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Qweak Ancillary Results: Exploring the Nucleus with Fundamental Symmetries¹

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While the primary focus of the Q_{weak} Experiment was the recently published measurement of the weak charge of the proton (Q_w^p) via parity-violation in elastic electron-proton scattering, many ancillary topics were also studied. This talk will cover the preliminary results for several of the ancillary measurements, all of which arose from the measurement of parity-violating asymmetries in the scattering of a longitudinally polarized electron beam from unpolarized targets. Measurements were made at two different kinematics settings ($E=877$ MeV, $Q^2=0.01$ GeV²; $E=1.16$ GeV, $Q^2=0.02$ GeV²) of the asymmetry in the $N \rightarrow \Delta$ transition. These measurements are sensitive to hadronic parity violation. A measurement of the asymmetry in the inelastic scattering of electrons from the proton above the resonance region ($E=3.35$ GeV, $Q^2=0.082$ GeV², and $W=2.23$ GeV) is sensitive to the γZ electroweak correction in parity-violating elastic electron scattering. Finally, the elastic parity-violating asymmetry in electron-²⁷Al scattering was measured at $E=1.16$ GeV and $Q^2=0.024$ GeV². This result is used to determine the radius of the neutron distribution in ²⁷Al.

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