

Report of the 3rd Ulaanbaatar International Conference on Nuclear Physics and Applications

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Abstract

The Nuclear Physics and Applications conference was held at Ulaanbaatar, Mongolia from 17-20 September 2012. The UBC2012 conference was organized jointly by the MonAme Scientific Research Center and Nuclear Research Center of National University of Mongolia.

1 Introduction

The main aim of the international conference brought nuclear scientists from around the world to Mongolia to exchange ideas and to present their new research results. Topics of the discussion include: Nuclear Physics

- nuclear reactions and structure
- nuclear modelling and computation
- nuclear data and evaluation
- nuclear theory
- astrophysics

Nuclear Applications

- nuclear sciences education
- nuclear energy and fuel cycle
- nuclear medicine
- nuclear applications in geology

2 Objectives

Prof. M. Aikawa, Dr. A. Makinaga, Dr. M. Odsuren and Dr. D. Ichinkhorloo attended to the conference from Nuclear Reaction Data Center (JCPRG), Hokkaido University.

Prof. M. Aikawa presented about Nuclear Reaction Data Compilation and Evaluation: A Case of Hokkaido University Nuclear Reaction Data Centre (JCPRG). His presentation focused on the research and development of JCPRG, it can be classified into four parts: such as experiment, compilation, evaluation and application. For instance, the experiment: Presently Hokkaido University has Electron Linear Accelerator which provide performance of the basic and applied researches. The maximum electron energy is 45 MeV. In this facility, we have been performed nuclear reaction experiments using electrons, photons, and neutrons as induced particles. Since 2010, several experiments have been performed under the Asian and domestic collaborations of the JCPRG initiative. For compilation: Since 1974, the JCPRG has been compiled experimental charged particle induced reaction data performed in Japan by using Japanese nuclear facilities and over 2,000 papers have been compiled in the original database.

For evaluation: he explained the results of nuclear structures and reactions within the frameworks of the continuum-discretized coupled channels (CDCC) method for the ${}^6,{}^7\text{Li}(n,n'){}^6,{}^7\text{Li}$ reactions and the complex scaling method (CSM) applying to the multi-cluster model for ${}^{16,17}\text{O}(n,\gamma){}^{17,18}\text{O}$ reactions. In addition, he introduced coding editor “HENDEL”. Moreover, he focused several items for development of the collaboration of Asian data centers: to enhance nuclear data activities, to develop collaboration, to encourage and educate young researchers, to share information, to promote collaboration of compilation and evaluation.

Dr. A. Makinga (JCPRG, Hokkaido University) presented about activities of nuclear data experiments at Hokkaido University such as: photon/neutron activation analysis, photon/neutron transmission and photon scattering with different target. In addition, she talked about current status of NRDF/A data (astrophysics data) and Asian nuclear data collaboration.

Dr. M. Odsuren reported about theoretical study of the $\alpha + \alpha$ scattering states in the ${}^8\text{Be}$. She introduced about CSOCM (complex scaled orthogonal condition model) and calculated low-lying resonance states of alpha-alpha system. She employed two kinds of basis functions in the calculated resonance states; Gaussian and HO wave functions, but also used the folding potential of the effective nuclear interaction. Furthermore, she explained about these two different basis functions and treatments of the Pauli principle are different for them; an effective Pauli-potential and the Pauli-allowed states are used, respectively. She also summarized that these treatments of the Pauli principle are expected to give the same results for two-body system.

Dr. D. Ichinkhorloo presented about analysis of ${}^7\text{Li}+n$ Reactions in the CDCC method. In this talk, she introduced calculated results of cross sections for ${}^7\text{Li}(n,n'){}^7\text{Li}^* \rightarrow \alpha + t$ reactions evaluated by using the CDCC, in which is adopted microscopic wave functions of ${}^7\text{Li}$ with the $\alpha + t$ model. In the analyses, it is found that the elastic cross sections for incident energies at 11.0, 13.0, 14.1 and 18.0 MeV can be reproduced by the present cluster model with one normalization parameter for the imaginary part of the JLM effective interaction. In additionally, she also presented results of the inelastic scattering cross sections and the neutron spectra.

3 Summary

The Nuclear Physics and Applications conference was held at Ulaanbaatar, Mongolia from September 17-20 2012. UBC2010 was attended by participants and invited speakers from USA, Japan, Korea, Mexico, Canada, Italy and Mongolia.

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