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Identification and Reconstruction of Michel electrons in ProtoDUNE-SP

The Deep Underground Neutrino Experiment (DUNE) is a cutting-edge experiment for neutrino science and physics beyond the Standard Model. The physics goals of DUNE are to perform neutrino oscillation physics, searches for physics beyond the Standard Model including baryon number violating processes, and studies of supernova burst neutrinos and other low-energy neutrino physics. The single-phase liquid argon prototype detector at CERN (ProtoDUNE-SP) is a crucial milestone for DUNE that will inform the construction and operation of the first and possibly subsequent 17-kt DUNE far detector modules. I will present the current status of reconstructing Michel electrons from the decays of cosmic-ray muons in the ProtoDUNE detector. These Michel electrons are distributed uniformly inside the detector and serve as a natural and powerful sample to study the detector's response for low-energy (tens of MeV) interactions as a function of position. We have developed selection tools to identify and reconstruct such Michel electrons which could benefit any LArTPC experiment generically.

Primary author: RAFIQUE, Aleena (Argonne National Laboratory)

Presenter: RAFIQUE, Aleena (Argonne National Laboratory)

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