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Systematic Studies for a Photon-like Low Energy Excess Search at MicroBooNE[1] GRAY YARBROUGH, Fermilab, MICROBOONE COLLABORATION — MicrBooNE is part of the global neutrino physics program which is currently focused on studying neutrino oscillations seeking explanation to questions such as the matter-antimatter asymmetry. The "low energy excess" (LEE) of electron neutrino and antineutrino charged current quasi-elastic events observed in the MiniBooNE experiment is a result that has great theoretical implications, but these depend on confirmation of the identification of these events. The MicroBooNE liquid argon time projection chamber (LArTPC) detector at Fermilab was built primarily to investigate this LEE. One possible interpretations of the MiniBooNE LEE is that it is comprised of neutrino-induced single-photon events. MicroBooNE is testing this hypothesis via a study of neutral current resonant delta production with subsequent radiative decay. This talk will cover the related studies to fully understand the systematic uncertainties of this single photon analysis, including re-weighting Monte Carlo events to estimate the effect of many flux and cross-section uncertainties as well as detector systematics. In addition, a simulation of constraining the final uncertainties utilizing secondary signal studies including neutral current pion production and subsequent decay is presented.

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