TITLE: Neutron Elastic Form Factor Ratio from Recoil Polarization

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ABSTRACT

The GEn-RP experiment is among various form factor experiments with the Super-Bigbite Spectrometer setup at Hall-A, Jefferson Lab and measures the ratio of electric to magnetic elastic form factors of the neutron, GEn/GMn using two recoil polarimetry techniques at Q2 = 4.5 (GeV/c)2 in quasi-elastic electron-neutron scattering from a deuterium target.

The ratio of the above-mentioned form factors is measured from the ratio of the transverse (Px) and the longitudinal (Pz) components of the spin polarization, that is transferred to the recoiling neutron from an incident, longitudinally polarized electron beam. Both low-momentum large-angle protons produced during np → np elastic scattering and high-momentum, small-angle protons produced by np → pn (charge exchange) are used to analyze the neutron polarization components upon precessing through a known magnetic field.

This experiment will yield GEn /GMn at the highest Q2 kinematic point yet recorded and the experimental figure-of-merit information on the polarimetry along with the analyzing powers will be used to optimize future measurements of GEn/GMn to reach higher Q2 values using recoil polarimetry techniques.

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