

Status of papers, especially the Big Paper

D. Brown for the CSEWG collaboration
National Nuclear Data Center, BNL



Paper(s) Status

Each ENDF/B release is documented in an NDS special issue



ENDF/B-VII.0 contains 393 neutron evaluations;
1764 citations since 2006 (Google Scholar)

ENDF/B-VII.1 contains 423 neutron evaluations;
1253 citations since 2011 (Google Scholar)

Paper(s) Status

Not shown:

- Neutron standards: Back to referees (10/30)

- 235,238U: In revision

- PFNS measurement: Accepted

- 239Pu(n,γ) measurement: Accepted

- 16O: Late, aiming for other journal

ENDF/B-VIII.0: In revision

ENDF/B-VIII.0: The 8th Major Release of the Nuclear Reaction Data Library with CIELO-project Cross Sections, New Standards and Thermal Scattering Data

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We describe the new ENDF/B-VIII.0 evaluated nuclear reaction data library. ENDF/B-VIII.0 fully incorporates the new IAEA standards, includes improved thermal neutron scattering data and uses new evaluated data from the CIELO project for neutron reactions on ¹⁹F, ²⁰Ne, ²³Na, and ²³⁹Pu, described in companion papers in the present issue of *Nuclear Data Sheets*. The evaluations benefit from recent experimental data obtained in the U.S. and Europe, and improvements in theory and simulation. Notable advances include updated evaluated cross sections for light nuclei, structural materials, activation, fusion energy release, prompt fission neutron and γ -ray spectra, thermal neutron scattering data, and charged-particle reactions. Integral validation testing is shown for a wide range of criticality, reaction rates, and neutron transmission benchmarks. In general, integral validation performance of

PFNS: Accepted

Evaluations of Energy Spectra of Neutrons Emitted Promptly in Neutron-induced Fission of ²³⁵U and ²³⁹Pu

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The energy spectra of neutrons emitted promptly in the neutron-induced fission reactions of ²³⁵U and ²³⁹Pu were re-evaluated for ENDF/B-VIII.0. These evaluations are based on a careful modeling of all relevant physics processes, an extensive analysis of experimental data and a detailed identification of pertinent uncertainties. Energy spectra of neutrons emitted in up to ten different fission channels are considered and both compound and pre-equilibrium processes are included. Also, important nuclear model parameters, such as the average total kinetic energy of the fission fragments and the multiple charge-fission probabilities, and their uncertainties are estimated based on experimental knowledge, model information and evaluated data. In addition to experimental information already available for ENDF/B-VIII.0, these new evaluations make use of recently published experimental data either of high precision or spanning a broad incident energy range, information on legacy measurements explaining discrepancies and recently measured data of average total kinetic energy as a function of incident neutron energy. The resulting evaluated data and covariances agree well with the experimental data used for the evaluation. However, the evaluated spectra are softer than the ²³⁵U and ²³⁹Pu ENDF/B-VIII.0 and JEFF-3.2 evaluations for incident neutron energies $E_{inc} < 1.5$ MeV and $E_{inc} < 5$ MeV, respectively. For $E_{inc} > 5$ MeV, the evaluated spectra show structure due to the improved modeling which are not present in ENDF/B-VIII.0 and JEFF-3.2 but can be observed in JENDL-4.0 evaluations. Part of these new evaluations were adopted for ENDF/B-VIII.0, while the ENDF/B-VIII.1 ²³⁹Pu PFNS was retained for $E_{inc} < 5$ MeV awaiting more conclusive experimental evidence.

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CIELO: Accepted

CIELO Collaboration Summary Results: International Evaluations of Neutron Reactions on Uranium, Plutonium, Iron, Oxygen and Hydrogen

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The CIELO collaboration has studied neutron cross sections on nuclei that significantly impact criticality in nuclear technologies. ²³⁵U, ²³⁹Pu, ²³⁸U and ²³⁸Pu and ²³⁸U with the aim of improving the accuracy of the data and resolving previous discrepancies in our understanding. This multi-laboratory pilot project, coordinated with the OECD/NEA Working Party on Evaluation Cooperation (WPEC) Subgroup 40 with support also from the IAEA, has motivated experimental and theoretical work and led to suites of new evaluated libraries that accurately reflect measured data and also perform

PFNS: Accepted

Evaluation of Neutron Reactions on Iron Isotopes for CIELO and ENDF/B-VIII.0

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The new suite of evaluations for ^{54,56,57,58}Fe has been developed in the frame of the CIELO international collaboration. New resolved resonances ranges were evaluated for ⁵⁶Fe and ⁵⁷Fe, while modifications were applied to resonances in ⁵⁸Fe. The low energy part of the ⁵⁶Fe file is almost totally based on the measurements. All the energy ranges in ^{56,57,58}Fe that were not covered by the measurements evaluation consist of model predictions carefully adjusted to available experimental data. We also make use of the high quality, and well experimentally-constrained differential evaluations from the IRRF/IBR2 theory. Special attention was dedicated to the elastic angular distributions, which were found to affect results of the integral benchmarking. The new set of iron evaluations was developed in concert with other CIELO evaluations and they were tested together in the integral experiments before being adopted for the ENDF/B-VIII.0 library.

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Big Paper Status

Paper back from referees (there are 3)

- Due back to Pavel 15 Nov 2017
- Referee comments on Google docs
- Comments VERY FAVORABLE
- We (Mark, Patrick, Denise, Dave) contacting people with requested fixes

Given short time scale, we have time for proactive corrections from you and not much else

Big Issues with the Big Paper

- **Missing final appendix with benchmark summary** (Skip will need formatting help)
- **Update all figs with final library** (Anyone have photoshop?)
- **Covariance section needs edits** (Patrick lead)
- **EPICS2017** (Dave lead)