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Extracting neutrino oscillation parameters using a simultaneous fit of the $\nu_{\mu e}$ appearance and $\nu_{\mu\mu}$ disappearance data in the NOvA experiment

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NOvA is a two detector, long baseline neutrino oscillation experiment designed to study $\nu_{\mu e}$ (anti $\nu_{\mu e}$) appearance and $\nu_{\mu\mu}$ (anti $\nu_{\mu\mu}$) disappearance in a ν_{μ} (anti ν_{μ}) beam produced at Fermilab. The near detector (ND) is located 100 meters underground at a distance of 1 km from the target whereas the far detector (FD) is located on the surface, 810 km away from the beam source in Ash River, MN. The ND is used to measure the beam before oscillations and the FD measures the oscillated spectrum. The ND and the FD are functionally identical detectors and the ND spectra are extrapolated to the FD to predict the signal and background spectra expected in the FD. I will present the extrapolation and data fitting techniques developed for these analyses within NOvA.

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