

Abstract Submitted
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Diamond Detector for Compton Polarimetry DOUGLAS W. STOREY, University of Winnipeg, QWEAK COLLABORATION — The Q_{weak} experiment, at Thomas Jefferson National Accelerator Facility, will make a precision test of the Standard Model prediction of the weak mixing angle, $\sin^2\theta_W$. The weak charge of the proton will be determined through parity violating electron-proton scattering and $\sin^2\theta_W$ will be extracted from this measurement. Compton polarimetry will be used to measure the longitudinal polarization of the incident electron beam to 1%. In Compton polarimetry, the polarization is extracted from the Compton scattering asymmetry between laser light and electrons polarized parallel and anti-parallel. The asymmetry is measured by detecting the Compton scattered electrons using a bulk semiconductor detector, fabricated from synthetic diamond. Initial prototyping of the diamond detector was successfully carried out and results will be reported. Data acquisition electronics were developed. Additionally, a GEANT simulation was used to model the polarimeter and to perform design studies related to the electron detector.

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