



Contribution ID: 30

Type: Poster

P1.31: Design and characterization of multichannel front-end electronics for detectors at HIRFL and HIAF

Monday, June 26, 2023 3:19 PM (1 minute)

Many kinds of detectors are highly desirable with a large number of experiments being performed at the heavy ion research facility in Lanzhou (HIRFL) and the high-intensity heavy-ion accelerator facility (HIAF). A competent and cost-effective front-end electronics system is required for the signal processing of these detectors. In this paper, we present a multichannel front-end readout electronics (MFEE) design based on the AD8488 chip. The MFEE mainly consists of an AD8488 chip, an ADC chip, an FPGA, four DDR3 memories, and an SFP interface. The lab test results show that the MFEE is relatively less nonlinear, i.e., about 1.4%. The RMS of noise levels below 5.57 ADC value. The joint tests performed using plastic scintillator detectors (PSD) show that the MFEE has an excellent performance in measuring cosmic rays. We are currently designing a revision of MFEE to make it more compact and less noisy.

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Session Classification: Poster (incl. coffee)