Japan Nuclear Reaction Data Centre (JCPRG)

Progress Report

Nuclear Reaction Data Centre (JCPRG),
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http://www.jcprg.org

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"International Network of Nuclear Reaction Data Centres"
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0. General

The Japan Nuclear Reaction Data Centre (JCPRG) is a research center for nuclear data activities in Hokkaido University. The main objectives of the center are as follows:

a) Compilation of nuclear reaction data for two databases, NRDF and EXFOR
b) Evaluation of nuclear reaction data
c) Development of software and systems for compilation and evaluation
d) Education of the graduate school students

For the detailed description of our activities, the annual report is available on our website.

0.1 Staff

We have 6 core members (1 Associate professor, 1 Assistant professor, 2 postdocs and 2 seniors). The activities are supervised by the JCPRG steering committee in the University, and assessed by the external advisory committee.

0.2 Budget

The annual budget for the activities of JCPRG is funded by the University. We also have an external budget funded by Japan Society for the Promotion of Science (JSPS) from 2013 until 2017.

0.3 Collaboration

JCPRG has collaborations with several organizations and institutes. We are collaborating with the Meme Media Laboratory in the University for the software development. For the data compilation, we are collaborating with RIKEN and JAEA. In the collaboration with ATOMKI started in 2014, we are conducting nuclear experiments for medical purposes at RIKEN.

1. Compilation

1.1 NRDF

NRDF is from Jun. 2016 to May 2017, 52 new papers of charged-particle and photonuclear reaction data have been compiled for NRDF.

1.2 EXFOR

Since the last NRDC meeting, we have transmitted 52 new and 8 revised/deleted entries as 9 trans files (E103-E108, J010, K016, 017) to the NDS open area. 32 new entries were compiled by Ms. Saito (and N. Otsuka) during her internship at IAEA.

We are grateful to NRDC colleagues for the valuable comments and suggestions.

Table 1. EXFOR E-entries transmitted from JCPRG to NDS IAEA.

TRANS	TRANS Status	ENTRY Tot.	ENTRY New	ENTRY Rev.
E103	Final (2016/06/25)	32	32	0
E104	Final (2017/02/17)	1	0	1
E105	Final (2017/03/03)	10	10	0
E106	Final (2017/03/03)	3	1	2
E107	Final (2017/05/08)	4	4	0
E108	Prelim. (2017/03/21)	3	2	1
Total		53	49	4

Table 2. EXFOR J-entries transmitted from JCPRG to NDS IAEA.

TRANS	TRANS Status	ENTRY Tot.	ENTRY New	ENTRY Rev.
J010	Prelim. (2017/05/08)	1	0	1
Total		1	0	1

Table 3. EXFOR K-entries transmitted from JCPRG to NDS IAEA.

TRANS	TRANS Status	ENTRY Tot.	ENTRY New	ENTRY Rev.
K016	Trans. (2016/8/12)	4	3	1
K017	Trans. (2016/11/23)	2	0	2
Total		6	3	3

2. Evaluation

We evaluate nuclear reaction data, such as ^{6,7}Li+n reaction data using Continuum-Discretized Coupled-Channels Method (CDCC) and photonuclear reaction data using a time-dependent mean-field theory. The nuclei (^{8}Be, ^{12}C, etc.) in which the alpha-cluster structure is developing are investigated by the complex scaled orthogonal condition method.

3. System Development

3.1 Data Retrieval System

We have 3 data retrieval systems mentioned below.

- NRDF (http://www.jcprg.org/nrdf/)
- NRDF/A (http://www.jcprg.org/nrdfa/)
- EXFOR/ENDF (http://www.jcprg.org/exfor/)

The relational database management system MySQL has been adopted for the databases to search and retrieve NRDF, EXFOR and ENDF data. For EXFOR, new trans files are copied from the NDS open area, and the MySQL database is updated periodically.

3.2 Coding Software

We have a coding editor and digitizing software applicable for the coding purpose

- Coding editor "HENDEL" (http://www.jcprg.org/manuals/hendel/)
- Digitization software "GSYS" (http://www.jcprg.org/gsys/)
- New original editor under construction (stand-alone type)

4. Others

4.1 ImPACT project

JCPRG participates to the ImPACT project which is promoted by Cabinet Office, Government of Japan. The project is named "Reduction and Resource Recycle of High Level Radioactive Wastes with Nuclear Transmutation". The role of JCPRG is mainly the compilation of new data. A member of JCPRG is employed by the budget from ImPACT project.