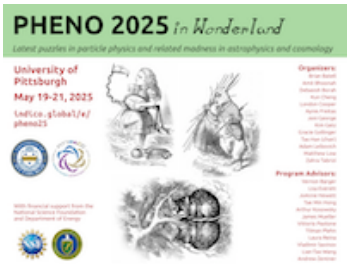

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Towards a Robust Exclusion of the Sterile-Neutrino Explanation of Short-Baseline Anomalies

Monday 19 May 2025 16:45 (15 minutes)

The sterile neutrino interpretation of the LSND and MiniBooNE neutrino anomalies is currently being tested at three Liquid Argon detectors: MicroBooNE, SBND, and ICARUS. It has been argued that a degeneracy between $\nu_\mu \to \nu_e$ and $\nu_e \to \nu_e$ oscillations significantly degrades their sensitivity to sterile neutrinos. Through an independent study, we show two methods to eliminate this concern. First, we resolve this degeneracy by including external constraints on ν_e disappearance from the PROSPECT reactor experiment. Second, by properly analyzing the full three-dimensional parameter space, we demonstrate that the stronger-than-sensitivity exclusion from MicroBooNE alone already covers the entire 2σ preferred regions of MiniBooNE at the level of $2-3\sigma$. We show that upcoming searches at SBND and ICARUS can improve on this beyond the 4σ level, thereby providing a rigorous test of short-baseline anomalies.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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