Contribution ID: **99** Type: **Contributed Oral/Poster**

Study of one- and two-neutron removal reactions with core + n + n model

Friday, 15 July 2016 15:30 (15 minutes)

Neutron-rich nuclei have exotic properties such as halo, skin formations and shell evolution. Study of these properties is one of the main subject in nuclear physics. Neutron removal reactions have played a key role in the study. Spectroscopic factors and orbital angular momenta of valence nucleons in incident nuclei can be deduced from the removal cross sections. To understand the exotic properties of neutron-rich nuclei, an accurate analysis for neutron removal reactions is highly desired.

As one of a reliable method of describing removal processes, the eikonal reaction theory (ERT) has been proposed [1]. ERT is a method of calculating one- and two-neutron removal reactions at intermediate incident energies. In ERT, Coulomb breakup is treated accurately with the continuum discretized coupled-channels method [2], which has been successful for describing breakup processes of two- and three-body projectiles.

In this study, we analyze neutron removal reactions with the eikonal reaction theory, where neutron rich nuclei are described by core + valence neutrons in order to treat accurately a pairing correlation of valence neutrons. The pairing correlation is significant for construction of halo and shell evolution. In the presentation, we will discuss the exotic properties of neutron rich nuclei of Be- and C- isotopes especially.

[1] M. Yahiro, K. Ogata, and K. Minomo, Prog. Theor. Phys. 126, 167 (2011).

[2] M. Yahiro K. Ogata, T. Matsumoto and K. Minomo, Prog. Theor. Exp. Phys. 2012, 01A206 (2012).

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Track Classification: Theoretical developments of direct reactions