

Mu2e: coherent $\mu \rightarrow e$ conversion experiment at Fermilab

Wednesday, 1 June 2016 14:00 (20 minutes)

Summary

The Mu2e experiment will search for Charged Lepton Flavor Violation (CLFV) looking at the conversion of a muon into an electron in the field of an aluminum nucleus. About $7 \cdot 10^{17}$ muons, provided by a dedicated muon beam line in construction at the Fermi National Accelerator Laboratory (Fermilab), will be stopped in 3 years in the Aluminum target. The corresponding single event sensitivity will be $2.5 \cdot 10^{-17}$.

The Standard Model of particle physics, even extended to include the finite neutrino masses, predicts the ratio $R_{\mu e}$ between muon conversions and muon nuclear captures to be $\sim 10^{-52}$. Several extensions of the Standard Model predict $R_{\mu e}$ to be in the range of $10^{-14} \sim 10^{-18}$. The current best experimental limit, set by the SINDRUM II experiment is $7 \cdot 10^{-13}$ @ 90% CL. The Mu2e experiment plans to improve this experimental limit by four order of magnitude to test many of the possible extensions of the Standard Model. To reach this ambitious goal, the Mu2e experiment is expected to use an intense pulsed muon beam, and rely on a detector system composed of a straw tube tracker and a calorimeter made of pure CsI crystals.

Primary author: PEZZULLO, Gianantonio

Presenter: PEZZULLO, Gianantonio

Session Classification: BSM + DM