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Design and Implementation of JUNO DAQ Prototype System

The Jiangmen Underground Neutrino Observatory (JUNO) is a multi-purpose underground neutrino experiment. About 18000 20-inch photomultipliers (PMTs) are instrumented in the Central Detector to detect the photons, and the signals will be captured by high-speed high-resolution waveform full sampling technique. This work builds a prototype DAQ system for JUNO, which can be used to test the full readout chain for 20-inch PMTs. The system is designed to continuously read out the data fragments from multiple electronics channels, check the raw data, concatenate them into full waveforms, and finally save them into disk. Meanwhile, the GUI will provide a real time display of the sampled waveforms. The prototype DAQ system is developed with the open source QT platform, and the data transmission between DAQ and electronics uses IPbus protocol. The detailed design and implementation of this DAQ prototype system will be presented.

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Author: ZHOU, Tong (Chinese Academy of Sciences)

Co-authors: ZHU, Kejun (Chinese Academy of Sciences (CN)); LI, Fei (Chinese Academy of Sciences (CN))

Presenter: ZHOU, Tong (Chinese Academy of Sciences)

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