



Contribution ID: 259

Type: Poster

Machine Learning for Background Hit Rejection in the Mu2e Straw Tracker

Tuesday, September 7, 2021 6:44 PM (1 minute)

The Mu2e experiment at Fermilab will search for charged lepton flavor violation (CLFV) via muon to electron conversion, with a goal of improving the previous upper limit four orders of magnitude and reaching unprecedented single-event sensitivities. The signal of CLFV conversion is a ~ 105 MeV electron, which is detected using a high-precision straw tracker. Protons produced by muon capture can create highly ionizing straw hits. Identifying and removing these hits can enhance the reconstruction efficiency. Through a poster, I will discuss improving the rejection of this background by replacing a simple cut on the energy deposited in the straw with a TMVA-based machine learning algorithm. In particular, it is found that a neural network using the ADC waveform shape and Time-Over-Threshold significantly improves both the signal electron acceptance and proton rejection efficiency.

Primary author: Mr ROY VARIER, Digvijay (University of California, Berkeley)

Co-author: Dr BONVENTRE, Richard (Lawrence Berkeley National Lab)

Presenter: Mr ROY VARIER, Digvijay (University of California, Berkeley)

Session Classification: Poster Session II

Track Classification: Tests of symmetries and conservation laws