Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Pion Charge Exchange Cross Section on Liquid Argon[1] KEVIN NELSON, William Mary Coll, LARIAT (FNAL T-1034) COLLABORATION — The observation of neutrino oscillations allows charge parity violation to be probed in the neutrino sector. Detectors with high calorimetric energy resolution and high spatial resolution will provide precise measurements of neutrino oscillations. By measuring small $\pi^{\pm}$ cross sections for individual interaction channels, specifically charge exchange, we will make a measurement in the first of its kind on liquid Argon and demonstrate the physics capabilities of a relatively new detector technology: the Liquid Argon Time Projection Chamber (LAr TPC). This analysis will report on the thin slab cross section measurement technique and the Monte Carlo cross section measurements in the energy range of 0.2 - 1.0 GeV. This analysis is the first iteration in classifying charge exchange events from a sample of incident pions, and it aims to identify events in which a π^0 was produced without any charged pions leaving the interaction vertex. We will also report on the methodology and efficiency of this algorithm in identifying particles and their interactions in liquid argon. This analysis will inform a future measurement of the $\pi^{\pm}$ charge exchange cross section on liquid argon.

[1]This work was supported in part by the National Science Foundation under Grant No. PHY-1359364

Kevin Nelson
William
Mary Coll

Date submitted: 25 Sep 2016 Electronic form version 1.4