

JCPRG Progress Report

May 6, 2014

Masayuki AIKAWA

Nuclear Reaction Data Centre (JCPRG)
Hokkaido University
JAPAN

Objectives of JCPRG

- Compilation of charged-particle and γ 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 (FY2013: Apr 2013 - Mar. 2014)

Group	Member
JCPRG Staff	Aikawa, Makinaga
JCPRG Researcher	Kato, Fujimoto, Furutachi
JCPRG Steering Committee	Aikawa, Hirabayashi, Kimura et al.
JCPRG Advisory Board	Aoi(RCNP), Fukahori(JAEA), Ohnishi(YITP), Otsuka(IAEA), Sakurai(RIKEN)
MML Researcher	Ebata, Ichinkhorloo, Odsuren, Vidya
Nuclear Theory Group	Kimura, Horiuchi, et al.
Hokkaido Nuclear Group	Chiba, Katayama, Masui, Noto, Okabe, et al.

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MML Researcher	Ebata, Ichinkhorloo, Odsuren, Vidya, <i>Imai</i> , <i>Aiganym</i> , <i>Zhou</i>
Nuclear Theory Group	Kimura, Horiuchi, et al.
Hokkaido Nuclear Group	Chiba, Katayama, Masui, Noto, Okabe, et al.

Compilation Result (FY2013: Apr 2013 - Mar. 2014)

- Member
 - [EXFOR] <u>Vidya</u>, Aikawa, Ebata, Ichinkhorloo, Makinaga, Odsuren
 - [NRDF] <u>Aikawa</u>, Chiba, Ebata, Katayama, Kato, Makinaga, Noto
- EXFOR
 - 42 new and 22 revised/deleted entries were transmitted as 17 trans files (E075-E088, K013-K014, R027) to the NDS open area.
- NRDF (Original database of JCPRG)
 - 42 new papers of charged-particle and γ induced reaction data were compiled for NRDF.

Four topics and keywords

- Experiment
 - @HU
 - @ATOMKI
 - @RIKEN



aco radiation

6Li(n,n')6Li, 14.1 MeV, 105 degree

- Compilation
 - IAFA
 - NRDC
 - Asian Centres

- Application
 - Medicine
 - Transmutation
 - Physics

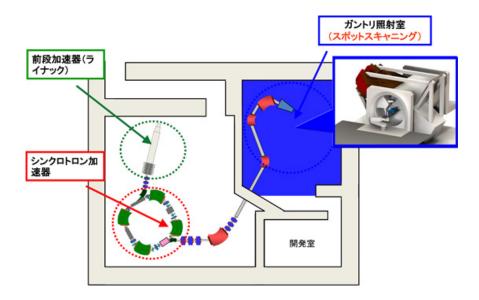


- CDCC
- OCM+CSM
- Cb-TDHFB



Experiment

- Makinaga managed our experiments at 45 MeV electron LINAC in Hokkaido University.
- Unfortunately, she moved to the Department of Medicine from Apr. 2014.



Proton synchrotron at Department of Medicine



Evaluation (Theoretical calculation)

- Member
 - Odsuren, Aikawa, Ebata, Ichinkhorloo, Kato, Kimura, Hirabayashi
- Method
 - CDCC
 - OCM+CSM
 - Cb-TDHFB

PHYSICAL REVIEW C 89, 034322 (2014)

Decomposition of scattering phase shifts and reaction cross sections using the complex scaling method

Myagmarjav Odsuren

Meme Media Laboratory, Hokkaido University, Sapporo 060-8628, Japan and Nuclear Research Center, National University of Mongolia, Ulaanbaatar 210646, Mongolia

Kiyoshi Katō[†] and Masayuki Aikawa[‡] Faculty of Science, Hokkaido University, Sapporo 060-0810, Japan

Takayuki Myo§

General Education, Faculty of Engineering, Osaka Institute of Technology, Osaka 535-8585, Japan and Research Centre for Nuclear Physics (RCNP), Osaka University, Ibaraki 567-0047, Japan (Received 15 January 2014; published 28 March 2014)

We apply the complex scaling method to the calculation of scattering phase shifts and extract the contributions of resonances in a phase shift and a cross section. The decomposition of the phase shift is shown to be useful in understanding the roles of resonant and nonresonant continuum states. As examples, we apply this method to several two-body systems: (i) a schematic model with the Gyarmati potential, which produces many resonances, (ii) the α - α system, which has a Coulomb barrier potential in addition to an attractive nuclear interaction, and (iii) the α -n system, which has no barrier potential. Using different kinds of potentials, we discuss the reliability of this method to investigate the resonance structure in the phase shifts and cross sections.

DOI: 10.1103/PhysRevC.89.034322

PACS number(s): 24.10.-i, 21.60.Gx

Odsuren et al., Phys. Rev. C 89, 034322 (2014)



Software and service

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

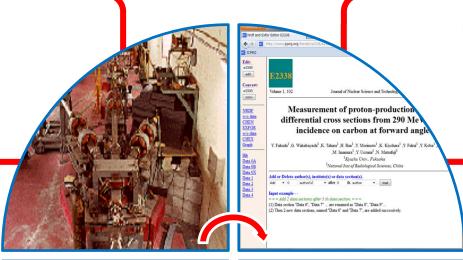
International and domestic collaboration

- 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



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- Application
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- CDCC
- · OCM+CSM
- Cb-TDHFB

