

Abstract Submitted  
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**Studies of Space Charge Effects in Liquid Argon Time Projection Chambers** MICAH GROH, Univ of Cincinnati — Space charge accumulation due to ionization of argon atoms by cosmic rays incident on liquid argon time projection chambers (LArTPCs) can distort the electric field inside the TPC, affecting the resolution of positional measurements. This effect is particularly relevant for LArTPC detectors located near or on the surface, such as MicroBooNE and the future detectors of Fermilab's short-baseline neutrino program. The purpose of these studies is to explore the effects of space charge in liquid argon time projection chambers, with particular focus on the 35 ton experimental LArTPC prototype for the ELBNF project at Fermilab. A simplified model for the charge density and electric field within the chamber are used to determine the effects of space charge on the electric field, electron drift velocity, and particle paths in the TPC. I will present results demonstrating that electric fields with a lower magnitude have a noticeably stronger effect from space charge. Ongoing studies will include the effects of the liquid argon flow inside the TPC. These studies will be valuable to interpret data from the ELBNF 35 ton detector, to be collected in Spring 2015.

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