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Constraints on the Neutrino Flux in NOvA using the Near Detector Data

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NOvA, a long-baseline neutrino oscillation experiment at Fermilab, is designed to measure electron-neutrino appearance and muon-neutrino disappearance in the NuMI beam. NOvA comprises of two finely segmented liquid scintillator detectors at 14 mrad off-axis in the NuMI beam. An accurate prediction of the neutrino flux is needed for precision oscillation and cross-section measurements. Data from the hadro-production experiments and, importantly, from the NOvA Near Detector provide powerful constraints on the muon-neutrino and electron-neutrino fluxes. In particular, the measurement of the neutrino-electron elastic scattering provides an in situ constraint on the absolute flux. This talk presents the data-driven predictions of the NOvA muon-neutrino and electron-neutrino flux, and outlines future improvements in the flux determination.

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