

Beam-test evaluation of pre-production Low Gain Avalanche Detectors for the ATLAS High Granularity Timing Detector

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The High Granularity Timing Detector (HGTD) will be installed in the ATLAS experiment as part of the Phase-II upgrade for the High Luminosity-Large Hadron Collider (HL-LHC). It will mitigate pile-up effects in the forward region, and measure per bunch luminosity. The design of HGTD is based on Low Gain Avalanche Detector (LGAD) sensors. This talk presents the results of beam-test campaigns conducted at CERN and DESY in 2023 and 2024 on HGTD pre-production LGAD sensors, before and after irradiation. The tested LGADs can meet HGTD requirements in term of charge collection, time resolution, and hit efficiency, even under HL-LHC end-of-life conditions, supporting their deployment in the final detector.

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