

Abstract Submitted
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Monte Carlo Simulation of Stopped Muon Monitor at DUNE

SERGEY GITALOV, Student — The Deep Underground Neutrino Experiment (DUNE) is a project under construction designed to study neutrino oscillations. Neutrinos rarely interact, so other particles involved in the neutrino production must also be studied to indirectly infer about the neutrino beam that will be produced at Fermilab. Among those particles are muons, which are produced alongside muon neutrinos via hadron decays (mainly pions). In order to study these muons, a variety of detectors may be deployed in the muon alcove. One of them is the Stopped Muon Monitor (SMM). Unlike most other muon detectors, the SMM is designed to detect a small portion of the muon beam that will stop and decay inside. Both the muons and the decay $e^{+/-}$ will be detected through scintillation and Cherenkov radiation. The signal from multiple SMM will then be used for muon beam reconstruction. In order to test the SMMs performance, a prototype at CU Boulder will collect data on cosmic ray muons. A Monte Carlo simulation (MC) is run to predict the SMMs performance and compare the results to cosmic ray data in the future. The MC uses an accurate detector geometry, material composition, and a model for cosmic ray muon generation. Future adjustments to the simulation will be used to run simulations of the SMM in the beamline.

Sergey Gitalov
Student

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