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Analysis of the Kinematics in the Qweak Experiment VALERIE GRAY, William & Mary Coll, QWEAK COLLABORATION — The Qweak experiment at Jefferson Lab aims to determine the weak charge of the proton to a precision of 4% by parity-violating elastic electron scattering on protons in a liquid hydrogen target. After two years of data-taking, the first results from the experiment's commissioning period have been published. The weak charge of the proton is directly related to the measured asymmetry, which is proportional to the squared four-momentum transfer Q^2 from the incoming electron to the struck proton. The uncertainty in Q^2 contributes directly to the precision of the measurement of the weak charge. We used two independent sets of drift chambers to reconstruct the electron trajectory through the experiment. Horizontal drift chambers are located just after the target while vertical drift chambers are located after a magnetic field just before the final Cerenkov detectors. Monte Carlo simulation is required to deduce the scattering vertex kinematics from the observed scattered energy and momentum. A Geant4 Monte Carlo simulation of the Qweak experiment was used to determine the momentum transfer and its uncertainty. I will discuss the sources that contribute to the uncertainty in the value of the momentum transfer, and the progress towards our goal of a 0.5% precision on Q^2.

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