Abstract Submitted
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A New Measurement of the Proton Elastic Form Factor Ratio at Low Q^2 XIAOHUI ZHAN, MIT — A high precision measurement of the proton elastic form factor ratio $\mu G_{\rm E}/G_{\rm M}$ in the range of Q^2=0.3 - 0.7 (GeV/c)^2 has been made using recoil polarimetry in Jefferson Lab Hall A. In this low Q^2 range, previous data (BLAST: C. B. Crawford *et al.* 2007, *Phys. Rev. Lett.* **98** 052301, LEDEX: G. Ron *et al.* 2007, *Phys. Rev. Lett.* **99** 202002) along with many fits and calculations indicate substantial deviations of the ratio from unity, and continue to suggest that structures might be present in the individual form factors, and in the ratio. In this new measurement, we used the high resolution sepctrometer to detect recoil protons incoincidence with the elastic scattered electrons tagged by BigBite calorimeter. With 80% polarized electron beam for 24 days, we are able to achieve $\sim$ 0.5% statistical uncertainty. This high precision result will confirm or refute all existing suggestions of few percent structures in the form factors ratio. Beyond the intrinsic interest in nucleon structure, the improved form factor measurements also have implications for DVCS, determinations of the proton Zemach radius and for parity violation experiments.

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