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## A Hybrid 3D/2D Field Response Calculation for Liquid Argon Detectors with PCB Based Anode

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The Liquid Argon Time Projection Chamber (LArTPC) is one of the main neutrino detection techniques. It enables highly detailed reconstruction of neutrino events with high spatial precision and low energy threshold. The field response, which describes the induced current on the anode-plane readout for the drifting ionization electrons, is a crucial input to the overall LArTPC event processing and reconstruction procedure. The ideal field response simulation should be done in 3 dimensions to simulate the electric field and electron behavior near the anode properly. Still, the required computation in the full 3 dimensions is too big for a realistic calculation. We developed a new package that calculates field response for newly proposed printed circuit board (PCB) anodes. The package combined 3D and 2D field simulations utilizing the finite-difference method to achieve fast and precise field response calculation. The simulated field response was compared against data from the recent CERN Vertical Drift detector prototype, which demonstrated sub 5% uncertainty. In this talk, we will review the package's technical aspects and its performance on data.

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