

Calibration for a Liquid Argon TPC

LArTPCs provide sensitivity to GeV signals, such as accelerator neutrinos and part of the supernova neutrino spectrum. TinyTPC is a LArTPC test stand for R&D of LAr doping to expand the reach of LArTPCs down to the 1-10 MeV range, which would substantially enhance the flagship analyses of experiments like DUNE, while enabling low energy analyses. We aim to dope LAr with Xe and photosensitive dopants to expand the LArTPC range by converting hard-to-detect scintillation light to efficiently-detected ionization charge. A critical element of the data analysis in TinyTPC is calibrating the readout. This poster will cover the calibration of TinyTPC, a pixelated liquid argon detector, where we find the distance a muon travels through each pixel. We then calculate the energy loss of muons traveling through the detector from cosmic data. We can reconstruct the path of the particles through the TPC using a density-based clustering algorithm designed to sort straight cosmic muon tracks from low energy radioactive decay curled paths and electronic noise.

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Session Classification: DUNE/SBND