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Constraining the Neutral Current π^0 Background for MicroBooNE's Single-Photon Search

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Liquid Argon Time Projection Chambers (LArTPCs) are an important technology in the field of experimental neutrino physics due to their exceptional calorimetric and position resolution capabilities. In particular, their ability to distinguish electrons from photons is crucial for current and future neutrino oscillation experiments. The MicroBooNE experiment is utilizing LArTPC technology to investigate the MiniBooNE low-energy excess, which could be either electron-like or photon-like in nature. On the photon-like side, MicroBooNE is searching for single-photon events, the most common of which result from neutral current (NC) Δ radiative decays. However, this search is complicated by the significantly more common neutrino-induced NC resonant π^0 production process. In this talk, I present my work in constraining this NC π^0 background. Using a modified version of the single-photon analysis framework, we instead select two-photon events which are characteristic of the NC π^0 topology. The selected sample is then used to constrain the systematic uncertainty on the NC Δ radiative decay measurement, which will be the first of its kind in argon.

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