Contribution ID: **126**   Type: **Poster**

Measuring Electron Neutrinos with Particle Identification in the MicroBooNE LArTPC for sensitivity to new Physics

The primary goal of the MicroBooNE experiment is to investigate the anomalies observed in accelerator-based short baseline neutrino experiments, with specific attention to the MiniBooNE low energy excess. MiniBooNE was unable to distinguish electrons from photons in this energy range, hence new experimental evidence is required. If the excess is associated with electron neutrinos, something MicroBooNE can determine, it could be an indication of new physics.

This poster describes the selection of such interactions at low energy, with emphasis on the novel particle identification techniques developed in MicroBooNE, which take full advantage of the calorimetric reconstruction of each individual particle produced in the interaction.

These techniques are also utilised to perform a selection of muon neutrinos, used to constrain many of the systematic uncertainties.

These results allow the interpretation of MicroBooNE's data in the context of possible new physics models, such as the hypothesis of additional sterile neutrinos.

Mini-abstract

MicroBooNE measurement of electron neutrinos might lead to new physics discovery

Experiment/Collaboration

MicroBooNE

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Session Classification: Poster Session 1