

Abstract Submitted  
for the APR11 Meeting of  
The American Physical Society

**Precision Compton Polarimetry for the  $Q_{weak}$  Experiment** JUAN CARLOS CORNEJO, College of William & Mary — The  $Q_{weak}$  experiment currently running in Hall C of Jefferson Lab will measure the electro-weak parity violating asymmetry in the cross sections of elastic electron-proton scattering at an energy of 1.16 GeV and determine the weak mixing angle  $\sin^2 \theta_W$  at a  $Q^2$  of 0.03 GeV<sup>2</sup>/c<sup>2</sup>. The largest contribution to the systematic error is the polarization measurement. To limit this uncertainty a new Compton polarimeter was built that will measure the polarization to 1% at the 1.16 GeV beam energy. The polarization is measured by backscattering a photon off the incoming electron and measuring the asymmetry in the yield for different helicity states. The Compton polarimeter is composed of a four dipole chicane, a green laser cavity, an electron and a photon detector. The photon detector consists of a undoped CsI crystal attached to a photomultiplier. The signals are integrated over a 1 ms long helicity window, and single photon pulses are accepted simultaneously. We are currently taking data in production mode. Preliminary polarization results from the ongoing analysis of the photon detector will be presented.

Juan Carlos Cornejo  
College of William & Mary

Date submitted: 13 Jan 2011

Electronic form version 1.4