

# Muon antineutrino charged-current neutral pion production differential cross-section measurement in the NOvA near detector

*Friday, 5 August 2022 17:10 (20 minutes)*

NOvA is a long-baseline neutrino oscillation experiment primarily designed to measure the muon (anti)neutrino disappearance and electron (anti)neutrino appearance in the off-axis Fermilab NuMI beam. It uses two functionally identical liquid scintillator detectors separated by 810 km and a narrow band beam centered around 2 GeV. Energetic neutral pions produced in  $\Delta$  resonance, deep-inelastic interactions or final state interactions are a significant background to the electron (anti)neutrino appearance measurement as the photons coming from neutral pion decay may be misidentified as electrons(positrons). The high statistics antineutrino mode data in the near detector can be used to perform a measurement of the differential cross section for the muon antineutrino charged-current neutral pion production. The analysis uses a convolutional neural network trained on individually simulated particles to identify neutral pions in the final state. A data-driven template fit approach is used to constrain backgrounds. The assessment of systematic uncertainties is also presented.

## Attendance type

In-person presentation

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**Session Classification:** WG2: Neutrino Scattering Physics

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