

Abstract Submitted
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RD toward design for a pion-production target for Mu2e-II VITALY PRONSKIKH, Fermilab, KEVIN LYNCH, City University of New York, DAVID NEUFFER, Fermilab, JAMES POPP, City University of New York, DAVID PUSHKA, Fermilab, MU2E COLLABORATION — The Mu2e experiment at Fermilab will search for evidence of charged lepton flavor violation by observing the conversion of a negative muon into an electron in the Coulomb field of a nucleus without emission of neutrinos and will probe effective new-physics mass scales in the $10^3 - 10^4$ TeV range. One of the main parts of the Mu2e experimental setup is its target station in which negative pions are generated in interactions of the 8 GeV primary proton beam with a tungsten target, which will be capable of producing $\sim 2 \cdot 10^{17}$ negative muons per year. Mu2e can be extended by a next generation experiment, Mu2e-II, with a sensitivity improved by another factor of 10 or more as enabled by the PIP-II accelerator upgrade project. PIP-II is a 250-meter-long linac capable of accelerating a 2 mA proton beam to a kinetic energy of 800 MeV corresponding to 1.6 MW of power. To achieve another factor of ten improvement in sensitivity, Mu2e-II will require about 100 kW of proton beam on target, and the added power requires a new target design. We will present our progress in RD of a target station conceptual design for Mu2e-II, using the MARS15 and G4beamline Monte-Carlo codes toward a selection between granular, conveyor, and rotating cylindrical target options.

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