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Cosmic Ray track reconstruction with ProtoDUNE Dual-Phase

The Deep Underground Neutrino Experiment (DUNE) aims to make precise measurements of long-baseline neutrino oscillations over a 1300 km baseline. The DUNE Far Detectors will be 10 kton Liquid Argon Time Projection Chambers (LArTPCs) which require a dedicated prototyping effort (ProtoDUNE), currently ongoing at CERN.

Two LArTPC technologies are being explored, Single Phase and Dual Phase, with kton-scale prototypes are currently being operated at the CERN neutrino platform.

In ProtoDUNE Dual-Phase, ionisation from particle tracks deposited in the liquid argon volume is drifted towards the liquid surface, extracted into the argon vapour, amplified by Large Electron Multipliers and collected by an anode plane with strip readout. ProtoDUNE Dual-Phase has been operational since September 2019, collecting data with cosmic ray muons. In this poster, we show preliminary results from the reconstruction of those cosmic rays using Pandora, a multi-algorithm reconstruction also used in ProtoDUNE Single Phase.

Mini-abstract

The tracks left by cosmic rays show the potential of a large, dual-phase LArTPC

Experiment/Collaboration

The Deep Underground Neutrino Experiment

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