DREB 2012 - Direct Reactions with Exotic Beams



Contribution ID: 14

Type: Talk

Correlations in direct two-proton knockout and details of the reaction mechanism

Wednesday, 28 March 2012 16:35 (20 minutes)

In surface-grazing collisions with a light target nucleus the sudden removal of two protons from an intermediateenergy neutron-rich projectile has been shown to proceed as a direct reaction. In addition to giving spectroscopic information, this type of reaction promises a rather unique tool assign spins by measuring the momentum distributions of the heavy reaction residues. In a two-nucleon removal reaction three reaction mechanisms contribute to the cross section: the inelastic removal of both nucleons, the elastic removal of one nucleon and inelastic removal of the second, and the elastic dissociation of both nucleons.

The direct two-proton knockout reaction from a 28Mg beam at 93 MeV/u has been studied at NSCL. First coincidence measurements of the heavy 26Ne projectile residues and the removed protons enabled the relative cross sections from each elastic and inelastic nucleon removal mechanism to be determined. These finalstate-exclusive measurements are key for further validation of this direct reaction and its use for quantitative spectroscopy of highly neutron-rich nuclei. The deduced yields for the three contributing mechanisms are compared to recent reaction model expectations based on the use of sd-shell model structure amplitudes and eikonal reaction dynamics. The kinematic correlations of the detected removed protons are also analyzed.

Primary author: WIMMER, Kathrin (NSCL - MSU)

Co-authors: GADE, Alexandra (NSCL - MSU); BAZIN, Daniel (NSCL - MSU); TOSTEVIN, Jeff (University of Surrey)

Presenter: WIMMER, Kathrin (NSCL - MSU)

Session Classification: Session 10