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Demonstration of a novel, ton-scale, pixel-readout LArTPC for the DUNE near detector

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To cope with the high event pile-up, the liquid argon time projection chamber of the near detector complex of the Deep Underground Neutrino Experiment, called ND-LAr, relies on an innovative modular design featuring an advanced high-coverage photon detection system, a true 3D pixelated charge readout, and a low-profile resistive-shell field cage. The capabilities of this detector, including the performance of the charge and light readout systems, the signal matching between the two, the detector purity, and the response uniformity, have been demonstrated with two ton-scale prototypes operated at the University of Bern that acquired large samples of cosmic ray data. The data have been compared to a microphysical detector simulation performed with highly-parallelized GPU algorithms. The main results from the analysis of these data sets, as well as the overall status of the ND-LAr detector development efforts, are presented in this talk.

In-person participation

Yes

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