Coulomb Dissociation of Borromean Nuclei ^{17}B

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Abstract

Neutron-rich isotopes have received much attraction in recent years due to its structural properties such as neutron halo: one or two neutrons in the nucleus are weakly bound so that they are spatially extended far from the core nucleus. Borromean nuclei are particularly interesting due to the two-neutron halo structure. The Borromean nucleus is a bound three-body system, where any of its two-body subsystems are unbound. Experimental data of 2n halo structure has been reported for 6He, 11Li, and 19B. These 2n halo nuclei are possible to have a dineutron correlation, a spatially compact neutron pair, and the recent Coulomb dissociation of 19B revealed the dineutron in 19B. [1] We focus on 17B, which is also considered as a 2n halo nucleus. 17B is the core of the 2n halo nucleus 19B but 17B itself is the 2n halo nucleus. Investigating a dineutron correlation in the 17B will gives us a critical information about multi-neutron halo structure in neutron-rich isotopes. To investigate the dineutron correlation at the 17B, the experimental measurement using Coulomb dissociation was performed at SAMURAI (Superconducting Analyser for MUlti particles from RAdio Isotope beams) spectrometer in RIBF (Radioactive Isotope Beam Factory), RIKEN. A 48Ca primary beam accelerated to 345 MeV per nucleon was incident on a primary Be target to produce a 17B secondary beam. The generated secondary beam was separated and identified by BigRIPS fragment separator and was incident into a secondary Pb target where 17B is dissociated into 15B and two neutrons. The charged fragment 15B was detected by the SAMURAI spectrometer, while the two neutrons were detected by the neutron detectors NEBULA to measure Coulomb dissociation exclusive cross section. In this poster, we report the current analysis statue.

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