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ProtoDUNE detector

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(Please update abstract)
The Deep Underground Neutrino Experiment (DUNE) will use large liquid argon (LAr) detector consisting of four modules, each with a fiducial mass of 10 ktons of LAr. One of the technology options for the far detector modules is a liquid-argon Time Projection Chamber (TPC) working in Dual-Phase mode. In a Dual-Phase TPC, ionization charge deposited in the liquid argon volume is drifted towards the liquid surface, extracted into the argon vapour, amplified by Large Electron Multipliers (LEM) and collected by an anode plane with strip readout. To validate this technology, a kton-scale prototype, ProtoDUNE Dual-Phase, has been constructed and is currently operating at the CERN neutrino platform.

In this talk, we will cover the principal features of the detector design, discuss its operation, and show some preliminary results from the collected comic ray data samples.

The single-phase liquid argon TPC at CERN (ProtoDUNE-SP) is an engineering prototype for the first module of the DUNE far detector. This prototype which has dimensions of a cube of about 10m edge provides full validation of the use of the membrane tank technology for large dimension cryostats. Furthermore, the very high performance of the protoDUNE-SP TPC with more than 500 days of continuous and stable operation, demonstrated the reliability of the LAr detection technology at a scale never tested before. In this talk, we will review the main characteristics and milestones of the construction and installation of protoDUNE-SP which provide a series of benchmarks for DUNE. The performance for several different detector working points will also be discussed.

Working group

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