A compact silicon strip detector design with SoC-FPGA-based readout electronics

Silicon strip detector (SSD) system is wildly used in many collider experiments and cosmic-ray experiments to measure high energy particle trajectory information. Suck system could reach O(10) um tracking resolution and ability to do particle identification for heavy ions. In addition, SSD based beam monitors/telescopes are useful tools for test beam studies to support the R&D of other detectors.

Based on Xilinx Zynq SoC-FPGA, we designed a compact readout electronics system for SSD sensor. This system includes a front-end board with several active components, like IDE1140, ADC, DC-DC, connect to the SSD sensors. The signal on the SSD sensor will be amplified and converted to digital on front-end board. The back-end data-acquisition system (DAQ) is implemented on an Zynq SoC board, which includes both firmware and software for online data processing and monitoring. In this poster, we will introduce this compact SSD readout design, beam monitor application, and test beam performance we achieved.