Experimental Status of the Proton Electric Form Factor at Large $Q^2$

ANDREW PUCKETT, Los Alamos National Laboratory, JEFFERSON LAB HALL C GEP-III COLLABORATION — Jefferson Lab experiments E99-007 in Hall A and the recently published E04-108 in Hall C extended the recoil polarization data for the proton electric form factor $G_E^p$ from $Q^2 = 3.5 GeV^2$ to $Q^2 = 8.5 GeV^2$. A common feature of both experiments was the use of large solid-angle lead-glass electromagnetic (EM) calorimeters to detect elastically scattered electrons in coincidence with scattered polarized protons. Since lead-glass calorimeters have relatively poor energy resolution and do not distinguish between electrons and photons of similar energies, both experiments relied on two-body angular correlations to suppress nonelastic backgrounds. While the recent E04-108 results for the ratio $R = \mu_p G_E^p / G_M^p$ are statistically compatible with the E99-007 results where they overlap, they hint at a possible systematic difference in the $Q^2$ dependence of $R$ between the two experiments. In light of the improved understanding of photon backgrounds from $\pi^0$ photoproduction and Compton scattering gained from the analysis of the recent E04-108 data, the data from E99-007 have been reanalyzed, resulting in improved consistency between the two experiments. The new and improved $G_E^p$ data for $4.0 \leq Q^2 \leq 8.5 GeV^2$ will be presented and discussed.

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