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Energy Resolution of a Large-Scale Liquid Argon Detector KEVIN WOOD, SANJIB MISHRA[1], University of South Carolina, LBNE COLLABORATION — The high granularity and feasibility of large-scale construction makes the Liquid Argon Time Projection Chamber (LArTPC) a suitable technology for the Long Baseline Neutrino Experiment (LBNE) far detector. Particle identification relies largely on the topology and calorimetric information from the signature left in the detector. The measurements LBNE intends to make depend on accurately distinguishing charged current electron neutrino events from neutral current background events. A neutrino event featuring an electron produced by ν_e interaction will tag it as signal; although, gammas from π^0 decays in neutral current events induce electromagnetic showers that resemble those of an electron. The granularity and high energy resolution of LArTPCs enable dE/dx to be extracted from the beginning of these showers which helps separate gammas from electrons and, ultimately, charged current electron neutrino events from neutral current events. Presented here is an estimation of the technology's energy resolution and a demonstration of its capabilities for separating electrons and gammas using dE/dx.

[1]Sanjib works closely with Kevin on the presented material

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