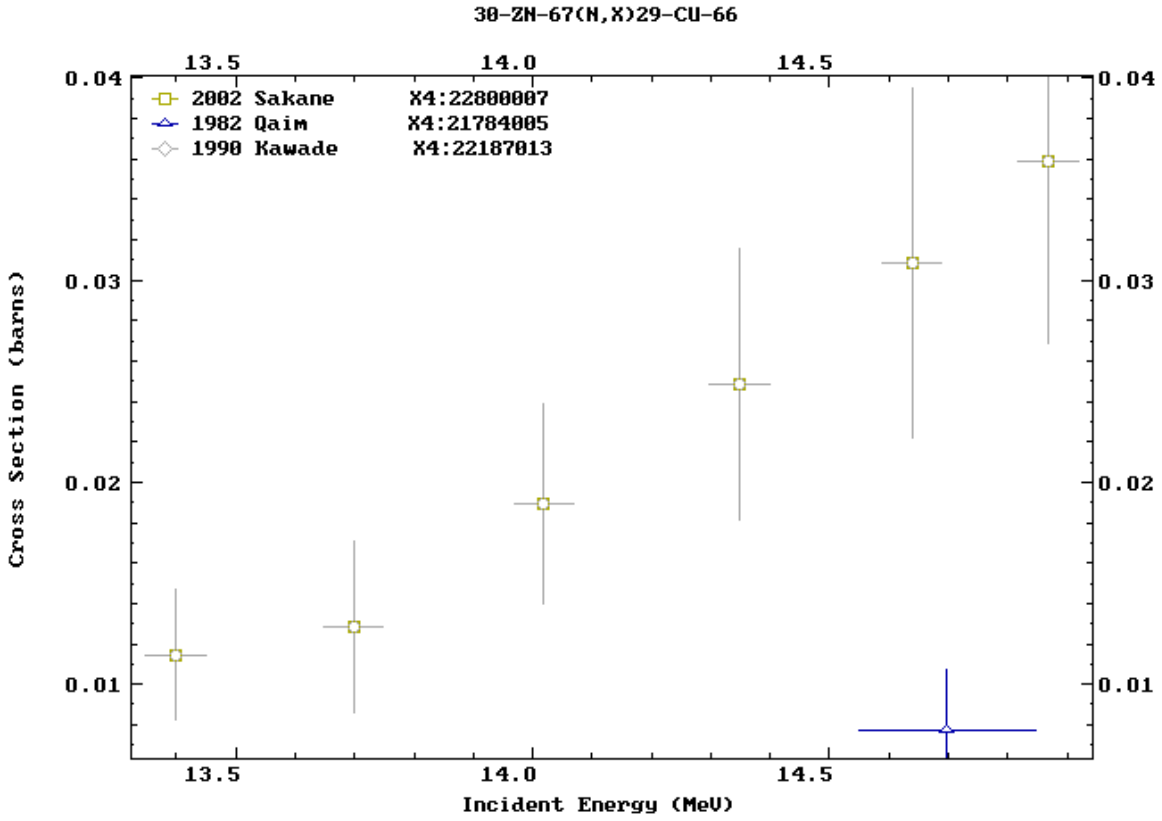
Archiving of Old Evaluated Data Libraries

(N. Otsuka, 2012-04-14)

B. Lalremruata (Mizoram Univ) and I found systematic duplication in EXFOR entries compiling cross sections measured at OKTAVIAN. As an example, ^{67}Zn(n,x)^{66}Cu cross sections are shown below. Duplication in data points compiled from Kawade et al. (1990) [1] and Sakane et al. (2002) [2] is clearly seen in addition to one data point from Qaim et al. [3]. We started discussion with Prof. K. Kawade (Nagoya Univ.) and his colleagues to understand and improve the situation of their EXFOR entries.



Their 1990 and 2002 publications explain that ^{27}Al(n,α)^{27}Mg cross section in ENDF-B/V and ENDF-B/VI libraries were adopted as standards, respectively. I looked for a system which allows comparison of ^{27}Al(n,α)^{27}Mg cross sections in both libraries, and could not find it. I got an ASCII file of ENDF-B/V from the NDS ENDF Archive (http://www-nds.iaea.org/ndspub/download-endf/ENDF-B-V/), and plot it after editing the ENDF/B-V MF3 file manually. The comparison (see the last page) shows about 3 to 4% difference, and therefore the above duplication is not understandable.

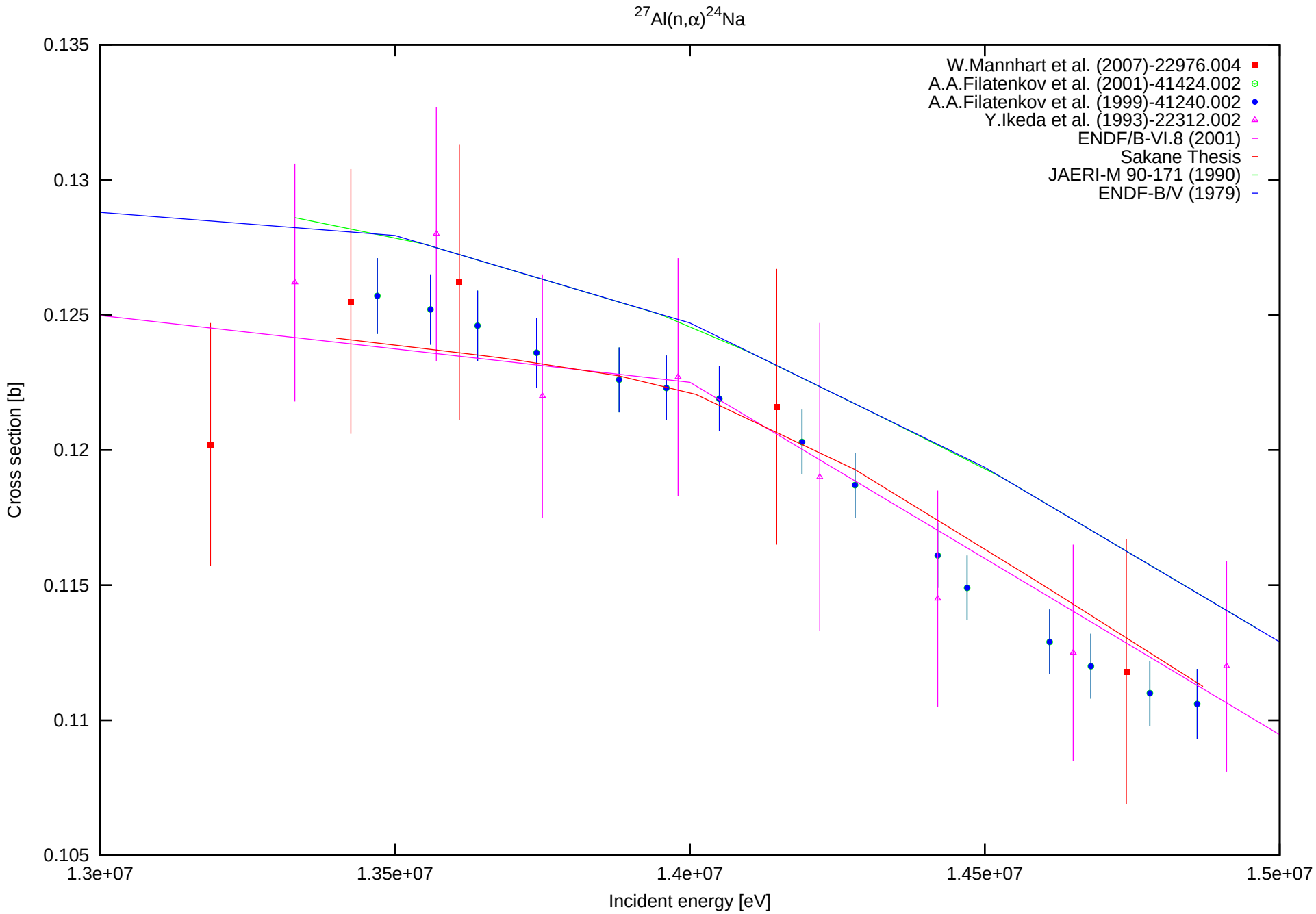
Cross sections in old data libraries are perhaps more important for renormalization of old experimental cross sections by the latest evaluated libraries. I recommend data centres to consider inclusion of old evaluated data libraries (especially cross sections used as standard) to their databases. The table of this paper shows extraction of old data libraries coded under `MONIT-REF` in the EXFOR library.

References

[1] K. Kawade et al., Report JAERI-M 90-171 (1990)
[2] H. Sakane et al., Ann. Nucl. Energy 29 (2002) 53.
[3] S. M. Qaim, Nucl. Phys. A382 (1982)255

Table: Old evaluated data libraries coded under EXFOR MONIT-REF.

Library	**REACTION**
ENDF/B-4	6-C-12(N,EL)6-C-12,,DA
ENDF/B-4	26-FE-56(N,INL)26-FE-56,PAR,SIG
ENDF/B-III	5-B-10(N,A)3-LI-7,,SIG,,AV
ENDF/B-IV	92-U-235(N,F),,SIG
ENDF/B-IV	92-U-238(N,F),,SIG
ENDF/B-IV	79-AU-197(N,G)79-AU-198,,SIG
ENDF/B-IV	13-AL-27(N,A)11-NA-24,,SIG
ENDF/B-IV	26-FE-56(N,P)25-MN-56,,SIG
ENDF/B-IV	3-LI-6(N,T)2-HE-4,,SIG
ENDF/B-IV	13-AL-27(N,A)11-NA-24,,SIG,,,EVAL
ENDF/B-IV	92-U-238(N,F),,SIG,,,EVAL
ENDF/B-IV	26-FE-56(N,P)25-MN-56,,SIG,,,EVAL
ENDF/B-IV	29-CU-65(N,2N)29-CU-64,,SIG,,,EVAL
ENDF/B-IV	29-CU-63(N,2N)29-CU-62,,SIG,,,EVAL
ENDF/B-V	3-LI-7(N,INL)3-LI-7,PAR,SIG
ENDF/B-V	49-IN-115(N,INL)49-IN-115-M,,SIG
ENDF/B-V	79-AU-197(N,G)79-AU-198,,SIG
ENDF/B-V	1-H-1(N,EL)1-H-1,,DA
ENDF/B-V	13-AL-27(N,A)11-NA-24,,SIG
ENDF/B-V	41-NB-93(N,2N)41-NB-92-M,,SIG
ENDF/B-V	13-AL-27(N,P)12-MG-27,,SIG
ENDF/B-V	13-AL-27(N,A)11-NA-24-G,,SIG
ENDF/B-V	13-AL-27(N,A)11-NA-24,,SIG
ENDF/B-V	26-FE-56(N,P)25-MN-56,,SIG
ENDF/B-V	92-U-238(N,2N)92-U-237,,SIG
ENDF/B-V	92-U-238(N,F),,SIG
ENDF/B-V	3-LI-6(N,T)2-HE-4,,SIG
ENDF/B-V	92-U-235(N,F),,SIG
ENDF/B-V	94-PU-239(N,F),,SIG,,AV
ENDF/B-V	94-PU-241(N,F),,SIG,,AV
ENDF/B-V	95-AM-242-M(N,F),,SIG,,AV
ENDF/B-V	96-CM-245(N,F),,SIG,,AV
ENDF/B-V	94-PU-239(N,F),,SIG
ENDF/B-VI	92-U-235(N,F),,SIG
IRDF-90	13-AL-27(N,A)11-NA-24,,SIG
IRDF-90	41-NB-93(N,2N)41-NB-92-M,,SIG
IRDF-90	29-CU-63(N,A)27-CO-60,,SIG
JENDL-D-99	49-IN-115(N,INL)49-IN-115-M,,SIG
JENDL-D-99	13-AL-27(N,P)12-MG-27,,SIG


^{27}Al(n,α)^{24}Na
W.Mannhart et al. (2007)-22976.004
A.A.Filatenkov et al. (2001)-41424.002
A.A.Filatenkov et al. (1999)-41240.002
Y.Ikeda et al. (1993)-22312.002
ENDF/B-VI.8 (2001)
Sakane Thesis
JAERI-M 90-171 (1990)
ENDF-B/V (1979)
Cross section [b]
0.135
0.13
0.125
0.12
0.115
0.11
0.105
1.3e+07
1.35e+07
1.4e+07
1.45e+07
1.5e+07
Incident energy [eV]