



Contribution ID: 118

Type: **Poster**

## **Liquid Argon Time Projection Chambers: MicroBooNE and Future Prospects for Neutrino Oscillation Physics**

MicroBooNE—the latest in a series of Booster Beam experiments located at Fermilab—is a Liquid Argon Time Projection Chamber (LArTPC) that will investigate the low energy neutrino excess seen by its predecessor, MiniBooNE. Cherenkov detectors, such as MiniBooNE, are limited by their inability to distinguish between single electrons and photons, a task LArTPCs are well suited for. With the high precision reconstruction capabilities of a LArTPC, MicroBooNE will be able to determine with high statistical certainty whether electrons or photons caused the anomalous MiniBooNE low energy excess. Of further interest to MicroBooNE are neutrino-nucleon cross-sections. Cross sections have accounted for much of the uncertainty in recent results from a variety of neutrino experiments, and sensitive measurements by MicroBooNE will lead to improved nuclear models and rate predictions. Beyond MicroBooNE, LArTPCs will continue to play a notable role in oscillation physics. LAr1-ND will act as a baseline for improving systematic uncertainties in MicroBooNE and investigating the nature of the MiniBooNE excess, while also acting a small-scale phase experiment for future, bigger LArTPCs such as LAr1 and LBNE. This poster will explore the LArTPC as used in MicroBooNE and future experiments.

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**Track Classification:** Short Baseline Oscillations / Sterile Neutrinos / Non-standard Oscillations