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The primarily design of 30-channel data acquisition system for 1-ton prototype detector of Jinping Neutrino Experiment

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The JNE(Jinping Neutrino Experiment) experiment is located in an underground laboratory in Jinping Mountain, China, with the ultimate goal of building a 500 ton detector with 4000 channels for detecting and studying solar neutrinos. This goal poses a huge challenge to electronic design. Therefore, 30-channel data acquisition system will be built for the 1-ton prototype detector to verify the electronic performance. This paper designs and tests 6 data acquisition(DAQ) boards and 1 Trigger &Time (TT) board used in 30-channel system. Each DAQ board has 6-channel 1GSPS 13-bit ADCs with ENOB(Effective Number of bits) greater than 9.5. The QSFP link Open UI on the DAQ front panel is greater than 55%. The maximum skew value of the synchronization clock between DAQ boards is 85.6ps. The test results indicate that the hardware performance meets the requirements for building a data acquisition system. This also provides a foundation for the development of 4000-channel system.

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

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