Contribution ID: **383** Type: **Poster**

Joint-Search for Light Sterile Neutrino Oscillations by PROSPECT, STEREO, and Daya Bay

Friday, 21 June 2024 17:30 (2 hours)

The PROSPECT, STEREO, and Daya Bay experiments have provided world-leading results regarding the detection of reactor-produced antineutrinos. PROSPECT and STEREO have made short-baseline (~10m) measurements of antineutrinos from highly enriched uranium (HEU) research reactors where over 99% of the antineutrino flux comes from ^{235}U. The Daya Bay experiment has studied antineutrino emission at low-enriched uranium (LEU) power reactors that use a mixture of fissile isotopes, with detectors spanning a much larger baseline from the reactor cores (~2km). All three experiments have performed independent searches for sterile neutrino oscillations, excluding different regions of oscillation phase space. The PROSPECT collaboration has recently implemented new analysis event reconstruction techniques into their analysis resulting in a multi-period dataset marked by a significant enhancement in statistical power and improved signal-to-background ratios providing greater sensitivity for the search of sterile neutrinos. In addition, a new collaborative effort, utilizing the final data sets from all three experiments, aims to improve the precision of the search for light sterile neutrinos beyond what would be achievable by each experiment individually. This presentation reports the final search for eV-scale sterile neutrinos with the final PROSPECT-I data set, as well as the current status of the joint oscillation analysis between these experiments.

Poster prize

Yes

Given name

Diego

Surname

Venegas-Vargas

First affiliation

University of Tennessee Knoxville

Second affiliation

Oak Ridge National Laboratory

Institutional email

dvenega1@vols.utk.edu

Gender

Male

Collaboration (if any)

PROSPECT, STEREO, Daya Bay

Primary author: VENEGAS VARGAS, Diego (University of Tennessee Knoxville/ Oak Ridge National Laboratory)

Presenter: VENEGAS VARGAS, Diego (University of Tennessee Knoxville/ Oak Ridge National Laboratory)

Session Classification: Poster session and reception 2

Track Classification: Sterile neutrinos