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The MUSE Measurement of the Proton Radius at PSI πM1: Simulations[1] KATHERINE MYERS, Rutgers University, MUSE COLLABORATION — The MUon proton Scattering Experiment (MUSE) at the Paul Scherrer Institut (PSI) πM1 beam line uses secondary particles generated from the interactions of a proton beam in a carbon production target. As a result, the beam has low intensity and large emittance compared to electron beams typically used for electromagnetic studies. To partially compensate, MUSE uses a large solid angle nonmagnetic spectrometer to measure $\mu^{\pm}p$ and $e^{\pm}p$ elastic scattering. The combination of these features makes the experimental challenges quite different from the standard measurement of nucleon form factors with electron beams and magnetic spectrometers, necessitating extensive simulations to ensure that potential issues are identified and under control. I will discuss the MUSE simulations and the challenges facing the experiment.

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