

Japan Nuclear Reaction Data Centre (JCPRG)

Progress Report

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0. General

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

0.1 Staff

We had 6 core members (1 Associate professor, 1 Assistant professor, 2 seniors and 2 postdoctoral researchers) to perform our activities. The doctoral and master students are also trained for the compilation activity. The activities are supervised by the JCPRG steering committee consisting of 6 professors at Hokkaido University. JCPRG is advised and assessed by the external advisory board consisting of 5 members.

0.2 Budget

The annual budget for the activities of JCPRG is funded by the Hokkaido University. In addition, Japan Society for the Promotion of Science allocated annual grant of 0.8 million JPY for compilation for five years between Apr. 2013 and Mar. 2018.

0.3 Collaboration

JCPRG has collaborations with institutes, both inside and outside of Hokkaido University. We are collaborating with Meme Media Laboratory in the university to develop some software. For the data compilation we are collaborating with RIKEN and JAEA. In collaboration with ATOMKI started from April 2014, we conduct experiments for medical purposes with RIBF at RIKEN. For evaluation activity we are collaborating with theory group at Padova (ITALY) and York (United Kingdom).

1. Compilation

1.1 NRDF

From June 2017 to April 2018, 37 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 37 new and 18 revised/deleted entries as 9 trans files (E108-E115, J010) to the NDS open area.

JCPRG is 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.
E108	Final (2017/05/29)	3	2	1
E109	Final (2018/01/18)	6	1	5
E110	Final (2018/01/25)	4	0	4
E111	Final (2018/02/26)	7	0	7
E112	Final (2018/04/25)	5	5	0
E113	Final (2018/04/25)	14	14	0
E114	Final (2018/04/25)	6	6	0
E115	Prelim. (2018/03/21)	9	9	0

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

TRANS	TRANS Status	ENTRY Tot.	ENTRY New	ENTRY Rev.
J010	Final. (2017/06/30)	1	0	1

2. Evaluation

Evaluation as one of the important activity at JCPRG, covers the theoretical investigation of wide range of nuclear systems close to stability line, at drip-lines and beyond the drip-lines. We evaluate

nuclear reaction data, such as ${}^{6,7}\text{Li}+n$ reaction data using Continuum-Discretized Coupled-Channels Method (CDCC). The theoretical investigation of wide range of nuclear systems close to stability line, at drip-lines (${}^{20}\text{C}+n+n$) and beyond the drip-lines (${}^{24}\text{O}+n+n$) is also carried out.

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/>)

4. Others

4.1 Publication of Annual Report

The "JCPRG Annual Report 2016" is under preparation and about to be published very soon.

4.2 ImPACT project

JCPRG participates in ImPACT project which is promoted by Cabinet Office, Government of Japan. The title of the project is "Reduction and Resource Recycle of High Level Radioactive Wastes with Nuclear Transmutation" which is one of ImPACT (Impulsing PARadigm Change through disruptive Technology) projects. The role of JCPRG in the project is mainly to compile new data. A member of JCPRG is employed by the budget from ImPACT project.