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Systematic analyses of one- and two-neutron removal cross sections with eikonal reaction theory

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Removal reactions have played a key role in investigating properties of valence nucleons in weakly-bound nuclei such as one- and two-neutron halo nuclei. Spectroscopic factors and orbital angular momenta of valence nucleons in incident nuclei can be deduced from the removal cross sections. To understand such properties of halo nuclei, an accurate analysis for neutron removal reactions is highly desired.

The eikonal reaction theory (ERT) proposed lately is a method of calculating one- and two-neutron removal reactions at intermediate incident energies in which Coulomb breakup is treated accurately with the continuum discretized coupled-channels method (CDCC). In the presentation, we analyze neutron removal reactions for 6He scattering on 12C and 208Pb at 240 MeV/nucleon and also 28Si at 56 MeV/nucleon. The ERT results are successful in reproducing experimental data. In particular, the ERT results for the heavy target in which Coulomb breakup is important yield much better agreement with the experimental data than the Glauber model results. Furthermore, we will discuss neutron removal cross sections for Be- and C-isotopes.

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