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Characterization and Calibration of the FIT SiPM Read-Out System

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The use of scintillating fiber detectors, read out with silicon photomultiplier (SiPM) arrays, has emerged as a promising technology for particle tracking in high-energy physics, cosmic-ray and gamma-ray astrophysics. The Fiber Tracker (FIT), proposed for the upcoming High Energy cosmic-Radiation Detection (HERD) facility, provides a spatial resolution at the scale of tens of micrometers with precise charge reconstruction measurements. The custom-made BETA ASIC has been developed to read out the SiPM arrays, fulfilling the stringent requirements for noise, linearity, dynamic range, and power consumption of space applications.

In this contribution, we present the performance of the SiPMs and the BETA read-out system used for FIT. The setup has been optimized, characterized, and calibrated using an LED light source. Furthermore, we discuss the system's performance in generating efficient triggers for the identification of ionizing particles.

Eligibility for "Best presentation for young researcher" or "Best poster for young researcher" prize

Yes

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