

Performance studies of a SiPM-readout system with a pico-second timing chip

A pico-second timing (PIST) front-end electronic chip has been developed using 55 nm CMOS technology for future electron-positron collider experiments (namely Higgs factories). Extensive tests have been performed to evaluate the timing performance of a dedicated SiPM-readout system equipped with a PIST chip. The results show that the system timing resolution can achieve 30 ps for SiPM signals corresponding to minimum-ionizing particles (MIP) level (200 p.e.) and better than 10 ps for signals larger than 800 p.e., while the PIST intrinsic timing resolution is 4.76 ± 0.09 ps. The time-over-threshold (ToT) response of the PIST ASIC has been attained, which can cover the SiPM response spanning from 560 p.e. to 25,000 p.e.

Primary authors: XIA, Xin (IHEP); LIU, Yong (Institute of High Energy Physics)

Presenter: XIA, Xin (IHEP)

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