

A Timing Measurement Prototype for LGAD Using the LATRIC ASIC

- Design and characterization of a readout prototype for Low-Gain Avalanche Diode (LGAD) sensors.
- The prototype is intended for
 - The outermost tracking detector of the CEPC reference detector.
 - Other applications demanding excellent timing resolution.
- The microstrip AC-LGAD sensor is proposed in TDR with a goal of
 - 10 μm spatial resolution
 - 50 ps time resolution
- An ASIC was designed and fabricated using a 55 nm CMOS process to achieve the desired goal, and its coincidence timing performance was characterized with an LGAD using a laser setup.
- The measured timing resolution for each channel is ~ 17.8 ps under full laser intensity, whereas it degrades to ~ 36 ps when the laser intensity is reduced to a level equivalent to that of a MIP.

