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Single Photon Searches at ICARUS with SPINE

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The MiniBooNE Low-Energy Excess (LEE) of electron-like events from the Booster Neutrino Beam (BNB) has puzzled neutrino physicists for decades. One possible explanation has been an unpredicted excess of neutral current (NC) Δ resonance interactions with a subsequent radiative decay. An increase in the rate of NC $\Delta \rightarrow N\gamma$ events by a factor of 3.18 could explain the LEE seen by MiniBooNE. ICARUS also sees neutrinos from the BNB and can check the rate of these single photon events. The SPINE particle physics reconstruction suite leverages deep neural networks (DNNs) to optimize particle reconstruction and identification in Liquid Argon Time Projection Chambers (LArTPCs). I present preliminary findings on the effectiveness of these machine learning (ML) techniques for single photon event reconstruction at ICARUS.

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Session Classification: Experiments - SBN