

# NuInt12 : Eighth International Workshop on Neutrino-Nucleus Interactions in the Few-GeV Region



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## Measurement of neutrino induced NC- $1\pi^0$ using the ND280 Tracker region

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Single  $\pi^0$  production is one of the most important backgrounds in the  $\nu_\mu \rightarrow \nu_e$  appearance measurement in T2K. Large uncertainties in this production rate make it difficult to predict. Therefore, measurement at the near detector (ND280) is required to constrain efficiently not only the background prediction at the far detector (Super-K) but also at the near detector to improve knowledge of the intrinsic  $\nu_e$  contamination within the beam. We present an analysis based on Monte Carlo simulation of neutral current (NC) single  $\pi^0$  production in the tracker region of ND280. NC- $1\pi^0$  are selected using a specific two-gamma signature in the tracker. The first gamma from the  $\pi^0$  decay is reconstructed by selecting an  $e^+/e^-$  pair starting in the Fine-Grained target Detector (FGD) and extending into the TPC, where the leptons can be identified and their momentum measured accurately. The second gamma is then selected in time in the calorimeter modules surrounding the tracker. We will present in detail selections cuts, efficiency and purity of the selection. A projection of the expected number of single  $\pi^0$  candidates that are expected for  $3 \times 10^{20}$  POT exposure (run I+II+III data) will be given.

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