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The SLAC RCE Platform for ProtoDUNE-SP

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The ProtoDUNE-SP is a single-phase liquid argon time projection chamber (LArTPC) prototype for the Deep Underground Neutrino Experiment (DUNE). Signals from 15,360 electronic channels are received by 60 Reconfigurable Cluster Elements (RCEs), which are processing elements designed at SLAC for a wide range of applications and are based upon the "system-on-chip"Xilinx Zynq family of FPGAs. The RCEs are housed in industry-standard ATCA shelves on a custom blade, called the Cluster on Board (COB). The RCE platform and its processing functions for the ProtoDUNE-SP will be presented. Additionally, a conceptual design of the RCE upgrade and its potential applications to the full-scale DUNE detectors will be discussed.

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