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The Mu2e tracker and calorimeter systems

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The Mu2e experiment at Fermilab will measure the charged-lepton flavor violating (CLFV) neutrino-less conversion of a negative muon into an electron in the field of a nucleus. This process results in a mono-energetic electron with an energy slightly below the muon rest mass (104.967 MeV). Mu2e will improve the previous measurement by four orders of magnitude using a new technique, reaching a SES (single event sensitivity) of 2.5×10^{-17} on the conversion rate. The experiment will reach mass scales of nearly 10^4 TeV, far beyond the direct reach of colliders. The experiment is sensitive to a wide range of new physics, complementing and extending other CLFV searches.

A very intense pulsed muon beam ($\sim 10^{10} \mu/\text{sec}$) is stopped on a target inside a very long solenoid where the detector is located. The Mu2e detector is composed of a tracker and an electromagnetic calorimeter and an external veto for cosmic rays surrounding the solenoid. The Mu2e tracker is the primary device to measure the momentum of the electron and separate it from background. The crystal calorimeter plays an important role in providing particle identification capabilities, a fast online trigger filter while aiding the track reconstruction capabilities.

This presentation will cover the details of the tracker and of the calorimeter providing a summary of the experimental status for the two detectors.

Experimental Collaboration

Mu2e

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