

Extending Sigma Web Retrieval to Incorporate Covariances

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BROOKHAVEN
NATIONAL LABORATORY
a passion for discovery

 **Office of
Science**
U.S. DEPARTMENT OF ENERGY





Evaluated Nuclear Data File (ENDF) Retrieval & Plotting



[Periodic Table Browse](#)

[Directory Tree Browse](#)

[Basic Retrieval](#)

[Advanced Retrieval](#)

[Plot Cart](#)

[Computations](#) NEW

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:

Sublibrary:

0	1																	2								
n	H																	He								
	3	4											5	6	7	8	9	10								
	Li	Be											B	C	N	O	F	Ne								
	11	12											13	14	15	16	17	18								
	Na	Mg											Al	Si	P	S	Cl	Ar								
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36								
	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															
	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg															
													58	59	60	61	62	63	64	65	66	67	68	69	70	71
													Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
													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

**Results for
Z=93**

235

236

237

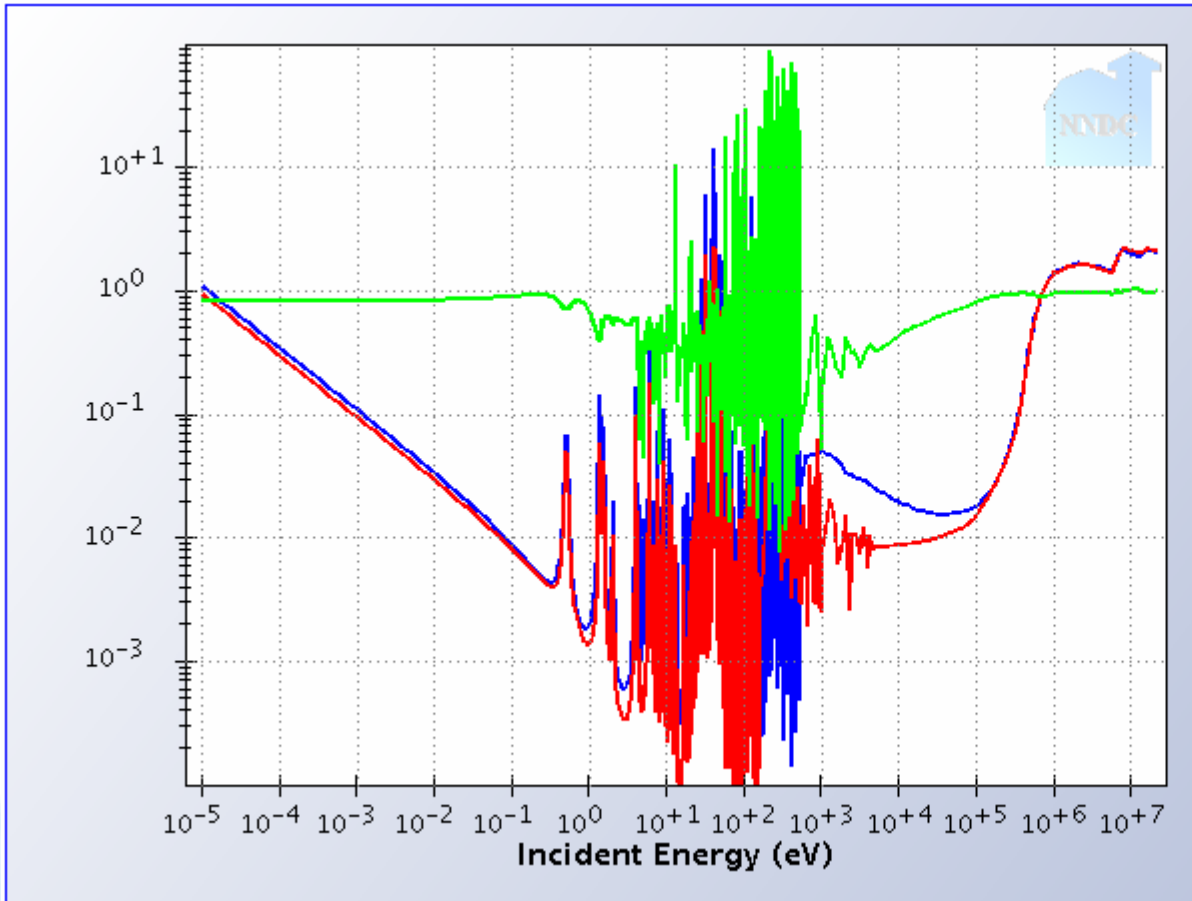
238

239

ENDF-6 format	Human-readable
Whole file -	
introduction	Interpreted Plot
total nubar	Interpreted Plot
delayed nubar	Interpreted Plot
prompt nubar	Interpreted Plot
fis.ene.release	Interpreted
res. param.	Interpreted
Cross sections:	
(n,total)	Interpreted Plot
(n,elastic)	Interpreted Plot
(n,non-elastic)	Interpreted Plot
(n,inelastic)	Interpreted Plot
(n,2n)	Interpreted Plot
(n,3n)	Interpreted Plot
(n,total fission)	Interpreted Plot
(n,4n)	Interpreted Plot
(n,n') (click to expand)	
(n,n ₀)	Interpreted Plot
(n,n ₁)	Interpreted Plot



Computations were recently added, ex $^{237}\text{Np}(n,f)$ JENDL-3.3 and ENDF/B-VI.8



Update Plot Reset Plot

Remove All Datasets Remove Some

$6.0\text{E-}6 \leq E_n \text{ (eV)} \leq 2.8\text{E}7$ Log ▾

$1.0\text{E-}4 \leq Y \leq 100.0$ Log ▾

- 93-Np-237(n,total fission) JENDL-3.3
- 93-Np-237(n,total fission) ENDF/B-VI.8
- y_1/y_0

[View evaluated data](#)
[Add your data](#)
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Coming soon, plotting of existing MF=33 evaluations



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Library: ENDF/B-VII.0 (USA, 2006) ▼

Sublibrary: Neutron reactions ▼

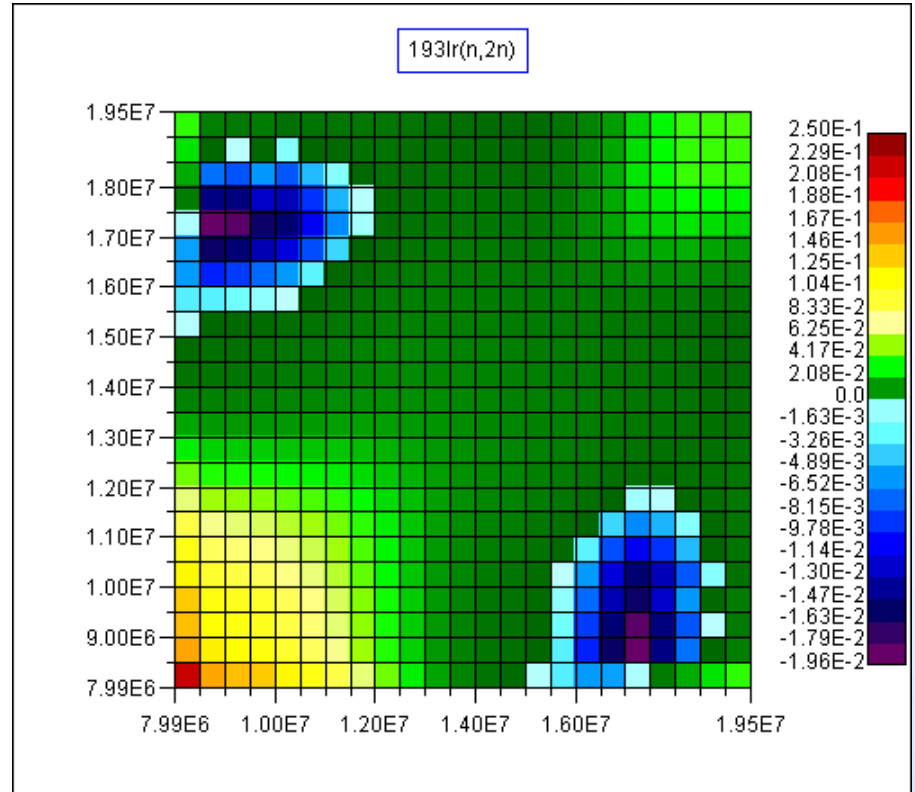
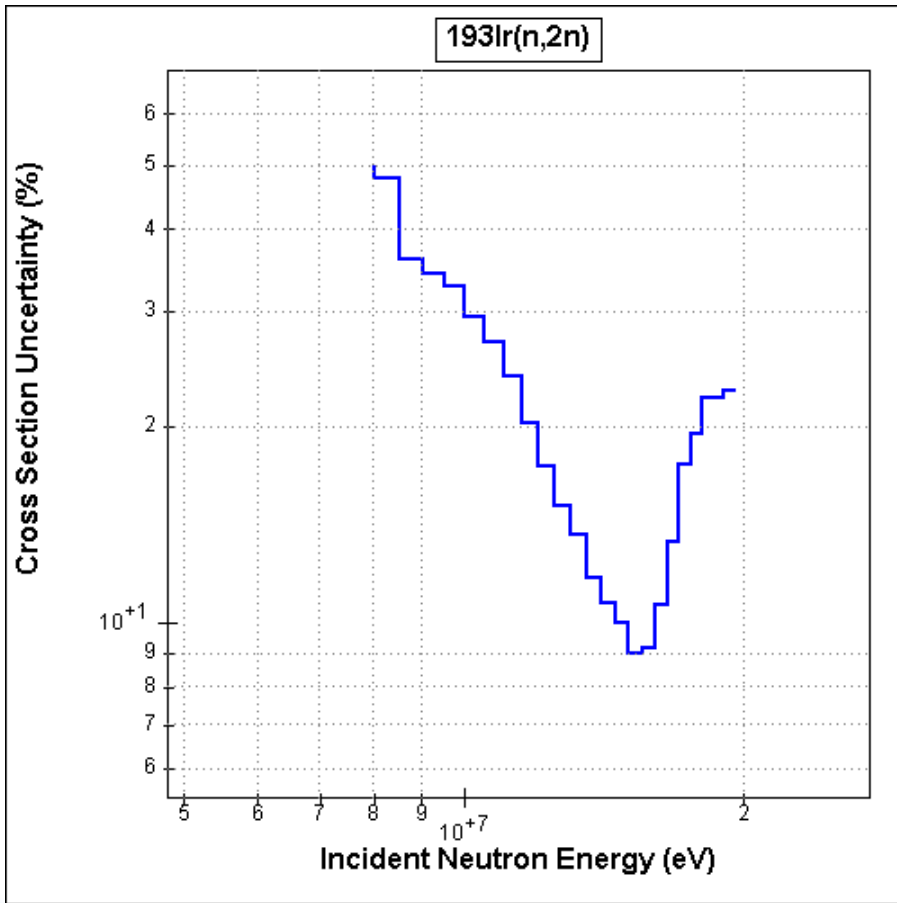
0 n	1 H																	2 He	
	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne	
	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr	
	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46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

Results for
Z=77

191

193

(n,γ)	Interpreted
Radioactivity and fission yields:	
(n,inelastic)	Interpreted
(n,2n)	Interpreted
(n,3n)	Interpreted
Cross sections for radionuclides prod.:	
(n,inelastic)	Interpreted
(n,2n)	Interpreted
(n,3n)	Interpreted
Mult. for γ production:	
(n,n' _γ) (click to expand)	
dσ/dω for γ production:	
(n,n' _γ) (click to expand)	
Cross section covariances:	
(n,total)	Interpreted
(n,elastic)	Interpreted
(n,inelastic)	Interpreted
(n,2n)	Interpreted
(n,γ)	Interpreted
(n,p)	Interpreted



Low Fidelity Project

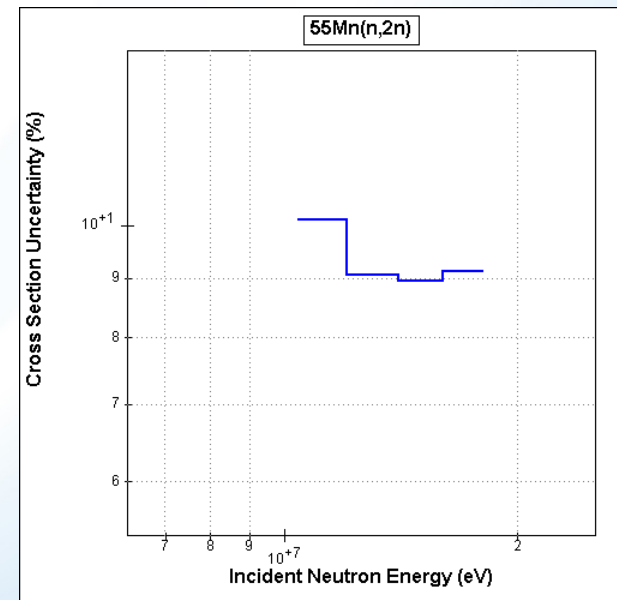
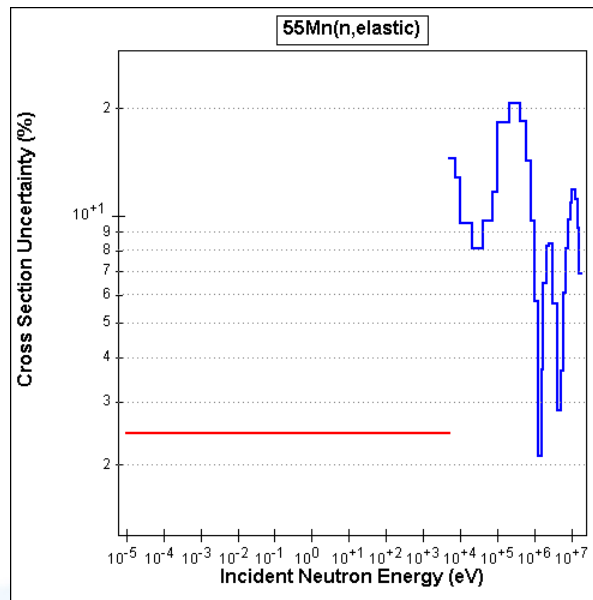
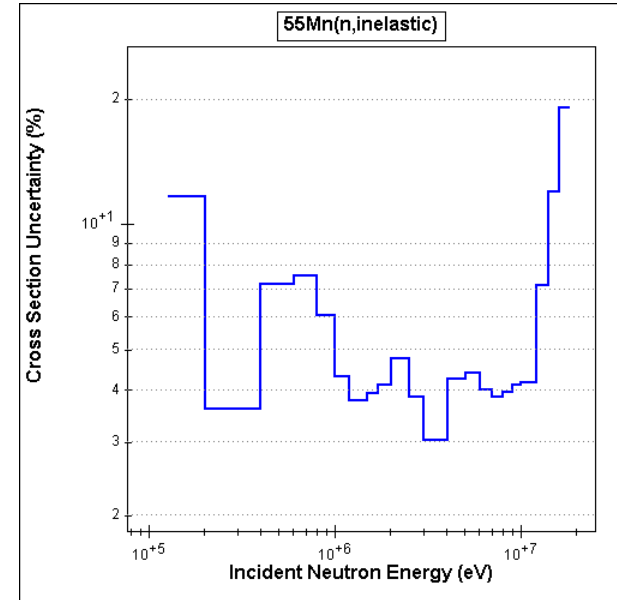
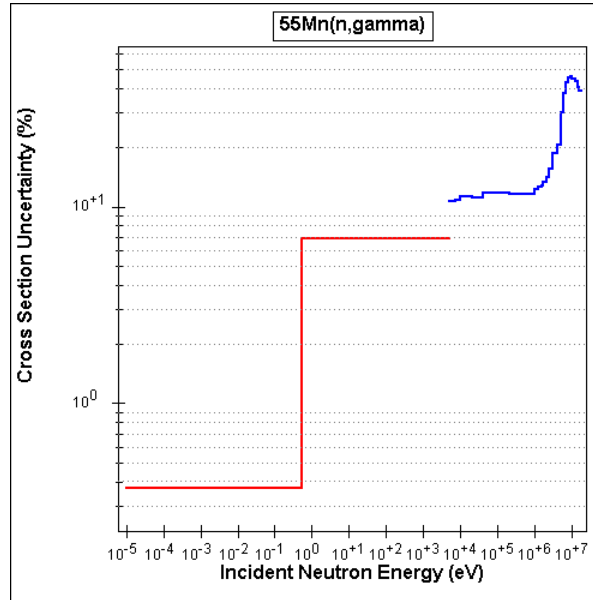
^{55}Mn as example

Uncertainties, i.e. diagonal elements

Plot from data as given, no regrouping, no neutron flux.

Notice log-log scale

Preliminary!



Low Fidelity Project

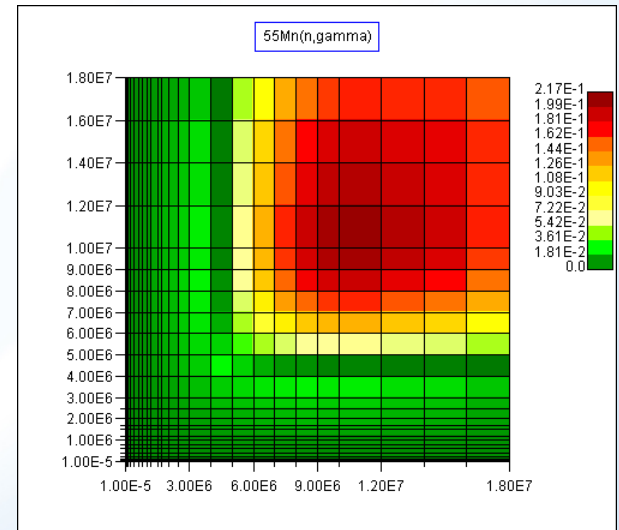
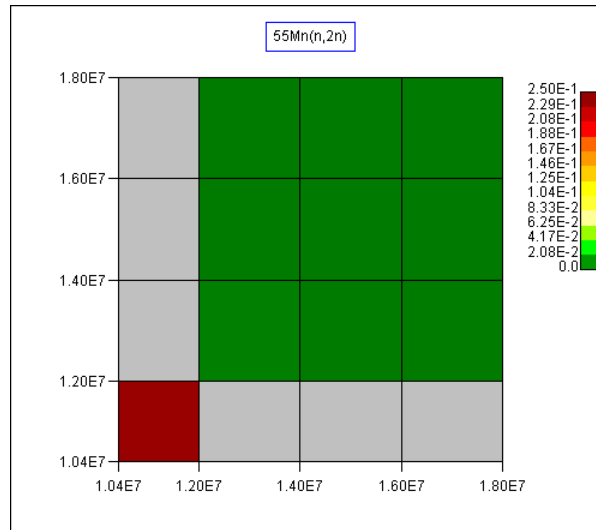
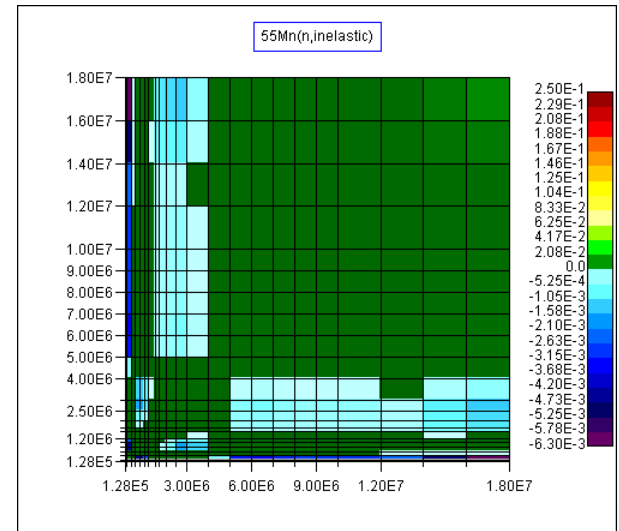
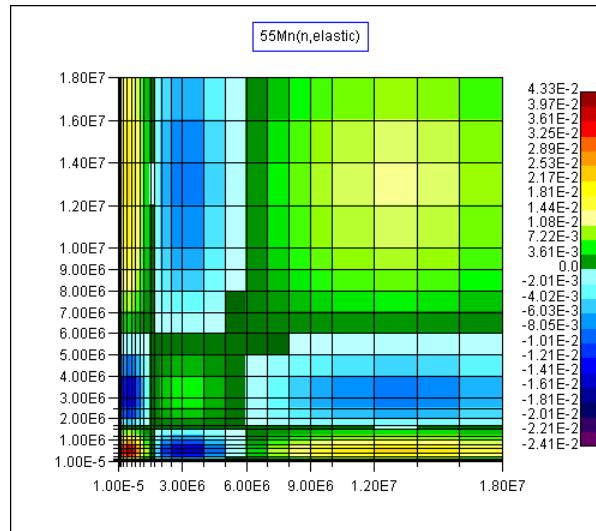
^{55}Mn as example

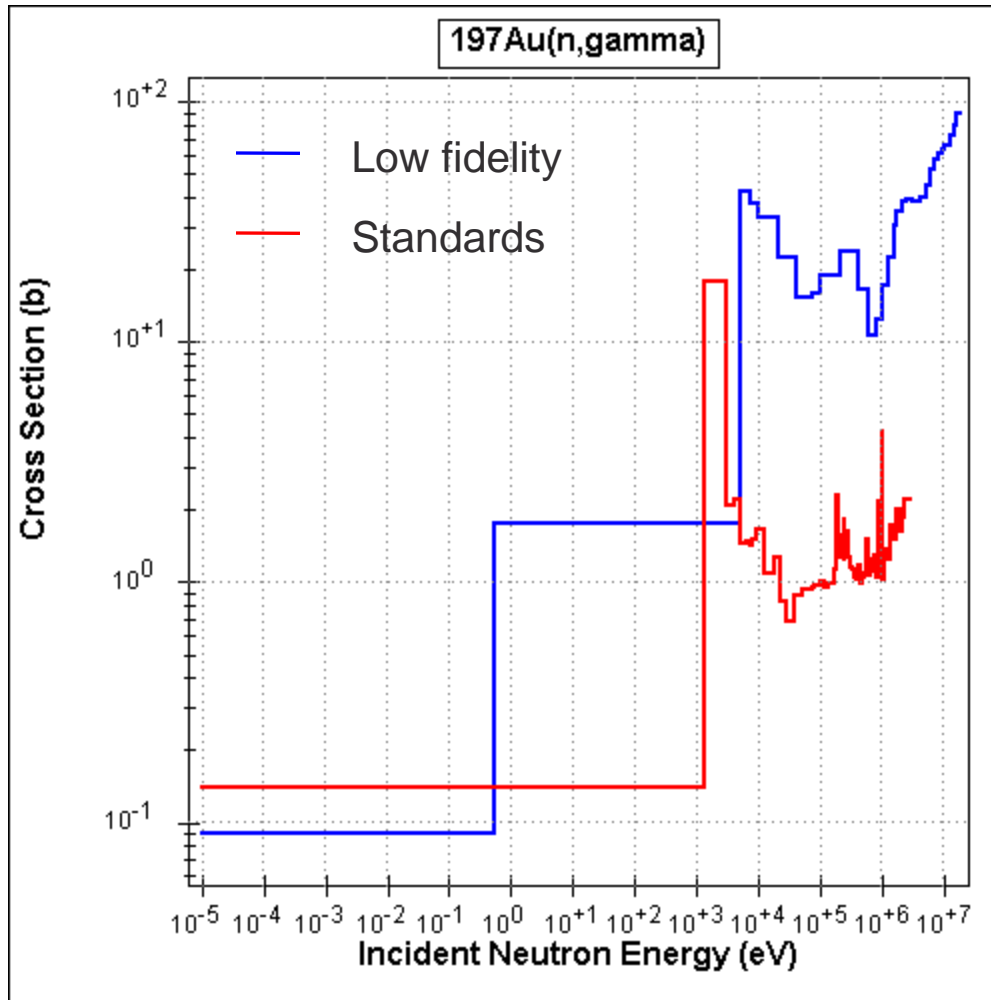
Correlation plots, as given in MF33

Plot from data as given, no regrouping, no neutron flux.

Notice lin-lin scale

Preliminary!





Low Fidelity Project

¹⁹⁷Au as example

Uncertainty plots could be compared with other existing MF=33 files, such as standards.

Preliminary!

Low Fidelity Project

We could make available the uncertainty and correlation plots on the web.

We could make it password protected to prevent the general public from using a product under development

Sigma 3.0 that includes plots for existing MF=33 files will be added in the near future.

Comments will be greatly appreciated.

See also Boris poster.