Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Current Status of the Inclusive Neutral Current π^0 Production Cross section Measurement with the NOvA Near Detector DAISY KALRA, Fermilab/Panjab University, NOVA COLLABORATION — The NOvA (NuMI Off-axis ν_e Appearance) experiment is designed to study long-baseline neutrino oscillations. It uses two detectors, the NOvA near detector (ND) at Fermilab and the NOvA far detector (FD) at a distance 810 km in northern Minnesota. NOvA measures the rate of ν_e appearance at the FD using a narrow-band ν_μ beam peaked at 2 GeV in energy. Neutral Current (NC) interactions with a π^0 in the final state are a significant background in the ν_e appearance measurement. The π^0 decay into two photons can fake the ν_e appearance signal either due to merging of two photon showers or one of the two photons escaping the detection. Therefore, a complete understanding of NC interactions with π^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 present the status of the analysis related to the inclusive NC π^0 production cross section measurement with the NOvA ND. A multivariate event identification algorithm is used to select the NC π^0 events of interest and the selection criteria are optimized by minimizing the fractional uncertainty on the total cross section.

Daisy Kalra
Fermilab/Panjab University

Date submitted: 11 Jan 2018 Electronic form version 1.4