

ProtoDUNE Photon Detection System

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DUNE will be a long-baseline neutrino oscillation experiment that will perform precision measurements of the PMNS mixing parameters, unambiguously determine the neutrino mass order, and discover leptonic CP violation. It also comprises a rich non-accelerator physics program as the detection of supernova neutrinos and BSM physics. The Far Detector of DUNE will consist of four modules, of which at least three, will be 17 kton liquid argon Time Projection Chambers (LAr-TPCs). Inside a LAr-TPC, a Photon Detection System (PDS) is needed to detect the scintillation light produced by the interacting particles. The PDS signal provides the interaction time for non-beam neutrinos and improves the calorimetric reconstruction. To validate DUNE technology, two large-scale prototypes, of 750 ton of LAr each, have been constructed at CERN, ProtoDUNE-HD and ProtoDUNE-VD. The PDS of both prototypes is based on the XArapuca concept, a device that provides good detection efficiency covering large surfaces at a reasonable cost. During this talk, the PDS design of both, ProtoDUNE-HD and ProtoDUNE-VD will be reviewed and the preliminary performance of ProtoDUNE-HD, which is taking data from April 2024, will be shown.

Working Group

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