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New results from MicroBooNE's search for a Low-Energy-Excess anomaly in the photon and e+e- channels

Monday 25 August 2025 14:40 (20 minutes)

The MicroBooNE experiment is an 85-ton active mass liquid argon time projection chamber (LArTPC) neutrino detector situated in the Fermilab Booster Neutrino Beam (BNB). In this talk, we will present several new results of the experiment's investigations of the MiniBooNE Low Energy Excess in both the single-photon and electron-positron channels, probing the Standard Model background interpretation as well as Beyond the Standard Model (BSM) explanations beyond 3+1 oscillations. For the photon channel, we performed a model-independent, inclusive search for events with photon showers. While data and predictions agree across the full signal region, a 2σ excess is observed in the subset of events with no visible protons in the final state. Additionally, searches for single photon production from neutral-current coherent-like processes as well as an updated result from Delta radiative decay will be presented. In the electron-positron channel, we conduct the first direct test of dark sector models in which dark neutrinos, produced via neutrino-induced scattering, decay into visible a e+e- pair and missing energy. The resulting constraints on these models as explanations for the MiniBooNE anomaly will be discussed.

Collaboration you are representing

MicroBooNE

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