Contribution ID: **70** Type: **Parallel talk**

Constraining cross section uncertainties for a DUNE Long-baseline analysis

Wednesday 9 April 2025 11:30 (15 minutes)

The DUNE Near Detector (ND) will have sufficiently high statistics to constrain the contributions from the neutrino flux, interaction cross-section, and detector efficiency. Neutrino-nucleus cross-sections will be a large source of systematic uncertainty for DUNE. It is therefore crucial to constraint this uncertainty as much as possible in order to make precision measurements of the neutrino oscillation parameters using the DUNE Far Detector (FD). One way of separating these uncertainties as a function of neutrino energy is by moving the DUNE ND off-axis (DUNE PRISM). It is also important to select projections and binning for the DUNE event rate that is not only most sensitive to neutrino oscillation but also directly correlates to the interaction kinematics and where the detector systematics can be well motivated. In this talk, I will explore the benefits of different sets of analysis projections. I will also discuss how DUNE PRISM can constrain cross-section uncertainties.

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Session Classification: Neutrino Physics

Track Classification: Neutrino Physics