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Charged lepton flavor violation and Mu2e experiment

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With the discovery of Higgs boson in 2012, the Standard Model was completed, and the search for the physics beyond the Standard Model is in full swing. One of the promising areas where the new physics could show up is the charged lepton flavor violation (CLFV) experiments. In this talk, I'll summarize the past and future CLFV experiments, involving μ ->e, μ ->$e\gamma$, μ ->eee, and Z ->μe decay channels, and present the status of the Mu2e experiment at FNAL, which is to search for the neutrino-less muon to electron conversion in the field of a nucleus. The goal of the experiment is to reach a single event sensitivity of 2.8 x 10^{-17}, setting an upper limit on the muon conversion rate at 6.7 x 10^{-17}. This corresponds to a four order of magnitude improvement with respect to the existing limits.