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Track Reconstruction and the Proton Radius Puzzle[1] STEVEN CLARK, Colorado School of Mines, ETHAN CLINE, RON GILMAN, Rutgers, The State University of New Jersey, MUSE COLLABORATION — In 2010, Pohl et al. (Nature 466, 213) measured the proton charge radius to be 0.84184(67) fm using muonic hydrogen spectroscopy. This value differs about 5σ from the CODATA proton radius from measurements with electrons. Other experiments with muons and electrons have confirmed the difference and the discrepancy has been termed the Proton Radius Puzzle. Currently there are no explanations for the puzzle. The MUon proton Scattering Experiment (MUSE) will make a significant measurement of the proton radius with muon scattering for the first time. The experiment tracks elastic scattering of electrons and muons off of liquid hydrogen. Particle tracks are reconstructed with track fitting software GenFit. Using a simulation of MUSE, GenFit has been determined to be proficient at track reconstruction.

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Steven Clark
Colorado School of Mines

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