



Contribution ID: 34

Type: **Poster plus Minioral**

Triggerless Electronics based on HTM Method for Cosmic Ray Muon Imaging

The optical scintillation fiber detector designed for muon imaging usually requires thousands of electronic readout channels, for this reason, a set of trigger-less multi-board synchronous data acquisition(DAQ) system is designed, its single board Analog-to-Digital Converter(ADC) can carry four 64 channel sigma delta ADC, in which oversampling method and the embedded digital shaping and filtering module help to better reconstruct the analog signal. Here, the performance of the ADC will be tested. The digitized signal is received by Field Programmable Gate Array(FPGA) which then interacts with server with the help of enhanced small form-factor pluggable(SFP+) interface. In order to solve the problem of multi-board synchronization, for the digital front-end part, the clock board is designed to provide the homologous clock for the whole DAQ system. For the back-end, the method is to decode the digital signal inside the FPGA, judge and select the effective signal through the triggerless algorithm. Finally, the data packet is split on the server to realize data synchronization. In Pandax-4T experiment, due to the large bandwidth input of signal source, there is congestion when calling memory on the server side to receive and sort data packets. Here, correction will be added on the FPGA to reduce the size of data packets with Head-Tail Marking(HTM) method and reduce the memory call pressure of the server, and realize the multi-board synchronization of the system.

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

Authors: Mr LI, Nan (Shandong University); Ms DONG, Jianing (Shandong University); Prof. LI, Haifeng (Shandong University); Mr LI, Qingchen (Shandong University); Prof. REN, Xiangxiang (Shandong University)

Presenter: Mr LI, Nan (Shandong University)

Track Classification: Front End Electronics and Fast Digitizers