Title: Two-Photon Exchange Contribution to the Electron-Neutron Elastic Scattering Cross Section and Data Calibrations for Gas Electron Multiplier Tracking Detectors

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Abstract:

The neutron Two-Photon Exchange (nTPE) experiment in Hall A, which uses the 12 GeV electron accelerator at Jefferson Lab and is the part of the Super BigBite Spectrometer (SBS) program, is the first measurement of the two-photon exchange contribution in elastic electron-neutron scattering from a deuterium target at $Q^2 = 4.5$ (GeV/c)2. The two-photon exchange contribution to *e-N* elastic scattering will be extracted by measuring the ratio(neutron/proton) of quasi-elastic yields at a single Q^2, but at two different beam energies (and electron scattering angles). The experiment was performed using the BigBite Spectrometer which detects the scattered electrons, and the Super BigBite Spectrometer which detects the scattered nucleons using a large aperture dipole magnet and Hadron Calorimeter. A main component of the BigBite Spectrometer are Gas Electron Multiplier (GEM) tracking detectors. GEMs were manufactured by Istuito Nazionale di Fisica Nucleare (INFN) and the University of Virginia (UVA) and were designed to handle a charged particle flux of 160 kHz/cm^2. The scope of this talk will be an overview of the physics goals for the nTPE experiment and a brief update about data calibrations for the GEM detectors from the ongoing analysis.