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Muon Removed Electron-added Study for Neutrino-Electron Elastic Scattering in the NOvA Near Detector

Monday 12 December 2022 14:00 (1 hour)

NOνA is a long-baseline accelerator neutrino experiment at Fermilab that aims at precision neutrino oscillation analyses and cross-section measurements. Large uncertainties on the absolute neutrino flux affect both of these measurements. Measuring neutrino-electron elastic scattering provides an in-situ constraint on the absolute neutrino flux. In this analysis the signal is a single, very forward-going electron shower with $E_e{\theta_e}^2$ peaking around zero. After the electron selection, the primary background for this analysis is the beam ν_e charged current events (ν_e CC). Muon removed electron-added (MRE), events are constructed from ν_μ CC interactions by removing the primary muon track and simulating an electron in its place. It helps us to understand the consequence of
hadronic shower mismodelling on ν_e selection. This talk presents an overview of on-going MRE studies and a plan for how this sample can be used to provide a data-driven constraint on the ν_e CC backgrounds present in the ν-e analysis.

Session

Neutrino Physics

Primary author: BRAHMA, Barnali (IIT Hyderabad)

Presenter: BRAHMA, Barnali (IIT Hyderabad)

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