

Abstract Submitted  
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**Study of Track Ambiguities and Wire Plane Orientation in Single Phase Liquid Argon Time Projection Chambers**<sup>1</sup> BRENDON BULLARD, Brandeis University, CHAO ZHANG, Brookhaven National Laboratory , DEEP UNDERGROUND NEUTRINO EXPERIMENT COLLABORATION — The Deep Underground Neutrino Experiment (DUNE) is currently in development and will utilize a ten-kiloton scale liquid argon time projection chamber (LArTPC) to observe neutrinos from a beam produced using protons from the Main Injector at Fermilab. It is difficult to accurately reconstruct tracks traveling nearly parallel to the LArTPC wire planes due to the finite time resolution of the detector and the limitations of using projective wire geometries. Such reconstructed tracks exhibit degeneracy to varying degrees and could have a large enough effect on primary signals and backgrounds to warrant a design change in the DUNE TPCs. We simulated charged current signal and neutral pion decay background events in order to understand the impact on signal efficiency and background rejection in a LArTPC using wire readout planes situated parallel or perpendicular to the neutrino beam. We found that using a perpendicular wire plane significantly reduces the degeneracy problem for both lepton and hadrons. Other aspects of perpendicular TPC design including signal processing are still under study.

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