

MicroBooNE's Search for Anomalous Single-Photon Production in Neutrino Scattering

Friday, August 5, 2022 4:10 PM (29 minutes)

We report the results from MicroBooNE's search for a single-photon excess in the Booster Neutrino Beam at Fermilab, a potential interpretation to the long-standing MiniBooNE low-energy excess anomaly. We highlight recent results targeting neutrino-induced neutral current resonant $\Delta(1232)$ baryon production followed by Δ radiative decay. Data corresponding to MicroBooNE's first three years of operations (6.80×10^{20} protons on target) were used to search for single-photon events with the backgrounds constrained via an in-situ high-purity measurement of NC π^0 events. This provided the world's most sensitive search for NC $\Delta \rightarrow N\gamma$ below 1 GeV and disfavors the hypothesis that anomalously large Δ radiative decay is the origin of the MiniBooNE low-energy excess. Additional cross-checks to this analysis utilizing a separate reconstruction framework are presented, along with plans and progress towards both a model-independent inclusive photon search, and new model-dependent search targeting NC coherent-like single-photon production.

Attendance type

In-person presentation

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