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**Feasibility of Parity-Violating Electron Scattering Experiments Below 1 GeV Beam Energy with a Toroidal Spectrometer**[1] KURTIS BARTLETT, William & Mary College — The next generation of high precision parity-violating electron scattering experiments could potentially make use of a toroidal spectrometer to perform additional measurements of the proton's weak charge ($Q_w^p$) using a hydrogen target, a test of the Standard Model using a carbon target as well as possibly studying the neutron skin of heavier nuclei. I will present the results of recent Geant4 Monte-Carlo studies performed to test the feasibility of such a toroidal spectrometer at beam energies below 1 GeV employing a concept similar to that used by the recent JLab $Q_{weak}$ measurement [Nucl. Instrum. Meth. A781 (2015) 105-133]. It appears that given sufficient beam time such a measurement could be complementary to the JLab measurement, but at a significantly lower $Q^2$. The feasibility of measuring the neutron skin using such a spectrometer will also be discussed. The key issue for this latter type of measurement is the ability to achieve the necessary resolution to separate the elastic and first excited state.

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