

Abstract Submitted
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The Physics Reach of MUSE¹ ETHAN CLINE, Stony Brook University, MUSE COLLABORATION — The MUon Scattering Experiment (MUSE), which takes place at the PiM1 beamline of the Paul Scherrer Institut (PSI), aims to simultaneously measure elastic ep and μp scattering in order to determine the proton charge radius. However with the beamline and kinematics available to the experiment, MUSE has a broader physics reach than extracting the proton radius. As the experiment uses both positively and negatively charged leptons, a precise two photon exchange measurement can be performed for both electrons and muons in the $0.002 \leq Q^2 \leq 0.08$ (GeV/c)² and $0.26 \leq \varepsilon \leq 0.94$ regime. The experiment has both a LH₂ target and a carbon target, allowing for a variety of precise cross section measurements. With access to π^\pm in the beam it is also possible to measure absolute and relative elastic pion cross sections to high precision with the MUSE detector. In this talk the physics reach of MUSE and projected uncertainties for the measurements will be discussed.

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