



**HOKKAIDO**  
UNIVERSITY

# JCPRG Progress Report



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

June 7, 2016

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Nuclear Reaction Data Centre (JCPRG)  
Hokkaido University  
JAPAN

# Objectives of JCPRG

- **Compilation** of charged-particle and  $\gamma$  induced nuclear reaction data obtained in Japan
- **Evaluation** (theoretical calculation) of nuclear reaction data on light nuclei
- **Collaboration** promoted with Asian and International Nuclear Reaction Data Centres (NRDC)
- **Education** for graduate school students



# JCPRG Member (FY2015: Apr. 2015 - Mar. 2016)

<b>Group</b>	<b>Member</b>
<b>JCPRG Staff</b>	Aikawa, Ebata
<b>JCPRG Researcher</b>	Kato, Fujimoto
<b>JCPRG Steering Committee</b>	Aikawa, Hirabayashi, Kimura et al.
<b>JCPRG Advisory Board</b>	Aoi (RCNP), Fukahori (JAEA), Ohnishi (YITP), Otsuka (IAEA), Sakurai (RIKEN)
<b>Faculty of Science, HU</b>	Aiganym, Ichinkhorloo, Imai, Zhou
<b>Nuclear Theory Group</b>	Kimura, Horiuchi, et al.
<b>Hokkaido Nuclear Group</b>	Chiba, Katayama, Masui, Noto, Okabe, et al.



# JCPRG Member (FY2016: Apr. 2016 - Mar. 2017)

Group	Member
JCPRG Staff	<b><i>Kimura</i></b> , Ebata, <b><i>Aikawa</i></b>
JCPRG Researcher	Kato, Fujimoto
JCPRG Steering Committee	Aikawa, Hirabayashi, Kimura et al.
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# Compilation Result (FY2015: Apr. 2015 - May 2016)

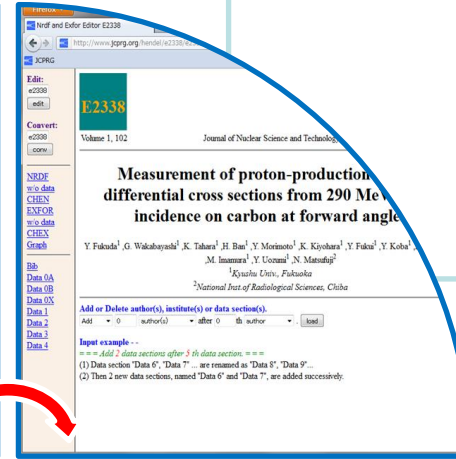
- Member
  - [EXFOR] **Ichinkhorloo**, Aiganym, Aikawa, Ebata
  - [NRDF] **Aikawa**, Chiba, Ebata, Katayama, Kato, Noto
- EXFOR
  - 94 new and 13 revised/deleted entries were transmitted as 12 trans files (E095-E103, K015,016, R028) to the NDS open area.
  - Kawai (27 entries) and Saito (32 entries) works are included in our results statistics, which are done in the internship at IAEA.
- NRDF (Original database of JCPRG)
  - 94 new papers of charged-particle and  $\gamma$  induced reaction data were compiled for NRDF.



# Four Topics and Keywords

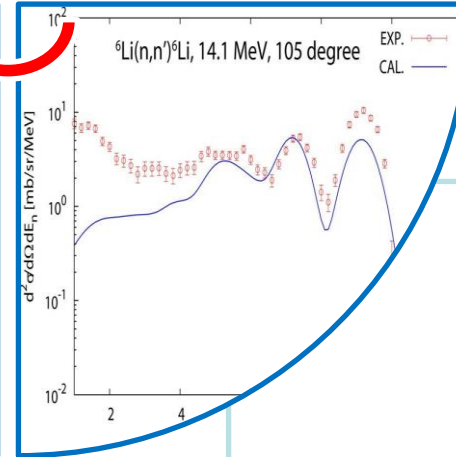
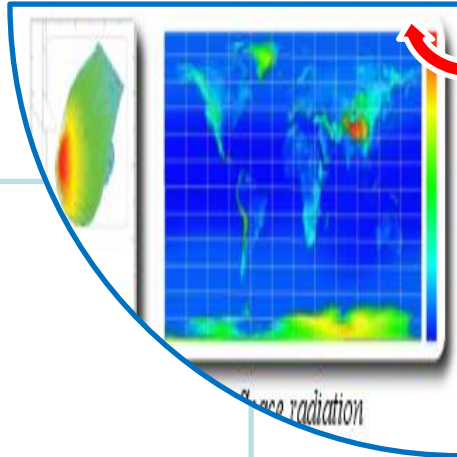
- Experiment

- @HU
- @ATOMKI
- @RIKEN



- Compilation

- IAEA
- NRDC
- Asian Centres



- Application

- Medicine
- Transmutation
- Physics

- Evaluation

- CDCC
- OCM+CSM
- Cb-TDHFB



# Experiment at RIKEN (Dec. 2015, Feb. 2016)



Cyclotron



Holder



Prof. S. Takacs & Prof. F. Ditroi



M. Saito (M1)



# Evaluation (Theoretical calculation)

- Member
  - **Zhou**, Aikawa, Ebata, Ichinkhorloo, Kato, Kimura, Hirabayashi
- Method
  - CDCC
  - Cb-TDHFB

## Low energy scattering cross sections for $n + {}^{6,7}\text{Li}$ reactions using the continuum-discretized coupled-channels method

D. Ichinkhorloo,<sup>1,\*</sup> M. Aikawa,<sup>2</sup> S. Chiba,<sup>3,4</sup> Y. Hirabayashi,<sup>5</sup> and K. Katō<sup>2</sup>

<sup>1</sup>*Meme Media Laboratory, Hokkaido University, Sapporo 060-8628, Japan*

<sup>2</sup>*Nuclear Reaction Data Centre, Faculty of Science, Hokkaido University, Sapporo 060-0810, Japan*

<sup>3</sup>*Research Laboratory for Nuclear Reactors, Tokyo Institute of Technology, Tokyo 152-8550, Japan*

<sup>4</sup>*National Astronomical Observatory of Japan, Mitaka, Tokyo 181-8588, Japan*

<sup>5</sup>*Information Initiative Center, Hokkaido University, Sapporo 060-0811, Japan*

(Dated: May 3, 2016)

We study the integrated elastic and inelastic scattering cross sections together with their angular distributions of  $n + {}^{6,7}\text{Li}$  using  $n + (\alpha + d)$  and  $n + (\alpha + t)$  cluster models, respectively, and the continuum-discretized coupled-channel framework. The microscopic single-folding potential is used for the neutron energies from 1 MeV to 24 MeV. The calculated elastic and inelastic scattering cross sections are in good agreement with experimental and evaluated data for the observed incident energies.

PACS numbers: 24.10.Eq, 25.40.Fq, 21.60.Gx

Ichinkhorloo et al., Accepted in Phys. Rev. C





# Software and Service

- Member
  - **Aiganym**, Aikawa, Ebata, Fujimoto, Imai, Chiba, Katayama, Noto
- Coding Software
  - Editor "HENDEL"
  - Digitizer "GSYS"
  - New editor (JAVA)
- Data Retrieval System
  - NRDF (<http://www.jcprg.org/nrdf/>)
  - NRDF/A (<http://www.jcprg.org/nrdfa/>)
  - EXFOR/ENDF (<http://www.jcprg.org/exfor/>)



# International and Domestic collaboration

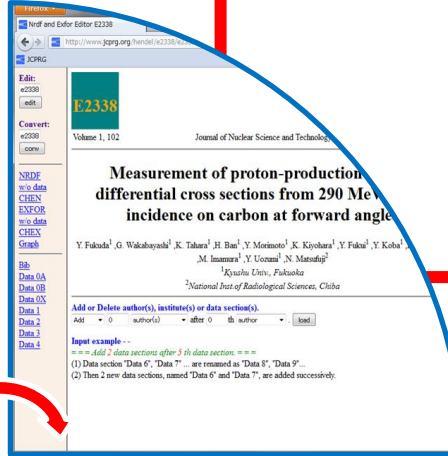
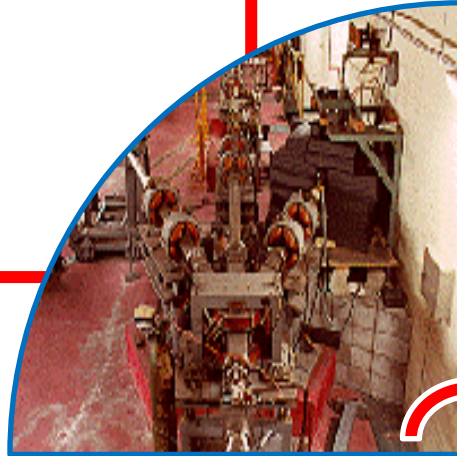
- IAEA and NRDC
- CA-NRDB: Nuclear Physics, Nuclear Technology
- RIKEN: Transmutation, Medicine
- JAEA: Transmutation, Medicine
- RCNP
  
- ATOMKI: Medicine
  - JSPS Bilateral Program was accepted and started from Apr. 2014.
  - Experiments was performed at ATOMKI and will be performed at RIKEN.
  - Theoretical calculation will be performed under the collaboration with JAEA.



# Summary (Keywords in Topics)

## • Experiment

- @HU
- @ATOMKI
- @RIKEN

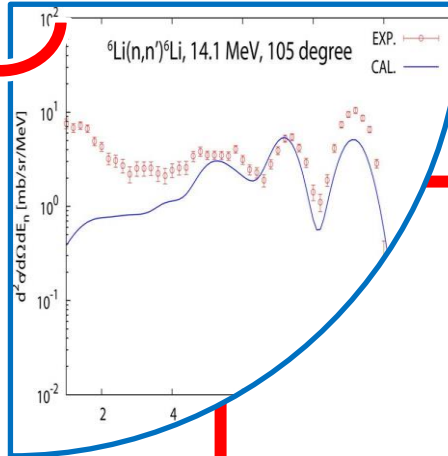
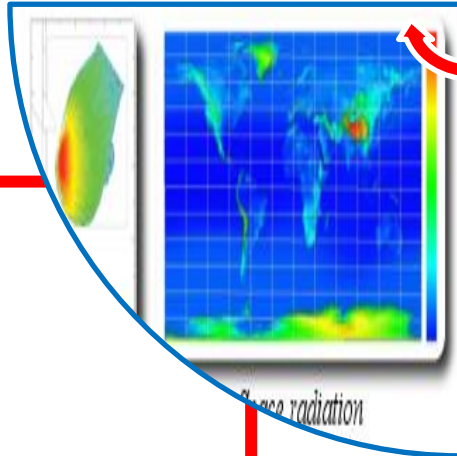


## • Compilation

- IAEA
- NRDC
- Asian Centres

## • Application

- Medicine
- Transmutation
- Physics



## • Evaluation

- CDCC
- OCM+CSM
- Cb-TDHFB

