

R&D of a Generic Readout Platform Based on the Modern SoC Architecture for CSNS

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To address complexities arising from the various readout electronics for different neutron detection or imaging system, a general readout electronics platform is introduced in the paper, which can greatly reduce the difficulty of designing and maintaining readout electronics for Chinese Spallation Neutron Source (CSNS). The fundamental thought of the general readout electronic platform is achieved through the cooperation of analog and digital modules. The analog module is used to condition the input signal in order to improve the signal-to-noise ratio. The digital module is a system-on-chip (SoC) solution, which can facilitates the following functionalities: analog-to-digital conversion, digital signal processing, communication and providing embedded Linux system for software development. The introduction of SoC architecture make the general readout electronics platform become a more modern system, which can flexibly achieve the data analysis, physical information extraction and access to data stream-processing platform, such as Apache-Kafka. As well as provide a brand new perspective on the process of developing next-generation neutron spectrometers software and hardware readout system.

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