

Improving NOvA's Sterile Neutrino Search with the Booster Neutrino Beam

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The NOvA experiment's most recent search for eV-scale sterile neutrinos is systematically limited in the region of parameter space where Δm_{41}^2 *gtrsim* 1 eV². This region of parameter space is preferred by sterile neutrino interpretations of current experimental anomalies; improving sensitivity here is high-priority. When added directly into the fit, additional data samples which are subject to orthogonal systematic uncertainties act as in-situ constraints, breaking the degeneracy between systematic uncertainties and sterile-induced oscillations. The NOvA experiment consists of two functionally identical detectors, 14.6 mrad off-axis of the NuMI beam, with the Near Detector (Far Detector) 1 km (810 km) from the beam source. The Near Detector's position on-site at Fermilab means that it is also able to observe neutrinos from a second neutrino beam, the BNB, 160 mrad off-axis. NOvA has been taking BNB data since 2015, but has not yet analysed these data. The BNB and NuMI are subject to different beam-related uncertainties, allowing us to leverage this sample as an in-situ constraint. This poster will present the current status, preliminary simulations, and potential additional uses of this unique experimental setup

Poster prize

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