

Abstract Submitted  
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**Beam particle tracking for MUSE<sup>1</sup>** ANUSHA LIYANAGE, Hampton Univ, MUSE COLLABORATION — The proton radius puzzle is the  $\sim 7\sigma$  disagreement between the proton radius extracted from the measured muonic hydrogen Lamb shift and the proton radius extracted from the regular hydrogen Lamb shift and elastic ep scattering form factor data. So far there is no generally accepted resolution to the puzzle. The explanations for the discrepancy include new degrees of freedom beyond the Standard Model. The MUon Scattering Experiment (MUSE) will simultaneously measure ep and  $\mu p$  scattering at the Paul Scherrer Institute, using the  $\pi M1$  beam line at 100-250 MeV/c to cover a four-momentum transfer range of  $Q^2=0.002-0.07$  (GeV/c)<sup>2</sup>. Due to the large divergence of the secondary muon beam, beam particle trajectories are needed for every event. They are measured by a Gas Electron Multiplier (GEM) tracking telescope consisting of three 10x10 cm<sup>2</sup> triple-GEM chambers. Fast segmented scintillator paddles provide precise timing information. The GEM detectors, their performance in test beam times, and plans and milestones will be discussed. This work has been supported by DOE DE-SC0012589 and NSF HRD-1649909.

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