

ETL LGAD characterization at USTC (CMS)

Thursday, 30 October 2025 17:00 (20 minutes)

The Endcap Timing Layer (ETL) of the CMS experiment's MIP Timing Detector (MTD) will employ Low-Gain Avalanche Diodes (LGADs). As a major breakthrough in silicon detector technology, LGADs boast two core advantages: outstanding time resolution and excellent signal-to-noise ratio. The experimental team has designed separate test schemes for LGAD test structures and sensor arrays, with all tests carried out on a probe station.

This report presents the laboratory characterization work on the 16×16-channel LGAD prototype sensor arrays and test structures developed for the ETL subsystem of the CMS experiment. It elaborates in detail on the design of the I-V (Current-Voltage) and C-V (Capacitance-Voltage) test setups used to measure key parameters, and also showcases the preliminary test results.

The relevant work provides crucial technical support for the performance optimization and engineering application of the MTD detector during the High-Luminosity LHC phase. Additionally, it accumulates key experience for the research, development, and testing of next-generation silicon-based timing detectors.

Primary author: 赵, 祥 (中国科学技术大学)

Presenter: 赵, 祥 (中国科学技术大学)

Session Classification: Parallel 1: Upgrade

Track Classification: Upgrade