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A tomography-inspired method for event reconstruction in Liquid Argon Time Projection Chamber

The Liquid Argon Time Projection Chamber (LArTPC) has characteristics suitable for precise reconstruction of neutrino interaction including inividual tracks as well as for calorimetric measurements. In order to gain sensitivity to reactions with very small cross-sections, modern LArTPC devices are built at a considerable scale. Future experiments such as the Deep Underground Neutrino Experiment (DUNE) will include tens of kilotons of the cryogenic medium. To be able to utilize sensitive volume that large while staying within practical limits of power consumption and cost of the front-end electronics, it is instrumented with arrays of wire electrodes grouped in readout planes, arranged with a stereo angle. This leads to certain challenges for object reconstruction due to ambiguities inherent in such scheme. We present a novel reconstruction method inspired by principles used in tomography, which brings the LArTPC technology closer to its full potential.

Summary

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