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

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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.

Authors: QI, Baohua (Chinese Academy of Sciences (CN)); WANG, Danqi (Zhejiang University); ZHU, Hongbo (ZJU - Zhejiang University (CN)); SHI, Huangchao (Zhejiang University); LIU, Yong (Institute of High Energy Physics, Chinese Academy of Sciences); ZHAO, Zhiyu (Tsung-Dao Lee Institute (CN))

Presenter: QI, Baohua (Chinese Academy of Sciences (CN))

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