

Status of JENDL

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Introduction

The current version JENDL-4.0 was released in 2010 with improving fission-product, minor-actinide, and covariance.

We are trying to develop nuclear data libraries to meet needs in various field of applications.

Special Purpose File (Recently released)

[JENDL/PD-2016.1](#): revision of photonuclear data file (Feb. 2020)

[JENDL/DEU-2020](#): deuteron induced reaction (Feb. 2021)

General Purpose File

[JENDL-5](#): under development

JENDL/PD-2016.1



JENDL Photonuclear Data File 2016 revision 1

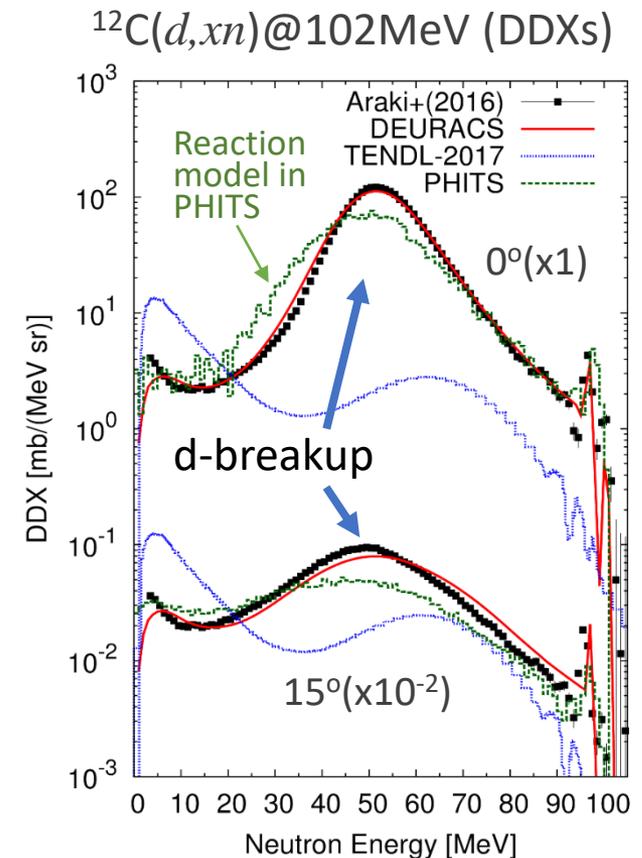
The evaluations have been done in connection with IAEA CRP on “Photonuclear Data and Photon Strength Functions.”

- The file includes the data of 2,684 nuclides ranging from H-2 ($Z=1$) to Lr-266 ($Z=103$).
- The photonuclear data are revised for 1096 nuclides from Si to Fm: mainly structural nuclides, actinides and nuclides with 10 min half-life or longer along the stability line.
- The upper energy is extended up to 200 MeV for nuclides evaluated by the CCONE code by the request of the CRP.

JENDL/DEU-2020

JENDL deuteron reaction data file

- Aiming to provide the data for accelerator-based neutron source
- The file contains the deuteron induced reaction data on Li-6,7, Be-9, and C-12, 13 up to 200 MeV.
- Evaluations have been performed with a reaction model code system DEURACS (CDCC + Glauber + DWBA + CCONE).
- The data will be prepared in the format of ENDF, ACE and Frag data (PHITS).



JENDL-5

For acceleration of nuclear innovation on backend as well as various applications

- Neutron data
 - Include all stable isotopes
 - Add isomer production for activation
 - Resonance of light nuclei by a new R-matrix code AMUR
 - MA resonance with new J-PARC data
 - Fast neutron fission cross section for major actinide (new simultaneous evaluation)
- New evaluation of thermal scattering law by MD
 - light water, heavy water, methane, benzene, etc.
- Other data
 - Decay data and fission product yield
 - charged particle and photon induced reactions
- To be released in 2021

Updates of neutron data

- Revisions or new evaluations have been made for
 - C, N, O, Ne, Na, Cl, Cr, Mn, Co, Cu, Zn, Ga, Sr, Zr, Nb, Tc, Ru, Pd, Sb, Te, I, Pr, Eu, Gd, Er, Ta, Re, Pt, Hg, Tl, Pb, Bi, U, Pu, Am, Cm
 - thermal scattering law for light water
- Several test libraries of JENDL-5 was created for benchmark testing of nuclear reactor and neutron shielding.
 - Feedbacks are reflecting to the evaluations of nuclear data of major isotopes.

Other sub-libraries

- Decay data
 - Update of JENDL/DDF-2015 with newer ENSDF data, theoretical calculation of beta-decay, delayed neutron spectrum, etc.
- Fission product yield
 - New evaluation with covariance data
K. Tsubakihara et al. JNST 58, 151 (2021)
- Charged-particle and photon induced reactions
 - Proton: JENDL/ImPACT-2018, JENDL-4.0/HE
 - Deuteron: JENDL/DEU-2020 + alpha
 - Photon: JENDL/PD-2016.1

V&V of nuclear data using integral experiments (1/2)

- Comparison of k-effective
 - Experimental data are obtained from ICSBEP, IRPhEP, and our own experimental data.
 - JOYO, MONJU, FCA,...
 - Continuous energy Monte Carlo calculation code MVP is used.
 - Cross section library is processed by FRENDY+LICEM.
- JAEA prepares **additional MVP input files** for ICSBEP/IRPhEP benchmarks.
 - Complete MVP input files for **Mosteller's suite**

V&V of nuclear data using integral experiments (2/2)

- DICE code of OECD/NEA is used to obtain the sensitivity analysis results.
 - To find the cause of difference between nuclear data libraries
 - To find which reaction and energy region affect the k-effective

V&V of nuclear data using PIE data

- Input files of PIE data are also prepared.
 - Takahama, Ohi, Fukushima-Daini, and so on.
 - SWAT (MVP+ORIGEN) is used for the PIE calculations.
- These PIE data will be used for validation of JENDL-5.