Problem on Unresolved Resonance Data in ENDF/B-VI, etc.

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At the 2003 symposium on nuclear data the followings are pointed out [1];

1) Elastic scattering cross section data of many nuclei with self-shielding correction in JENDL-3.3 a large strange ramp at the upper energy of the unresolved resonance region.
2) The larger average reduced neutron widths are required to obtain average elastic scattering cross sections in the unresolved resonance region but they cause larger self-shielding correction.
3) The average reduced neutron widths or the upper energy of the unresolved resonance region in JENDL-3.3 should be checked.

Other evaluated nuclear data libraries may have the same problems. Here ENDF/B-VI is investigated.

The check procedure is the followings;

1) Matxs files of ENDF/VB-VI with unresolved resonance data were produced with the NJOY code in the same conditions as MATXSLIB-J33 [2].
2) Multigroup libraries with and without self-shielding correction from the matxs files of ENDF/B-VI were made with the TRANSX code.
3) Multigroup elastic cross section data with self-shielding correction were compared.
4) If the elastic cross section with self-shielding correction of a nucleus has a large strange ramp in at the upper energy of the unresolved resonance region, the unresolved data of the nucleus has some problems.

All the data of nuclei (~ 80) with unresolved resonance data in ENDF/B-VI were examined. Unresolved resonance data of about half of the nuclei (~ 40) have some problems. The unresolved resonance data in ENDF/B-VI should be rechecked and revised by considering self-shielding correction in the next version.

Results of the same tests for BROND2.2 and CENDL2.1 will be presented.

References

[1] C. Konno : JAERI-Conf 2004-005, p. 236.
[2] K. Kosako, et al. : JAERI-Data/Code 2003-011.