

The 2x2 Demonstrator: DUNE ND-LAr Prototype

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The Deep Underground Neutrino Experiment (DUNE) is a precision long-baseline neutrino oscillation experiment that will employ LArTPC technology in a near detector placed at Fermilab and a far detector at the Sanford Underground Research Facility, at a baseline of 1300 km. The DUNE Liquid Argon Near Detector (ND-LAr) design takes into account the high neutrino intensity expected from the LBNF beam: several optically separated time projection chambers are instrumented with a pixel-based, true 3D charge readout alongside scintillation light traps to disentangle the $O(50)$ neutrino events expected per 10 μ s beam spill. The 2x2 Demonstrator will test the DUNE ND-LAr design between upstream and downstream repurposed MINERvA tracking planes under the NuMI beam at Fermilab in the few-GeV energy range. It consists of four 0.7m x 0.7m x 1.4m TPC modules filled with 2.6t of LAr, read out by over 300k charge-collecting pixels. Every module has been commissioned and tested with cosmic ray data at the University of Bern. The 2x2 Demonstrator is scheduled to begin data-taking in Fall 2023, collecting the first neutrino beam data with this technology. This talk will provide an overview of the detector design for ND-LAr and the 2x2 demonstrator, as well as the latter's status and expected physics program.

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