Abstract Submitted
for the TSS18 Meeting of
The American Physical Society

Simulating the Electric Field for the Proto-DUNE Dual Phase Detector MATHEW RAPP, Univ of Texas, Arlington — The Proto-DUNE Dual Phase Detector is a prototype for DUNE, the Deep Underground Neutrino Experiment. This Dual Phase Liquid Argon TPC operates as one of two prototypes for the far detector used for the DUNE experiment. The detector is housed within a cryogenic structure submerged in 300t of Liquid Argon. A uniform electric field of 500 volts per centimeter is maintained within the active space of the detector by large voltage differences across 98 aluminum profiles. Simulations of the electric field allow for the behavior of the detector to be studied before it becomes operational. The geometry used to simulate the detector can be manipulated to test for tolerances of its components. A large source of error for this experiment is the buildup of charges on the surface of the detectors components. Simulations computed to assist in identifying where this might occur within the detector. Hence, performing these simulations is vital to understand and anticipate how specific parts will affect the detectors performance. These simulations will be of use to both Proto-DUNE modules, as well as future projects involving LArTPC technology.

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Date submitted: 02 Mar 2018 Electronic form version 1.4