Calibration Study and Preliminary Results of PRad Experiment

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The latest measurements of the proton radius through muonic hydrogen Lamb shift show a discrepancy of 7σ from a global analysis of standard hydrogen Lamb shift and elastic *ep*-scattering. In order to understand this *proton radius puzzle*, the PRad experiment, supported in part by NSF MRI award PHY-1229153, successfully took in last June some elastic *ep*-scattering data at very low Q^2 ($2 \cdot 10^{-4}$ to 10^{-1} GeV^2) with very accurate angle and energy measurements to minimize the systematic uncertainties.

Before measuring the cross-sections that will be used to extract the electromagnetic form factor $G_E(Q^2)$ and the proton radius, a very careful calibration of the electromagnetic calorimeter ($HyCal$) must be performed to get a good energy resolution and separate *ep*-events from Møller events especially at low angle.

We will present an extended study of the electromagnetic calorimeter calibration of this experiment as well as some preliminary results on *ep*- and *ee*-scattering processes extracted from the data. This work is supported in part by NSF award PHY-0855543.