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Neutrino interactions in a modularised-LArTPC demonstrator for the DUNE near detector

Friday 28 October 2022 16:00 (20 minutes)

The Deep Underground Neutrino Experiment (DUNE) adopts a design of modularised LArTPC for the near detector. It is equipped with revolutionary pixelated readout which enables true 3D projection of particle passages. The pixelated readout eliminates projection ambiguity presented in wire-readout LArTPCs and is particularly suitable for busy detector environment close to the intense neutrino beam. The LArTPC also deploys novel light detectors (ArcLight and LCM) to measure module-contained scintillation light signal with high position resolution and high light yield. The modularised LArTPC provides defined volume for charge-light matching which is particularly useful to identify neutrino events in the detector environment with high event-rate. In combination with the pixelated readout and the light detection, the modularised LArTPC design opens up the potential to study detached secondary particles from neutrino interactions. A demonstrator of this LArTPC with four modules, named as 2x2, will be moved into NuMI neutrino beamline in 2023. It will provide unique opportunity of measuring neutrino-Argon interactions in the relevant neutrino energies for DUNE. This talk will focus on the novel LArTPC design and the 2x2 in the NuMI beam.

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