

Abstract Submitted
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Gas Electron Multiplier (GEM) detectors for parity-violating electron scattering experiments at Jefferson Lab JOHN MATTER, KONDO GNANVO, NILANGA LIYANAGE, Univ of Virginia, SOLID COLLABORATION, MOLLER COLLABORATION — The JLab Parity Violation In Deep Inelastic Scattering (PVDIS) experiment will use the upgraded 12 GeV beam and proposed Solenoidal Large Intensity Device (SoLID) to measure the parity-violating electroweak asymmetry in DIS of polarized electrons with high precision in order to search for physics beyond the Standard Model. Unlike many prior Parity-Violating Electron Scattering (PVES) experiments, PVDIS is a single-particle tracking experiment. Furthermore the experiment's high luminosity combined with the SoLID spectrometer's open configuration creates high-background conditions. As such, the PVDIS experiment has the most demanding tracking detector needs of any PVES experiment to date, requiring precision detectors capable of operating at high-rate conditions in PVDIS's full production luminosity. Developments in large-area GEM detector R&D and SoLID simulations have demonstrated that GEMs provide a cost-effective solution for PVDIS's tracking needs. The integrating-detector-based JLab Measurement Of Lepton Lepton Electroweak Reaction (MOLLER) experiment requires high-precision tracking for acceptance calibration. Large-area GEMs will be used as tracking detectors for MOLLER as well. The conceptual designs of GEM detectors for the PVDIS and MOLLER experiments will be presented.

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