



Progress Report of Nuclear Data Center of Japan Atomic Energy Agency for FY 2021 – 2022

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JAEA/NDC

- JAEA/NDC consists of 9 staffs.
 - 7 regular staffs, 1 postdoc and 1 secretaries as of April 1, 2023.
- Nuclear data measurements
 - TOF neutron cross section measurement with ANNRI in MLF at J-PARC
 - Activation cross section measurement at KUR and JRR-3
- Nuclear data libraries
 - JENDL-5 (released in 2021): general purpose file
(11 updated files have been released for correction of errors in JENDL-5)

Neutron TOF C.S. measurements

- [241Am Neutron Capture Cross Section](#) in the keV region using Si and Fe-filtered neutron beams, G. Rovira et al., JNST, 60(5), 489 (2023).
- KeV-neutron [capture cross-section](#) measurement of [197Au](#) with a Cr-filtered neutron beam at the ANNRI beamline of MLF/J-PARC, G. Rovira et al., JNST, 59(5), 647-655 (2022).
- [Neutron capture and total cross-section](#) measurements and resonance parameter analysis of [niobium-93](#) below 400 eV, S. Endo et al., JNST, 59(3), 318-333 (2022).
- KeV-region analysis of the [neutron capture cross-section of 237Np](#), G. Rovira et al., JNST, 59(1), 110-122 (2022).
- Measurements of the [neutron capture cross section of 243Am](#) around 23.5 keV, Y. Kodama et al., JNST, 58(11), 1159-1164 (2021).
- [Neutron beam filter system](#) for [fast neutron cross-section](#) measurement at the ANNRI beamline of MLF/J-PARC, G. Rovira et al., NIM A, 1003, 165318 (2021).
- [Neutron capture cross sections](#) of [curium isotopes](#) measured with ANNRI at J-PARC, S. Kawase et al. JNST, 58(7), 764-786 (2021).

Neutron activation measurements

- [Neutron capture cross-section](#) measurement by mass spectrometry for [Pb-204](#) irradiated in JRR-3, S. Nakamura et al., JNST, published online (2023). doi:10.1080/00223131.2023.2172088
- [Thermal-neutron capture cross-section](#) measurements of [neptunium-237](#) with graphite thermal column in KUR, S. Nakamura, JNST 59(11), 1388 (2022).
- [Integral experiment](#) of [129I\(n, \$\gamma\$ \)](#) using fast neutron source in the "YAYOI" reactor, S. Nakamura et al., JNST, 59(7), 851-865 (2022).
- Measurements of [thermal-neutron capture cross-section](#) of the [237Np\(n, \$\gamma\$ \)](#) reaction with TC-Pn in KUR, S. Nakamura et al., KURNS Progress Report 2021, 93-93 (2022).
- [Integral experiments](#) of [technetium-99](#) using fast-neutron source reactor "YAYOI", S. Nakamura, JNST, 58(12), 1318-1329 (2021).
- [Thermal-neutron capture cross-section](#) measurement of [tantalum-181](#) using graphite thermal column at KUR, S. Nakamura et al., JNST, 58(10), 1061-1070 (2021).
- [Thermal-neutron capture cross-section](#) measurement of [237Np](#) using graphite thermal column, S. Nakamura et al., KURNS Progress Report 2020, 94-94 (2021).

Gamma-ray emission/induced measurements

- Measurement of [the transverse asymmetry of \$\gamma\$ rays](#) in the $^{117}\text{Sn}(n,\gamma)^{118}\text{Sn}$ reaction, S. Endo et al., PRC, 106(6), 064601.
- Evaluation of analyzing power of [gamma-ray polarimeter](#), S. Endo et al., UVSOR-49, 38-38 (2022).
- [Angular distribution of \$\gamma\$ rays](#) from the [p-wave resonance of \$^{118}\text{Sn}\$](#) , J. Koga et al., PRC, 105(5), 054615 (2022).
- Low-lying [dipole strength](#) distribution in ^{204}Pb , T. Shizuma et al., PRC, 106(4), 044326 (2022).
- Energy-dependent [angular distribution of individual \$\gamma\$ rays](#) in the $^{139}\text{La}(n,\gamma)^{140}\text{La}^*$ reaction, T. Okudaira et al., PRC, 104(1), 014601_1-014601_6 (2021).

Nuclear data library/evaluation

- Japanese Evaluated Nuclear Data Library version 5; [JENDL-5](#), O. Iwamoto et al., JNST, 60(1), 1-60 (2023).
- [JENDL photonuclear data file 2016](#), N. Iwamoto, JNST, published online (2023).
doi:10.1080/00223131.2022.2161657
- Theoretical evaluation of [neutron thermal scattering laws of heavy water](#) for JENDL-5, A. Ichihara, Y. Abe, JAEA-Conf 2022-001, 175-180 (2022).
- EXFOR-based simultaneous evaluation of [neutron-induced uranium and plutonium fission cross sections](#) for JENDL-5, N. Otsuka, O. Iwamoto, JNST, 59(8), 1004-1036 (2022).
- Calculation of [deuteron-induced reaction cross-sections](#) for nuclear transmutation of [long-lived fission products](#), S. Nakayama et al., NEA/NSC/R(2020)4, 345-349 (2022).
- Evaluation of [neutron nuclear data on cobalt-59](#) for JENDL-5, N. Iwamoto, JAEA-Conf 2021-001, 126-131 (2022).
- Theoretical analysis of [deuteron-induced reactions](#) and development of deuteron nuclear database, S. Nakayama, JAEA-Conf 2021-001, 65-70 (2022).
- [JENDL/DEU-2020; Deuteron nuclear data library](#) for design studies of accelerator-based neutron sources, S. Nakayama et al., JNST, 58(7), 805-821 (2021).

Evaluation method/theory

- Nuclear data generation by [machine learning](#), 1; application to [angular distributions for nucleon-nucleus scattering](#), S. Watanabe, JNST, 59(11), 1399-1406 (2022).
- The [Optical potential](#) for neutron-nucleus scattering derived by [Bayesian optimization](#), S. Watanabe et al., JAEA-Conf 2022-001, 103-108 (2022).
- Calculation of [recoil nucleus spectrum](#) in the presence of multi-particle emission in nuclear reaction with [Monte Carlo method](#) as an extension of CCONE code, O. Iwamoto, JNST 59(10), 1232-1241 (2022).
- Calculation of [\$\beta\$ -decay half-lives](#) within a [Skyrme-Hartree-Fock-Bogoliubov energy density functional](#) with the [proton-neutron quasiparticle random-phase approximation](#) and [isoscalar pairing strengths optimized by a Bayesian method](#), F. Minato et al., PRC, 106(2), 024306 (2022).
- G-HyND: A [Hybrid nuclear data estimator](#) with [Gaussian processes](#), H. Iwamoto et al., JNST, 59(3), 334-344 (2022).
- Theoretical study of [deuteron-induced reactions](#) in the nuclear data field, S. Nakayama et al. Few-Body Systems, 63(1), 4 (2022).
- [\$\beta\$ -delayed neutron-emission and fission](#) calculations within [relativistic quasiparticle random-phase approximation](#) and a [statistical model](#), F. Minato et al., PRC, 104(4), 044321 (2021).

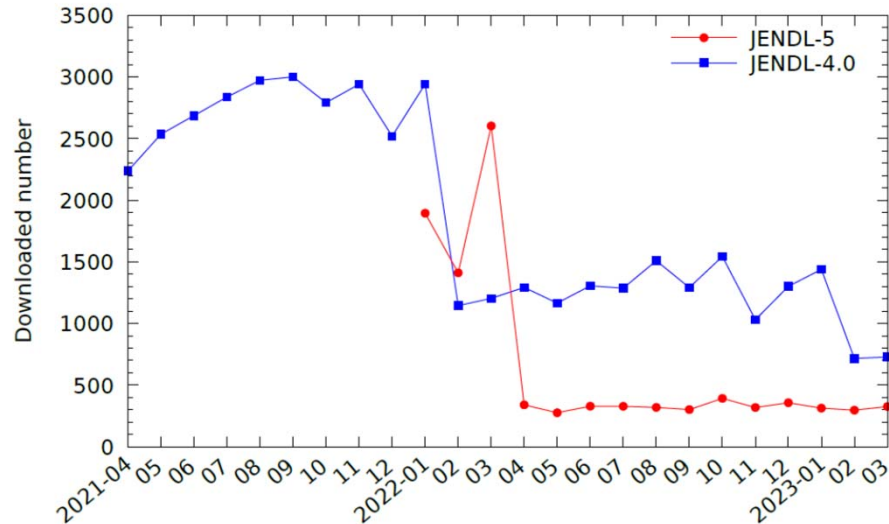
EXFOR compilation

- JAEA started to compile the data measured at J-PARC or by member of our group in 2019.
 - J-PARC TOF: Am, Np, Cm, ...
 - KUR activation: Np, ...
- JAEA is continuing the compilation so far. Otsuka-san has suggested us to do it as an official task.
 - We are thinking it positively.
- Possible responsibility
 - Neutron data measured at JAEA or measured in Japan in cooperation with JAEA Nuclear Data Center

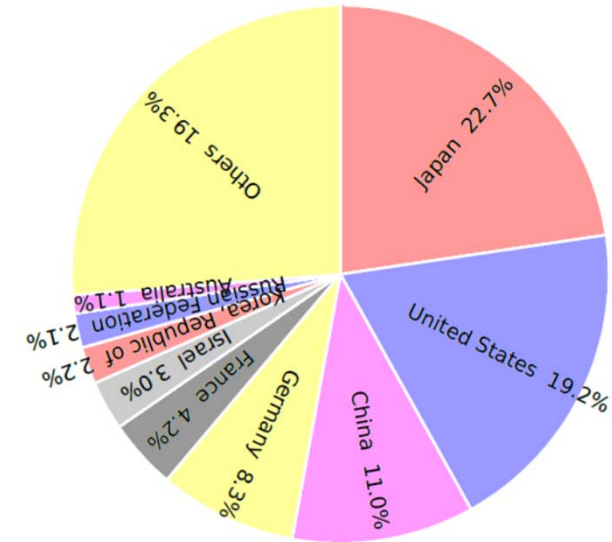
(The compilation may belong to the area 2 and it would be done with a support by NEA DB in checking)

Data service by web

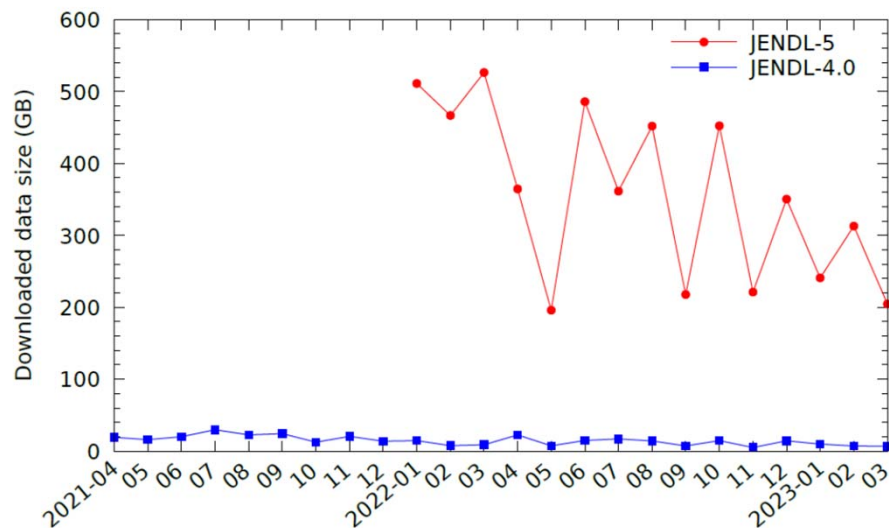
Number of JENDL downloads



FY2021: Downloaded data size 2332GB



Data size of JENDL downloads



FY2022: Downloaded data size 4593GB

