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Investigation of phenomena arising in medium-mass nuclei at the neutron dripline

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The understanding of the nuclear forces at play inside the nucleus is one of the major goals of modern nuclear physics. In particular, the study of phenomena arising in nuclei located near or beyond the neutron dripline, such as shell evolution, deformation, halo formation, provides a wealth of information that challenge our current knowledge. The Facility for Rare Isotope Beams (FRIB) offers the unique opportunity to extend such studies to dripline nuclei in the medium-mass region thanks to higher beam intensities. The MoNA collaboration is leading such effort at FRIB by launching an ambitious experimental program aiming to investigate the structure of nuclei in the region and to reveal the mechanism behind the neutron-halo formation observed or predicted in some nuclei.
Updates on recent MoNA experiments and future planned studies will be presented. In particular, the use the MoNA neutron scintillator array to perform kinematically complete Coulomb-breakup measurement of key nuclei of interests will be discussed. This, in combination to reaction theory calculations, will allow for unambiguous determination of the Coulomb-breakup cross-section, neutron separation energy, and ground state configuration of halo nuclei in this rather uncharted region.
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Consent

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