

Calibrating a Liquid Argon Detector using Stopping Muons

Authorship annotation

on behalf of the DUNE collaboration

Session and Location

Wednesday Session, Poster Wall #49 (Auditorium Gallery Right)

Abstract content

ProtoDUNE-SP is a single phase Liquid Argon Time Projection Chamber (LArTPC) which is under construction at CERN and is expected to be operational in August 2018. Its main goals are the design validation and the response calibration of the full size DUNE far detector components exploiting cosmic ray data and test-beam data of different particles of known energy and type. The high rate of cosmic ray interactions in this surface detector allows for calibrations of energy scale by using stopping muons and their decay (Michel) electrons. This poster presents a preliminary analysis of cathode-crossing t_0 -tagged stopping cosmic muons in protoDUNE-SP using simulated data; these events allow for conversion of charge deposition, dQ/dx , to energy deposition, dE/dx , using the known Bragg curve of the muon. A Michel electron event selection is also presented; 98% purity and 2.4% efficiency are achieved by clustering hits which are tagged as Michel-like by a Convolutional Neural Network.

Poster included in proceedings:

no

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