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

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NOvA is a long-baseline neutrino oscillation experiment designed to measure muon (anti)neutrino disappearance and electron (anti)neutrino appearance in Fermilab's NuMI beam. It uses two functionally identical liquid scintillator detectors separated by 810km and a narrow band beam centered around $E_\nu = 2$ GeV. Energetic neutral pions produced in resonant, deep-inelastic, or final state interactions are a significant background to the electron (anti)neutrino appearance measurement due to the misidentification of photons from neutral pion decay as electrons(positrons). Using the high statistics antineutrino mode data, the near detector can be used to measure the differential cross section for muon antineutrino charged-current neutral pion production on a hydrocarbon target. The status of this measurement including a convolutional neural network to identify neutral pions in the final state, a data-driven template fit approach used to constrain backgrounds, and the expected systematic uncertainties will be presented.

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