

# Japan Nuclear Reaction Data Centre (JCPRG)

## Progress Report

*Nuclear Reaction Data Centre (JCPRG),  
Faculty of Science, Hokkaido University*

IAEA's Technical Meeting on the  
"International Network of Nuclear Reaction Data Centres"  
April 23-25, 2013

### **0. General**

In this report, we review the activities of Japan Nuclear Reaction Data Centre (JCPRG) since the last NRDC meeting in 2012. Our main objectives are as follows:

- a) Compilation of nuclear reaction data for two databases, NRDF and EXFOR
- b) Evaluation of astrophysical nuclear reaction data
- c) Development of software and systems
- d) Development of collaboration among Asian countries

#### **0.1 Staff**

We have 8 core members (2 professors, 2 seniors and 4 postdoctoral researchers) to perform our activities. The activities are supervised by the JCPRG Steering Committee consisting of 6 professors of Hokkaido University. JCPRG is advised and will be assessed by the JCPRG Advisory Board consisting of 5 members external to the university.

#### **0.2 Budget**

We receive an annual budget for research and education from Hokkaido University. In addition, annual grant of 0.8 million JPY is allocated by Japan Society for the Promotion of Science (JSPS) for five years between 2013 and 2018.

#### **0.3 Collaboration**

JCPRG has collaborations with institutes, both inside and outside of Hokkaido University. We collaborated with Meme Media Laboratory in the university to develop some software. As for the collaboration with RIKEN, we advance the compilation of RI beam data performed in RIKEN.

Under the collaboration with JAEA, we cooperate to educate graduate school students and to evaluate light nuclei reaction data.

## **1. Compilation**

### **1.1 NRDF**

From April 2012 to March 2013, 39 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 39 new and 89 revised/deleted entries as 11 trans files (E068-E075, K011-K012, R026) 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.**

<b>TRANS</b>	<b>TRANS Status</b>	<b>ENTRY Tot.</b>	<b>ENTRY New</b>	<b>ENTRY Rev.</b>
E068	Final* (2012/5/23)	32	0	32
E069	Final (2012/6/15)	18	12	6
E070	Final (2012/8/25)	8	7	1
E071	Final (2012/10/10)	22	0	22
E072	Final (2013/1/10)	8	6	3
E073	Final (2013/3/1)	5	5	0
E074	Final (2013/4/15)	14	0	14
E075	Prelim. (2013/4/12)	7	3	4

\* The Prelim. file had been transmitted before the last NRDC meeting.

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

<b>TRANS</b>	<b>TRANS Status</b>	<b>ENTRY Tot.</b>	<b>ENTRY New</b>	<b>ENTRY Rev.</b>
K011	Final* (2012/5/29)	4	3	1
K012	Final (2012/12/12)	6	3	3

\* The Prelim. file had been transmitted before the last NRDC meeting.

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

<b>TRANS</b>	<b>TRANS Status</b>	<b>ENTRY Tot.</b>	<b>ENTRY New</b>	<b>ENTRY Rev.</b>
R026	Final (2013/4/17)	3	0	3

## **2. Evaluation**

We evaluate nuclear reaction data, such as  ${}^7\text{Li}+n$  reaction data using Continuum-Discretized Coupled-Channels Method (CDCC).

## **3. System Development**

### **3.1 Data Retrieval System**

We have 4 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/>)
- CINDA (<http://www.jcprg.org/cinda/>)

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

### **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. Asian Collaboration**

From August 27 to 29, 2012, the 3rd Asian Nuclear Reaction Database Development Workshop had been held at Pohang, Korea. This workshop was organized by Center for High Energy Physics (CHEP), KNU, Division of Advanced Nuclear Engineering (DANE), POSTECH, and Nuclear Data Center, KAERI. This workshop is also partly supported by the Asia-Africa Science Platform Program (AASPP) of the Japan Society for the Promotion of Science (JSPS). The main purpose of the workshop was to develop nuclear data activities and collaboration in Asia. There were many participants from nuclear reaction data centres and other institutes in Asia, such as Japan, China, India, Kazakhstan, Mongolia, South Korea, and Vietnam. The sessions in the workshop were

devoted to share information about their activities, to strengthen collaboration among the researchers in Asia and to promote the dissemination and improvement of data compilation techniques. The workshop was very fruitful for participants and the next meeting will be held in Almaty, Kazakhstan.

## **5. Others**

### **5.1 Publication of Annual Report**

The "JCPRG Annual Report 2011" had been published and made available on our website.