Simulation of Fiducial Cuts for the CLAS12 Electromagnetic Calorimeter[1]

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The mission of Jefferson Lab is to understand the quark nature of the atomic nucleus. In Hall B we will use an 11-GeV electron beam to collect the products of electron-nucleus scattering with the CEBAF Large Acceptance Spectrometer (CLAS12). CLAS12 is made of layers of detectors that characterize the scattered particles. A central instrument in CLAS12 is electromagnetic calorimeters system (ECAL) made of altering layers of lead and scintillator. A particle that hits ECAL creates a particle shower that induces light in the scintillators which is converted to a voltage to determine the particle's position and deposited energy. If a particle hits near the edge of the ECAL, some energy may seep out the side and go undetected. To study this effect we simulated and reconstructed CLAS12 electron events, using CLAS12 Common Tools to analyze these near-edge hits. To identify an optimal distance from the ECAL edge for observing complete particle showers we studied the resolution and deposited energy of those events. We will show the results of these simulations for different sets of kinematics.

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