Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Experience with GEM detectors during the PREX-2 Physics run[1]

CHANDAN GHOSH, Univ of Mass - Amherst — Proper understanding of beam optics is crucial for any measurement involving the high resolution spectrometer (HRS) in Hall A at JLab. The vertical drift chambers (VDCs), used for decades for optics calibration of the HRSs, are not designed to typically handle high event rates ($\approx$20kHz/cm^2) required for the PREX-2 experiment. Event rate over 10 kHz/cm^2 distorts the Q^2-distributions due to pileup in the VDC. New Gas Electron Multiplier (GEM) detectors were installed for PREX-2 and used along with the VDC to acquire higher rate data. Three 10cm$\times$20cm triple-GEM detectors (from Idaho State, and Stony Brook Univ.) and three 50cm$\times$60cm triple-GEM detectors (from Univ. of Virginia) are used on each arm of the HRS. A CODA (CEBAF Online Data Acquisition) based acquisition system using multipurpose digitizer (MPD) and required software for GEM based tracking analysis were developed and incorporated with the standard HallA analyzer. PREX-2 is the first experiment in Hall A at JLab where CODA is used with GEM detectors and MPDs. We will report on cosmic muon and in-beam performance of the GEM detector systems, as well as characterizations with respect to the VDC for efficiency and track reconstruction. This characterization will help planned future experiments.

[1]Work supported in part by DOE Award DE-SC0013321

Chandan Ghosh
Univ of Mass - Amherst

Date submitted: 26 Jun 2020 Electronic form version 1.4