Contribution ID: **89** Type: **Talk**

Studies of AC-coupled Low Gain Avalanche Detector for the CEPC Outer Tracker System

Friday, 7 November 2025 09:20 (20 minutes)

AC-coupled Low Gain Avalanche Detectors (AC-LGADs) have become leading contenders for upcoming 4D tracking systems, attracting considerable interest from numerous research organizations. These detectors have been selected as the Outer Tracker (OTK) detectors for the Circular Electron Positron Collider (CEPC), as the detector can provide both high-precision spatial resolution (~10 μm) for momentum measurement and high-precision timing (~ 50 ps) for particle identification. Research on AC-LGADs developed by the Institute of High Energy Physics (IHEP), featuring 5.65-mm-long strip sensors, has shown impressive results, with a timing resolution of about 40 picoseconds and a spatial resolution of approximately 10 micrometers. Total Ionizing Dose (TID) radiation studies have further indicated that these sensors maintain strong performance under CEPC's radiation conditions. Towards CEPC OTK system, An AC-LGAD with a strip length of ˜4 cm has been designed, and its performance be evaluated. This presentation includes simulations of AC-LGAD design parameters, including n+ layer dose, isolation structures and so on, with a focus on capacitance optimization aimed at enhancing performance. The design of IHEP's AC-LGAD strip sensors and the preliminary testing results of AC-LGAD sensors with long strips will also be reported.

Primary author: ZHAO, Mei (高能所, IHEP)

Presenter: ZHAO, Mei (高能所, IHEP)

Session Classification: Silicon Detector

Track Classification: Detector and System: 12: Silicon Detector