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Probing the Structure of the Unbound Nuclei ^9He and ^{10}N Through Proton Elastic Scattering

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The study of light nuclei at the drip lines offers a unique opportunity to test our ab-initio understanding of nuclear structure in the case of extreme proton to neutron ratios. With the advent of high-quality radioactive beams, these nuclei can now be accessed through transfer, charge exchange, or elastic scattering experiments in inverse kinematics. The very neutron-rich ^9He nucleus has been a subject of active research over the past decade, and many peculiarities in its structure have been claimed. We have recently performed a measurement of proton elastic scattering from ^8He to study the T=5/2 isobaric analog states of ^9He at energies near the T=2 neutron decay threshold. The quality and intensity of the ^8He beam at TRIUMF allowed for a high-resolution experiment with excellent statistical uncertainty, and the results of our study will be presented. At the other extreme, we have also recently performed a proton elastic scattering experiment on ^9C at Texas A&M University to directly probe the structure of the proton-unbound nucleus ^{10}N . Preliminary results of this experiment will be discussed as well.

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