DETAIL BENCHMARK TEST ON JENDL-4 IRON DATA

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JENDL-4, the major revised version of Japanese Evaluated Nuclear Data Library (JENDL), was released in spring, 2010. We carried out the benchmark tests of JEDL-4 by analyzing our integral benchmark experiments (in-situ and Time-of-Flight (TOF) experiments) with DT neutrons at the Fusion Neutronics Source (FNS) facility in Japan Atomic Energy Agency (JAEA). The MCNP code was used in the analysis. ACE files of JENDL-4 were produced with NJOY99.304 and patches for JENDL-4.

It was found out that the iron data in JENDL-4 were particularly improved. Figure 1 shows neutron spectra at the depth of 41 cm in the in-situ experiment with an iron assembly of 1 m in diameter and 0.95 m in thickness. The calculated spectrum with JENDL-4 agrees with the measured one much better than that with JENDL-3.3. This improvement comes from the modification of the first inelastic scattering cross section of ^{57}Fe.

Figure 2 shows the ratio of calculated to experimental data (C/E) for the neutron flux above 10 MeV in the in-situ experiment with the iron assembly. The underestimation tendency in the calculation result with JENDL-3.3 is improved in the calculation result with JENDL-4. The higher forward peak angular distribution in the elastic scattering reaction of JENDL-4 ^{56}Fe leads this improvement.

We pointed out that the above problems in JENDL-3.3.[1] It was confirmed that the problems of iron data in JENDL-3.3 were adequately modified. In the conference we will also compare JENDL-4 iron data with those in other nuclear data libraries.

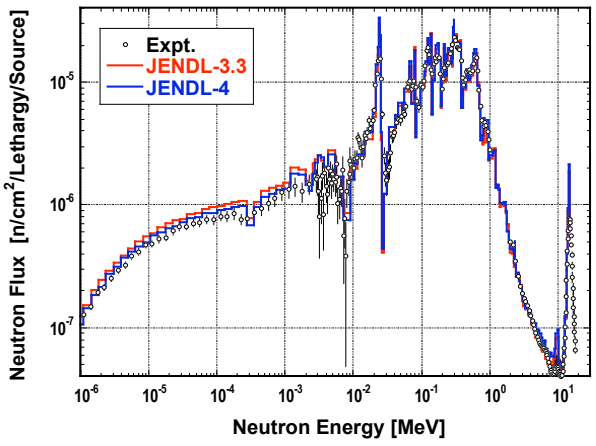

Figure 1: Neutron spectra at 41 cm inside iron assembly

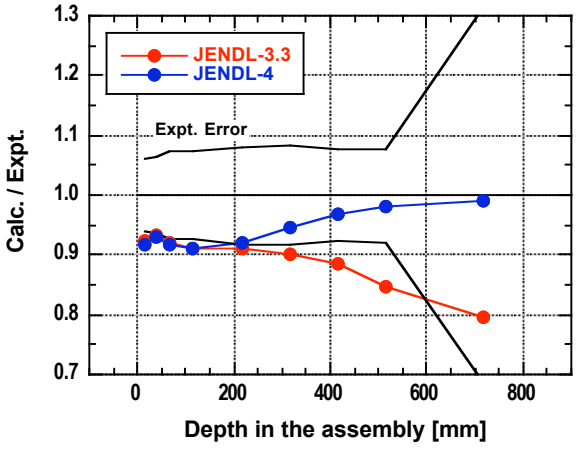

Figure 2 : C/E of neutron flux above 10 MeV

[1] C. Konno et al., Fusion Eng. Design, 84, 2009, 1095-1098