

# Hokkaido University 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"  
May 6-9, 2014

### **0. General**

In this report, we review the activities of Japan Nuclear Reaction Data Centre (JCPRG) since the last NRDC meeting in 2013. 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) Promotion of collaboration among Asian countries

#### **0.1 Staff**

We had 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, Japan Society for the Promotion of Science allocates 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 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. As a new collaboration, we launched to perform experiments and evaluation on nuclear reactions related to medical purposes.

## **1. Compilation**

### **1.1 NRDF**

From April 2013 to March 2014, 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>
E075	Final* (2013/6/11)	6	3	3
E076	Final (2013/6/13)	5	3	2
E077	Final (2013/9/6)	5	3	2
E078	Final (2013/9/6)	2	2	0
E079	Final (2013/11/4)	3	0	3
E080	Final (2013/11/4)	3	2	1
E081	Final (2013/12/11)	10	6	4
E082	Final (2013/12/11)	1	1	0
E083	Final (2014/1/25)	3	0	3
E084	Final (2014/1/25)	4	4	0
E085	Final (2014/2/17)	5	5	0
E086	Final (2014/3/25)	4	3	1
E087	Final (2014/3/25)	3	3	0
E088	Final (2014/4/1)	1	0	1
E089	Final (2014/4/25)	3	0	3

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

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

TRANS	TRANS Status	ENTRY Tot.	ENTRY New	ENTRY Rev.
K013	Final (2013/5/21)	5	5	0
K014	Final (2014/1/24)	3	2	1

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

TRANS	TRANS Status	ENTRY Tot.	ENTRY New	ENTRY Rev.
R027	Final (2013/10/7)	1	0	1

## **2. Evaluation**

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

## **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 2012" had been published and is available on our website.

## **4.2 JSPS Bilateral Program**

The JSPS Bilateral Program "Measurement and Evaluation of Important Nuclear Data for Diagnosis and Therapy Treatments" with ATOMKI was accepted for two years between Apr. 2014 to Mar. 2016.