

Final Search for Short-Baseline Neutrino Oscillations with the PROSPECT-I Detector at HFIR

The Precision Reactor Oscillation and SPECTrum (PROSPECT) reactor antineutrino experiment is designed to detect eV-scale sterile neutrino oscillation at short baselines. PROSPECT's segmented detector is positioned approximately 7 meters away from the compact research reactor core at Oak Ridge National Laboratory's High Flux Isotope Reactor. During the data collection period, certain photomultiplier tubes (PMTs) experienced current instabilities, which resulted in the previous search for sterile neutrino oscillation being dominated by statistical uncertainties. However, by using new analysis approaches: multi-period dataset combined with single-ended event reconstruction, we successfully recovered and maximized Inverse Beta Decay (IBD) events while reducing background for each period. The poster will present the final results for sterile neutrino oscillation searches from the PROSPECT experiment using the optimized dataset.

This material is based upon work supported by the following sources: US Department of Energy (DOE) Office of Science, Office of High Energy Physics, and internal investments at all institutions.

Working Group

WG 1: Neutrino Oscillation Physics

Primary authors: ANDRIAMIRADO, Manoa (University of Antananarivo); PROSPECT COLLABORATION

Presenter: ANDRIAMIRADO, Manoa (University of Antananarivo)

Session Classification: Poster session

Track Classification: WG5: Neutrino Beyond PMNS