Abstract Submitted
for the APR11 Meeting of
The American Physical Society

Results from the Particle Tracking System of the Qweak Experiment SIYUAN YANG, College of William and Mary — The goal of the Qweak experiment is to measure the value of the weak charge of the proton, $Q^p_{weak} = 1 - 4\sin^2\theta_w$, to 4% precision. Because the Standard Model makes a firm prediction of Q^p_{weak}, the measurement of Q^p_{weak} will either confirm the prediction or will provide clear evidence for new physics. In this experiment, we study elastic electron proton scattering at four momentum transfer Q^2=0.03GeV^2/c^2 by scattering a high current polarized electron beam on a liquid hydrogen target. A crucial element to the precise measurement of Q^p_{weak} is to determine the four momentum transfer Q^2 to a high precision because the parity violation asymmetry is directly proportional to Q^2: $A^p_{LR} = A_0[Q^p_{weak}Q^2 + B_4(Q^2)Q^4 + ...]$. Therefore, the experiment is also designed to run in a low current mode in which the Q^2 is determined by using the tracking detectors. The tracking system is aimed at reconstructing the track of a particle to get the Q^2 with an accuracy of 1%. The experiment is now in the phase I data production run, which will end in May 2011. I will describe the procedure of the track reconstruction and the first results coming from it.

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Date submitted: 13 Jan 2011 Electronic form version 1.4