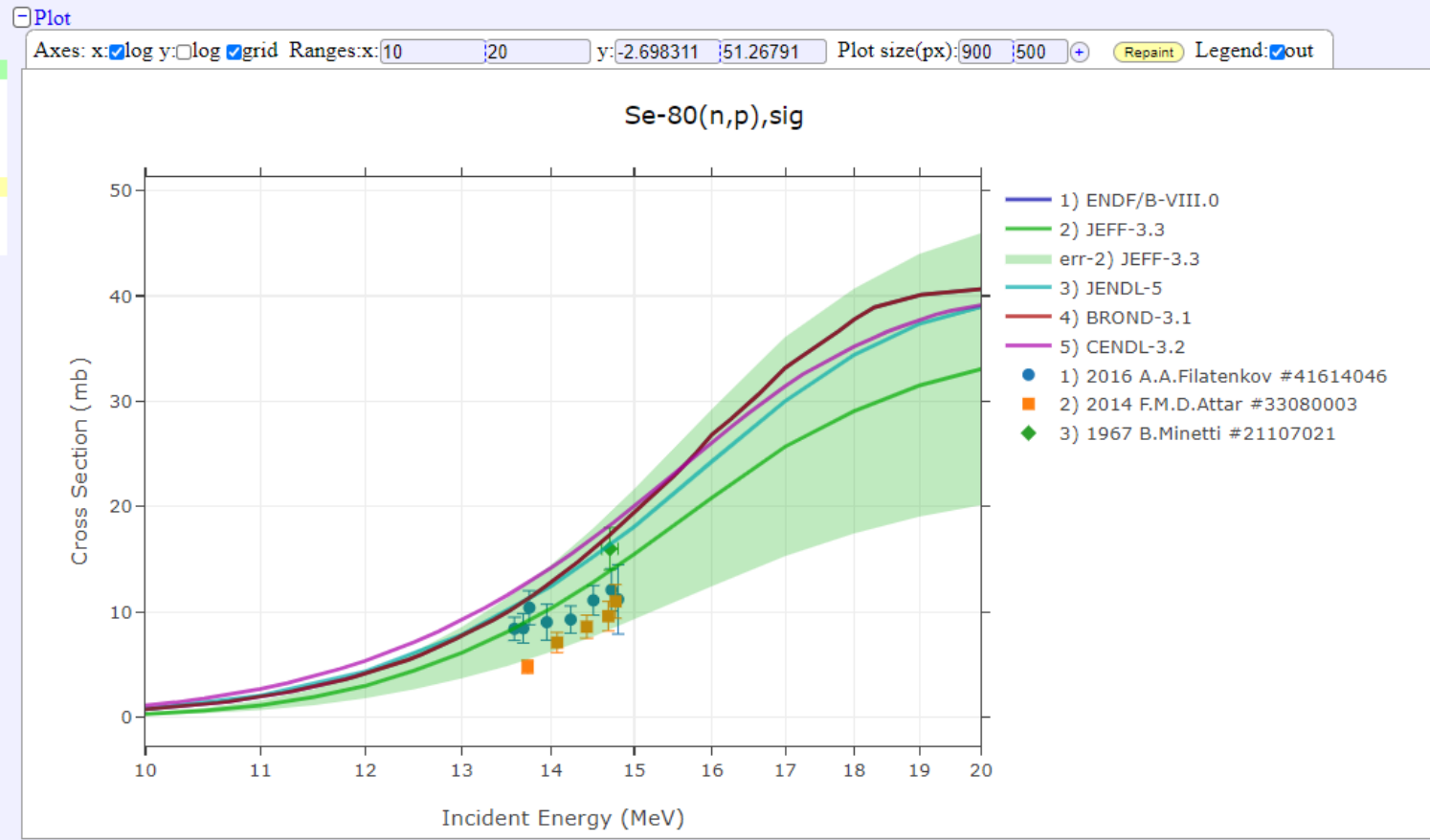
## EE-VIEW

Experimental-Evaluated data Viewer //cross sections See also: [v1] [da]  
/under development by: V.Zerkin, IAEA, 2022-2023, ver.2023-10-06/

### $^{80}\text{Se}(n,p)^{80}\text{As}$ cross section

Projectile Target Emission Libraries Options  
n Se-80 p EXFOR Evaluated curves with error band

Se-80(n,p) 3) exp:3/0.2s eval:5/1.6 plot:0.1s all/1.8sec  
Select  
Se-80(n,p) Reset Plot E(MeV)min,max: 13.58,14.8  
1) ENDF: SE-80(N,P)AS-80,SIG MF:3 MT:103  
2) JEFF-3.3 20171231 A.J.Koning+ [44] E:4.82+30  
3) JENDL-5 20191117 S.Kamada+ [20] E:6+20  
4) BROND-3.1 20111222 Jndc Fp Nuclear ... [271] E:5+20  
5) CENDL-3.2 JU20 L.L.Liu+ [67] E:7.2+20  
1) EXFOR: 34-SE-80(N,P)33-AS-80,,SIG  
1) 41614046 2016 A.A.Filatenkov [8] E:13.6+14.8  
2) 33080003 2014 F.M.D.Attar [5] E:13.7+14.8  
3) 21107021 1967 B.Minetti E=14.7  
ENDF: datasets:5, data points:673, Energy(MeV):4.82+30  
EXFOR: reactions:1, datasets:3, points:14, E(MeV):13.6+14.8  
Download selected EXFOR data: [csv] [csv+]  
Plotted data: Copy Paste Clean



Projectile: n  
Target: Se-80  
Emission: p



# Advanced Plot (Diff. Cross Section etc.)

**Data Selection**



Retrieve  Selected  Unselected  All

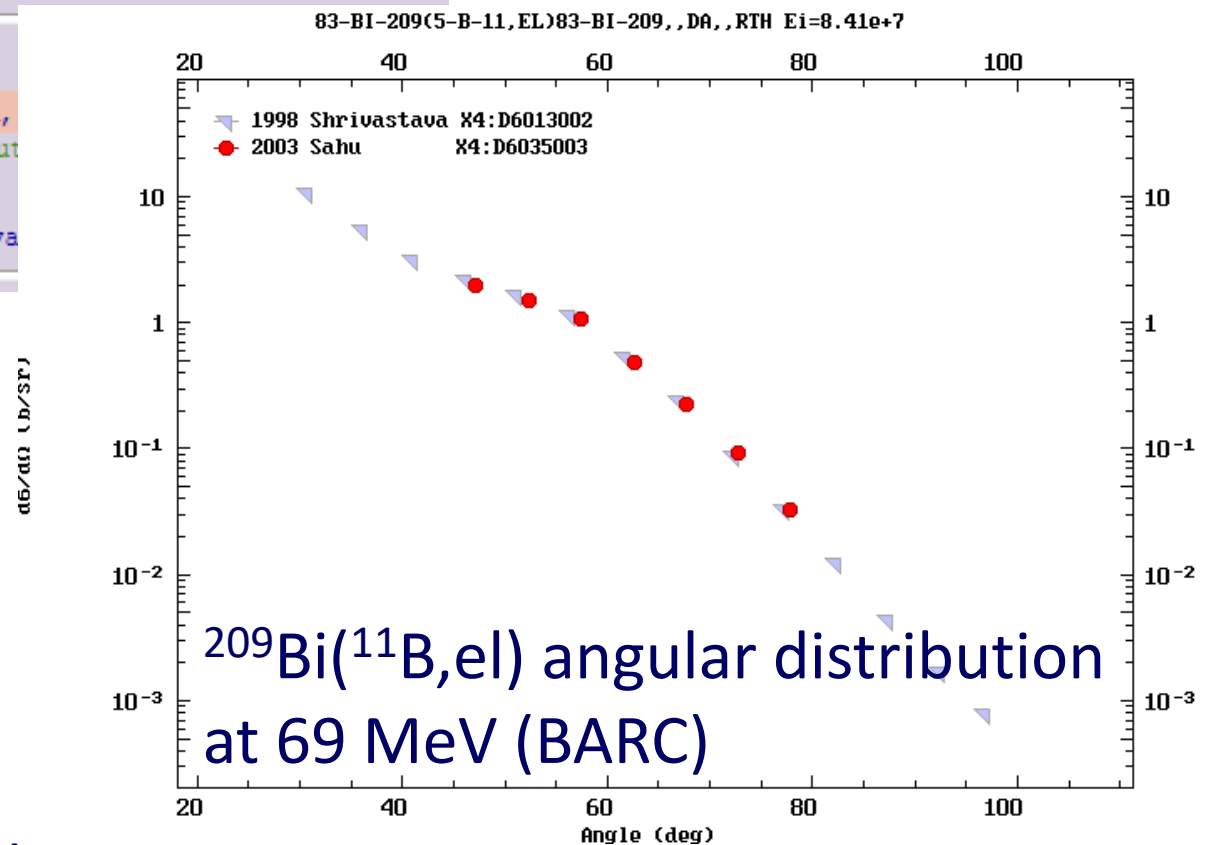
**Output:**  X4+  EXFOR  Bibliography  TAB  C4  PlotC4

**Plot:**  Quick-plot (cross-sections)  ungrouped  Advanced plot [how to] using  C5 and

Narrow incident energy (optional), eV: Min:  Max:

Apply  Data re-normalization (for advanced users, results in: C4, TAB and PlotC4)

n	Display	Year	Author-1
1)	  83-BI-209(5-B-11,EL)83-BI-209,,DA,,RTH		
Quantitv: [DA] Differential cs d/dA rel.to Rut			
	<input type="button" value="T4"/>	2003	P.K.Sahu+
	<input type="button" value="T4"/>	1998	A.Shrivastava



Send your question to  
the NDS Web system developer  
Dr. V. Zerkin ([v.zerkin@gmail.com](mailto:v.zerkin@gmail.com)).

