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Design and production of GEM modules for the MOLLER experiment

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The upcoming MOLLER experiment at Jefferson Lab (JLab) will measure the parity-violating asymmetry by scattering longitudinally polarized electrons off unpolarized electrons with high precision in a liquid Hydrogen target. The high precision will enable a search for new physics beyond the standard model.

Twenty-eight large area triple Gas Electron Multiplier (GEM) detector-packages will be utilized for spectrometer calibration and background measurements. Stony Brook University was responsible for construction of 16 of the 28, which have now been completed and delivered to JLab. In this talk, we will present the design considerations of the GEM detectors, the fabrication process, and present preliminary results of characterization studies undertaken at SBU and JLab.

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