

Abstract Submitted  
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**Current Analysis Status for the Inclusive Neutral Current  $\pi^0$  Production Cross section Measurement with the NOvA Near Detector** DAISY KALRA, GIULIA BRUNETTI, Fermilab — NOvA (NuMI Off-axis  $\nu_e$  Appearance) experiment is designed to study long-baseline neutrino oscillations. It uses two detectors, the Near Detector (ND) at Fermilab and the Far Detector (FD) at a distance 810 km in Northern Minnesota. NOvA looks for the  $\nu_e$  appearance at the FD using a narrow band  $\nu_\mu$  beam peaked at 2 GeV in energy. Neutral Current (NC) interactions with a  $\pi^0$  in the final state represents the main background in the  $\nu_e$  appearance measurement. The  $\pi^0$  decay into two photons can fake the  $\nu_e$  appearance either due to merging of two photon showers or one of the two photons escaping the detection. Therefore, a complete understanding of  $\nu_\mu$  induced NC interactions with a  $\pi^0$  in the final state is very important. It will also help in reducing the background uncertainties for current and future long-baseline neutrino oscillation experiments. We will present the status of the analysis related to the inclusive NC  $\pi^0$  production cross section measurement with the NOvA ND.

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