

Proton Charge Radius (PRad) Experiment GEM detector performance and efficiency results *

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The PRad experiment (E12-11-106¹) was performed in 2016 at Jefferson Lab in Hall B, it aims to investigate the proton charge radius puzzle through electron proton elastic scattering process. The experiment used a non-magnetic spectrometer method, and reached a very small ep scattering angle and thus an unprecedented small four-momentum transfer squared region, Q^2 from 2×10^{-4} to $0.06(\text{GeV}/c)^2$. PRad experiment was designed to measure the proton charge radius within a sub-percent precision. Gas Electron Multiplier (GEM) detectors have contributed to reach the experimental goal. A pair of large area GEM detectors, and a high resolution calorimeter(HyCal) were utilized in the experiment. The precision requirements of the experiment demands a highly accurate understanding of efficiency and stability of GEM detectors. In this talk, we will present the preliminary results on the performance and efficiency of GEM detectors.

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