

DUNE Vertical Drift LArTPC design

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The Deep Underground Neutrino Experiment (DUNE) is a long-baseline neutrino-oscillation experiment aiming at measuring CP-violating phase and neutrino mass ordering. The far detector consists of four 17-kt modules based on Liquid Argon Time Projection Chamber (LArTPC) technology.

The recently proposed Vertical Drift (VD) concept has been selected as the design of the second module. This concept uses a novel perforated-PCB anode design, which considerably simplifies the TPC construction compared to the standard wired-based anodes with similar calorimetry and tracking efficiencies.

A VD-prototype, so-called Module-0, is currently under final assembly at the CERN Neutrino Platform and is foreseen to take cosmic and beam data early 2024. The Module-0 is equipped with four anode planes, or Charge-Readout Plane (CRP), which have all been operated in a dedicated full-scale cryostat with cosmic data over the past year.

This talk will introduce the LArTPC Vertical Drift concept and present the performance results from the CRP full-scale data campaign. The status and the preparation work for the upcoming Module-0 data will be discussed, such as the plans towards the second DUNE far detector module.

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