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Lessons from Mu2e Tracker Construction and Mu2e-II Tracker Opportunities

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The Mu2e experiment at Fermilab will search for the neutrinoless conversion of a muon into an electron in the field of an Al nucleus, with a sensitivity improvement of four orders of magnitude over previous measurements. Observation of this process would be unambiguous evidence for physics beyond the Standard Model. The signature of muon to electron conversion is a monoenergetic electron with energy nearly equal to the muon mass. Precise tracking with minimal energy loss or multiple scattering is paramount to this measurement. The Mu2e tracker will consist of 20,000 thin-walled straw tubes operating in a vacuum of 10^{-4} torr. The construction process of the tracker has imparted many lessons and techniques which have improved functionality and building efficiency of the detector. These lessons will help to improve the design for future detectors, such as the tracker required for Mu2e-II, a proposed upgrade to the Mu2e experiment. In this talk, we will discuss the Mu2e tracker, lessons learned during the ongoing construction process, as well as Mu2e-II tracker options and opportunities for improvement.

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