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Investigations of the MiniBooNE anomaly and sterile neutrino search with MicroBooNE

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MicroBooNE uses a liquid argon time projection chamber (LArTPC) detector to investigate the observed anomalous low energy excess (LEE) of single electromagnetic shower events reported by the MiniBooNE experiment. By leveraging the LArTPC technology's ability to distinguish electron and photon electromagnetic showers, MicroBooNE is able to thoroughly test a number of hypotheses for the origin of the LEE. After five years of data taking from two accelerator beamlines at Fermilab, MicroBooNE has recently published results testing explanations for the MiniBooNE anomaly, including three single-photon searches spanning multiple underlying processes and topologies, a search for the photon-like signature of an electron-positron pair produced by dark neutrinos, an electron neutrino search utilizing the full 5-year dataset collected with the Booster Neutrino Beam (BNB), and a 3+1 sterile neutrino oscillation analysis leveraging both the BNB and Neutrinos at the Main Injector (NuMI) beamlines. This talk will present these results and prospects for future measurements.

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