

Abstract Submitted
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The Polarized ^3He Target for the Measurement of G_E^n at high Q^2 in Hall A AMEYA KOLARKAR, University of Kentucky, E02-013 COLLABORATION, HALL A COLLABORATION — In early 2006, the Jefferson Lab experiment E02-013 successfully collected data to measure the neutron electric form factor G_E^n at the four-momentum transfer values in the range of 1.2 to 3.5 (GeV/c) 2 . It used a polarized ^3He target and a polarized electron beam at energies up to 3.2 GeV to study the semi-exclusive $^3\vec{H}e(\vec{e}, e'n)$ scattering reaction in quasi-elastic kinematics. The electrons were detected in the BigBite spectrometer and the recoiling neutrons in an array of scintillators. The data will be used to extract G_E^n from the transverse asymmetry A_T . The expected statistical accuracy for $\Delta G_E^n / G_{Dipole}$ is 0.04 for these values of Q^2 . To reduce the systematic uncertainties in A_T , the magnetic field direction was measured to better than 2 mrad with a newly developed air-floated compass. For the first time at JLab, the ^3He target was polarized using spin-exchange with rubidium *and* potassium. A uniform magnetic field was generated in the target region by a newly developed iron enclosure. Nuclear Magnetic Resonance (NMR) and Electron Paramagnetic Resonance (EPR) techniques were used to measure target polarization. Polarizations in excess of 50% were achieved during running conditions. This talk will focus on various aspects of the target.

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