

Abstract Submitted
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Maintaining ProtoDUNE Dual Phase's Uniform Electric Field with Divider Board¹ DOUGLAS ZENGER, Univ of Texas, Arlington, PROTO-DUNE TEAM² — The ProtoDUNE project of the dual-phase Liquid Argon (LAr) Time Projection Chamber (TPC) is a prototype experiment for the Deep Under Ground Neutrino Experiment (DUNE) at Fermilab. The protoDUNE field cage (FC) consists of 98 extruded aluminum profiles, supported by fiber reinforced plastic I-beams. A neutrino will interact with LAr, and the resulting secondary particles ionize LAr, whose electrons are detected in the gaseous argon. A strong, uniform electric field of 500V/cm generated by the FC will cause the electron to drift upwards, requiring a voltage potential of -300kV at the cathode at the bottom. To connect profiles electrically and to protect the power supply, four 2G Ω resistors, reducing the current flowing, and two groups of four varistors in series, protecting the resistors from potential electrical surges, will be placed in parallel between each profile placed on a divider board. Testing will ensure the quality of the parts using liquid nitrogen. The resistors used will have only 1.5% difference from the mean of its resistance compared to other resistors, causing about a 40% rejection rate. Varistors will be tested to show if a high resistance at 1.5kV is present, showing about a 15% rejection rate.

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