Contribution ID: **95** Type: **Parallel talk**

Latest Three-Flavor Neutrino Oscillation Results from NOvA

Wednesday 16 October 2024 14:00 (15 minutes)

NOvA, is a two-detector, long-baseline neutrino oscillation experiment located at Fermilab, Batavia, IL, USA. It aims to constrain neutrino oscillation parameters by analyzing $\nu_\mu(\bar{\nu}_\mu)$ disappearance and $\nu_e(\bar{\nu}_e)$ appearance data. The experiment uses the Neutrinos at Main Injector (NuMI) beamline at Fermilab, which delivers a high-purity 900 KW beam of neutrinos and anti-neutrinos. The detectors are functionally identical finely granulated liquid tracking calorimeters, both situated 14.6 mrad off-axis to the beam direction. The NOvA Near Detector (ND), situated 100 meters underground and 1 kilometer from the beam source, detects the un-oscillated $\nu_\mu(\bar{\nu}_\mu)$ and beam $\nu_e(\bar{\nu}_e)$ events. The Far Detector (FD), located in Ash River, MN, USA, 809 kilometers from the ND, records the oscillated $\nu_e(\bar{\nu}_e)$ and the un-oscillated $\nu_\mu(\bar{\nu}_\mu)$ events. NOvA employs an extrapolation technique to predict the expected events at the Far Detector based on the Near Detector data, thereby providing a significant constraint on systematic uncertainties in the oscillation analyses. As NOvA accumulates more data, controlling these systematic uncertainties becomes increasingly important. This talk will detail the NOvA neutrino oscillation analysis framework and its approach to minimizing dominant systematic uncertainties using Near Detector data. The latest three flavor neutrino oscillation results based on a neutrino-beam exposure of 26.60×10^{20} POT and an anti-neutrino beam exposure of 12.50×10^{20} POT and a novel low energy ν_e sample, will also be presented.

Track type

Neutrino Physics

Primary authors: CHOUDHARY, Brajesh (University of Delhi (IN)); Mr SINGH, Ishwar (University of Delhi); SUTER, Louise

Presenter: Mr SINGH, Ishwar (University of Delhi)

Session Classification: Parallel - Neutrino