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Recent progress on Wire-Cell 3D imaging and tracking for LArTPC

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The single-phase liquid argon time projection chamber (LArTPC) provides a large amount of detailed information in the form of fine-grained drifted ionization charge from particle traces. MicroBooNE is a 85 metric tonne single-phase LArTPC and the first detector taking data in the Short Baseline Neutrino (SBN) program, located at Fermilab, which will examine a rich assortment of physics topics, such as searches for a light sterile neutrino and measurements of neutrino-Argon interaction cross sections. A novel and generic tomographic event reconstruction paradigm, Wire-Cell, was developed in MicroBooNE. It incorporates the time, charge, wire plane geometry, and sparsity, connectivity information to reduce the ambiguity from wire readout and reconstructs the topology agnostic 3D image of ionization electrons. The principle and the performance of the Wire-Cell 3D imaging will be presented. The progress of the subsequent 3D tracking based on Wire-Cell 3D images will also be reported.

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