

A Read-Out System with Charge Measurement using Time-Over-Threshold Property of NINO ASICs using FPGA.

Monday 25 May 2020 18:40 (20 minutes)

A simple inexpensive read-out system has been developed for an RPC based muon imaging system. The Time-Over-Threshold property of the fast pre-amplification, discrimination chip NINO, can be utilized to measure the pulse-height and hence the charge content of a detector signal. The charge profile of an event can be obtained from the fired strips, which localizes the particle track. This alternative way of charge-measurement can reduce the cost of electronics required for a muon tracker with hundreds of readout channels. The NINO output pulse-width from a read-out strip, that triggered by a scintillator hodoscope has been measured using a 1 GHz, 5GS/s oscilloscope. The mean value of the pulse-width has been found to be around 25 ns in the avalanche mode and 60 ns in the streamer mode. The same measurement is also being done with Altera MAX-10 FPGAs. A 400 MHz clock produced using a Phase-Locked loop clock generator can measure the pulse width with an uncertainty of 2.5 ns.

Funding information

Primary authors: TRIPATHY, sridhar; DATTA, Jaydeep; Mr DAS, SUBHENDU (SINP); MAJUMDAR, Nayana (Saha Institute of Nuclear Physics); MUKHOPADHYAY, Supratik (Saha Institute of Nuclear Physics (IN)); Prof. SARKAR, Sandip (Saha Institute of Nuclear Physics)

Presenters: TRIPATHY, sridhar; DATTA, Jaydeep; MAJUMDAR, Nayana (Saha Institute of Nuclear Physics); MUKHOPADHYAY, Supratik (Saha Institute of Nuclear Physics (IN))

Session Classification: Poster

Track Classification: Readout: Front-end electronics