



CALOR 2024

第20回 素粒子・原子核物理学
カロリメータ検出器国際会議
(つくば国際会議場, 2024年5月20日～24日)

Contribution ID: 100

Type: Poster

Studies of a large dynamic range SiPM readout ASIC MPT2321-B (poster-ID100)

Thursday 23 May 2024 14:10 (5 minutes)

The high-granularity homogeneous electromagnetic calorimeters (ECALs), designed for future lepton colliders, demonstrate outstanding electromagnetic energy resolution and maintain sufficient low-energy photon detection capability. This demands an excellent electronic system for the readout of silicon photomultipliers (SiPMs), capable of covering a wide dynamic range from single photons to 10^5 photons. The novel 32-channel large dynamic range Application-Specific Integrated Circuit (ASIC) MPT2321-B developed by MicroParity is considered to be a promising candidate for the front-end readout of the high-granularity homogeneous ECALs.

Comprehensive measurements were made using the charge injection method and laser calibration of SiPMs in the laboratory. The first high-energy electron beamtest of the chip with crystals and SiPMs has been conducted, demonstrating excellent signal-to-noise for single photon calibration and a large dynamic range.

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Session Classification: Poster Session (with Coffee)