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Tomographic Event Reconstruction Techniques in the MicroBooNE LArTPC IVAN CARO TERRAZAS, Colorado State Univ, MICROBOONE COLLABORATION — Neutrino event reconstruction in liquid argon time projection chambers (LArTPCs) involves both the imaging of particle interactions and the subsequent performance of pattern recognition on the images to reconstruct particle tracks and electromagnetic showers in the detector. The imaging makes use of the charge and time information associated with ionization electron signals measured at the wire readout of the induction planes and collection plane. Wire-Cell, a novel approach to neutrino event reconstruction in LArTPCs that uses tomographic techniques for imaging of the event, has been developed recently for use at LArTPC neutrino experiments such as MicroBooNE (Micro Booster Neutrino Experiment) and DUNE (Deep Underground Neutrino Experiment). In this approach, the trajectories of particles in the event are mapped directly to a 3D image by matching local charge depositions across both the induction and collection planes. Using data from the MicroBooNE detector, we highlight the intricacies of signal processing in LArTPCs and characterize the performance of charge estimation at the wire readout, the cornerstone of the Wire-Cell approach to neutrino event reconstruction.

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