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Recent Results from MicroBooNE's Search for a Low-Energy-Excess Anomaly under the Electron Hypothesis and additional BSM Studies

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The MicroBooNE experiment utilizes an 85-tonne active mass liquid argon time projection chamber neutrino detector. It can distinguish between photon and electron electromagnetic showers and select charged-current electron neutrino and muon neutrino events with exceptional performance. In this talk, we will present new results on MicroBooNE's investigation of the MiniBooNE Low Energy Excess under the electron hypothesis. These results are based on the complete dataset collected over the experiment's five years of operation. This measurement excludes an electron-like interpretation of MiniBooNE's excess at above 99% CL. Additionally, we will present our progress in searching for eV-scale sterile neutrinos in the 3+1 oscillation framework. This effort leverages the well-understood charged-current electron neutrino and muon neutrino event selections and utilizes neutrinos from both the on-axis Booster Neutrino Beam and the off-axis Neutrino from the Main Injector beam. This enables us to test the sterile neutrino hypothesis, probing the parameter space that is compatible with short baseline anomalies from the LSND, MiniBooNE, Neutrino-4, Gallium, and BEST experiments. Finally, we will present other BSM searches, including searches for heavy neutral leptons and Higgs portal scalars using MicroBooNE data.

Collaboration you are representing

MicroBooNE

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