Di-neutron correlations in ^{6}He through Coulomb breakup reactions

Y. Kikuchi[1], T. Myo[2], M. Takashina[3], K. Kato[1] and K. Ikeda[4]

[1]*Division of Physics, Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan*

[2]*General Education, Faculty of Engineering, Osaka Institute of Technology, Osaka 535-8585, Japan*

[3]*Research Center for Nuclear Physics (RCNP), Osaka University, Ibaraki 567-0047, Japan*

[4]*The Institute of Physical and Chemical Research (RIKEN), Wako 351-0198, Japan*

A two-neutron halo structure is a symbol of the light exotic nuclei near the neutron drip line, and some papers have been published on its properties. [1-3] In particular, a spatially-correlated two-neutron pair, the so-called di-neutron, was suggested and has attracted much interest of nuclear physicists.

A breakup reaction is an essential tool to investigate the properties of weakly-bound nuclei. For two-neutron halo nuclei, some experiments have been performed to measure the Coulomb breakup cross sections and the E1 transition strengths. [4,5] These experimental data are useful to understand the electric properties and the excitation mechanism of the halo nuclei.

However, the observed data such as the E1 transition strengths have been reported as the distributions with respect to the excitation energy of the total system. To understand the correlation of the subsystem, e.g. di-neutron in two-neutron nuclei, the energy distributions corresponding to the energy of the subsystems such as the Dalitz plot are helpful.

Our main aim of this contribution is to estimate the correlation of subsystem, especially di-neutron, from the observed E1 transition strength for ^{6}He. We calculate the distribution of the E1 transition strength with respect to the energy of subsystems, such as n-n and core-n, and discuss how we can probe the di-neutron correlation experimentally.

Reference

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