

Abstract Submitted  
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**Probe of Electroweak Interference Effects in Non-Resonant Inelastic  $\vec{e}p$  Scattering** JAMES DOWD, College of William and Mary, QWEAK COLLABORATION — The  $Q_{weak}$  Experiment at Jefferson Lab made the first direct measurement of the proton's weak charge,  $Q_W^p$ , via a measurement of the parity-violating asymmetry in elastic  $\vec{e}p$  scattering with low four-momentum transfer. Energy-dependent radiative corrections must be applied to the asymmetry. The most problematic of these is referred to as the  $\gamma Z$  box, where a photon and a Z-boson are simultaneously exchanged. The asymmetry arising from the  $\gamma Z$  box depends on the  $\gamma Z$  interference structure functions,  $F_{1,3}^{\gamma Z}$ , for which there is almost no experimental world data. Using the  $Q_{weak}$  apparatus, with modifications, a measurement of the parity-violating asymmetry of non-resonant inelastic  $\vec{e}p$  scattering was made with 3.35 GeV incident electrons. Inelastically scattered electrons with  $Q^2 \approx 0.09$  GeV<sup>2</sup> and  $W \approx 2.23$  GeV were selected and focused on eight quartz Cerenkov detectors. This asymmetry measurement resides in a kinematic region that will provide additional validation of the theoretical models used to predict the  $\gamma Z$  box and can provide insight on hadron structure. Analysis methods and preliminary results will be presented.

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