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An analysis of photons collected from tagged cosmic-ray muons in ProtoDUNE-SP

In the Fall of 2018, the first in a pair of full-scale prototypes of the Deep Underground Neutrino Experiment (DUNE) Far Detector known as ProtoDUNE- Single Phase (SP), was activated. ProtoDUNE-SP consists of a Liquid Argon Time-Projection Chamber (LArTPC), integrated Photon Detection System (PDS) and Cosmic-Ray Tagger (CRT) configured to observe particles provided by the CERN SPS, however cosmic-ray events are also present. This poster presents an analysis of the light produced by cosmic-ray muons identified using the CRT and TPC. The relationship between the observed light in an S-ARAPUCA PDS module versus the distance to the track was compared between data and simulation and agreed better with a Rayleigh scattering length of 90 cm rather than 60 cm.

Mini-abstract

Photons in ProtoDUNE-SP prefer a simulated Rayleigh Scattering length of 90cm rather than 60cm.

Experiment/Collaboration

DUNE

Primary author: Dr RAMSON, Bryan

Presenter: Dr RAMSON, Bryan

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