

## 0.1 Graphical presentation of EXFOR data

The experimental nuclear reaction data database EXFOR [1], actively kept up to date by the international Network of Nuclear Reaction Data Centres, is the reference tool to access experimental nuclear data. In order to easily assess the available experimental data on a particular reaction, a summary of the available data sets for the reaction is indispensable.






We have tempted to produce a concise graphical presentation of each of the reactions relevant for this subgroup. In earlier versions the used entries were based on the the C4 summary table of the EXFOR database, which is regularly updated and made available [2]. To have more flexibility we then used directly the data from the MySQL database, also available from the IAEA [3]. This database contains many of the records of the initial EXFOR file. The information of this database was processed to extract for each reaction a number of relevant items to construct the summary plots in an automatized way.

We used the programming language PERL [4] to make up the SQL queries, retrieve the results from the database, uncompress the data records on the fly where necessary, and process them to generate the plots using the scriptable plotting package GNUPLOT [5].

A match is determined by an EXFOR-formatted reaction string, composed of the entrance channel, for example 5-B-10(n,, the exit channel, for example g), tot) or lumping several exit channels together written as for example as a|abs). Also part of the match is the measurement quantity, EXFOR-formatted, or a list of quantities separated by a "|", like sig) or sig|wid|ri). Each matching entry is then displayed as a bar on the energy region it covers. The energy limits are slightly enlarged in order to obtain a visible representation of entries at a single energy, like thermal values. The entries are sorted by year to show a chronological history of experiments. The number of entries per plot is limited and the total number of entries is spread over several plots if needed. No additional selection is performed on the entries. Next to the bar the following basic information is displayed:

- year
- author information
- EXFOR accession number
- number of data points  $n$
- part of the reaction string  $r$
- average uncertainty  $\overline{\Delta x}/\bar{x} \times 100\%$ , also represented by the color of the bar

**Table 1.** The color scale used for the total average uncertainty for the data sets. The uncertainty value is also reported in the figures.

color	uncertainty range (%)
	$0.0 < \sigma_x < 2.0$
	$2.0 < \sigma_x < 5.0$
	$5.0 < \sigma_x < 10.0$
	$10.0 < \sigma_x < 20.0$
	$\sigma_x > 20.0$

The color of the bar represents the reported average uncertainty on a color scale as shown in table 1. When no uncertainty information is available, the bar color is set to black. For single datapoints the uncertainty is straightforward. For a dataset consisting of many points  $x_i$  it is less evident to summarize the uncertainty information in a single number. Also due to the rather flexible way of storing data columns in EXFOR, it is not always trivial to retrieve the columns corresponding to data and uncertainties in an automated way. The average uncertainty  $\sigma_x$  is calculated as

$$\sigma_x = \frac{\sum_i |\Delta x_i|}{\sum_i |x_i|} \quad (1)$$

The results are given in the figures on the following pages for each of the nuclei considered. The reactions and nuclei are extracted from the NEA/WPEC-26 subgroup report [6], where nuclear data needs are identified for a number of isotopes, reactions and energy ranges relevant for 8 different reactor systems. These systems are taken from the Generation-IV list [7] and consist of a very high-temperature reactor and several types of fast reactors, all based on the uranium cycle. The inventory of existing experimental in EXFOR has been summarized for the isotopes and reactions taken from the SG26 report, and the energies ranges have been extended to cover all available data sets in order to have a complete view of the existing data. Three items (O, C, Pb) were in some cases originally listed as elements. In these cases we included in the EXFOR overview the search results for data on the element (indicated by a 0,  ${}^0\text{C}$ ,  ${}^0\text{O}$  and  ${}^0\text{Pb}$ ) as well as on the most abundant natural isotopes ( ${}^{12}\text{C}$ ,  ${}^{16}\text{O}$  and  ${}^{206,207,208}\text{Pb}$ ). Also the reaction listed originally at one point as "scattering" has been included in both "elastic" and "inelastic" scattering. Table 2 gives an overview of the included isotopes and reactions.

The resulting match of subentries in the plots can be of help in getting an overview of datasets for a particular reaction. Nevertheless, the plots still needs careful examination in order to select the relevant datasets.

**Table 2.** Overview of the isotopes and reactions as summarized from the SG26 report.

reaction	(n, $\gamma$ )	(n,f)	(n,n)	(n,n')	scat	$\nu$
<sup>10</sup> B	X					
<sup>12</sup> C	X		X	X		
<sup>15</sup> N			X			
<sup>16</sup> O	X				X	
<sup>16</sup> O	X		X			
<sup>23</sup> Na				X		
<sup>28</sup> Si				X		
<sup>52</sup> Cr			X			
<sup>56</sup> Fe	X		X	X		
<sup>58</sup> Ni	X					
<sup>90</sup> Zr				X		
<sup>208</sup> Pb	X			X		
<sup>206</sup> Pb	X			X		
<sup>207</sup> Pb				X		
<sup>208</sup> Pb			X			
<sup>209</sup> Bi				X		
<sup>234</sup> U		X				
<sup>235</sup> U	X					
<sup>238</sup> U	X		X	X	X	
<sup>237</sup> Np	X	X		X		
<sup>238</sup> Pu	X	X				X
<sup>239</sup> Pu	X			X		
<sup>240</sup> Pu	X	X		X		X
<sup>241</sup> Pu	X	X				
<sup>242</sup> Pu	X	X		X		
<sup>241</sup> Am	X	X		X		X
<sup>243</sup> Am	X	X		X		
<sup>242<sup>m</sup></sup> Am	X	X				
<sup>242</sup> Cm		X				
<sup>243</sup> Cm		X				
<sup>244</sup> Cm	X	X				X
<sup>245</sup> Cm		X				
<sup>246</sup> Cm		X				

## Annex

### Am-241 (n,g|labs) sig|wid|ri|par

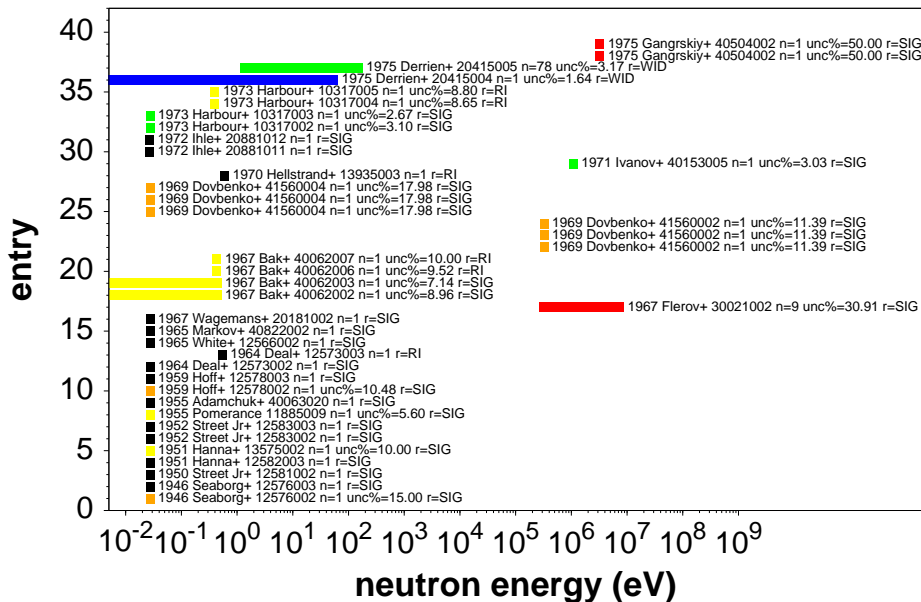


Figure A-1. Summary of the 96 EXFOR entries for the nuclide Am-241, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

### Am-241 (n,g|labs) sig|wid|ri|par

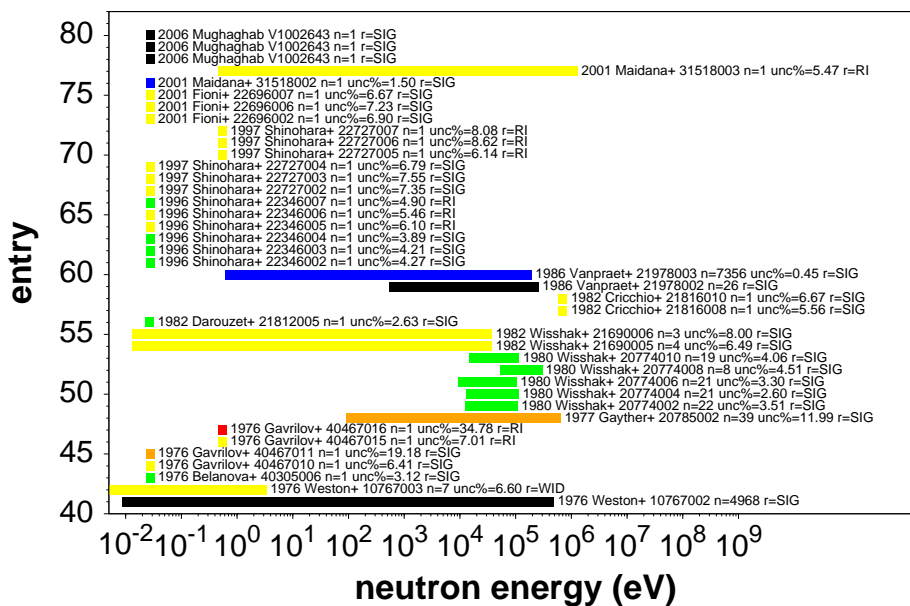


Figure A-2. Summary of the 96 EXFOR entries for the nuclide Am-241, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 3.

### Am-241 (n,g|abs) sig|wid|ri|par

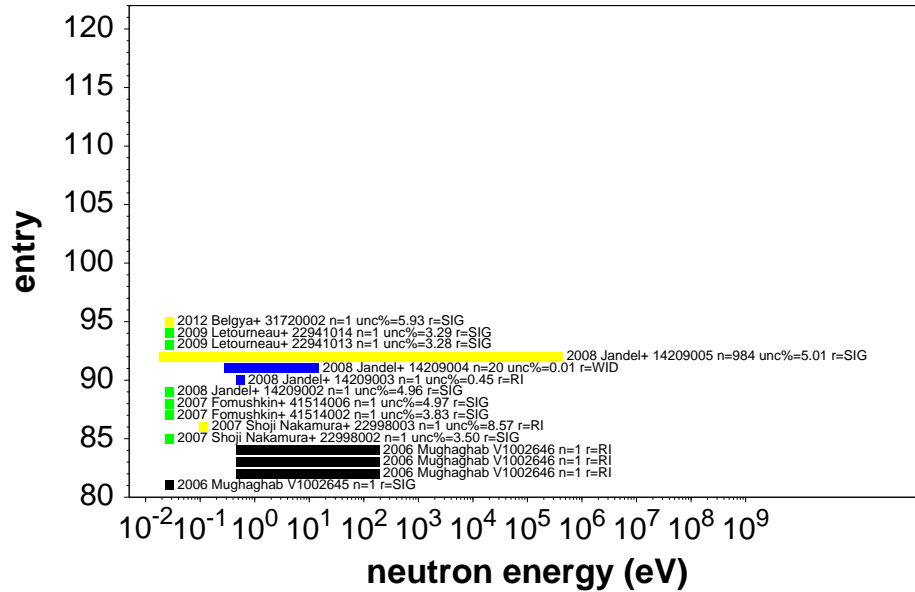


Figure A-3. Summary of the 96 EXFOR entries for the nuclide Am-241, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 3 of 3.

### Am-243 (n,g|abs) sig|wid|ri|par

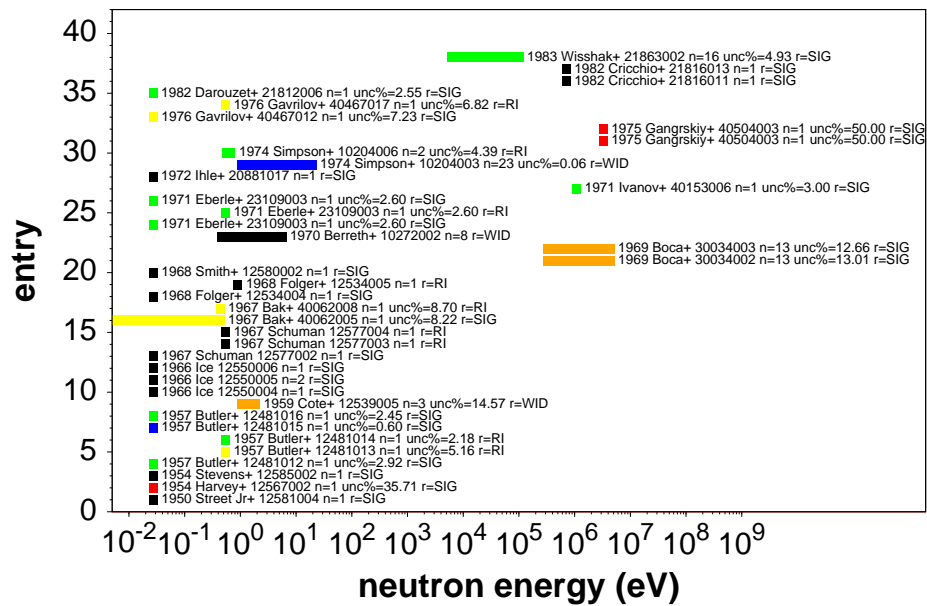


Figure A-4. Summary of the 77 EXFOR entries for the nuclide Am-243, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### Am-243 (n,g|labs) sig|wid|ri|par

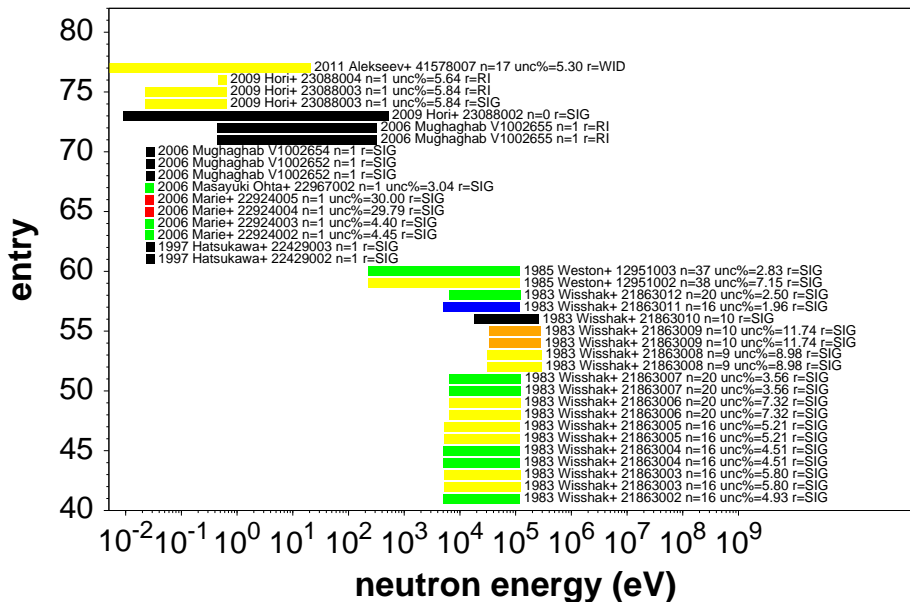


Figure A-5. Summary of the 77 EXFOR entries for the nuclide Am-243, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

### Cm-244 (n,g|labs) sig|wid|ri|par

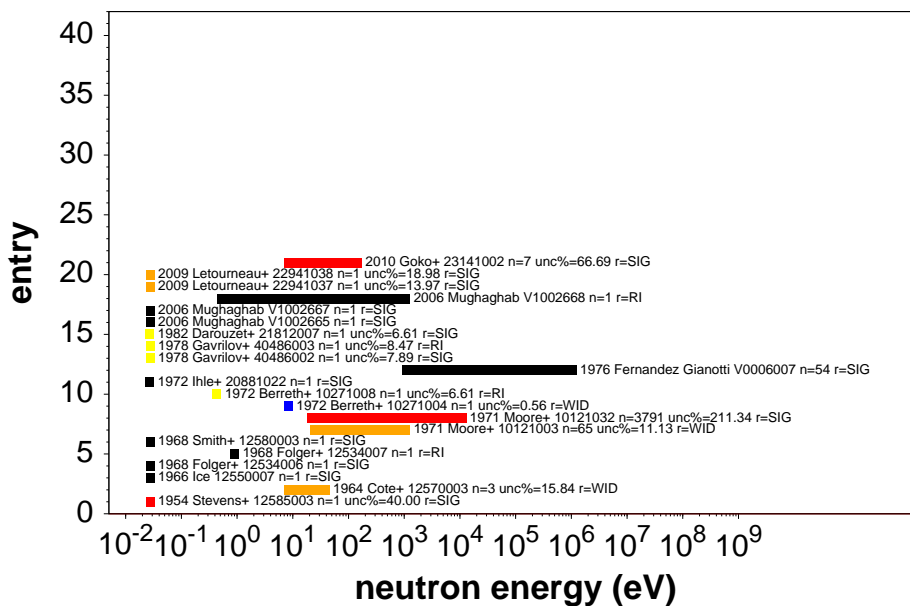


Figure A-6. Summary of the 22 EXFOR entries for the nuclide Cm-244, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Fe-56 (n,g|abs) sig|wid|ri|par

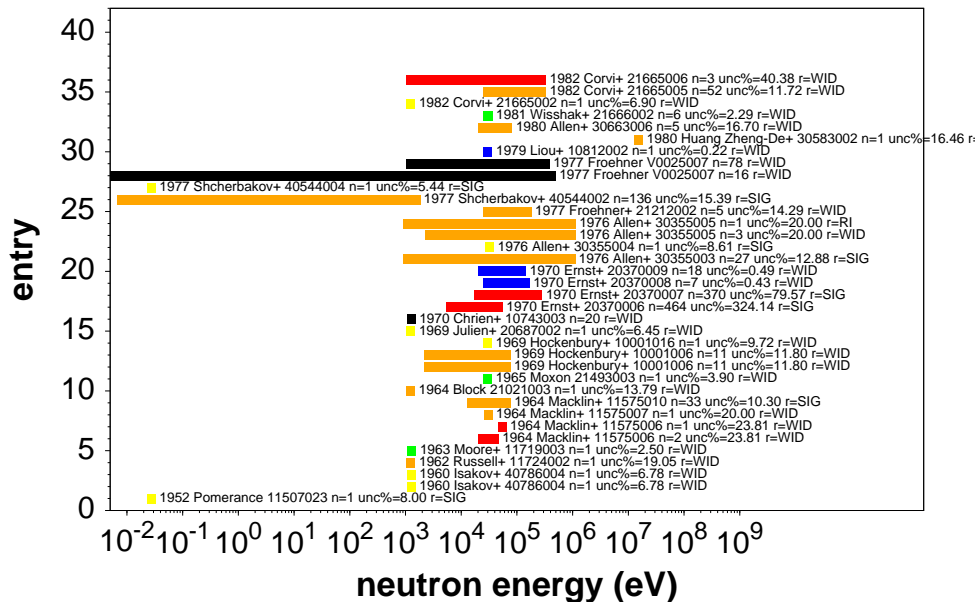


Figure A-7. Summary of the 60 EXFOR entries for the nuclide Fe-56, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### Fe-56 (n,g|abs) sig|wid|ri|par

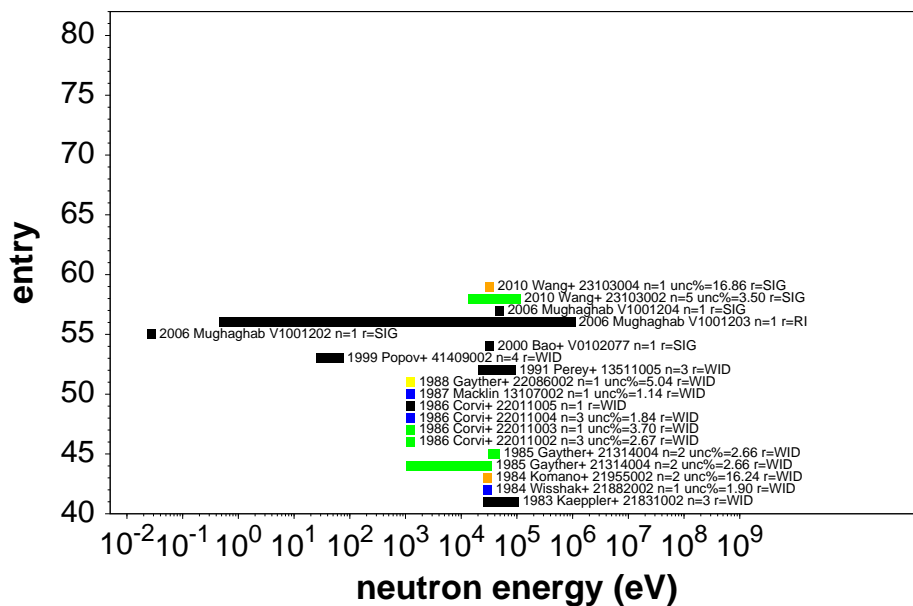


Figure A-8. Summary of the 60 EXFOR entries for the nuclide Fe-56, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 2.



### Ni-58 (n,g|abs) sig|wid|ri|par

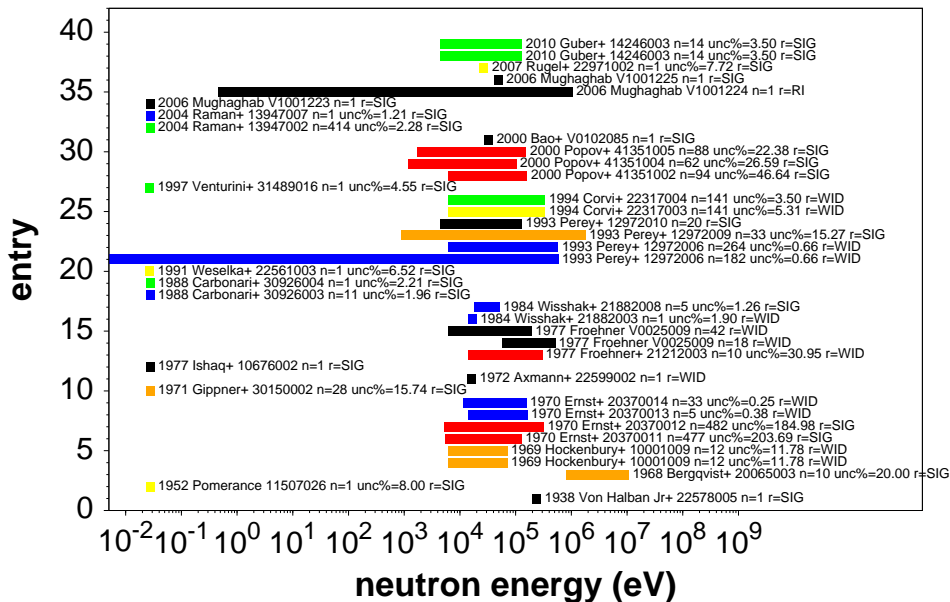


Figure A-9. Summary of the 40 EXFOR entries for the nuclide Ni-58, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Np-237 (n,g|abs) sig|wid|ri|par

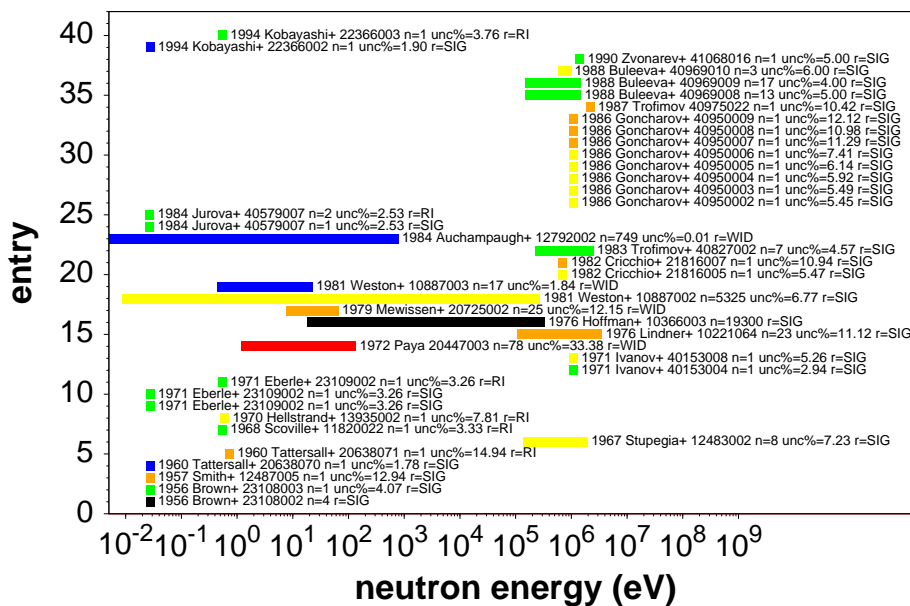


Figure A-10. Summary of the 87 EXFOR entries for the nuclide Np-237, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

### Np-237 (n,g|abs) sig|wid|ri|par

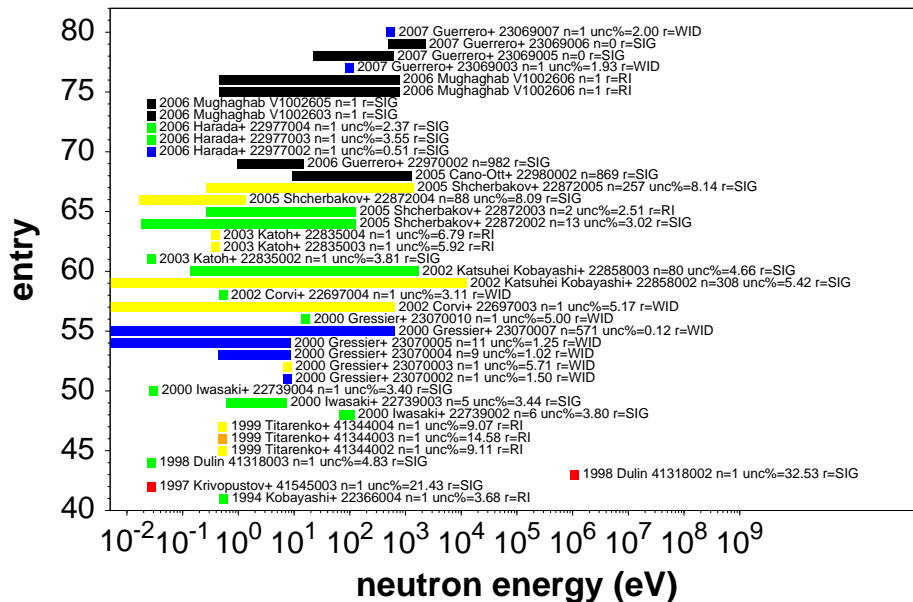


Figure A-11. Summary of the 87 EXFOR entries for the nuclide Np-237, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 3.

### Np-237 (n,g|abs) sig|wid|ri|par

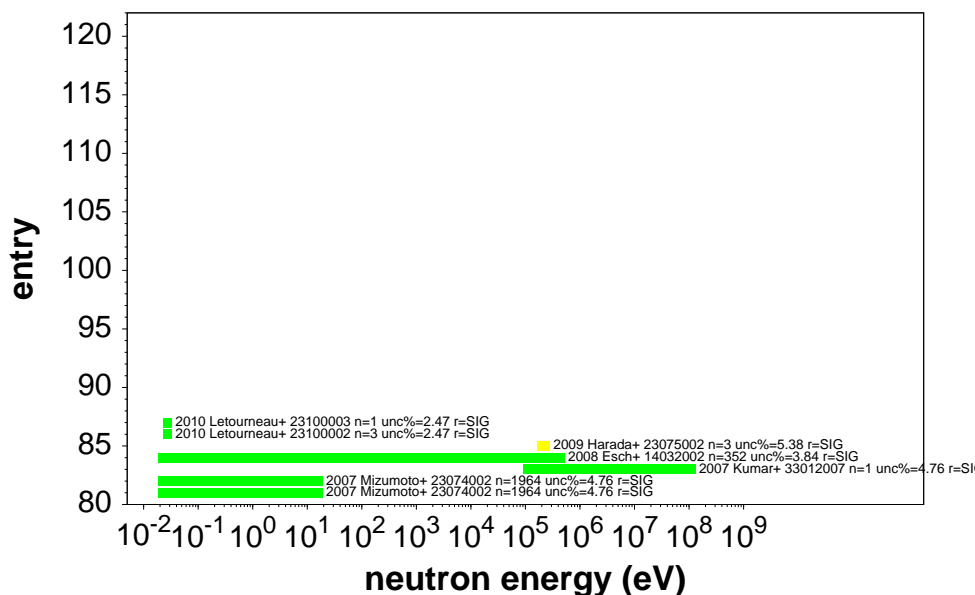


Figure A-12. Summary of the 87 EXFOR entries for the nuclide Np-237, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 3 of 3.

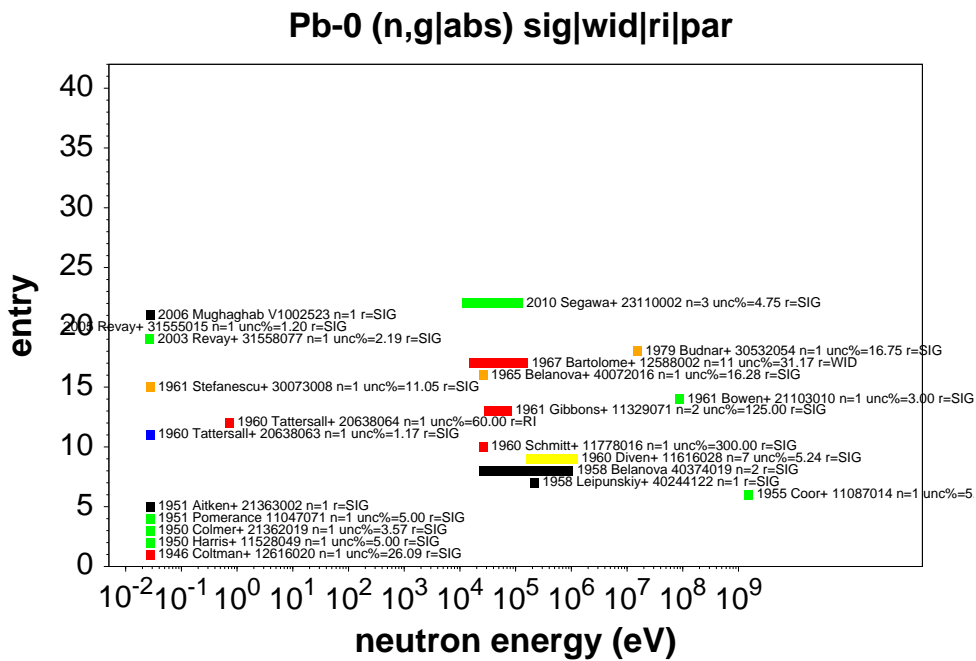


Figure A-13. Summary of the 22 EXFOR entries for the nuclide Pb-0, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

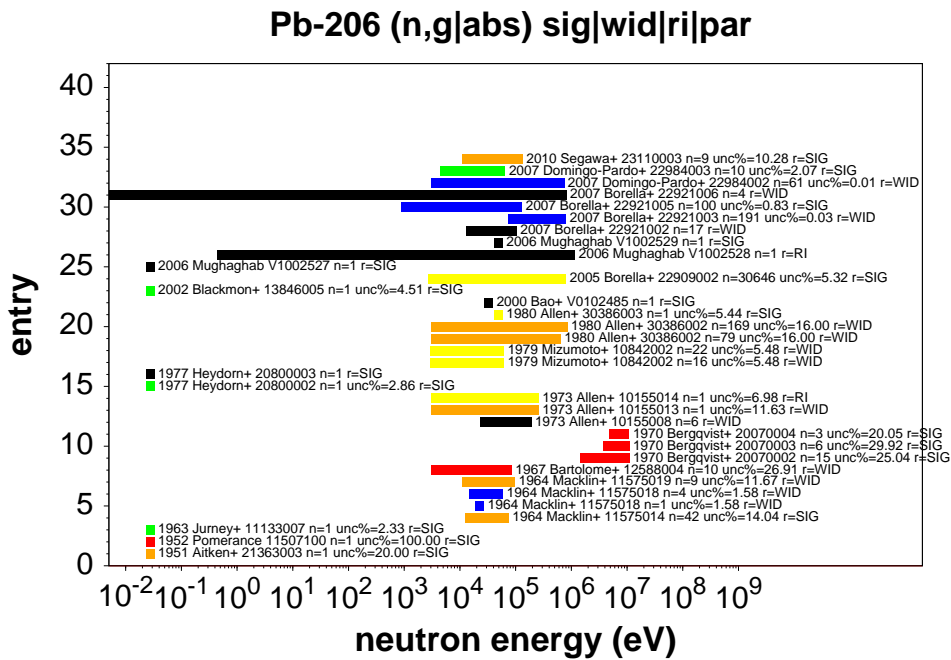


Figure A-14. Summary of the 34 EXFOR entries for the nuclide Pb-206, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Pb-207 (n,g|abs) sig|wid|ri|par

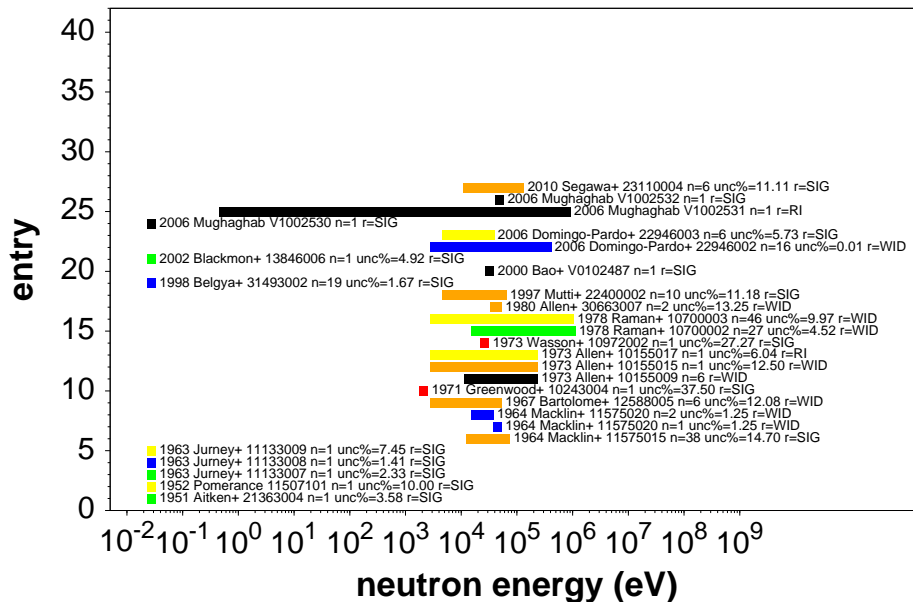


Figure A-15. Summary of the 27 EXFOR entries for the nuclide Pb-207, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Pb-208 (n,g|abs) sig|wid|ri|par

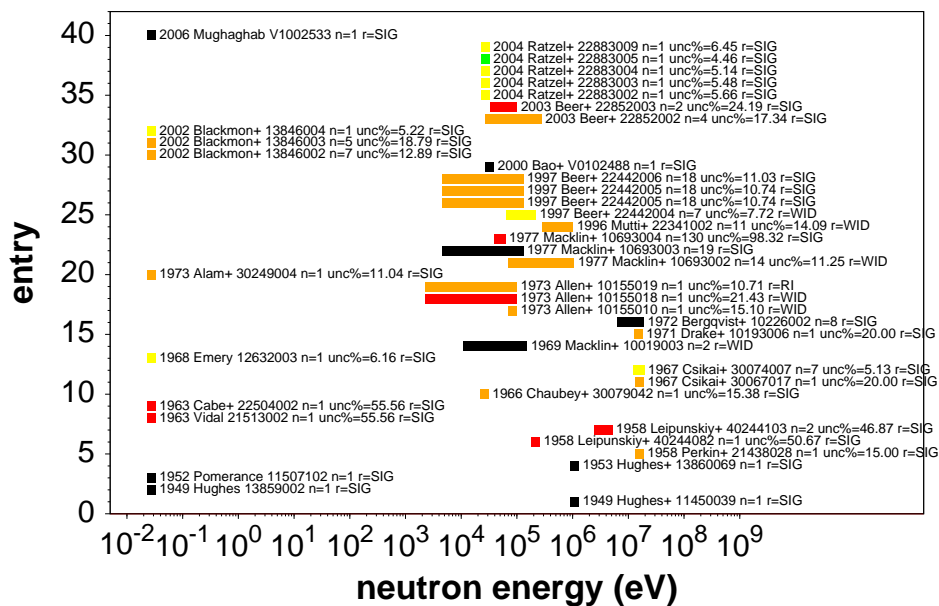
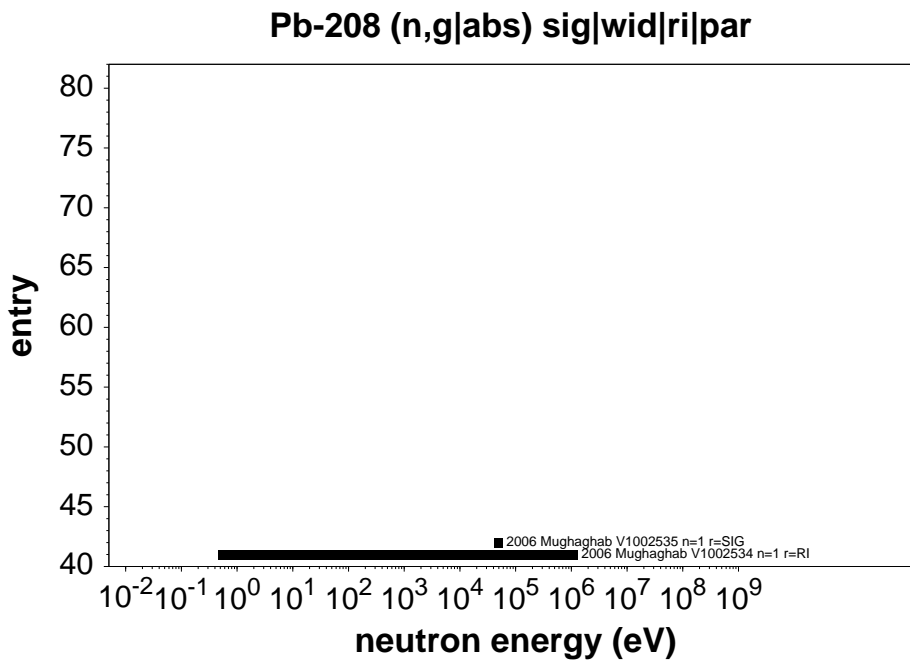
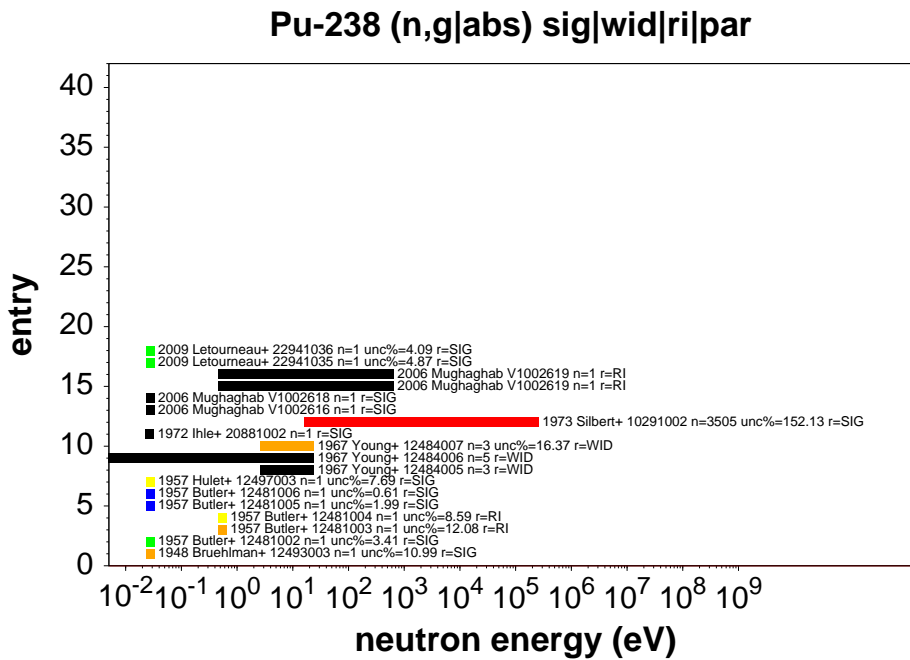


Figure A-16. Summary of the 42 EXFOR entries for the nuclide Pb-208, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 2.



**Figure A-17.** Summary of the 42 EXFOR entries for the nuclide Pb-208, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 2.



**Figure A-18.** Summary of the 19 EXFOR entries for the nuclide Pu-238, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Pu-239 (n,g|abs) sig|wid|ri|par

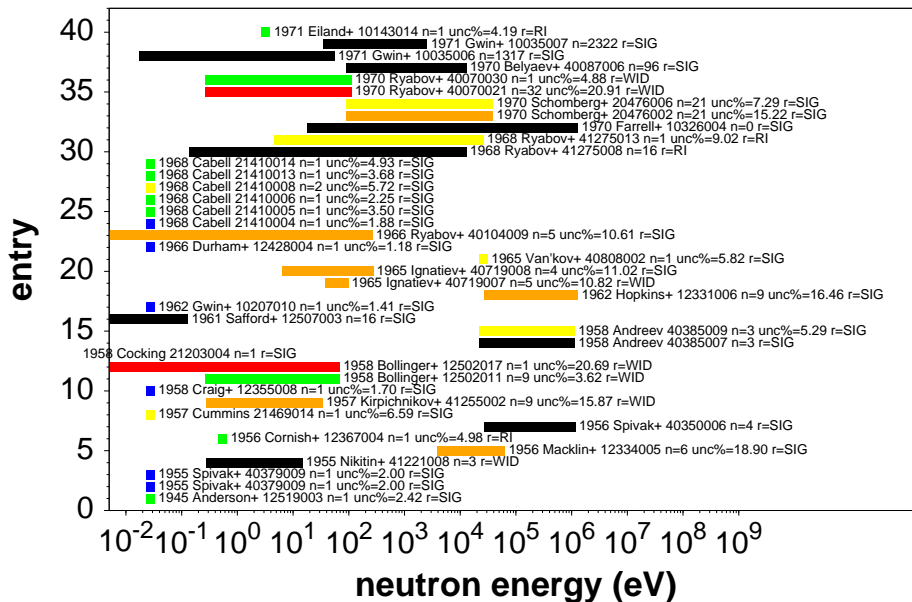


Figure A-19. Summary of the 61 EXFOR entries for the nuclide Pu-239, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### Pu-239 (n,g|abs) sig|wid|ri|par

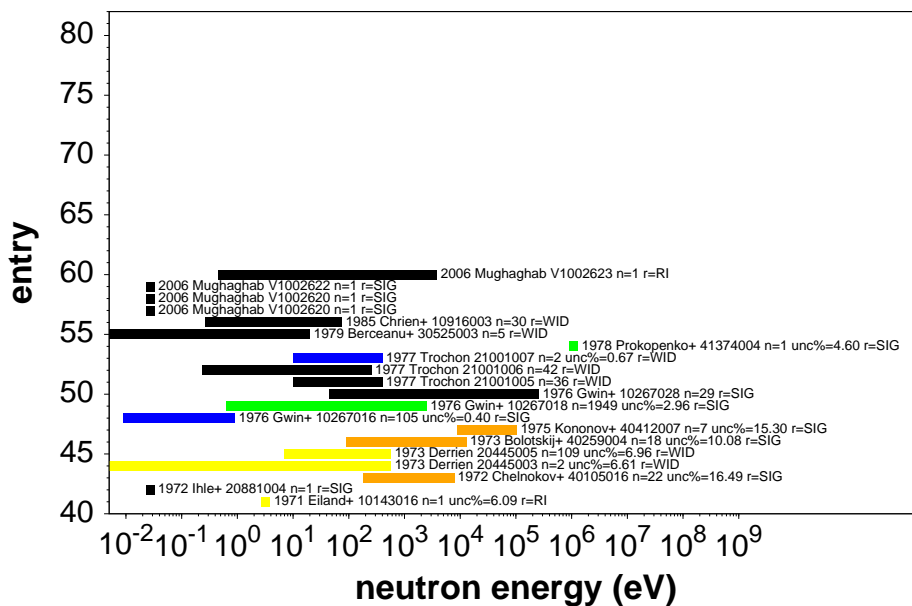


Figure A-20. Summary of the 61 EXFOR entries for the nuclide Pu-239, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

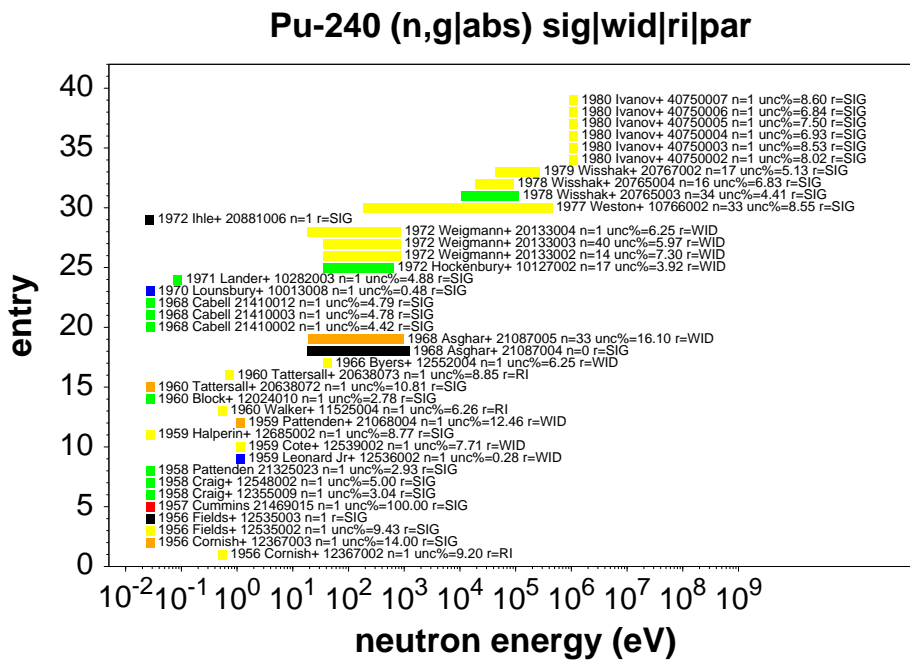


Figure A-21. Summary of the 52 EXFOR entries for the nuclide Pu-240, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

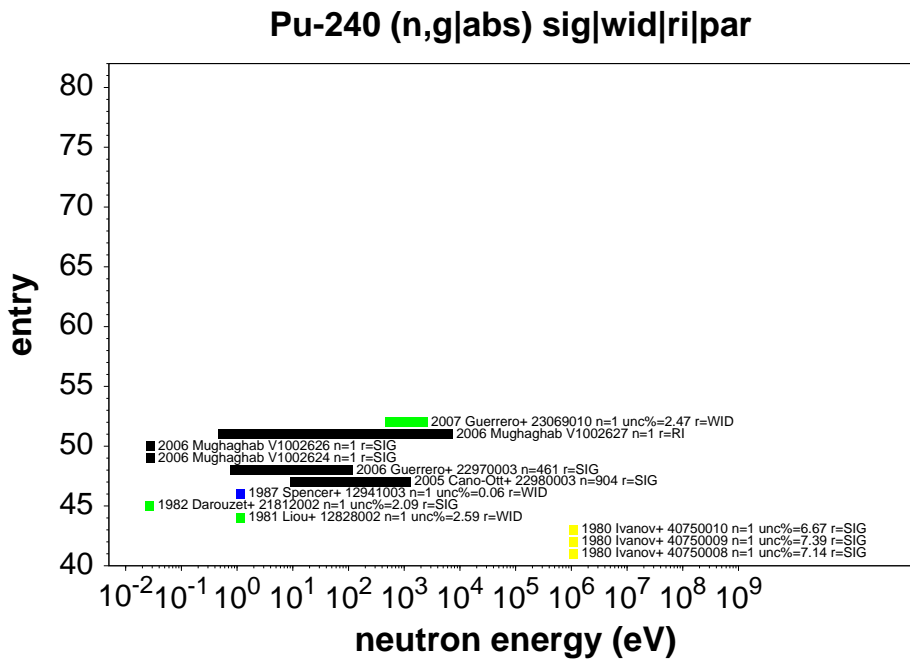


Figure A-22. Summary of the 52 EXFOR entries for the nuclide Pu-240, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

### Pu-241 (n,g|abs) sig|wid|ri|par

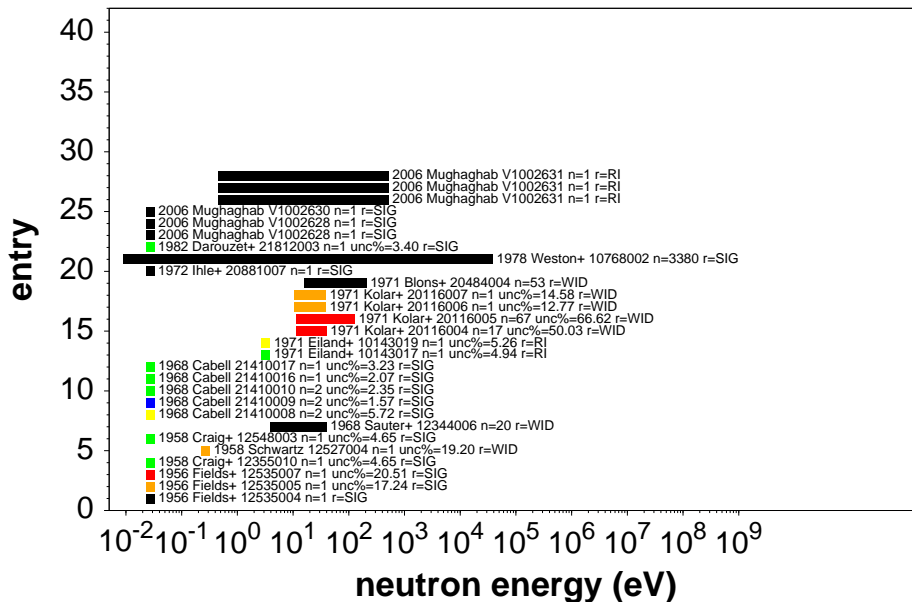


Figure A-23. Summary of the 28 EXFOR entries for the nuclide Pu-241, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Pu-242 (n,g|abs) sig|wid|ri|par

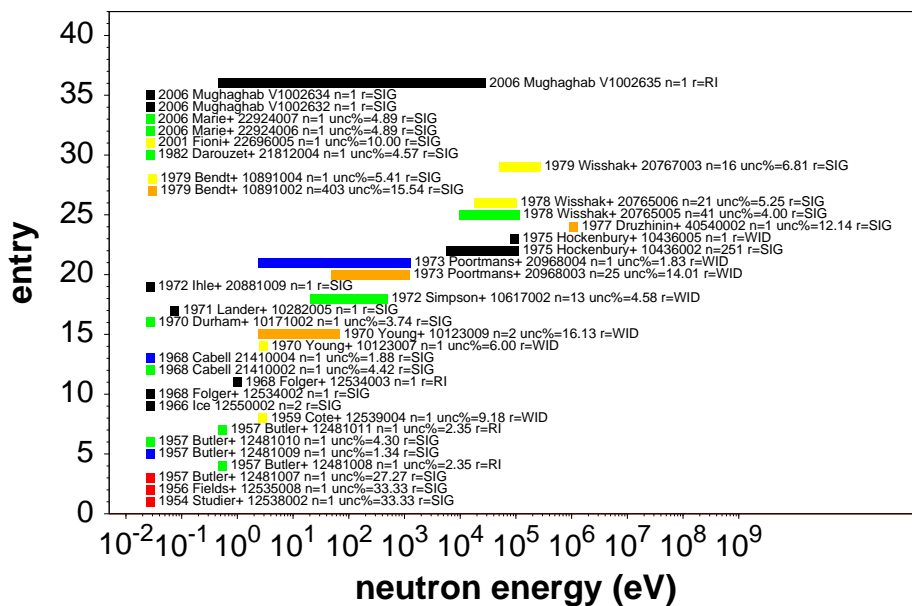


Figure A-24. Summary of the 38 EXFOR entries for the nuclide Pu-242, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.



### U-235 (n,g|abs) sig|wid|ri|par

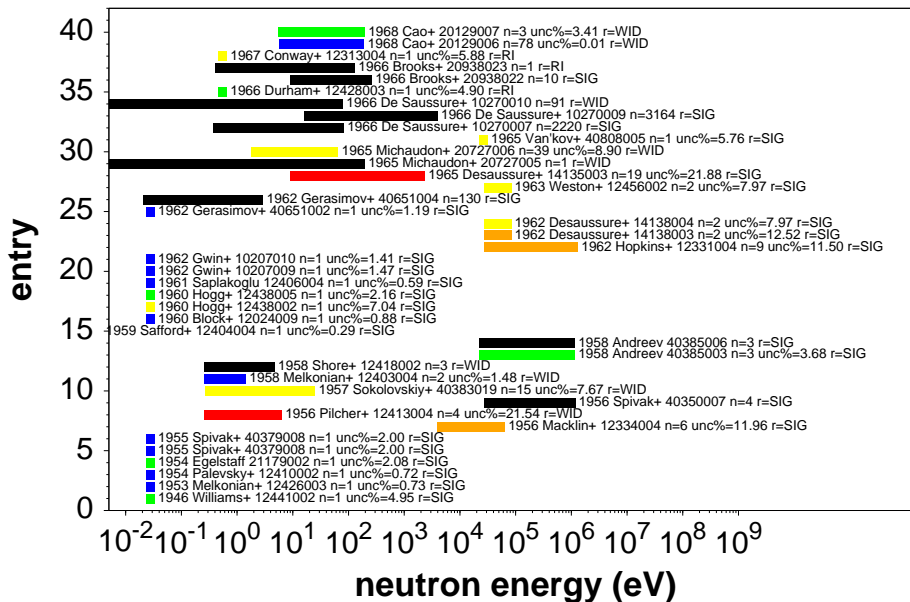


Figure A-25. Summary of the 82 EXFOR entries for the nuclide U-235, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

### U-235 (n,g|abs) sig|wid|ri|par

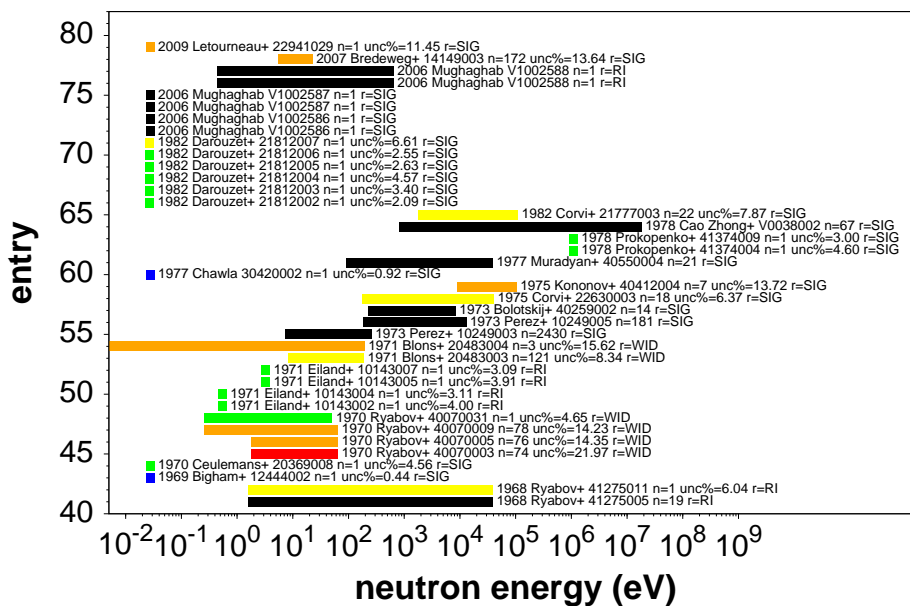


Figure A-26. Summary of the 82 EXFOR entries for the nuclide U-235, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 3.

### U-235 (n,g|abs) sig|wid|ri|par

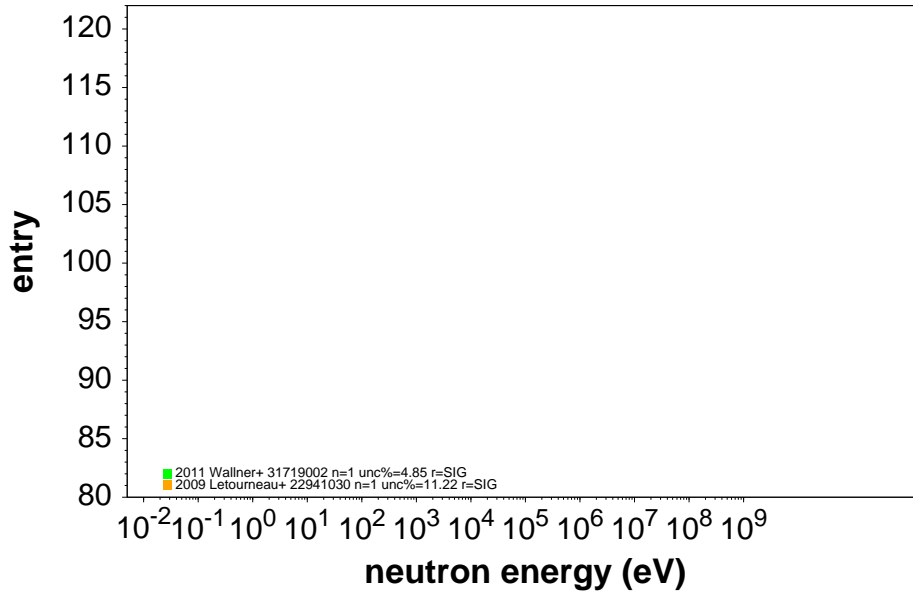


Figure A-27. Summary of the 82 EXFOR entries for the nuclide U-235, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 3 of 3.

### U-238 (n,g|abs) sig|wid|ri|par

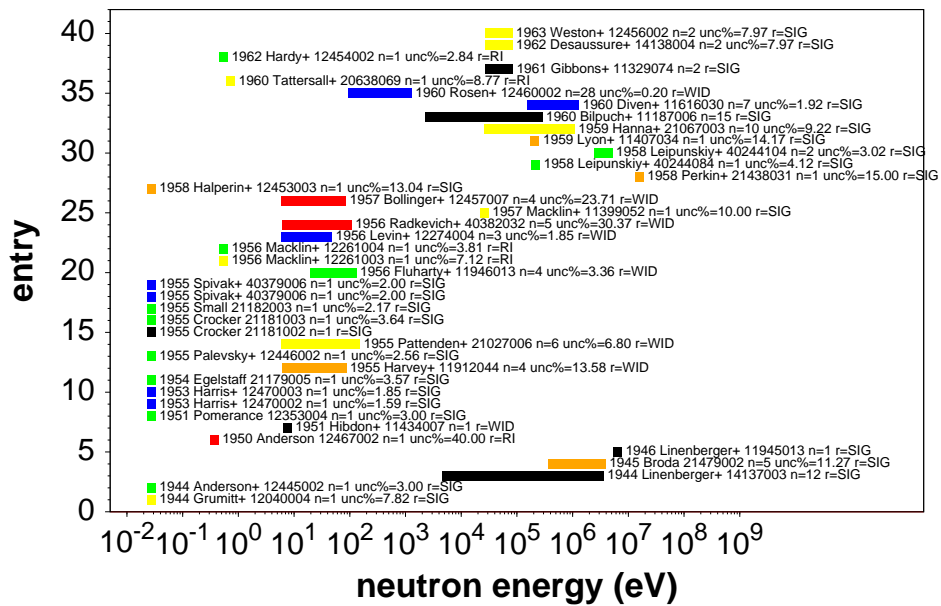


Figure A-28. Summary of the 200 EXFOR entries for the nuclide U-238, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 5.

### U-238 (n,g|abs) sig|wid|ri|par

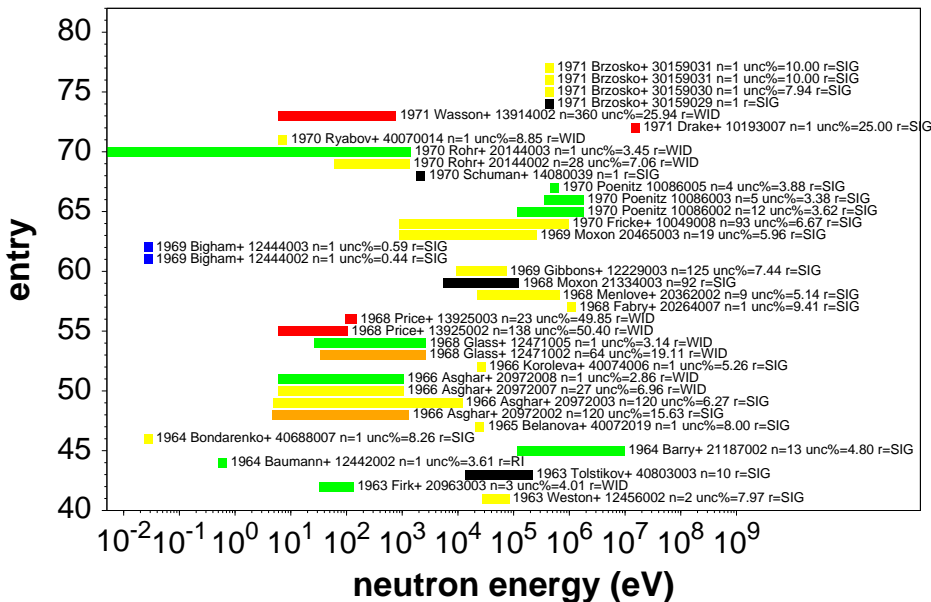


Figure A-29. Summary of the 200 EXFOR entries for the nuclide U-238, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 2 of 5.

### U-238 (n,g|abs) sig|wid|ri|par

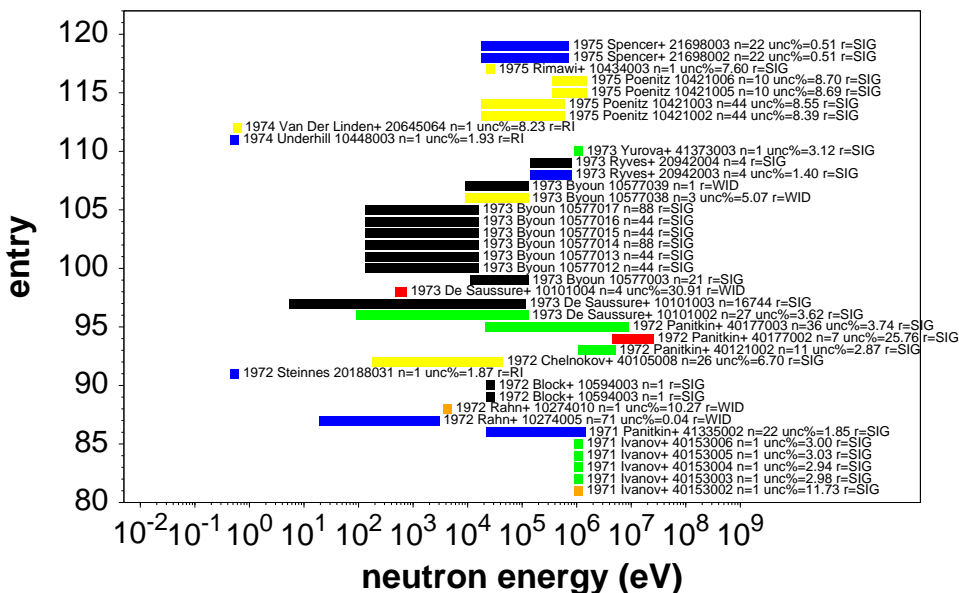


Figure A-30. Summary of the 200 EXFOR entries for the nuclide U-238, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 3 of 5.

### U-238 (n,g|abs) sig|wid|ri|par

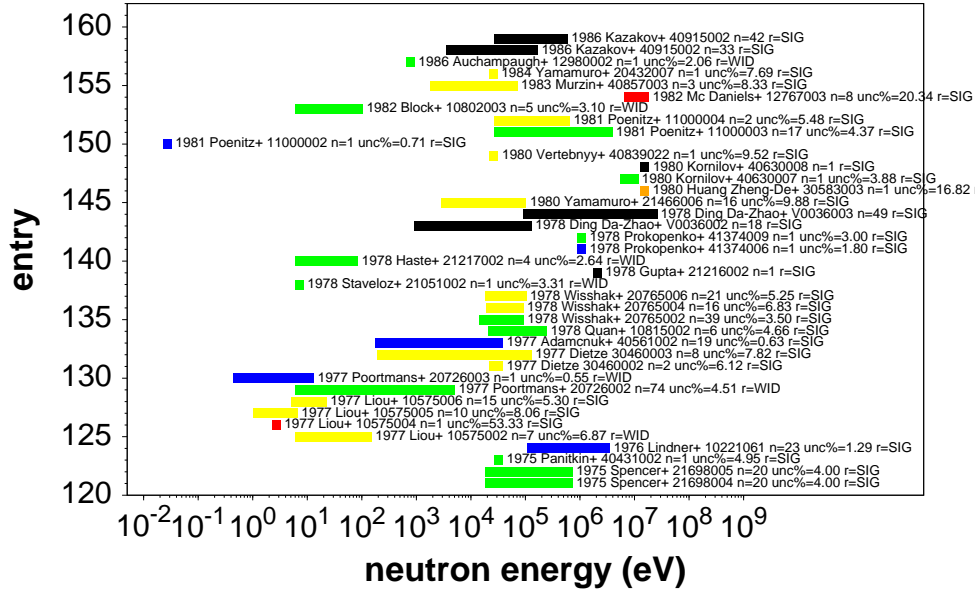


Figure A-31. Summary of the 200 EXFOR entries for the nuclide U-238, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 4 of 5.

### U-238 (n,g|abs) sig|wid|ri|par

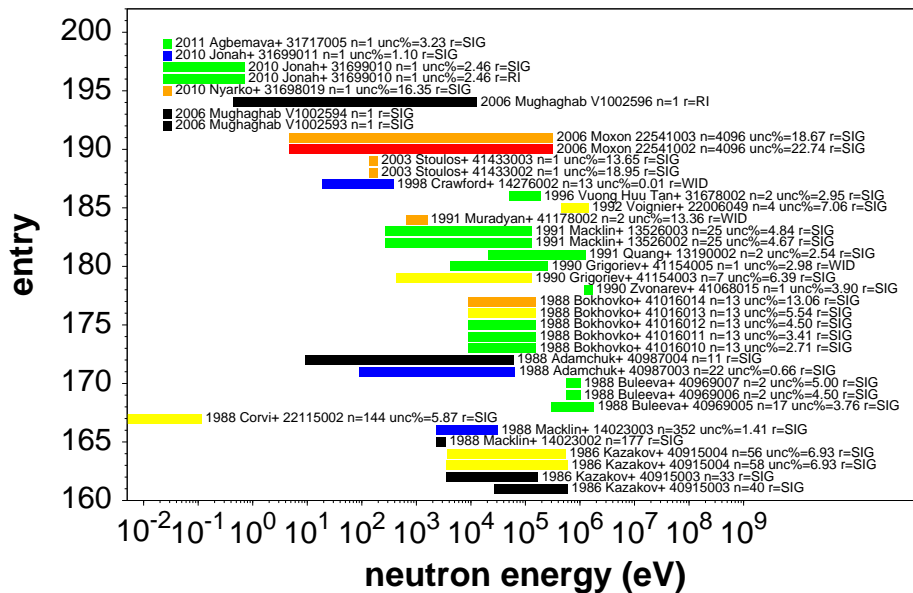


Figure A-32. Summary of the 200 EXFOR entries for the nuclide U-238, and reactions (n,g), (n,abs), for entries matching the quantities sig, wid, ri, par; part 5 of 5.

### Am-241 (n,f) sig|wid|ri|par

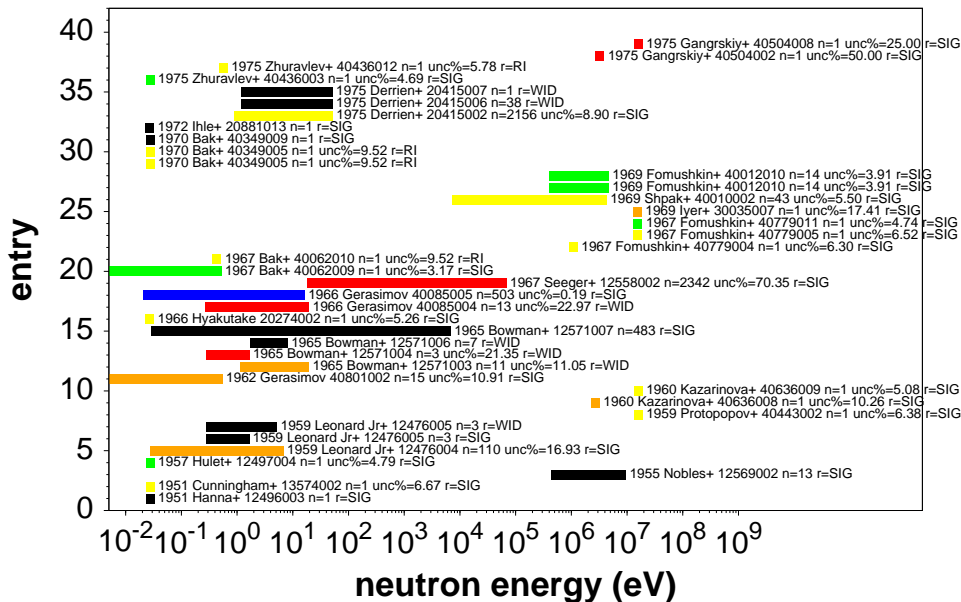


Figure A-33. Summary of the 100 EXFOR entries for the nuclide Am-241, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

### Am-241 (n,f) sig|wid|ri|par

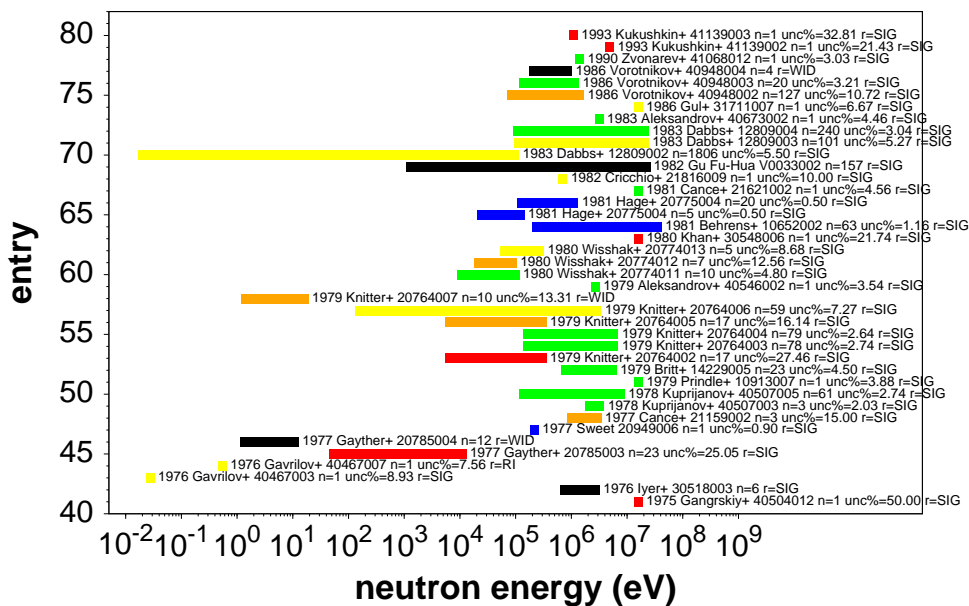


Figure A-34. Summary of the 100 EXFOR entries for the nuclide Am-241, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 3.

### Am-241 (n,f) sig|wid|ri|par

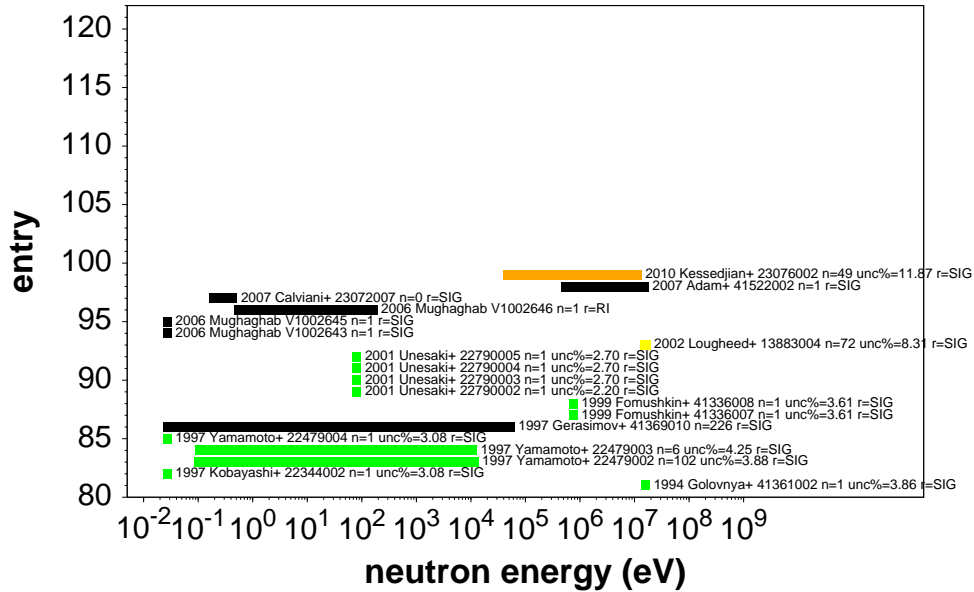


Figure A-35. Summary of the 100 EXFOR entries for the nuclide Am-241, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 3 of 3.

### Am-243 (n,f) sig|wid|ri|par

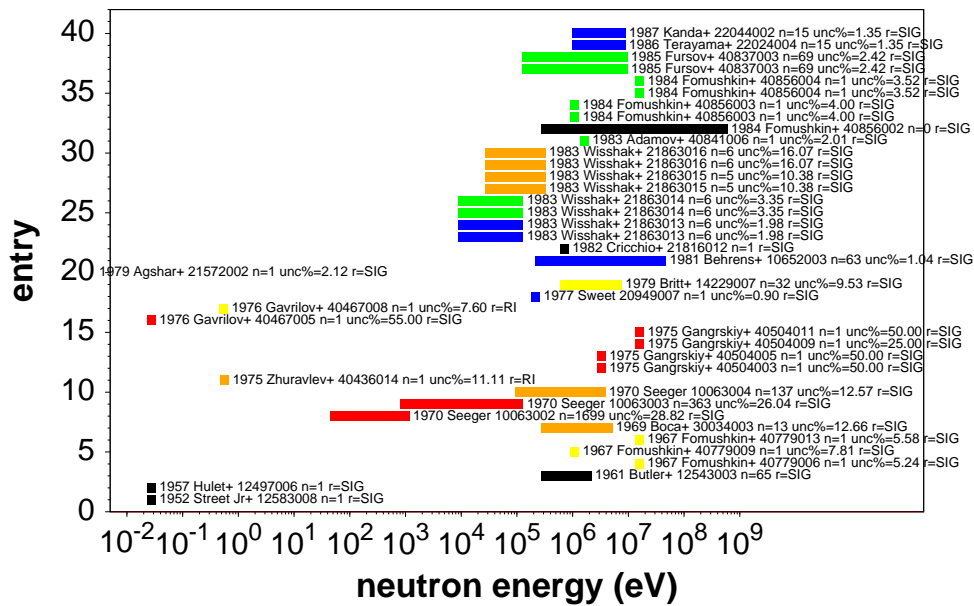


Figure A-36. Summary of the 67 EXFOR entries for the nuclide Am-243, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### Am-243 (n,f) sig|wid|ri|par

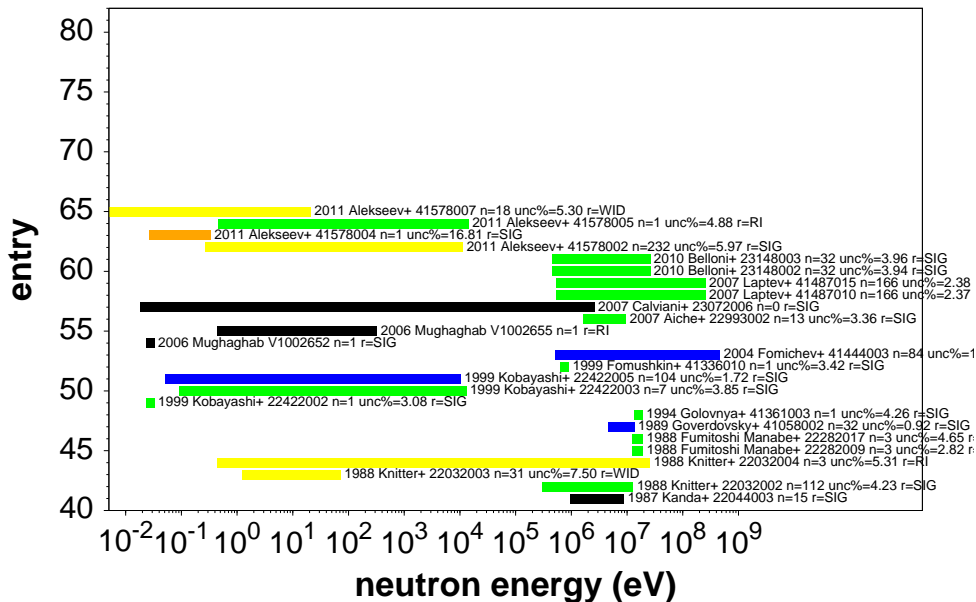


Figure A-37. Summary of the 67 EXFOR entries for the nuclide Am-243, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

### Cm-242 (n,f) sig|wid|ri|par

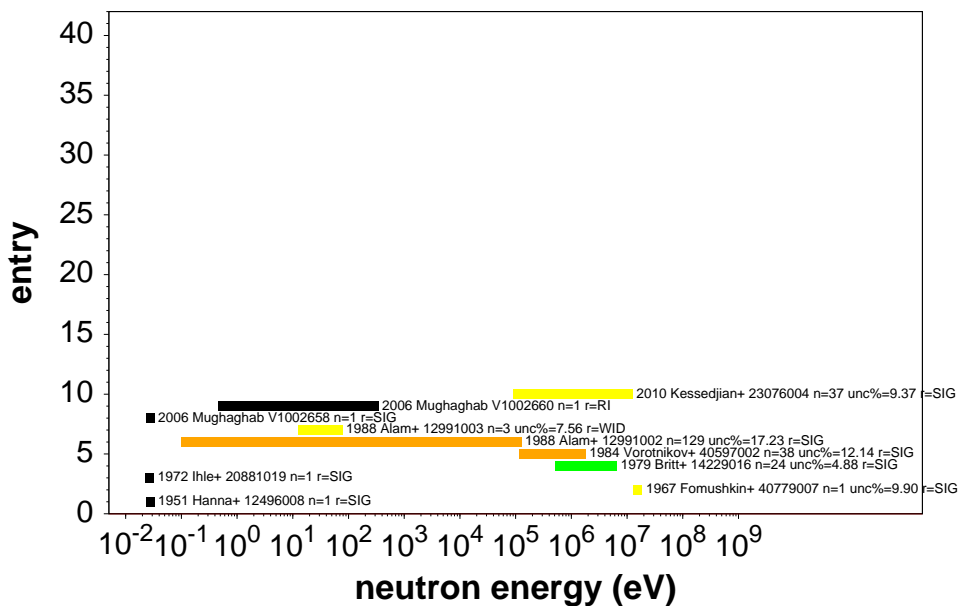


Figure A-38. Summary of the 10 EXFOR entries for the nuclide Cm-242, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

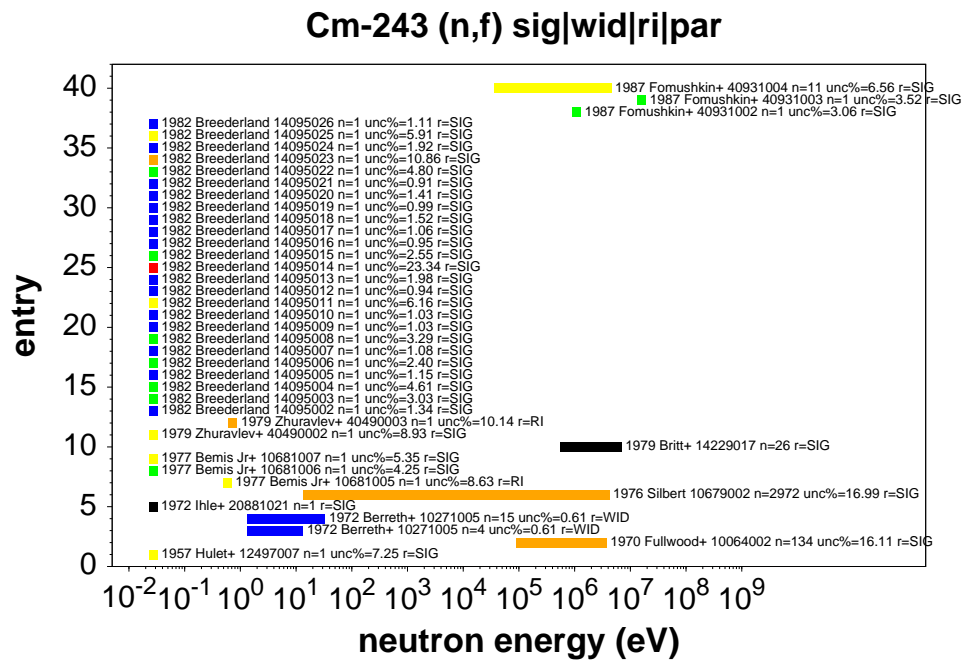


Figure A-39. Summary of the 55 EXFOR entries for the nuclide Cm-243, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

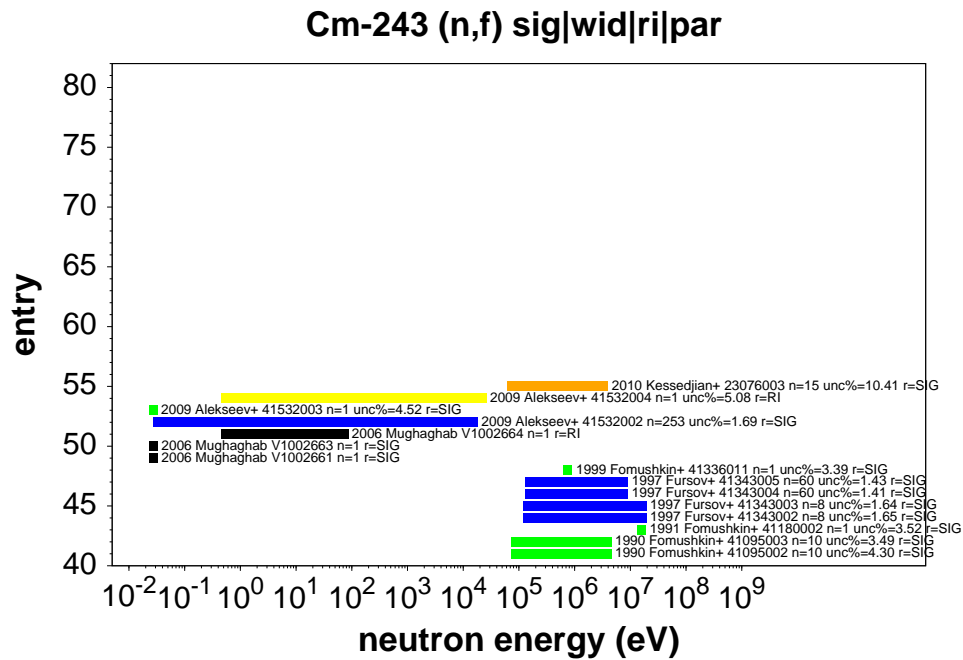


Figure A-40. Summary of the 55 EXFOR entries for the nuclide Cm-243, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 2.



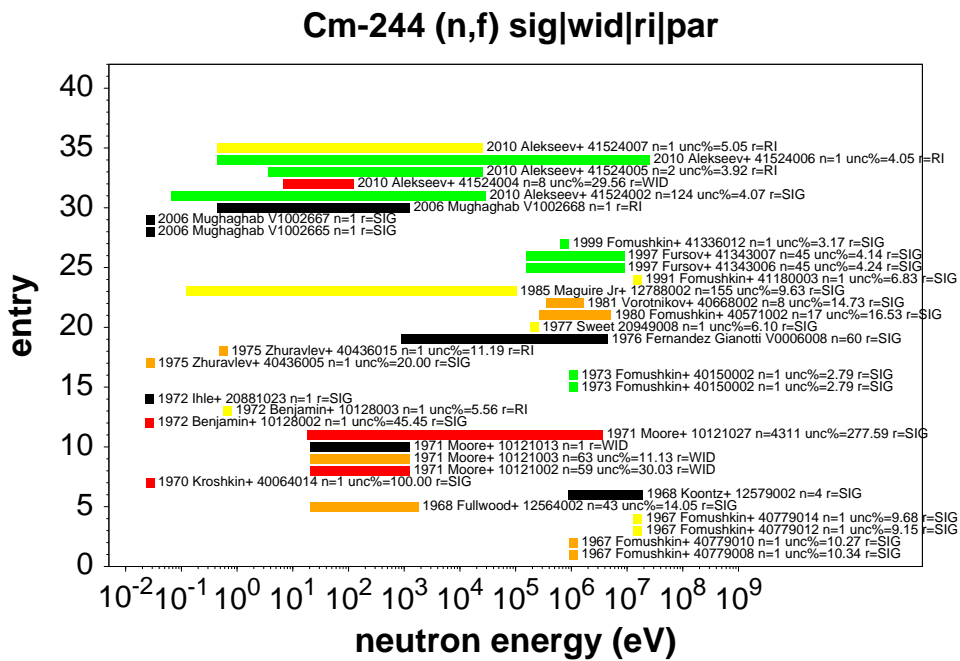


Figure A-41. Summary of the 35 EXFOR entries for the nuclide Cm-244, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

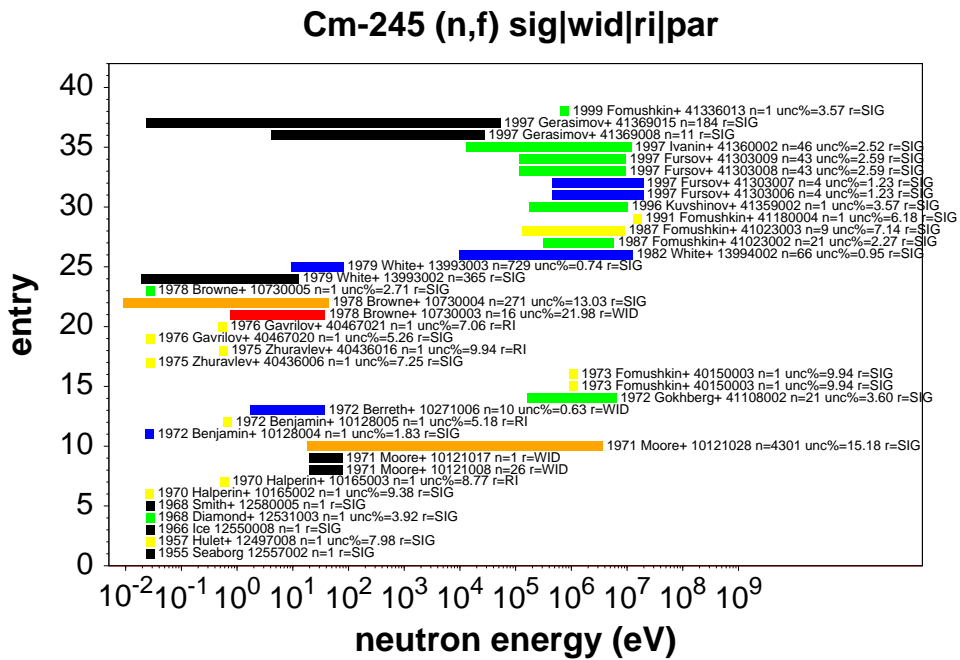


Figure A-42. Summary of the 52 EXFOR entries for the nuclide Cm-245, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

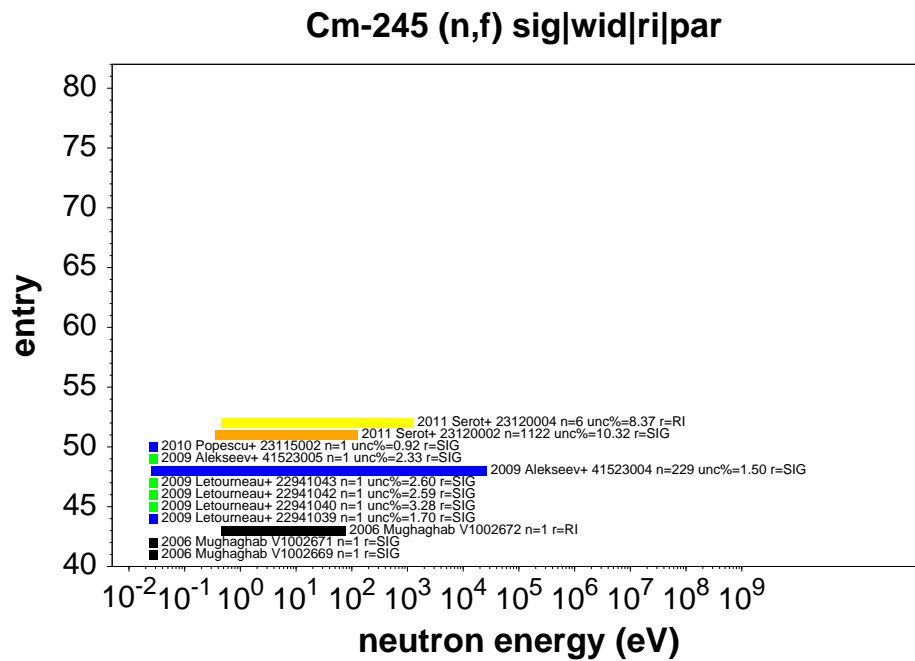


Figure A-43. Summary of the 52 EXFOR entries for the nuclide Cm-245, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

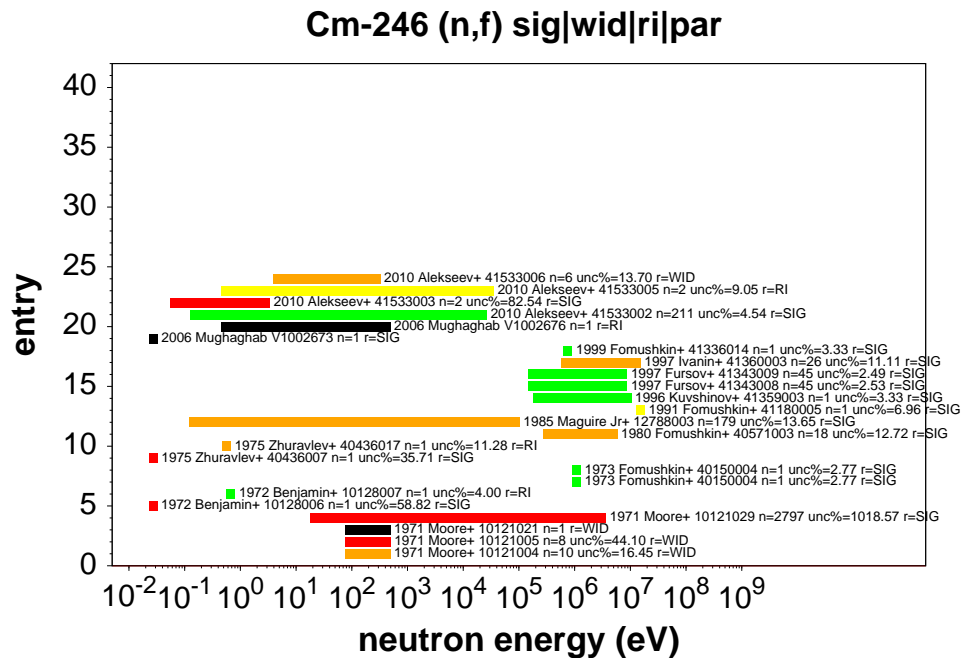


Figure A-44. Summary of the 24 EXFOR entries for the nuclide Cm-246, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Np-237 (n,f) sig|wid|ri|par

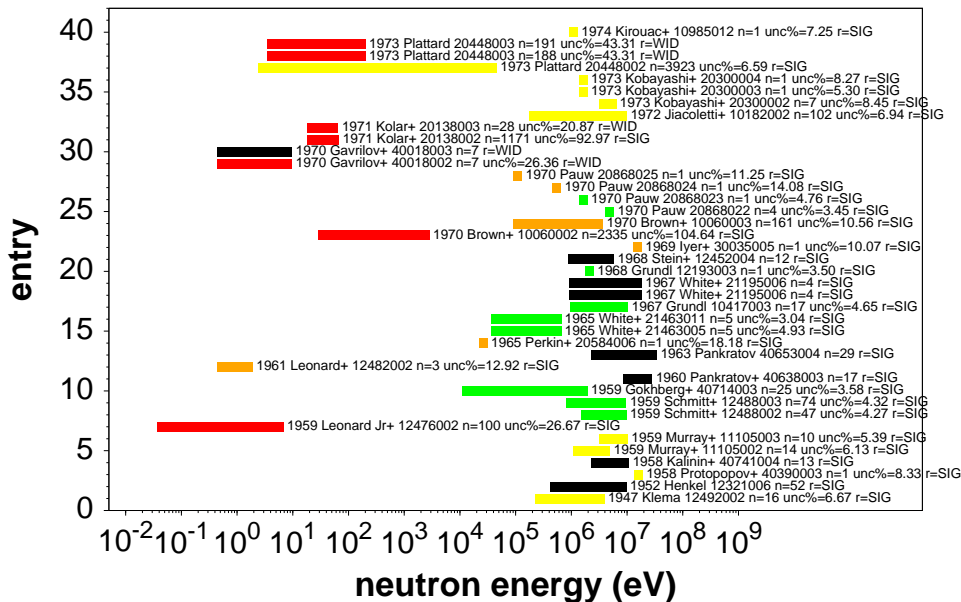


Figure A-45. Summary of the 147 EXFOR entries for the nuclide Np-237, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 4.

### Np-237 (n,f) sig|wid|ri|par

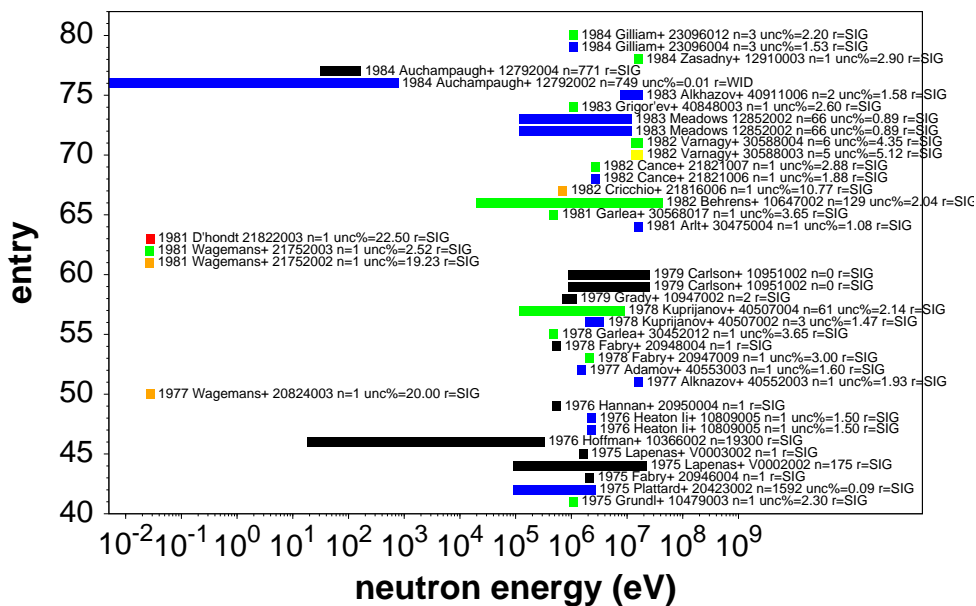


Figure A-46. Summary of the 147 EXFOR entries for the nuclide Np-237, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 4.

### Np-237 (n,f) sig|wid|ri|par

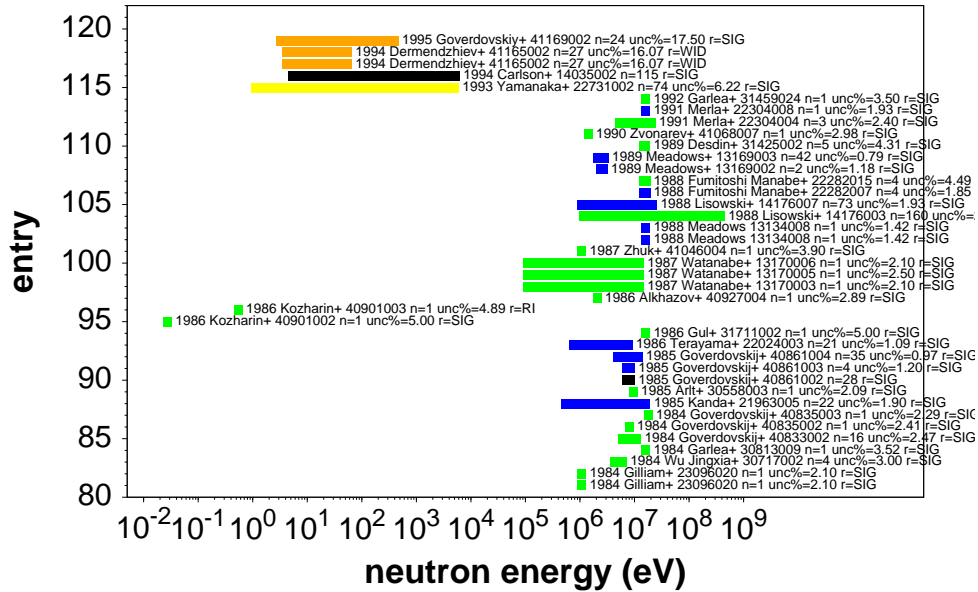


Figure A-47. Summary of the 147 EXFOR entries for the nuclide Np-237, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 3 of 4.

### Np-237 (n,f) sig|wid|ri|par

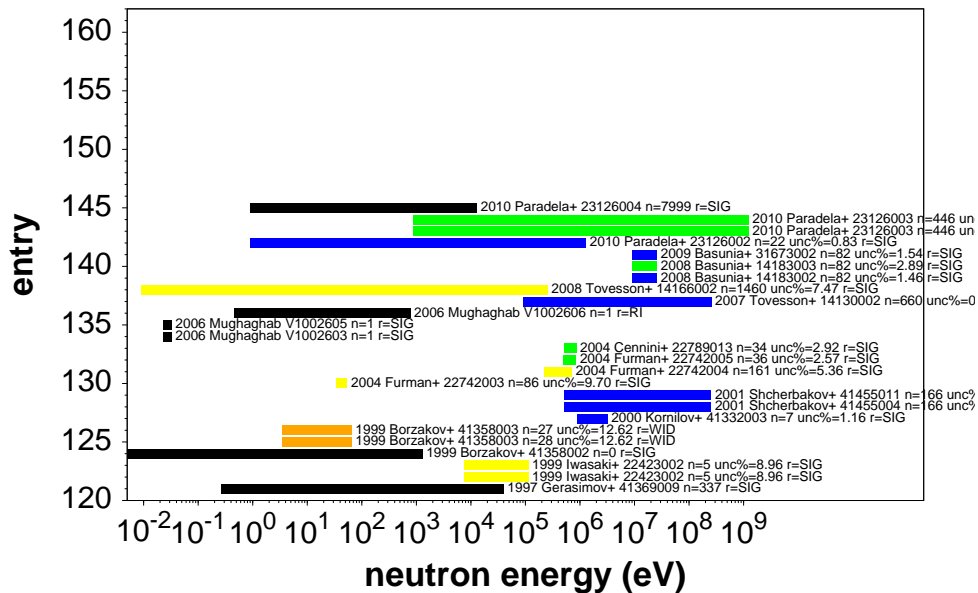


Figure A-48. Summary of the 147 EXFOR entries for the nuclide Np-237, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 4 of 4.

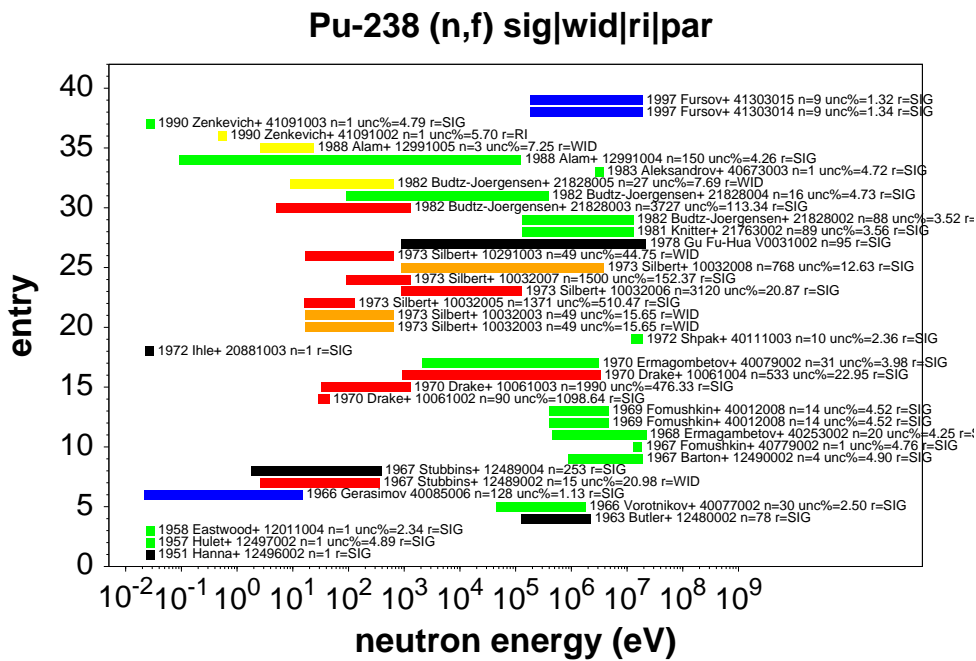


Figure A-49. Summary of the 49 EXFOR entries for the nuclide Pu-238, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

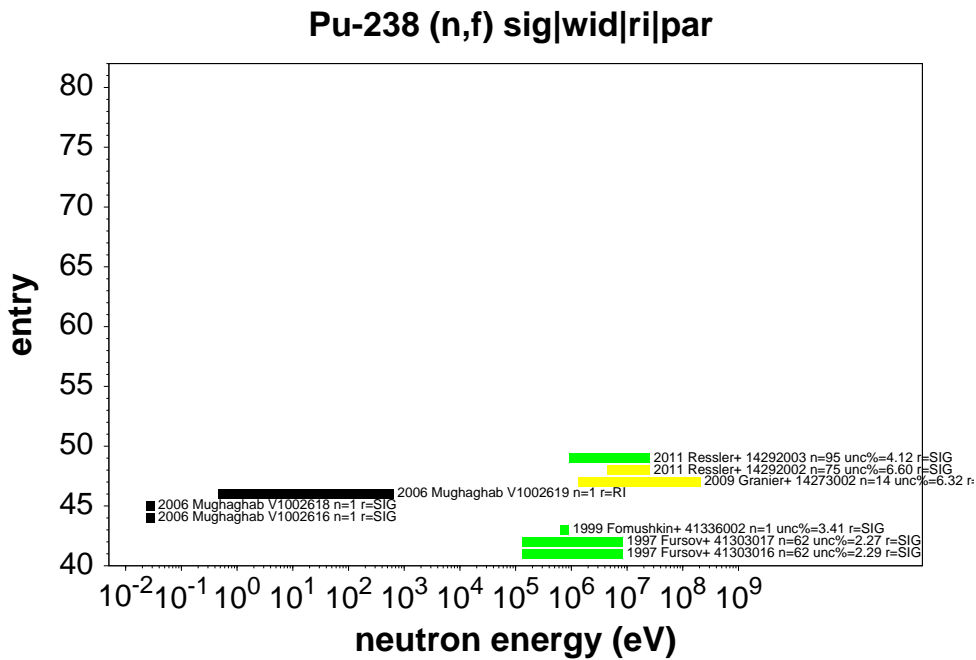


Figure A-50. Summary of the 49 EXFOR entries for the nuclide Pu-238, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

### Pu-240 (n,f) sig|wid|ri|par

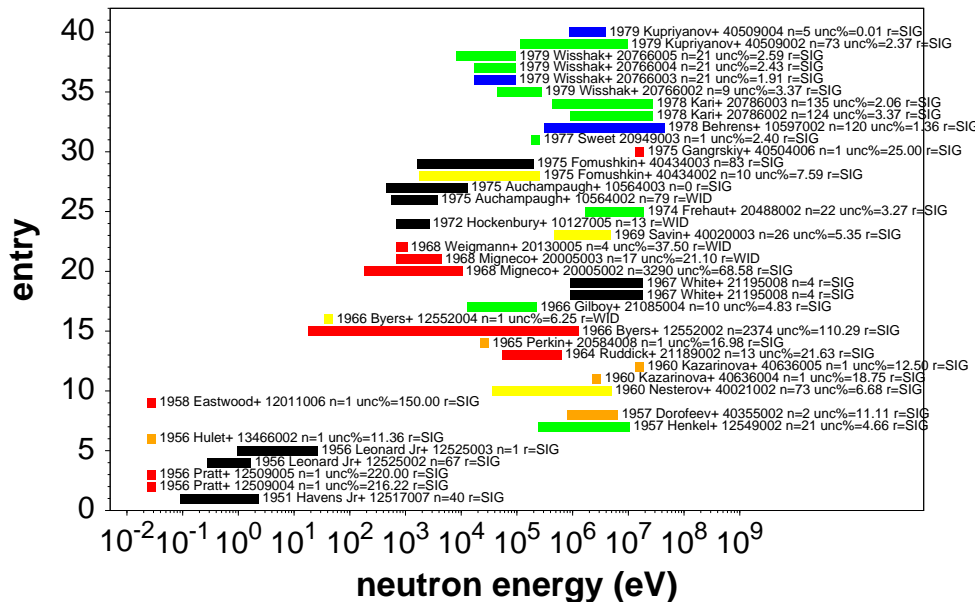


Figure A-51. Summary of the 73 EXFOR entries for the nuclide Pu-240, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### Pu-240 (n,f) sig|wid|ri|par

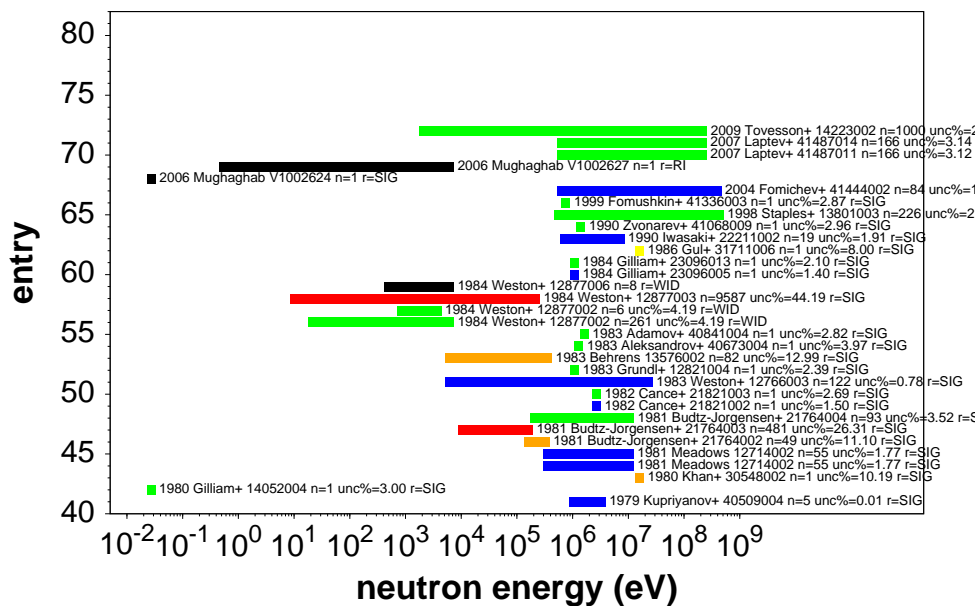


Figure A-52. Summary of the 73 EXFOR entries for the nuclide Pu-240, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

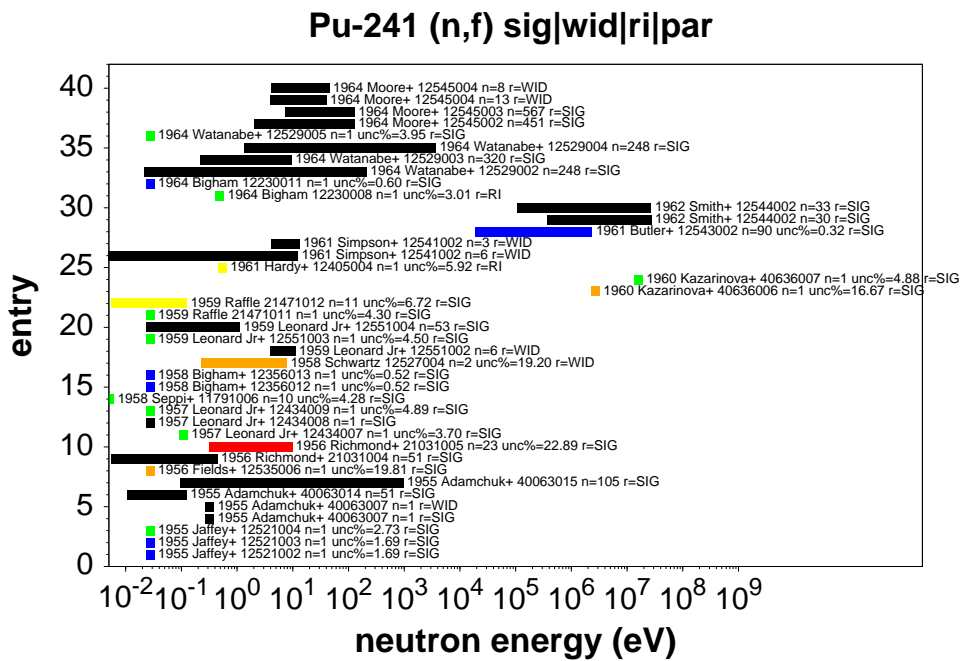


Figure A-53. Summary of the 118 EXFOR entries for the nuclide Pu-241, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

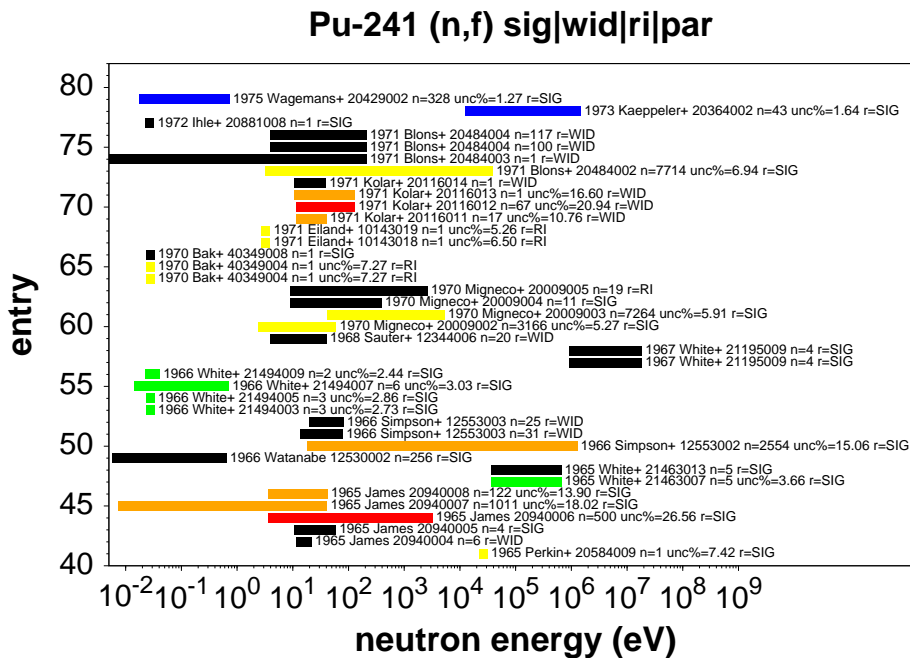


Figure A-54. Summary of the 118 EXFOR entries for the nuclide Pu-241, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 3.

### Pu-241 (n,f) sig|wid|ri|par

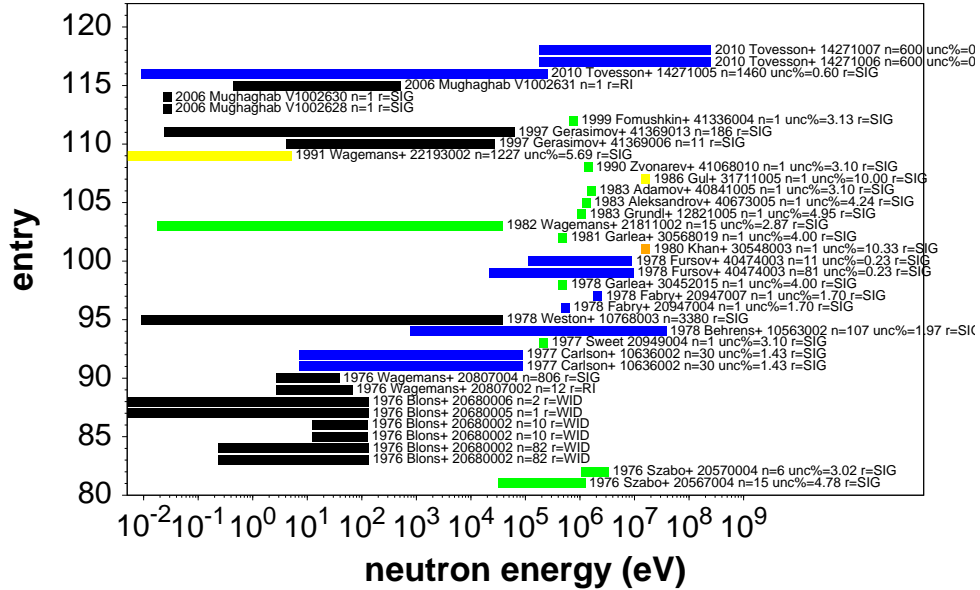


Figure A-55. Summary of the 118 EXFOR entries for the nuclide Pu-241, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 3 of 3.

### Pu-242 (n,f) sig|wid|ri|par

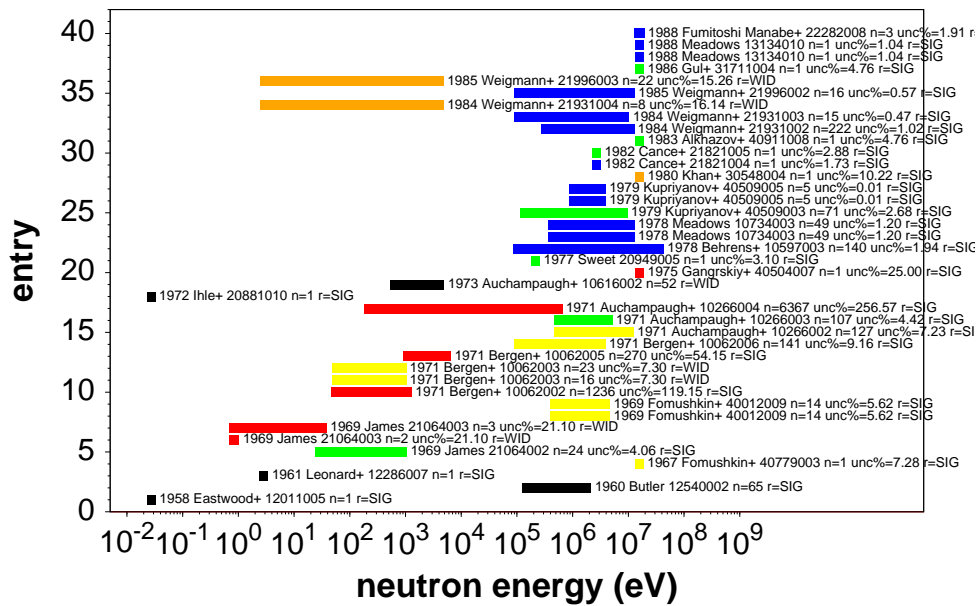


Figure A-56. Summary of the 49 EXFOR entries for the nuclide Pu-242, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 1 of 2.



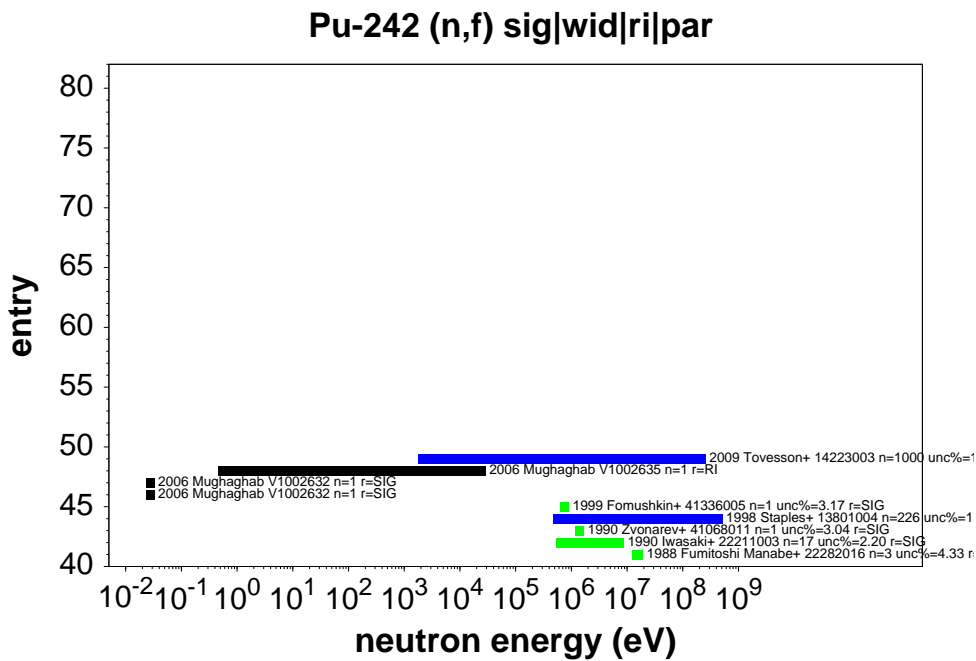


Figure A-57. Summary of the 49 EXFOR entries for the nuclide Pu-242, and reactions (n,f), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

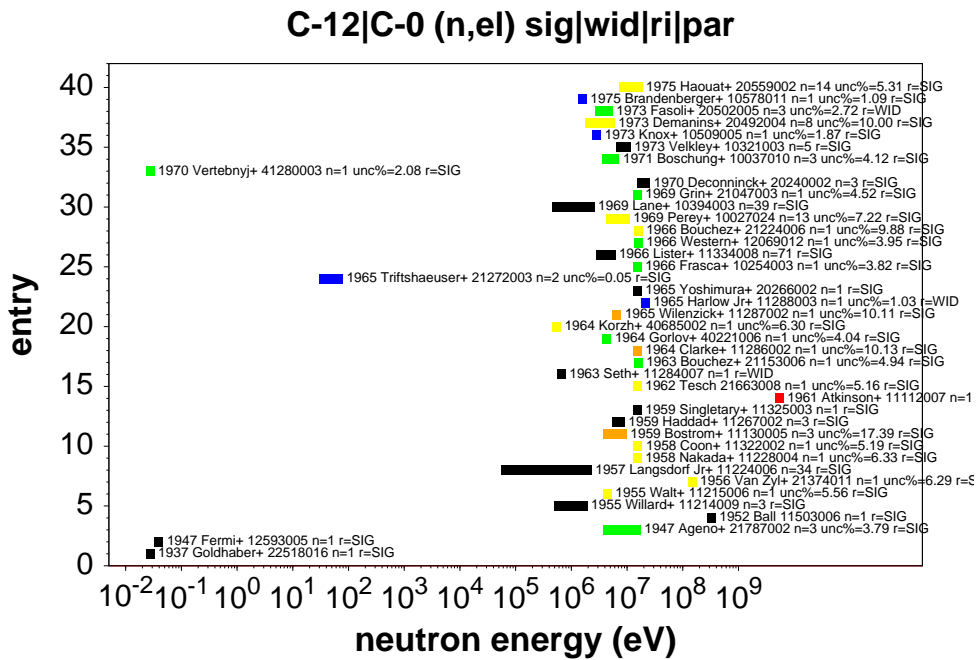


Figure A-58. Summary of the 61 EXFOR entries for the nuclide C-12, C-0, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### C-12|C-0 (n,el) sig|wid|ri|par

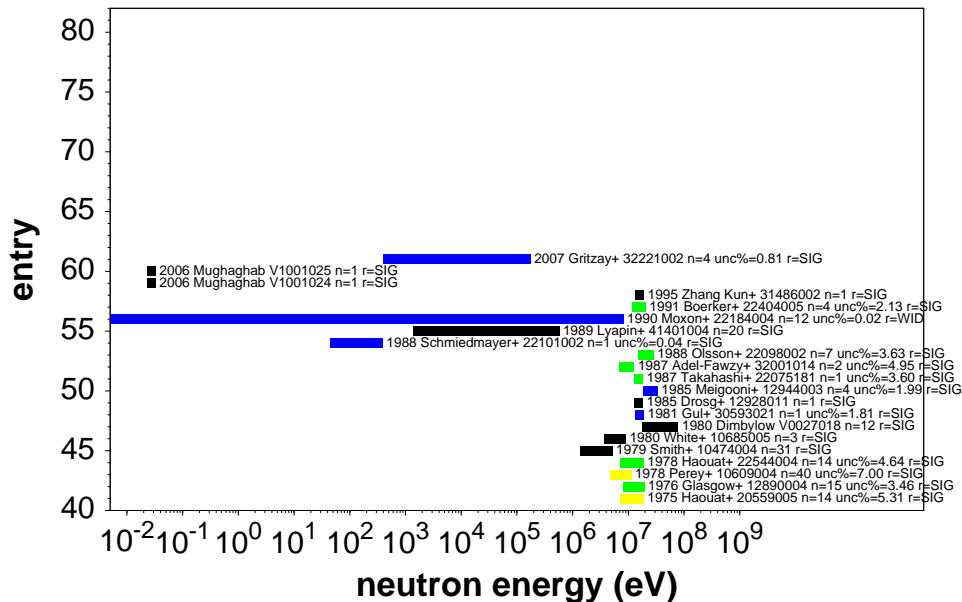


Figure A-59. Summary of the 61 EXFOR entries for the nuclide C-12, C-0, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

### Cr-52 (n,el) sig|wid|ri|par

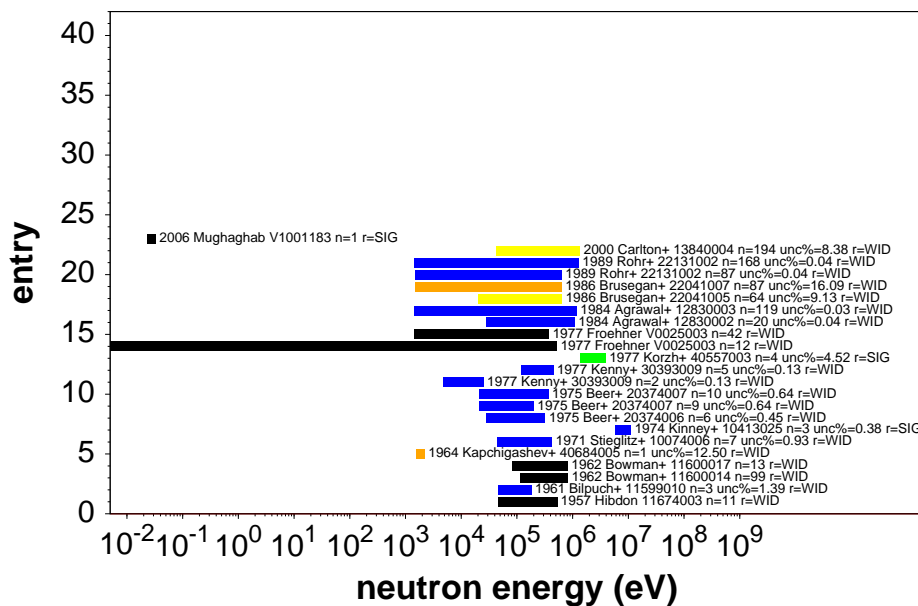


Figure A-60. Summary of the 24 EXFOR entries for the nuclide Cr-52, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Fe-56 (n,el) sig|wid|ri|par

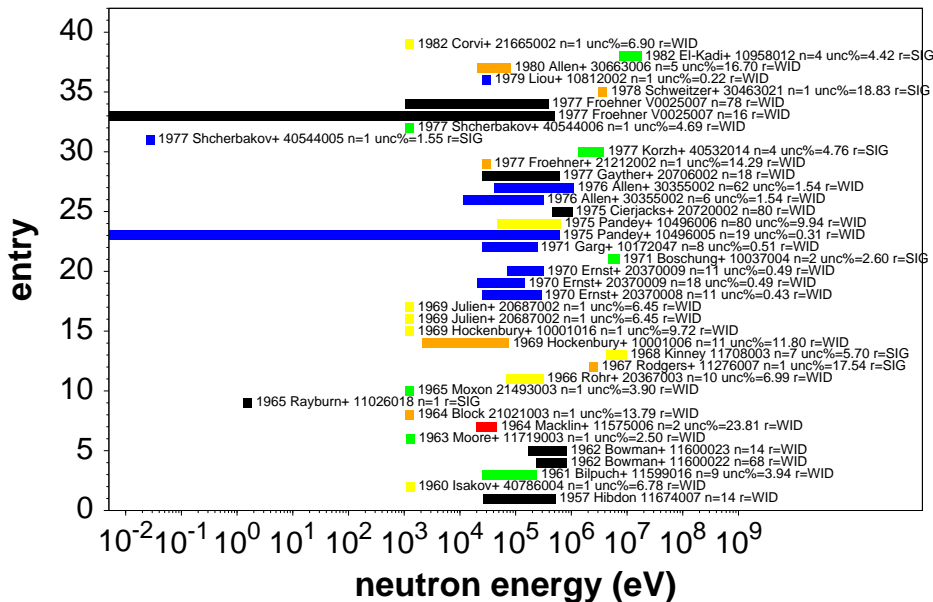


Figure A-61. Summary of the 62 EXFOR entries for the nuclide Fe-56, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### Fe-56 (n,el) sig|wid|ri|par

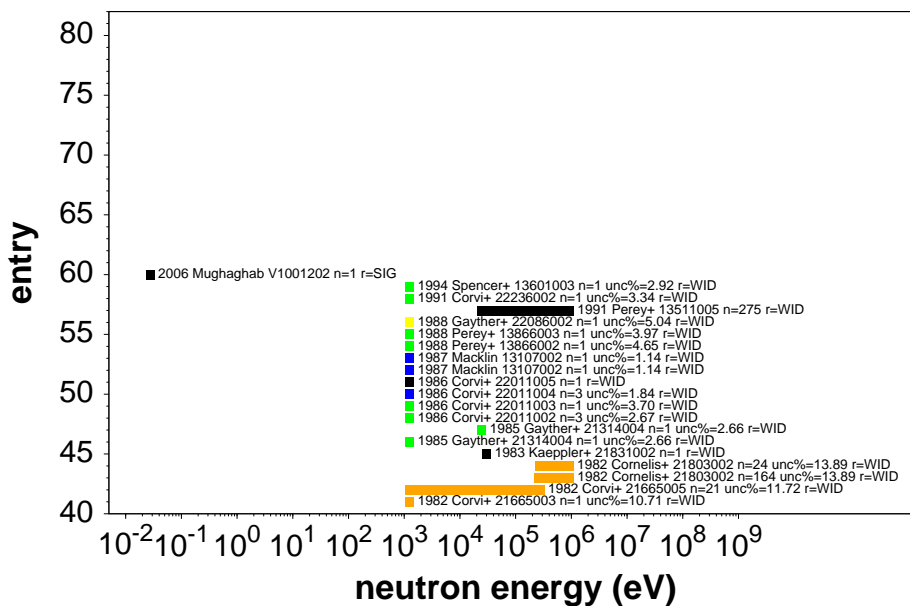


Figure A-62. Summary of the 62 EXFOR entries for the nuclide Fe-56, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

### N-15 (n,el) sig|wid|ri|par

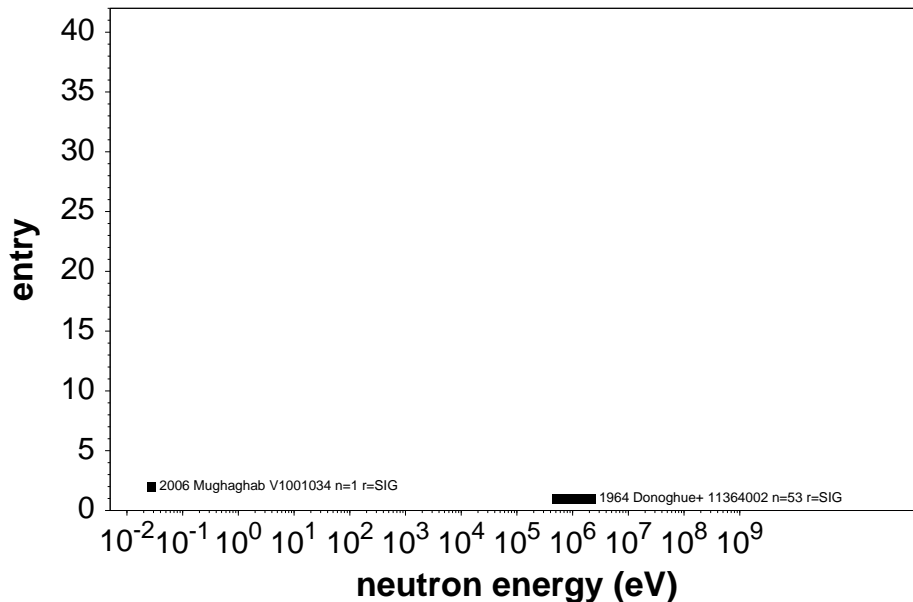


Figure A-63. Summary of the 2 EXFOR entries for the nuclide N-15, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### O-16|O-0 (n,el) sig|wid|ri|par

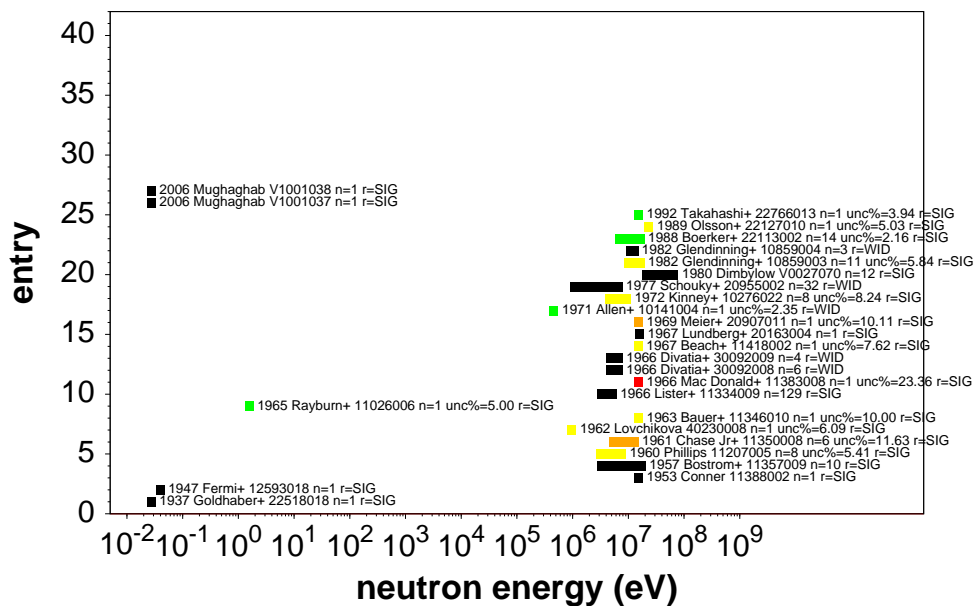


Figure A-64. Summary of the 27 EXFOR entries for the nuclide O-16, O-0, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

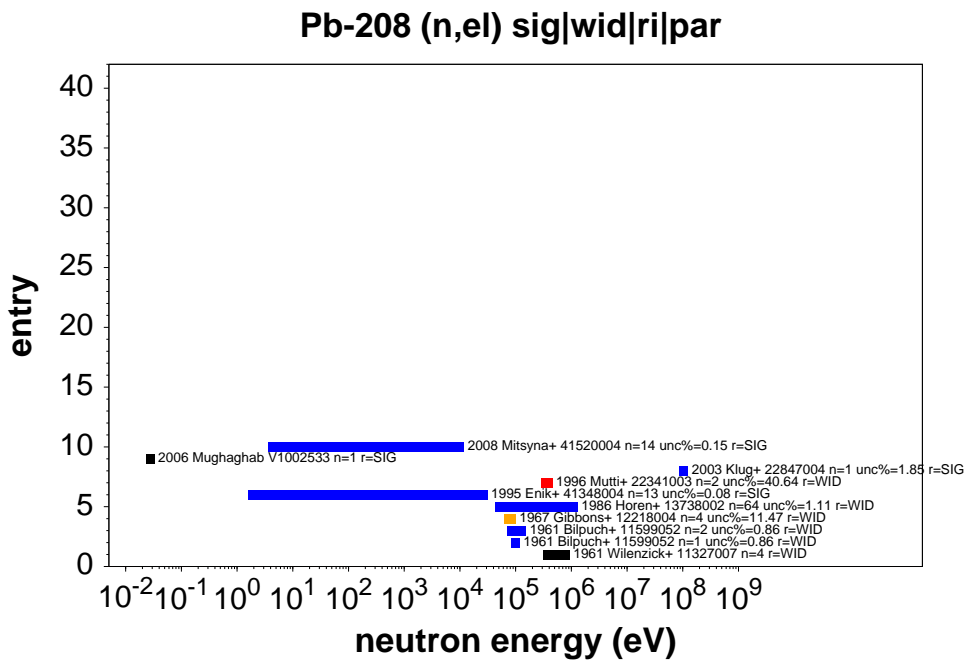


Figure A-65. Summary of the 10 EXFOR entries for the nuclide Pb-208, and reactions (n,e), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

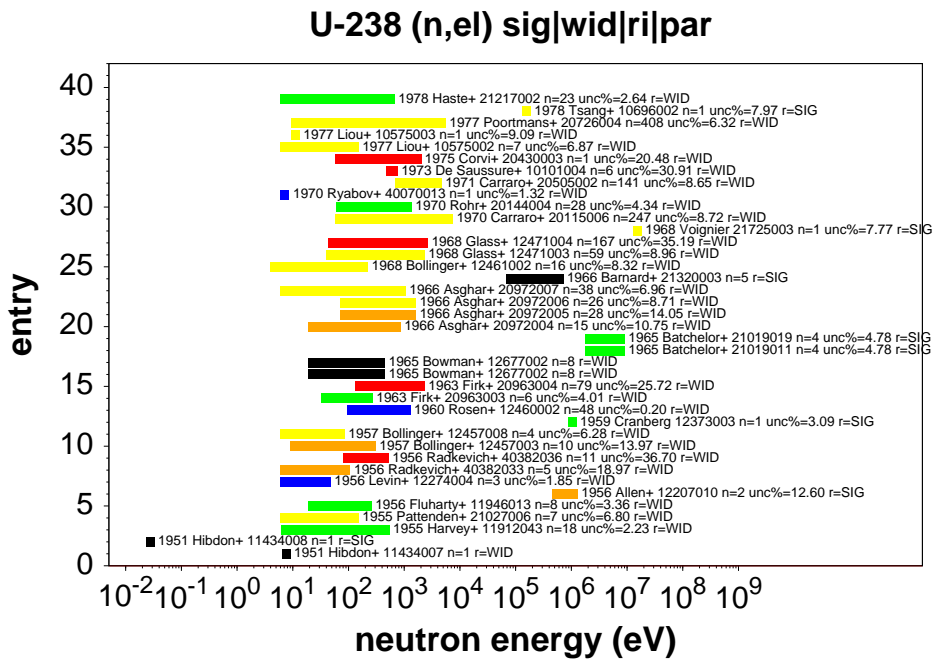


Figure A-66. Summary of the 58 EXFOR entries for the nuclide U-238, and reactions (n,e), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

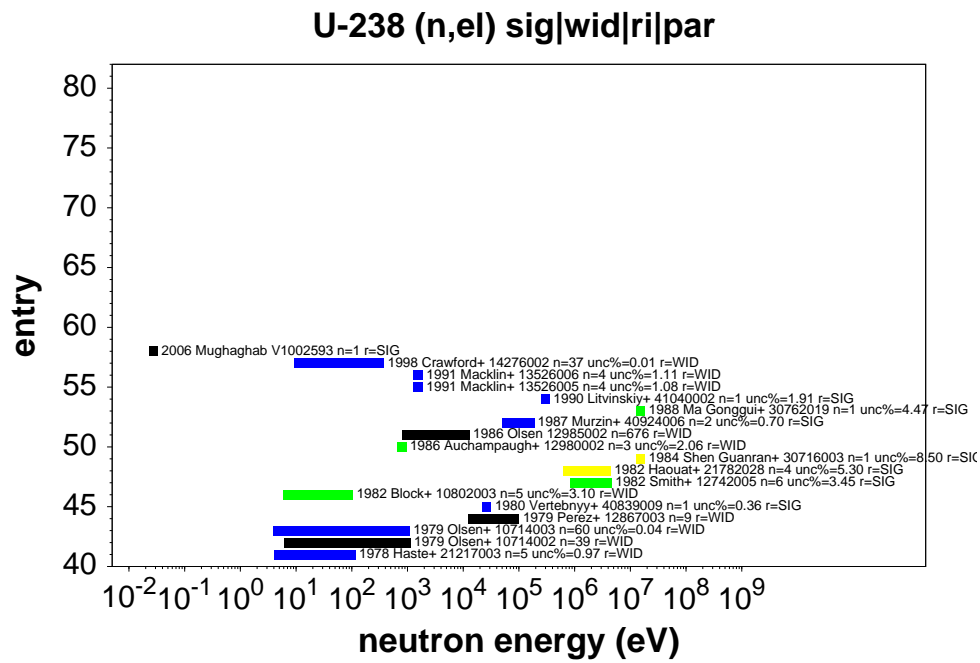


Figure A-67. Summary of the 58 EXFOR entries for the nuclide U-238, and reactions (n,el), for entries matching the quantities sig, wid, ri, par; part 2 of 2.

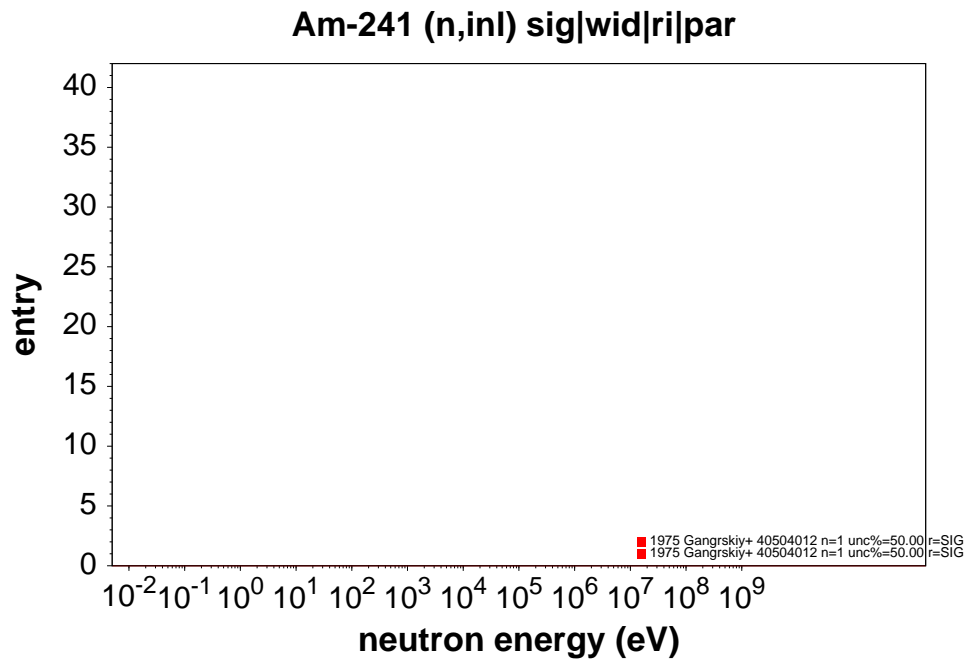


Figure A-68. Summary of the 2 EXFOR entries for the nuclide Am-241, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Am-243 (n,inl) sig|wid|ri|par

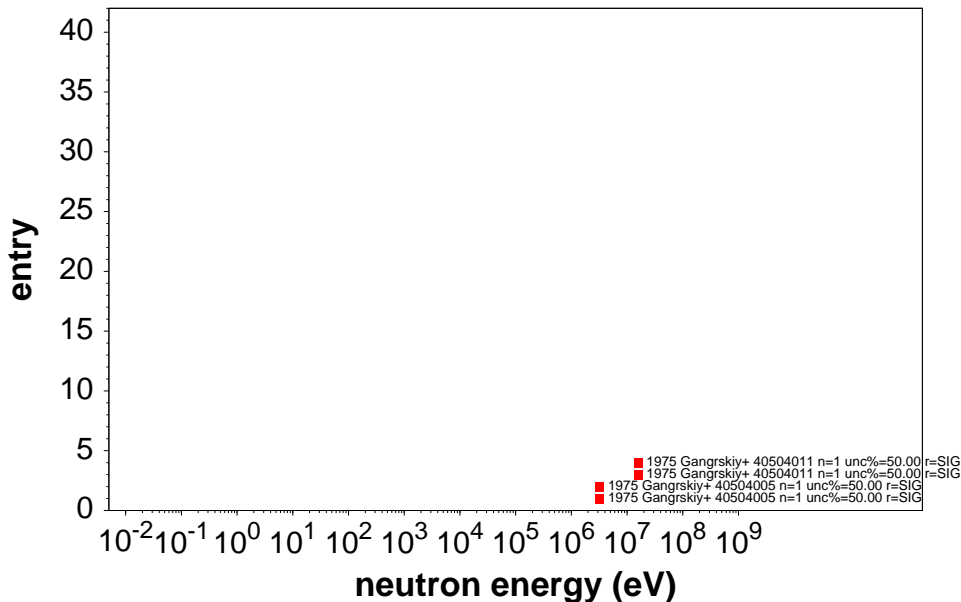


Figure A-69. Summary of the 4 EXFOR entries for the nuclide Am-243, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Bi-209 (n,inl) sig|wid|ri|par

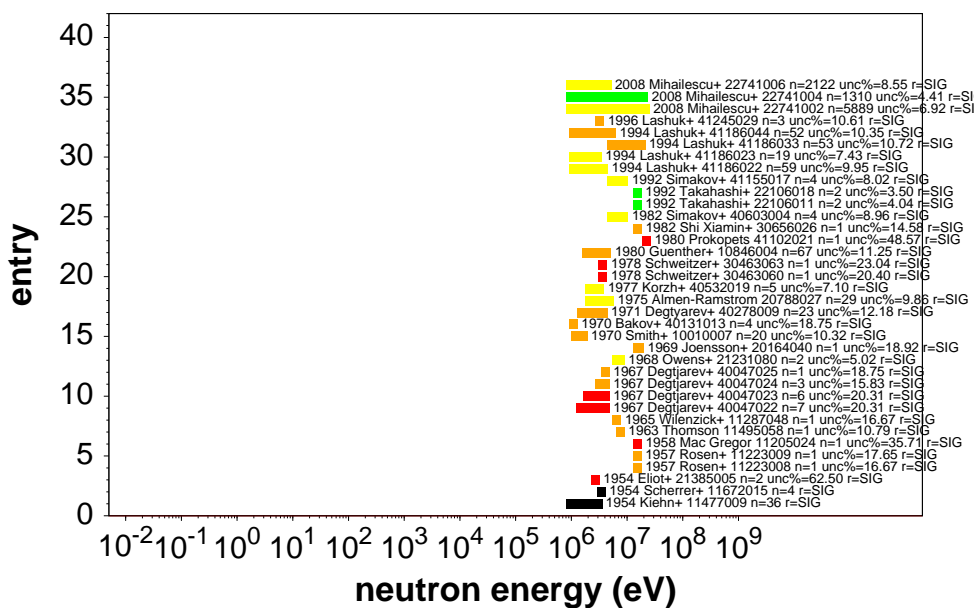


Figure A-70. Summary of the 36 EXFOR entries for the nuclide Bi-209, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### C-12|C-0 (n,inl) sig|wid|ri|par

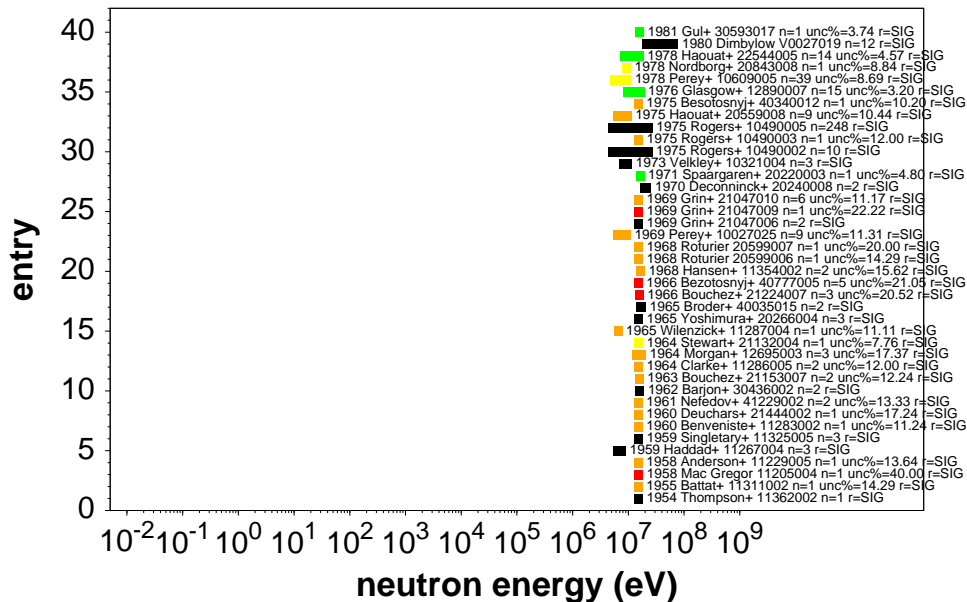


Figure A-71. Summary of the 50 EXFOR entries for the nuclide C-12, C-0, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### C-12|C-0 (n,inl) sig|wid|ri|par

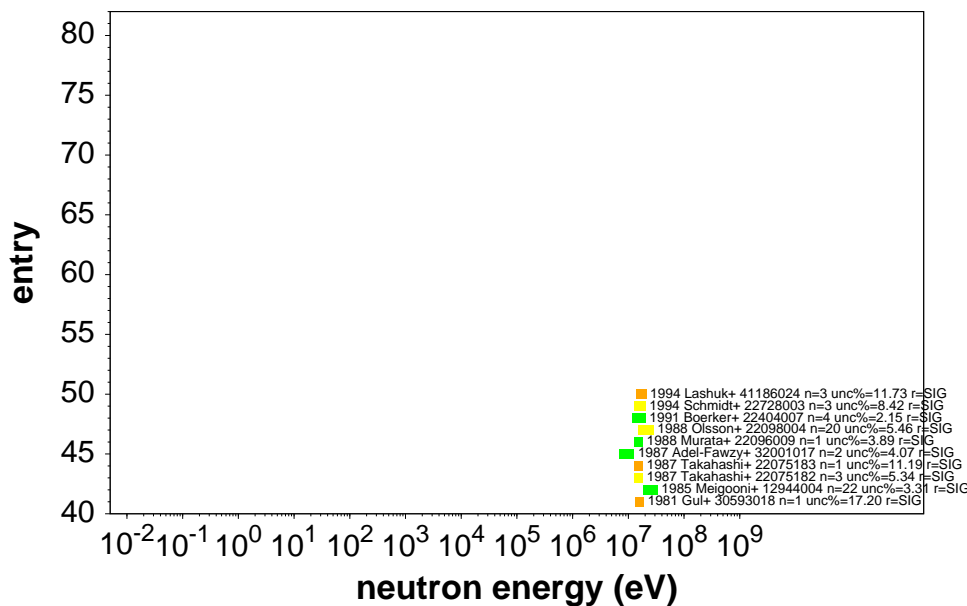


Figure A-72. Summary of the 50 EXFOR entries for the nuclide C-12, C-0, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 2 of 2.



### Fe-56 (n,inl) sig|wid|ri|par

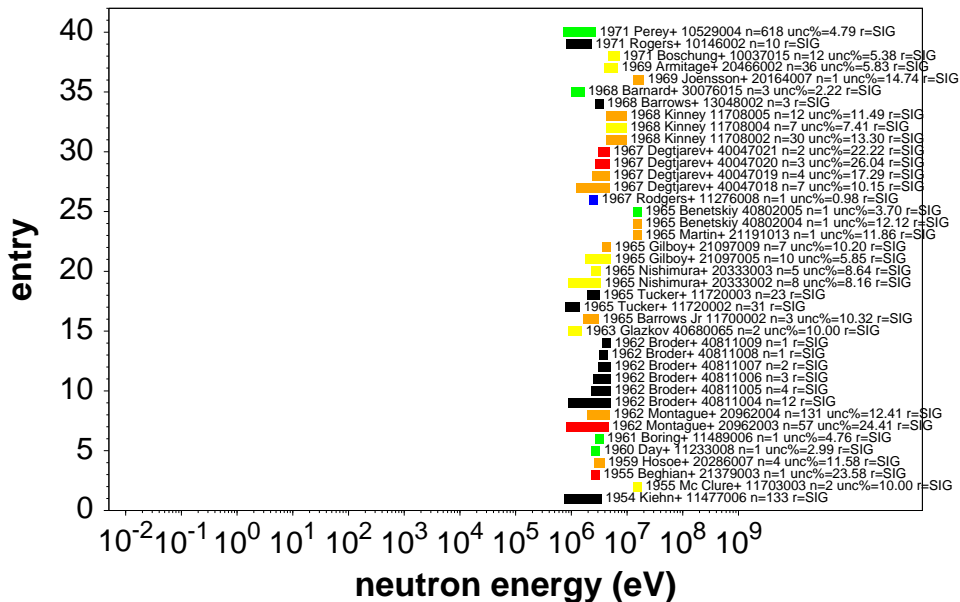


Figure A-73. Summary of the 109 EXFOR entries for the nuclide Fe-56, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

### Fe-56 (n,inl) sig|wid|ri|par

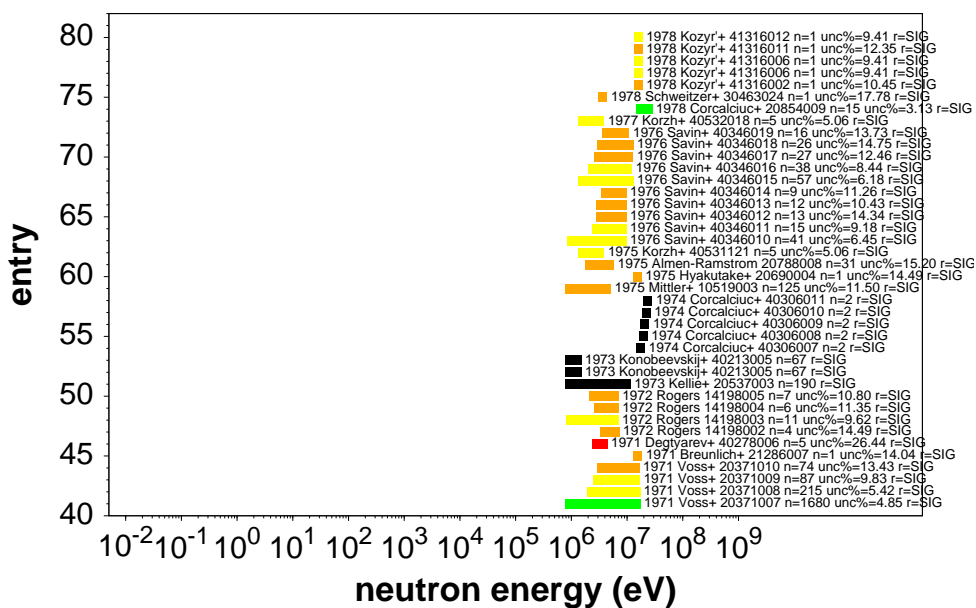


Figure A-74. Summary of the 109 EXFOR entries for the nuclide Fe-56, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 2 of 3.

### Fe-56 (n,inl) sig|wid|ri|par

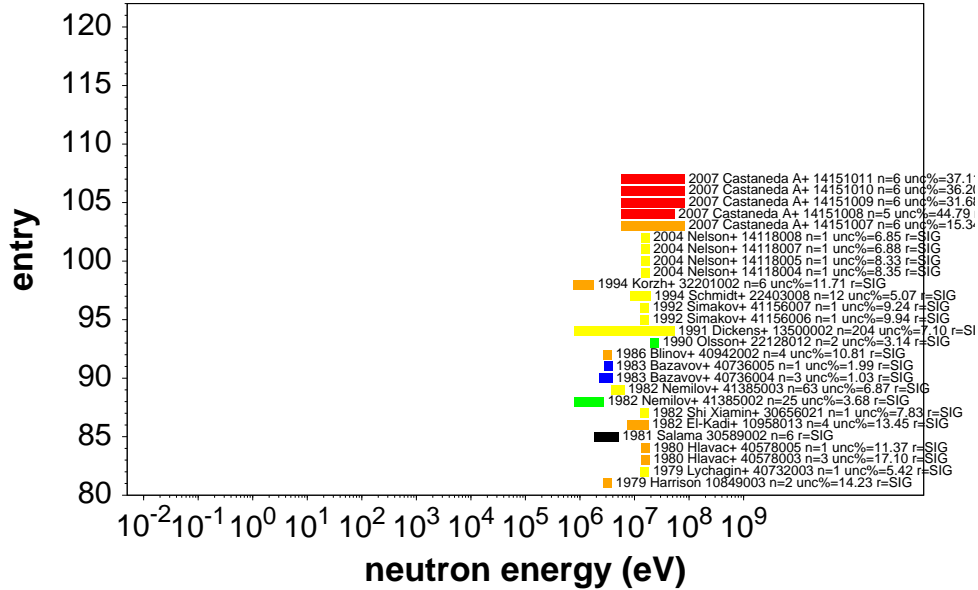


Figure A-75. Summary of the 109 EXFOR entries for the nuclide Fe-56, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 3 of 3.

### Na-23 (n,inl) sig|wid|ri|par

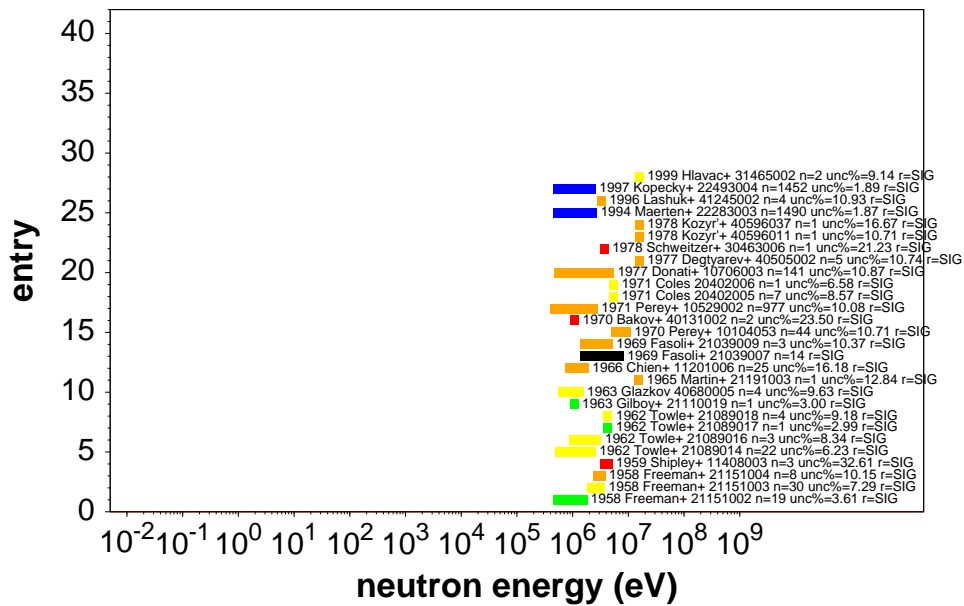
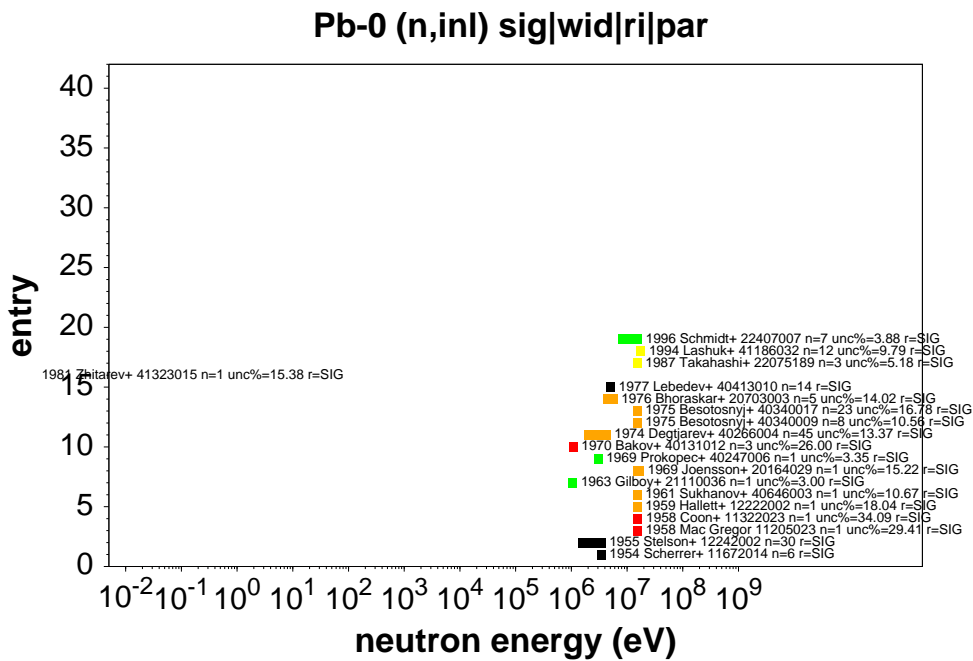
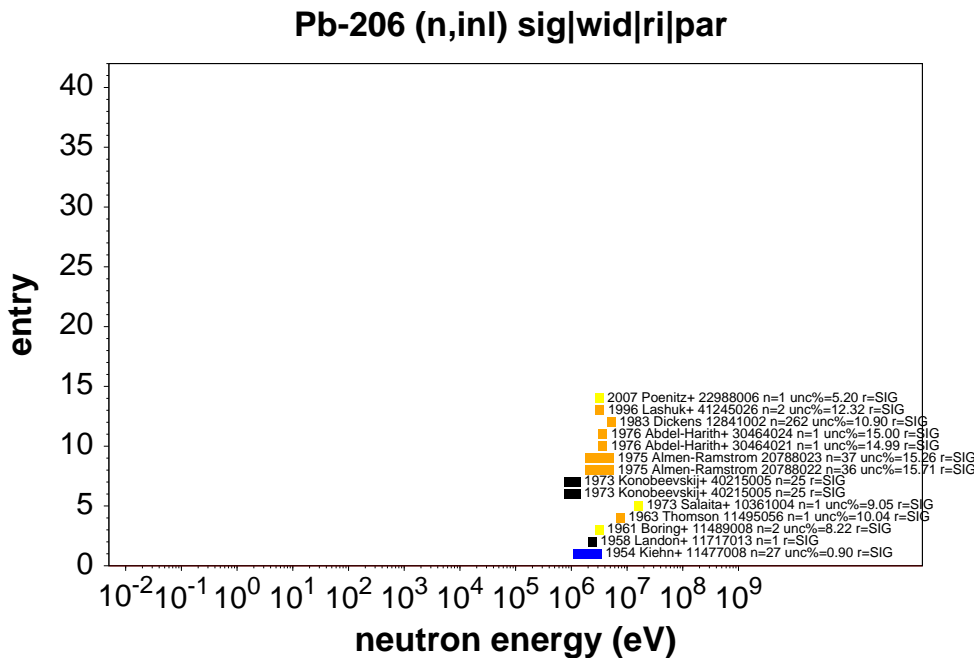


Figure A-76. Summary of the 37 EXFOR entries for the nuclide Na-23, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.



**Figure A-77.** Summary of the 19 EXFOR entries for the nuclide Pb-0, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.



**Figure A-78.** Summary of the 16 EXFOR entries for the nuclide Pb-206, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

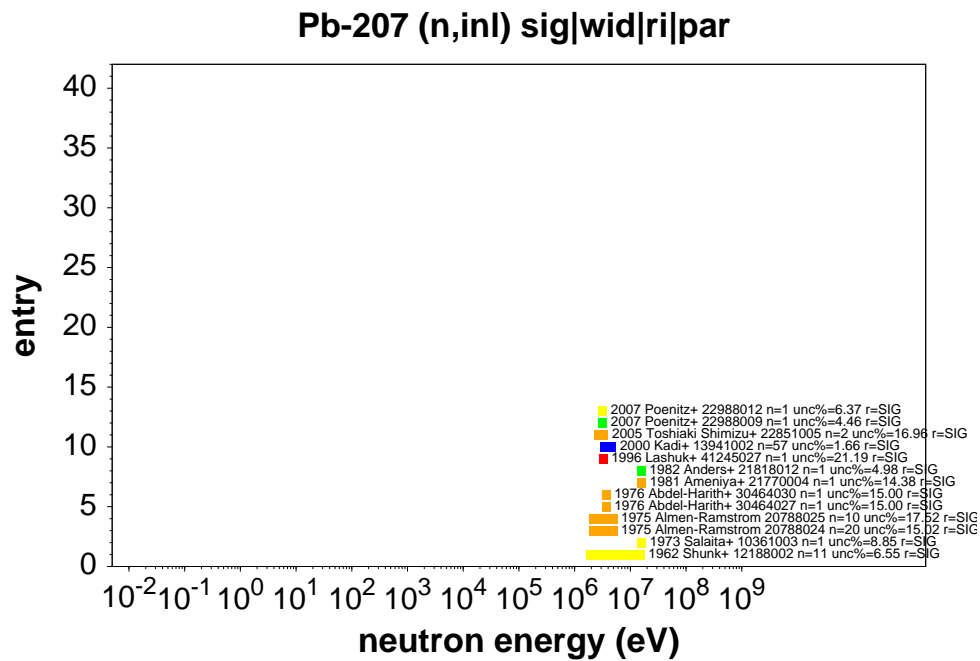


Figure A-79. Summary of the 15 EXFOR entries for the nuclide Pb-207, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

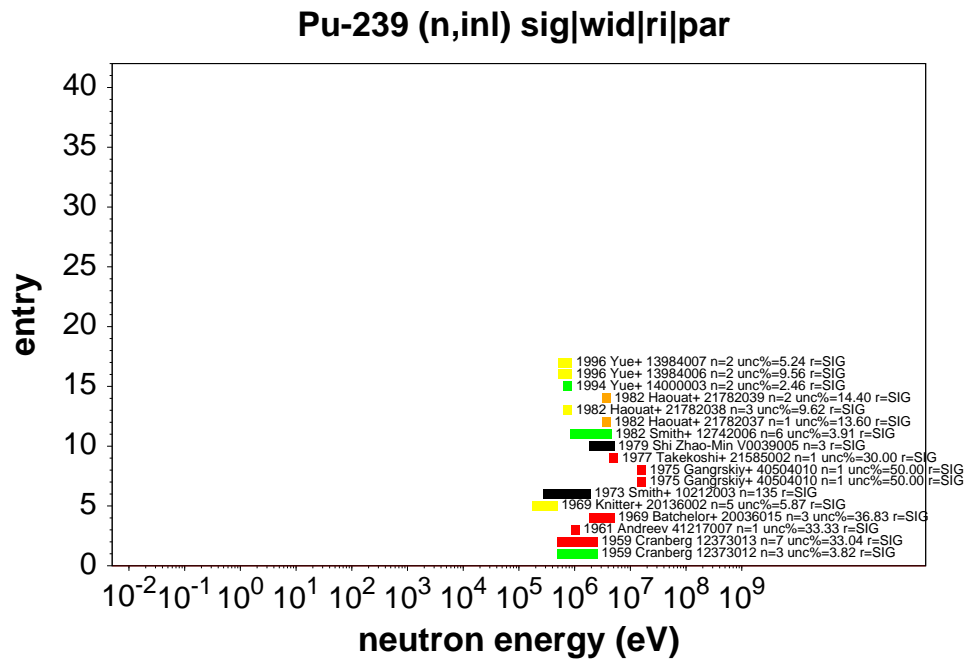
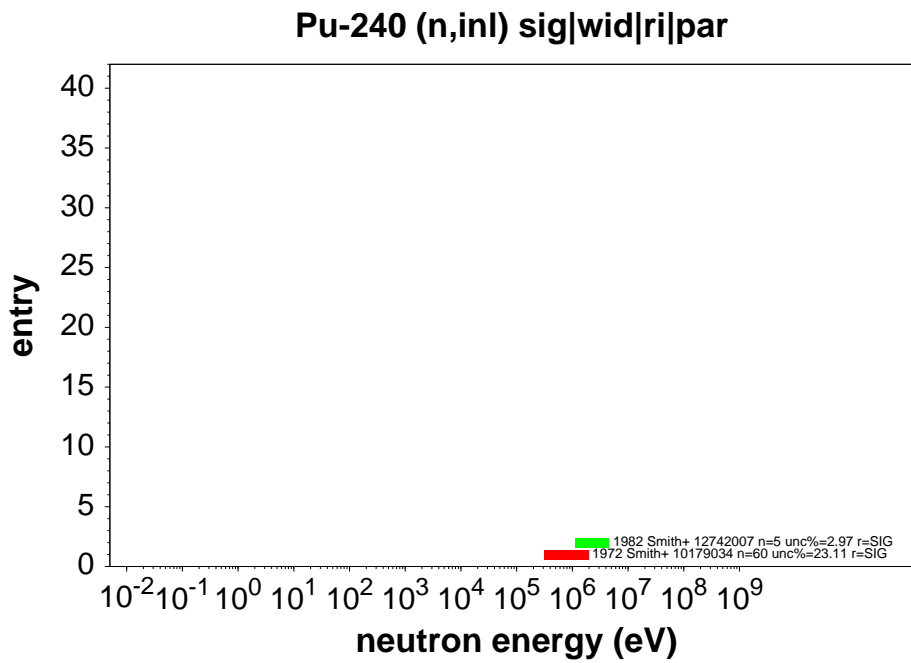
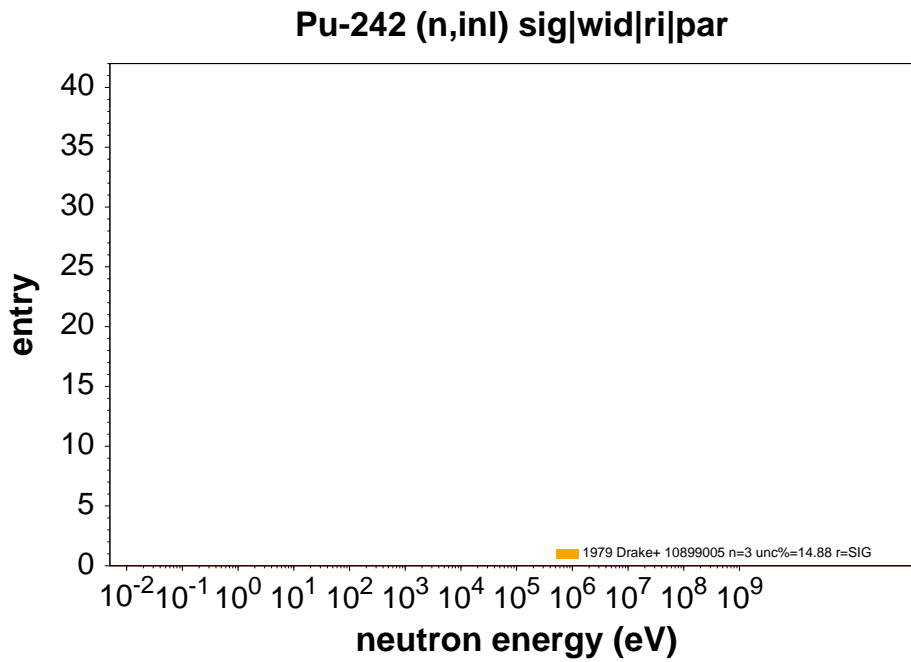


Figure A-80. Summary of the 17 EXFOR entries for the nuclide Pu-239, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.



**Figure A-81.** Summary of the 2 EXFOR entries for the nuclide Pu-240, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.



**Figure A-82.** Summary of the 1 EXFOR entries for the nuclide Pu-242, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### Si-28 (n,inl) sig|wid|ri|par

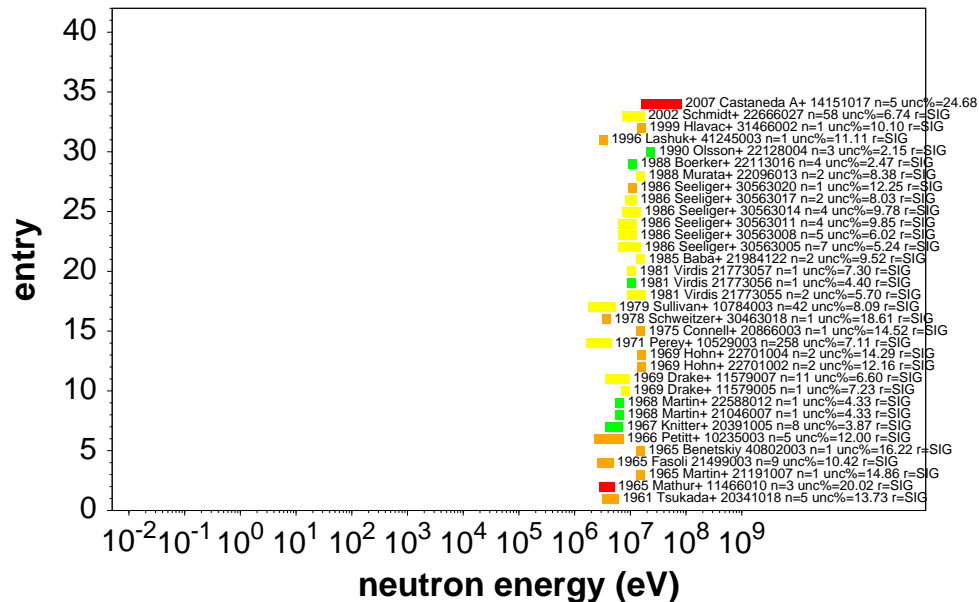


Figure A-83. Summary of the 37 EXFOR entries for the nuclide Si-28, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### U-238 (n,inl) sig|wid|ri|par

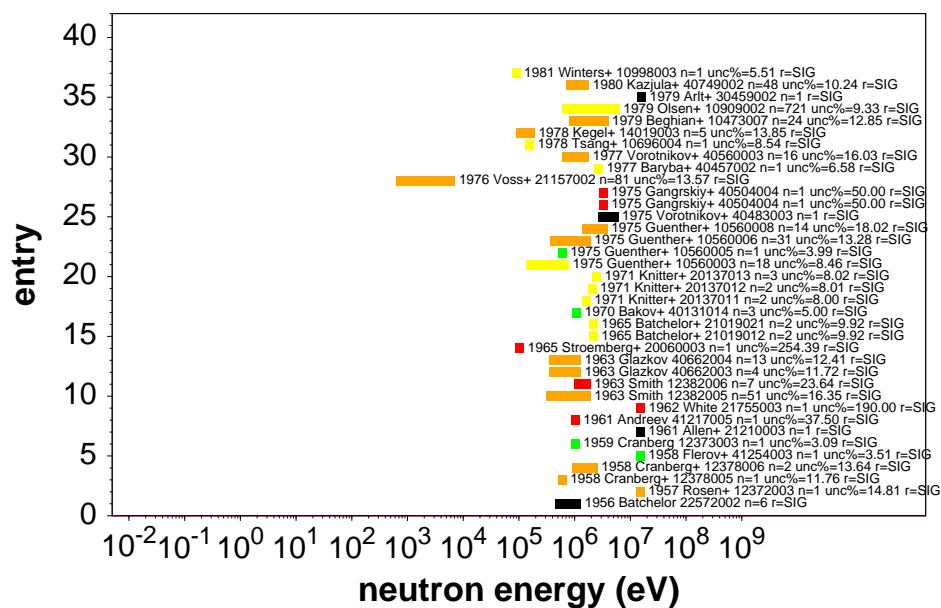
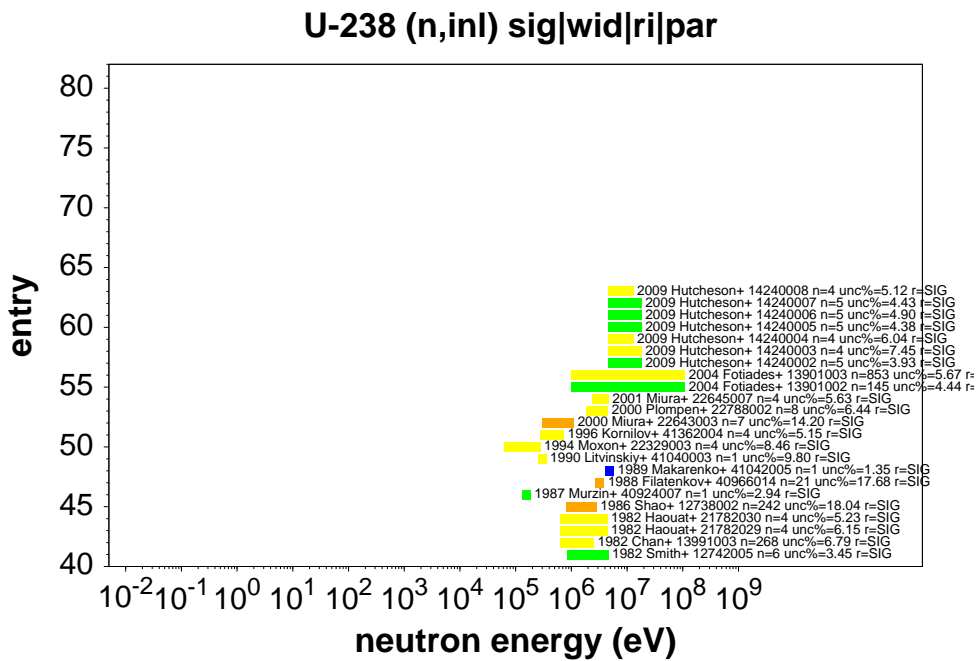
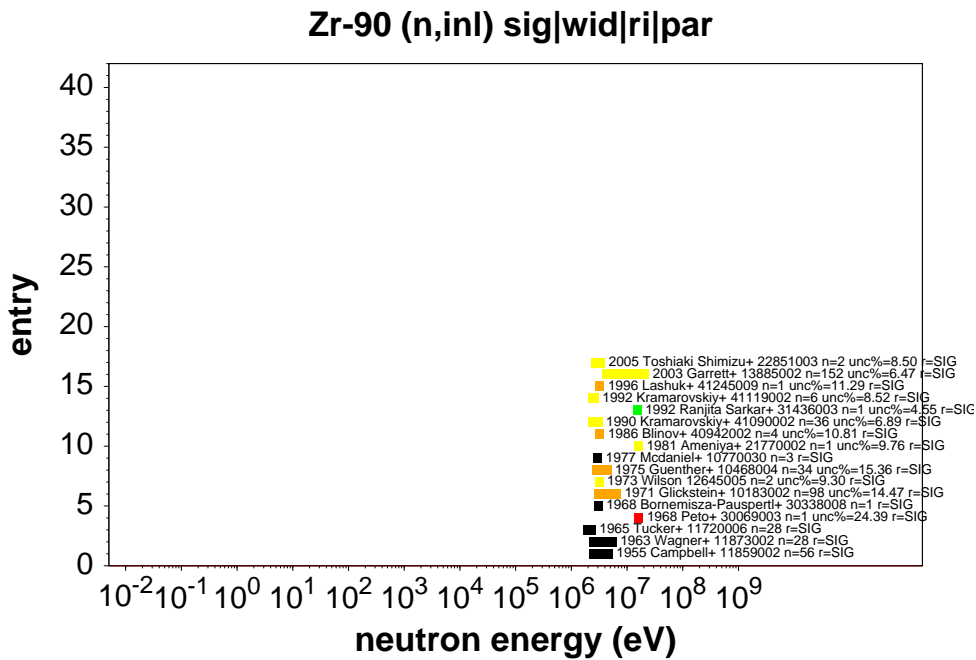


Figure A-84. Summary of the 63 EXFOR entries for the nuclide U-238, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 2.



**Figure A-85.** Summary of the 63 EXFOR entries for the nuclide U-238, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 2 of 2.



**Figure A-86.** Summary of the 17 EXFOR entries for the nuclide Zr-90, and reactions (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

### O-16|O-0 (n,sct|el|inl) sig|wid|ri|par

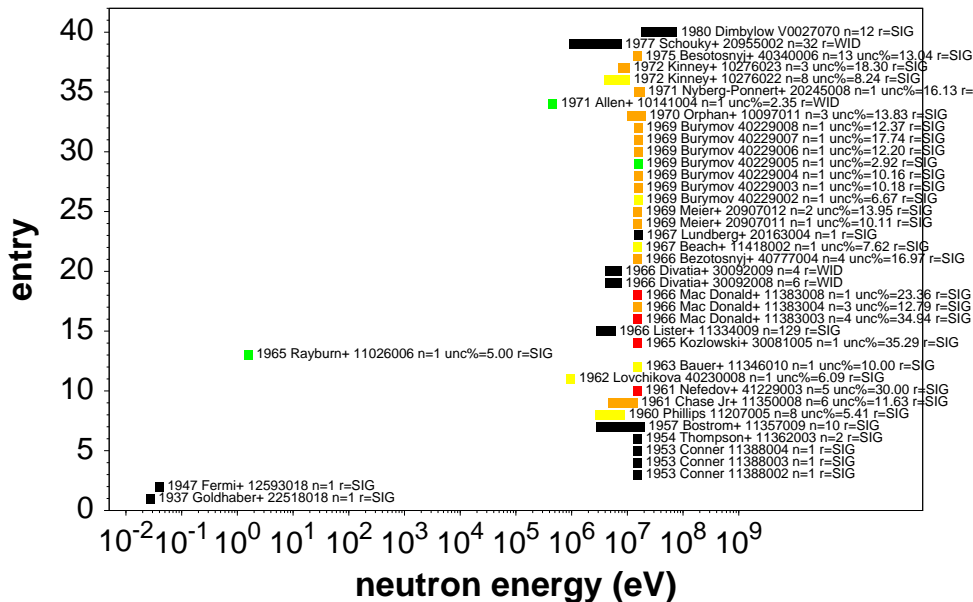


Figure A-87. Summary of the 53 EXFOR entries for the nuclide O-16, O-0, and reactions (n,sct), (n,el), (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 2.

### O-16|O-0 (n,sct|el|inl) sig|wid|ri|par

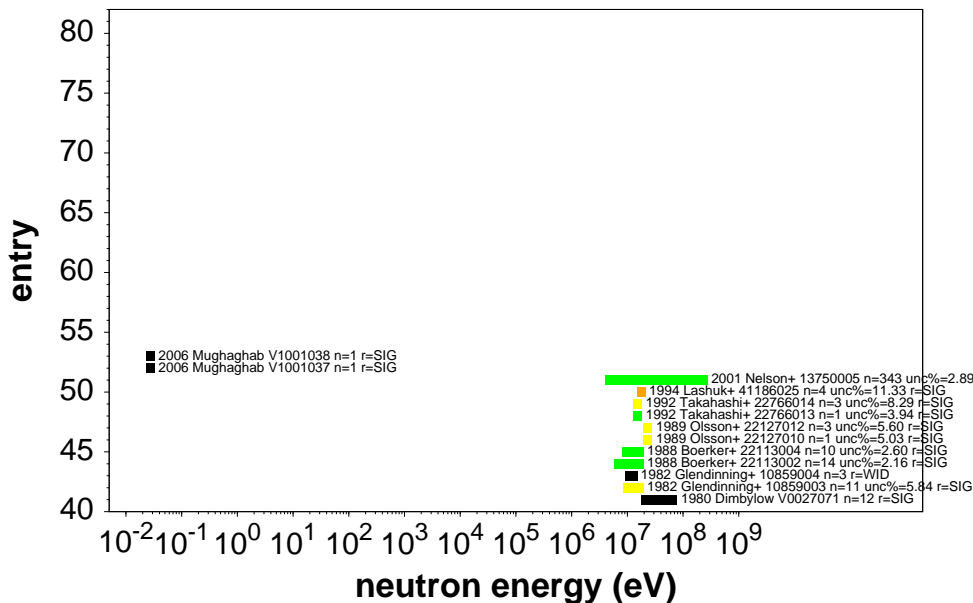


Figure A-88. Summary of the 53 EXFOR entries for the nuclide O-16, O-0, and reactions (n,sct), (n,el), (n,inl), for entries matching the quantities sig, wid, ri, par; part 2 of 2.



### U-238 (n,sct|e|inl) sig|wid|ri|par

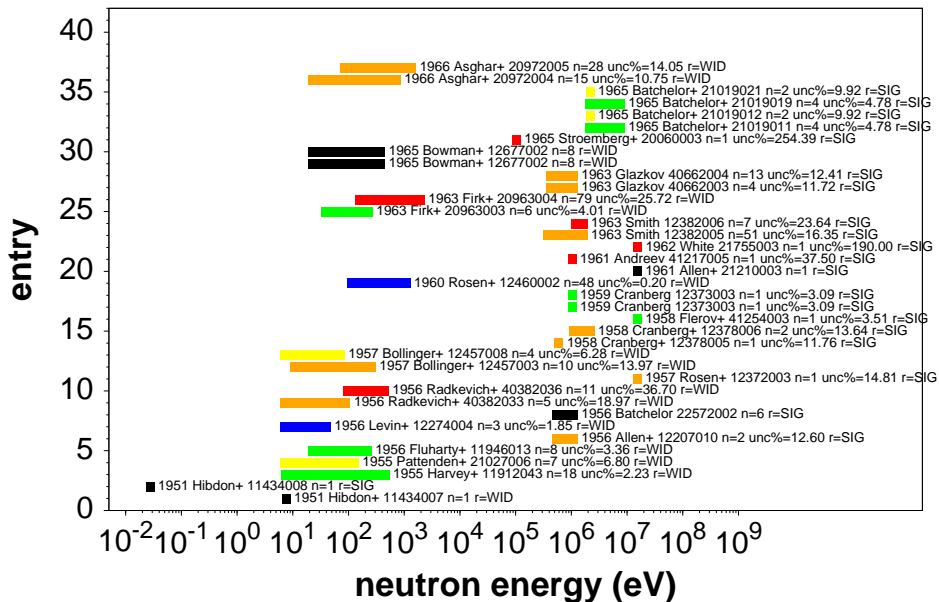


Figure A-89. Summary of the 131 EXFOR entries for the nuclide U-238, and reactions (n,sct), (n,e), (n,inl), for entries matching the quantities sig, wid, ri, par; part 1 of 4.

### U-238 (n,sct|e|inl) sig|wid|ri|par

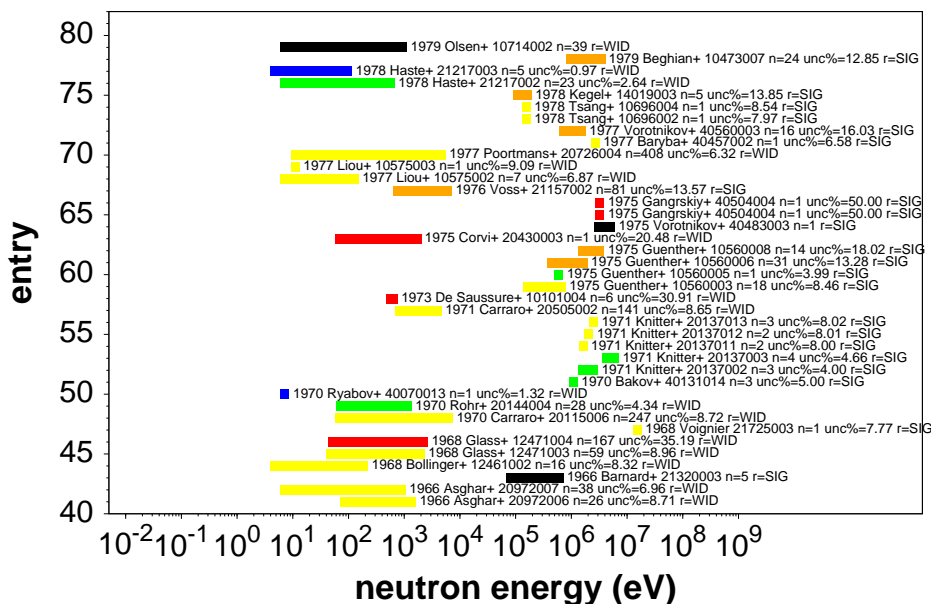


Figure A-90. Summary of the 131 EXFOR entries for the nuclide U-238, and reactions (n,sct), (n,e), (n,inl), for entries matching the quantities sig, wid, ri, par; part 2 of 4.

### U-238 (n,sct|el|in) sig|wid|ri|par

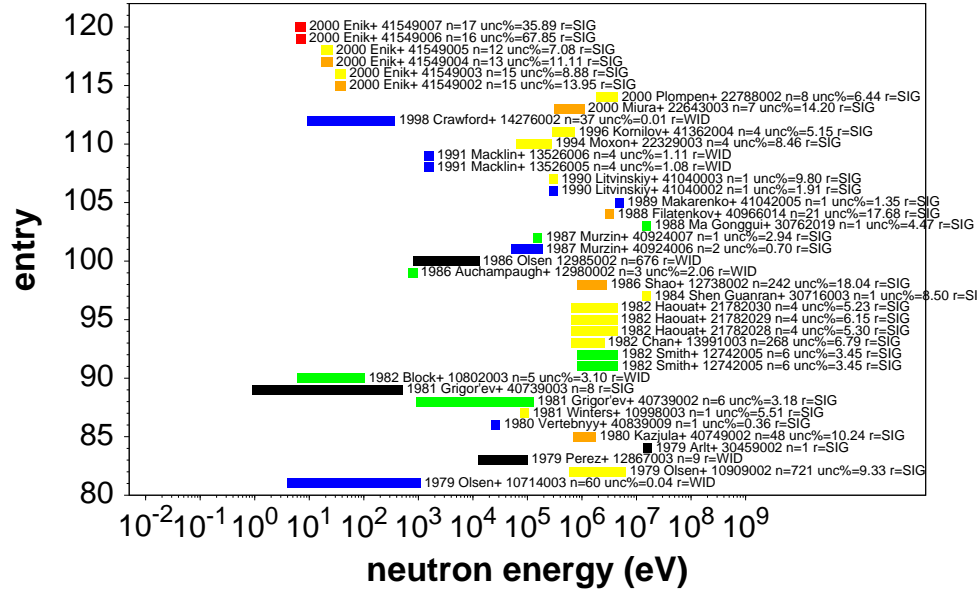


Figure A-91. Summary of the 131 EXFOR entries for the nuclide U-238, and reactions (n,sct), (n,el), (n,in), for entries matching the quantities sig, wid, ri, par; part 3 of 4.

### U-238 (n,sct|el|in) sig|wid|ri|par

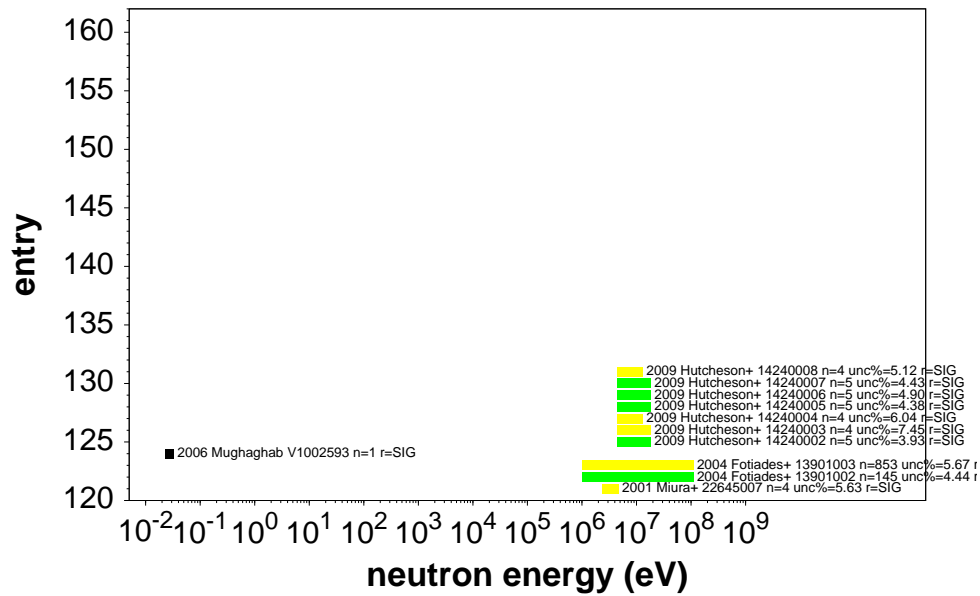


Figure A-92. Summary of the 131 EXFOR entries for the nuclide U-238, and reactions (n,sct), (n,el), (n,in), for entries matching the quantities sig, wid, ri, par; part 4 of 4.

### B-10 (n,a|abs|tot) sig|wid|ri|par

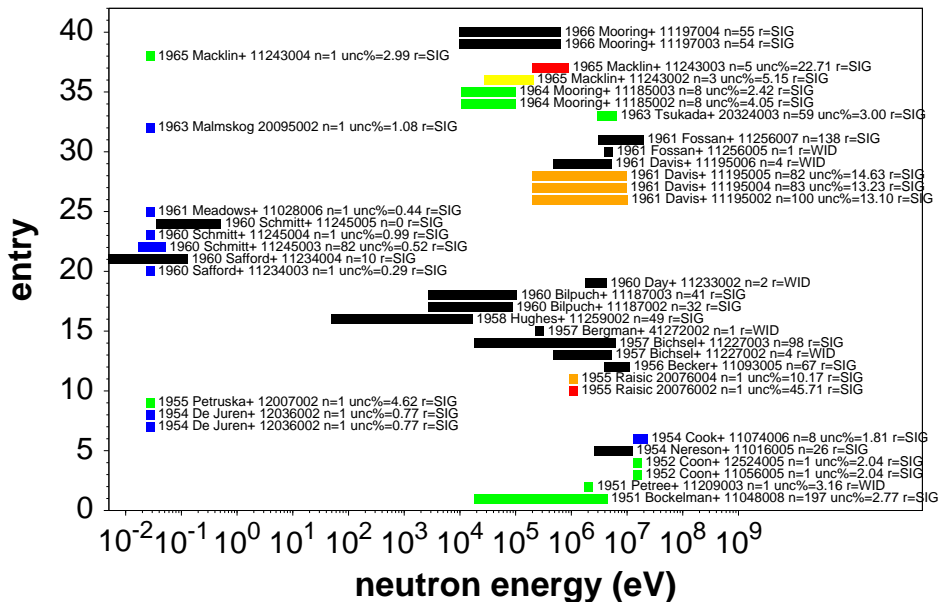


Figure A-93. Summary of the 117 EXFOR entries for the nuclide B-10, and reactions (n,a), (n,abs), (n,tot), for entries matching the quantities sig, wid, ri, par; part 1 of 3.

### B-10 (n,a|abs|tot) sig|wid|ri|par

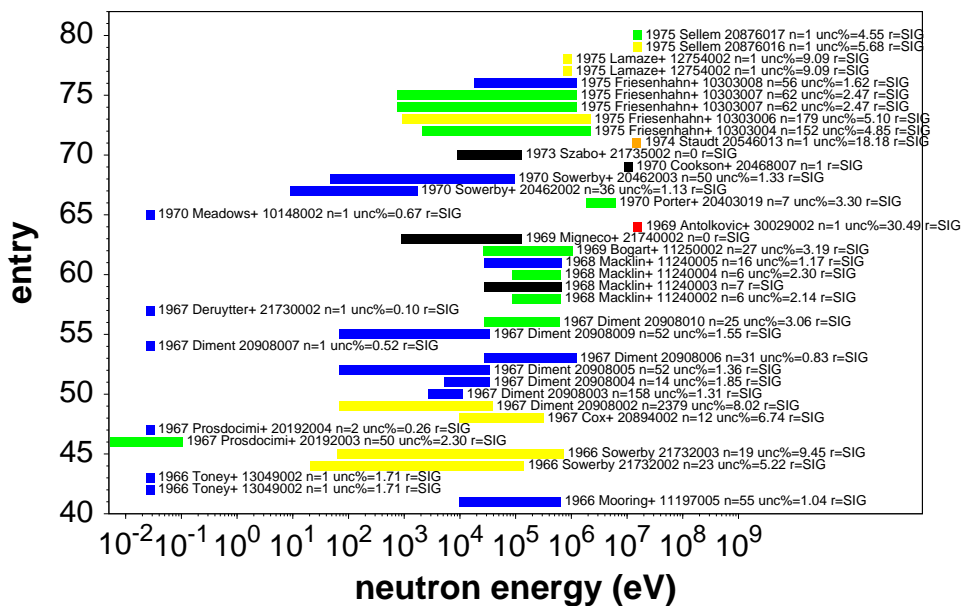
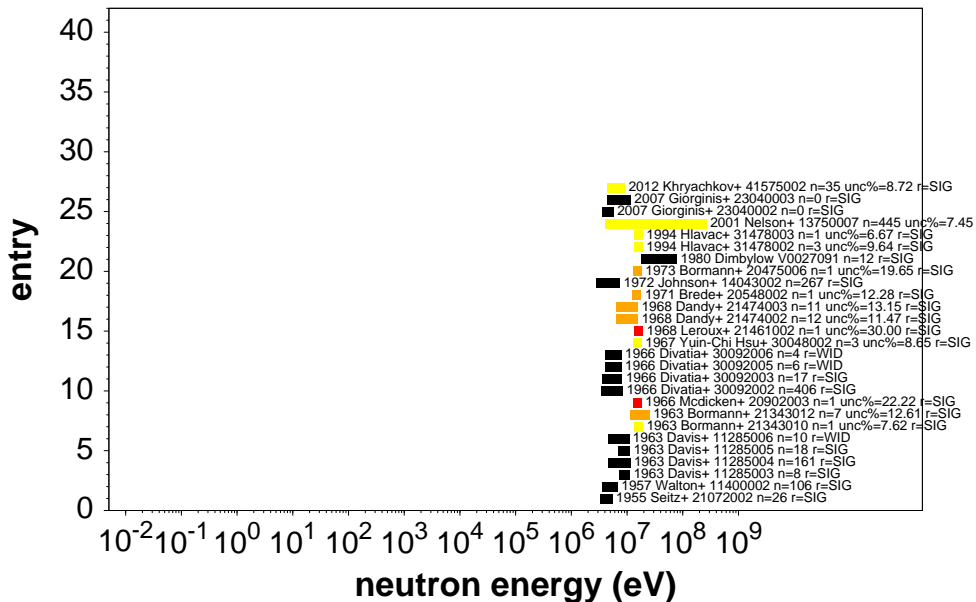


Figure A-94. Summary of the 117 EXFOR entries for the nuclide B-10, and reactions (n,a), (n,abs), (n,tot), for entries matching the quantities sig, wid, ri, par; part 2 of 3.



### O-16|O-0 (n,a|abs) sig|wid|ri|par



**Figure A-97.** Summary of the 27 EXFOR entries for the nuclide O-16, O-0, and reactions (n,a), (n,abs), for entries matching the quantities sig, wid, ri, par; part 1 of 1.

## References

- [1] EXFOR, *Experimental Nuclear Reaction Data Database*. See for example the OECD Nuclear Energy Agency on [www.nea.fr](http://www.nea.fr).
- [2] V. Zerkin. file: C4-2012-07-10.xc4.tbl. IAEA, Vienna. 2012.
- [3] <http://www-nds.iaea.org/ndspub/download-endf/Tools/x4app/x4app-2012-12-04.tar.gz>. IAEA, Vienna. 2012.
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- [5] <http://www.gnuplot.info>.
- [6] “Uncertainty And Target Accuracy Assessment For Innovative Systems Using Recent Covariance Data Evaluations”. NEA No. 6410 (2008).
- [7] G. Palmiotti et al. “Nuclear Data Target Accuracies for Generation-IV Systems Based on the Use of New Covariance Data”. *Journal Of The Korean Physical Society* 59.2, Part 3, SI (2011), 1264–1267.