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Data-Driven Constraints on ν_e Signal and Background Using Neutrino and Anti-Neutrino Modes in NOvA MIRANDA ELKINS, Iowa State University, NOVA COLLABORATION — NOvA is a long baseline neutrino oscillation experiment which consists of two functionally identical detectors utilizing liquid scintillator tracking calorimeters. NOvA strives to measure ν_e appearance and $\nu_\mu$disappearance at the far detector using neutrinos originating from the NuMI Beam at Fermilab. The near detector is positioned at Fermilab, and measures the $\nu_\mu$component of the NuMI beam as well as background components which could be misinterpreted as the ν_μ to $\nu_e$oscillated signal at the far detector. The background contains: Charged Current ν_μ, Neutral Current, and $\nu_e$events. In order to predict the far detector signal, NOvA needs to determine what fraction of the near detector sample can be attributed to each of these components. To accomplish this, NOvA decomposes the near detector measurement in three different ways and extrapolates these components separately to obtain a data-driven correction to the intrinsic $\nu_e$background. In the past, NOvA has done extensive studies decomposing the neutrino mode of the NuMI beam. More recently, we have studied the anti-neutrino mode. In my talk, I will present details of the decomposition and extrapolation techniques for predicting the far detector spectrum using both the neutrino and anti-neutrino modes.

Miranda Elkins
Iowa State University

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