

Workshop on Advanced Radiation Detector and Instrumentation in Nuclear and Particle Physics (Online)



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A Compact and Cost effective Data Acquisition Module (C-DAQ) for Particle physics instrumentation

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Nuclear and particle physics instrumentation often requires lots of NIM based modules and lengthy cables for setting up experiments. Data Acquisition modules with FPGA are used as alternatives. But FPGA modules are expensive and require expertise handling. To address this issue a Cost effective, compact and user friendly Data acquisition module using FPGA was developed. This miniature module consists of a daughter card with 8 input channels which accept negative pulses from a few millivolts to 1 or 2 Volts. This module discriminates analog negative pulses with a common threshold then converts to TTL and sends to FPGA. A low form factor MAX10 FPGA development board was used as a mother board. A user programmable logic with counting of all input pulses up to 100ns resolution and coincidence logic was implemented inside the FPGA. This coincidence output is available in NIM format for triggering purposes. 32bit Counter data of all eight input signals and coincidence counter data are sent to the control PC via USB UART port. Same USB port used for supplying 5V 1A power required by the module. A Simple python script controlled UART protocol is used to receive counter data and send configuration logic. This paper describes architecture and various applications of C-DAQ in detail

What is your experiment?

India based Neutrino Observatory

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