Planned Improvements to Sterile Neutrino Searches in the NOvA Far Detector

SIJITH EDAYATH, Cochin University of Science and Technology (CUSAT) / Fermilab. — The evidence of neutrino oscillations from the majority of neutrino oscillation experiments are consistent with a three-flavor model, but the existence of additional sterile neutrino flavors is required to explain deviations observed in short-baseline experiments, such as LSND and MiniBooNE, in terms of neutrino oscillations. The NOvA experiment, which uses a long baseline of 810 km between its Near Detector (ND) at Fermilab and Far Detector (FD) in Minnesota, has the potential to search for sterile neutrino mixing by looking for a deficit of neutral-current (NC) neutrino interactions at the FD with respect to the ND prediction. In this talk, I will present the scope of the future planned 2018 NC analysis and will also present the improvements being developed for the NC sterile neutrino search. These analysis improvements include a simultaneous ND-FD shape fit of the NC energy spectrum, allowing NOvA to probe a wider range of sterile neutrino masses than previous analyses.

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