

MicroBooNE's Search for Anomalous Single-Photon Production

Tuesday 22 August 2023 14:48 (24 minutes)

The MicroBooNE experiment is an 85-ton active volume liquid argon time projection chamber (LArTPC) neutrino detector situated in the Fermilab Booster Neutrino Beam (BNB). Leveraging the unique capabilities of the LArTPC technology to distinguish photons from electron electromagnetic showers, MicroBooNE has achieved the world's most sensitive search for neutrino-induced single-photon production. In this talk, we will present a comprehensive overview of these results, as well as recent advancements in our search for single-photons as an explanation for the MiniBooNE Low Energy Excess. These include a more model-independent approach utilizing inclusive photon searches, as well as a targeted search for NC coherent-like single-photon production. Moreover, we will introduce a new direction of focused searches aimed at exploring "Beyond the Standard Model" scenarios, which involves investigating exotic e^+e^- pair production that could be attributed to neutrinos acting as a portal to a potential "Dark Sector" of new physics.

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Session Classification: parallel (room#302)

Track Classification: WG5: Neutrinos Beyond PMNS