

Status Report of JAEA Nuclear Data Center
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1. General

Nuclear Data Center of Japan Atomic Energy Agency (JAEA) is working on the nuclear data evaluation for Japanese Evaluated Nuclear Data Library JENDL. The evaluation and related works are performed in the cooperation with Universities, Research Organizations and Companies in Japan through Japanese Nuclear Data Committee.

The number of Nuclear Data Center staff members is 7 including one technical assistant as of April 1, 2011. The manpower is not enough for the evaluation and related work. The budget is obtained from MEXT (Ministry of Education, Culture, Sports, Science and Technology), but is annually decreasing after establishment of JAEA. Especially the budget must be much shorter than usual in 2011FY, since many of it will be spent for recovering after the earthquake. We are seeking another fund to compensate the decreasing budget.

2. Evaluation

Main work of evaluation is to compile the JENDL library. The project of JENDL-4.0 started officially at 2005. The highlight of the recent work is the completion of JENDL-4.0 project. The compilation of JENDL-4.0 library was completed in March 2010. After the JAEA internal procedure for public release, JENDL-4.0 was released in May 2010. The comprehensive benchmark tests have been performed and the tests have shown good performance of the JENDL-4.0 library for both of thermal and fast reactor systems. The reference papers have been published as followings;

JENDL-4.0 original:

- K. Shibata, O. Iwamoto, T. Nakagawa, N. Iwamoto, A. Ichihara, S. Kunieda, S. Chiba, K. Furutaka, N. Otuka, T. Ohsawa, T. Murata, H. Matsunobu, A. Zukeran, S. Kamada, and J. Katakura, "JENDL-4.0: A New Library for Nuclear Science and Engineering", *J. Nucl. Sci. Technol.* **48**, 1-30 (2011).

Benchmark tests:

- G. Chiba, K. Okumura, K. Sugino, Y. Nagaya, K. Yokoyama, T. Kugo, M. Ishikawa, and S. Okajima, "JENDL-4.0 Benchmarking for Fission Reactor Applications", *J. Nucl. Sci. Technol.* **48**, 172-187 (2011).

The 5 year period from 2010 to 2014 is the second period of mid-term research plan of JAEA. According to the mid-term plan, an objective of nuclear data research is "incident energy extension of JENDL". For this purpose, the nuclear reaction model code, CCONE is planned to be expanded to higher energy region. The considered improvements are;

- to add the multi-particle emission from the pre-equilibrium stage,
- to add the complex-particle emission from the pre-equilibrium stage, and
- to add the function of calculating photo-induced reactions.

The JENDL High Energy File (JENDL/HE) contains neutron and proton induced reaction data for energy up to 3 GeV. The JENDL-4.0 data were remerged with JENDL/HE-2007 to provide the data for the IAEA/CRP on FENDL-3. Final JENDL/HE is expected to include the reaction data of

132 nuclides.

The version up of FP Decay Data File 2000 is now planned to include recent measured and compiled data. The sensitivity analysis of FP decay heat and the error of fission energy were studied. The branching ratios of delayed neutron were reviewed and recompilation was done by using ENSDF and/or Pfeiffer & Kratz. The decay data of 1263 nuclides have been recompiled for FP Decay Data File with considering the latest ENSDF, Yoshida's TAGS data (including the "pandemonium" effect) and delayed neutron data. The test calculation was done for the decay heat after the ^{235}U fission, and gave good agreement with the experimental data. The further check is planned to be done. After that, data for nuclides other than FPs will be compiled.

3. Web Service

The data related to JENDL are provided on our web site (<http://www.ndc.jaea.go.jp/index.html>). The monthly downloaded data size of the last Japanese fiscal year (2010/4/1 to 2011/3/31) is shown in Fig.1. The share by the country is shown in Fig.2.

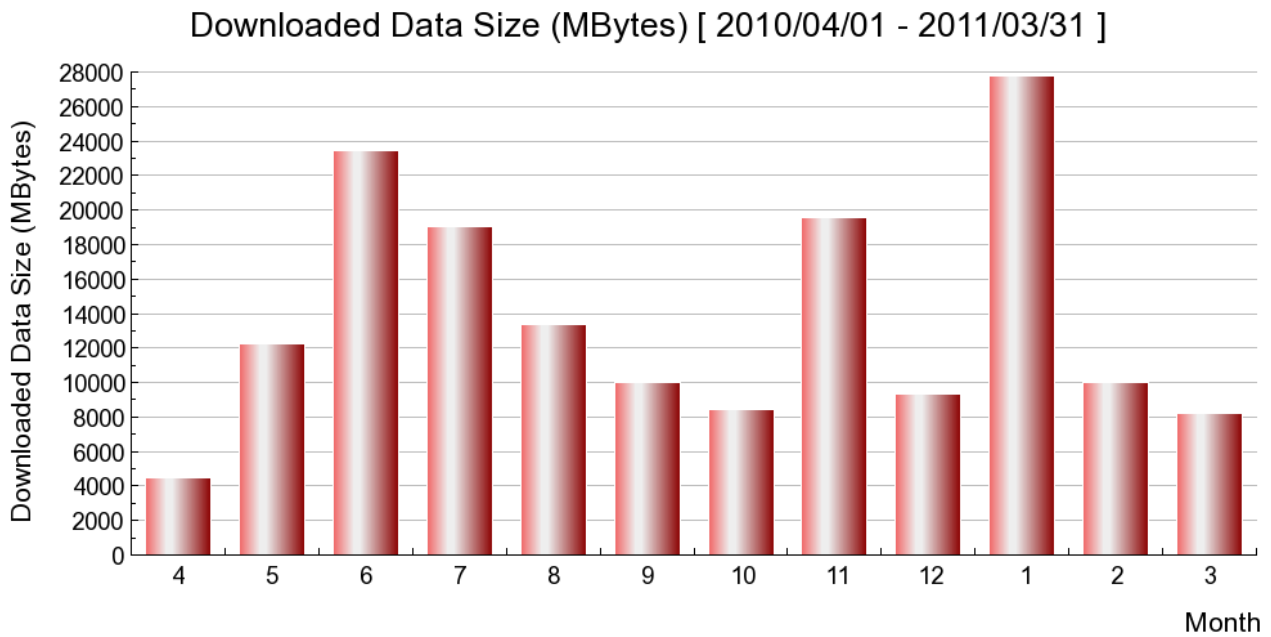


Fig.1 Down loaded Data Size in 2010 fiscal year (MBytes)

Downloaded Data Size (MBytes) (Top 10) [2010/04/01 - 2011/03/31]

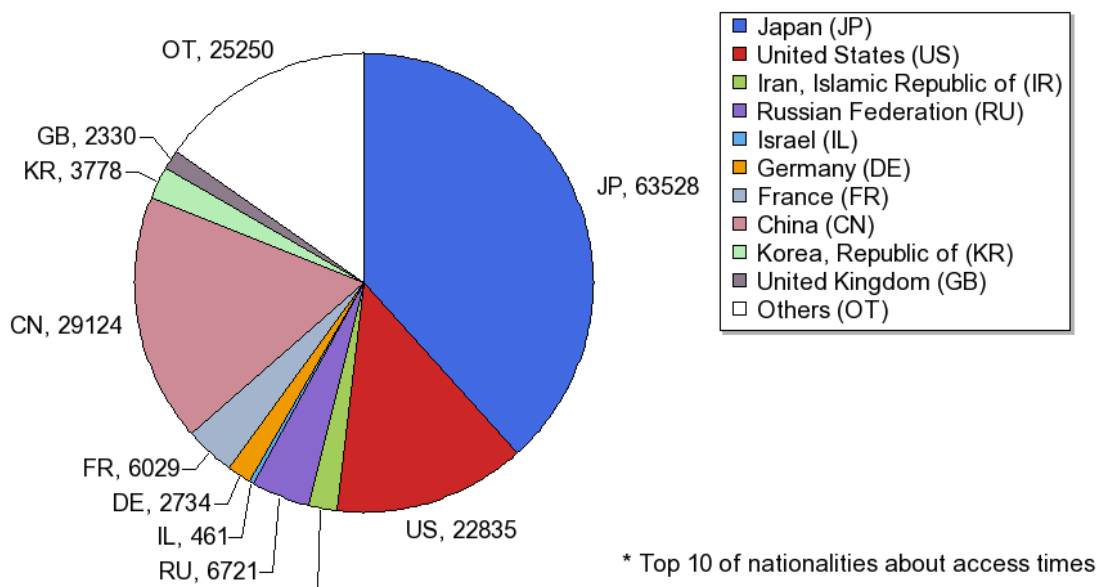


Fig. 2 Downloaded data by countries