



Contribution ID: 27

Type: **Poster presentation**

Development of front-end readout electronics for CsI (TI) gamma detection array at ETF of CSR

Tuesday 7 June 2016 15:00 (1h 30m)

A Front-end readout electronics has been developed for CsI (TI) Gamma Array with 1024 large area avalanche photodiodes (APDs) at External Target Facility (ETF) of Cooler Storage Ring (CSR) in the Institute of Modern Physics. The full read-out electronics consists of 32 identical analog boards, 8 Acquisition and Control boards (ACBs) and a PXI chassis. In the analog board Application Specific Integrated Circuits (ASICs) ATHED (Asic for Time & High Energy Deposit) are used to realize multi-channel energy and time measurements. The ACB implements analog output signal conversion, slow control, fast timing control signals generation and data acquisition. The read-out of the system is based on a PXI data acquisition, which can satisfy the requirements of a high counting rate and a large number of readout channels. The test results show that with a ^{60}Co source an energy resolution of 7.2% has been achieved.

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Session Classification: Poster session 1

Track Classification: Data Acquisition