

Abstract Submitted  
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**High Luminosity Integrating Detector Development for the MOLLER Experiment at Jefferson Laboratory** MICHAEL GERICKE, University of Manitoba, THE MOLLER COLLABORATION — The MOLLER collaboration is currently preparing an experiment to measure the Weak charge of the electron to a fractional accuracy of 2.3% at very low momentum transfer, using parity violating electron scattering at 11 *GeV*. At this precision, the experiment will be sensitive to new physics with a mass reach of 19 *TeV*. The experiment will measure the asymmetry in the number of scattered electrons from a liquid hydrogen target, as a function of electron helicity. The asymmetry has a Standard Model predicted size of 35 *ppb* (part per billion). The measurement requires a high luminosity beam, leading to detector event rates at the level of *GHz/cm<sup>2</sup>*. This requires either very high detector segmentation or current mode operation. The challenges we face regarding detector design include high radiation hardness, low noise and high efficiency operation, and low background sensitivity. We are currently exploring highly segmented quartz Cherenkov detectors for current mode operation. I will provide an overview of the current detector design and results from initial prototype tests performed at the MAMI facility in Mainz, Germany. This work is done in conjunction with the detector development work for the P2 experiment planned at MAMI.

Michael Gericke  
University of Manitoba

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