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The QPix pixelated readout concept for future Liquid Argon Time Projection Chambers: status and prospects

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Future long baseline neutrino experiments such as the Deep Underground Neutrino Experiment (DUNE) pose challenges for development of readout techniques for multi-kiloton LAr Time Projection Chambers (TPC). In contrast to wire/strip anode readout, a pixelated readout eliminates disadvantages such as disambiguation in 2D track reconstruction. The Q-Pix Consortium, established in 2019, is developing a pixelated readout technique for LAr TPCs based on charge-integrate/reset (CIR) circuits. The CIR blocks generate a sequence of reset pulses with time intervals corresponding to fixed charge integrals, allowing signal reconstruction without continuous digitization. The Q-Pix ASIC, intended for reading out pixel arrays, comprises CIR blocks along with digital components responsible for communication and reconfigurable data routing. This talk will give an overview of the Q-Pix project, its status, and prospects, with emphasis on the development and prototyping of the Q-Pix readout ASICs.

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