

# 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  $\Delta$  radiative decay. Data corresponding to MicroBooNE's first three years of operations ( $6.80 \times 10^{20}$  protons on target) were used to search for single-photon events with the backgrounds constrained via an in-situ high-purity measurement of NC  $\pi^0$  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  $\Delta$  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

**Primary author:** SUTTON, Kathryn (Caltech)

**Co-author:** ROSS-LONERGAN, Mark (IPPP Durham University)

**Presenter:** SUTTON, Kathryn (Caltech)

**Session Classification:** WG5: Beyond PMNS

**Track Classification:** WG5: Beyond PMNS