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The Data Acquisition System of protoDUNE dual-phase

Friday 16 October 2020 08:35 (20 minutes)

ProtoDUNE dual-phase is a prototype at the scale 1/20 of the future DUNE 10 kton dual-phase module. The detector is based on the liquid argon time projection chamber technology with amplification and collection of the ionization electrons in the gas phase. The detector has an active volume of 6x6x6 m3 containing 300 ton of liquid argon. A drift window of 6 m corresponds to 4 ms which are subdivided in 10000 samples of 12 bit for each one of the 7680 readout channels used to instrument the segmented anode collecting the drifted charges at the top of the detector. The data acquisition system of protoDUNE dual-phase is the outcome of a long R&D process aimed at simplifying the design and costs while preserving high bandwidth performance for a trigger rate up to 100 Hz. The front-end digitizing units are 120 AMC cards of 64 channels with 10 gbit/s connectivity. Groups of 10 AMC cards are integrated in 12 μTCA crates together with timing and synchronization slave nodes based on the White-Rabbit standard, used as well to dispatch external triggers. ProtoDUNE dual-phase started operating in August 2019. This talk will focus on the design aspects and the operation experience of the DAQ system.

Minioral

No

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No

Are you a student?

No

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