

Neutrino oscillation results from NOvA

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NOvA is a long-baseline neutrino oscillations experiment designed to precisely measure the neutrino oscillation parameters. We do this by directing a beam of predominantly muon neutrinos from Fermilab towards northern Minnesota. The experiment consists of two functionally equivalent detectors each located 14.6 mrad off the central axis of Fermilab's 700 kW NuMI neutrino beam, the world's most intense neutrino beam. Both the Near Detector, located 1 km downstream from the beam source, and the Far Detector, located 810 km away in Ash River, MN, were constructed from plastic extrusions filled with liquid scintillator. The three-flavour long-baseline search probes undetermined physics parameters such as the neutrino mass hierarchy (ordering), CP violation in the lepton sector and the octant of θ_{23} (the large mixing angle). To extract these parameters, we compare the neutrino interactions in the detectors to observe the disappearance of muon neutrinos and the appearance of electron neutrinos, due to oscillations. I will present results based on the combined neutrino-mode and antineutrino-mode beam data-sets, collected by the NOvA experiment up to April 2018. I will also discuss the future physics reach of NOvA.

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