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Study on the Real-time Lossless Data Compression Method Used in the Readout System for Micro-pattern Gas Detector

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The data compression technology now is fully developed and widely used in many fields such as communication, multi-media, image information processing and so on. The large physical experiments, especially the ones with Micro-pattern Gas Detectors (MPGD), which always have many readout channels and have a lot of data to be transferred and saved, are however relatively seldom use this technology. In this paper, the real-time lossless data compression method is proposed for a general-purposed MPGD readout system. The lossless data compression can reduce the data transmission bandwidth of the system as well as keep all information of the data. The compression method discussed in the paper mainly consists of two steps. The first step is to pre-process the data according to different characteristics of different signals and the second step is to compress the pre-processed data using common lossless compression algorithm. Besides, the whole compression method is implemented in FPGA and is able to run real-timely. The system is then used to readout two different kinds of signals and the compression rate can reach as high as 43% and 30% respectively.

Minioral

Yes

Description

Micromega

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