

INO's RPC-DAQ module: Performance review and upgrade plans

Thursday, May 27, 2021 9:30 AM (18 minutes)

The India-based Neutrino Observatory (INO) has proposed to build a magnetised Iron-CALorimeter (ICAL) to study atmospheric neutrinos. The ICAL detector will use 28,800 Resistive Plate Chambers (RPCs) of 2 m x 2 m area as active detector elements. The particle interaction signals in the RPCs are amplified and converted into logic signals using discriminators. These logic signals are processed by the RPC-DAQ module which is mounted with every RPC. RPC-DAQ is built around Intel's Cyclone IV FPGA, HPTDC and Ethernet controller W5300. Pre-trigger signals generated in each RPC-DAQ, participate in forming a global event trigger (GT). On receiving the GT, the RPC-DAQ records mainly the event time, RPC strip-hit pattern along with relative time stamps of the hits. The strip rates, are recorded periodically in order to monitor the health of the RPCs. The RPC-DAQ then packages these data and sends them over Ethernet to the back-end servers. RPC-DAQ performance and upgrade plans will be presented.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

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Session Classification: Readout: Trigger and DAQ

Track Classification: Readout and Data Processing: Readout: Trigger and DAQ