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Collected charge, gain and jitter measurement of unirradiated LGADs from Teledyne e2v

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To suppress the pile-up expected at High-Luminosity LHC, timing information can be assigned to particle tracks. In order to implement this technique, track timing resolution of the order of tens of picoseconds is required over the lifetime of the detector. Low Gain Avalanche Detectors (LGADs) were selected as the basis for the timing detectors at the HL-LHC, offering suitable timing resolution. While the development and testing of sensors is undertaken by the University of Oxford, the University of Birmingham, the Rutherford Appleton Laboratory, and the Open University, production of LGAD sensors is done by Teledyne e2v. This collaboration focuses on developing ultra-fast silicon detectors with characteristics suitable for the implementation in the HL-LHC High Granularity Timing Detector, with the potential to be used in other high-energy experiments as well. In this talk we will present results from one of the LGAD wafers produced by Teledyne e2v, focusing on the measurements of charge collected and gain, including jitter measurements, using a system based on a ps laser source and SPICE characterization of the RF amplifiers used. Details and plans for future tests will also be discussed.

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