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## An in-depth study of Inverse-LGAD sensors

An in-depth study of a p-in-p LGAD sensor (Inverse-LGAD) is presented. Contrary to the conventional LGAD, the baseline device for the HL-LHC mip timing detectors, the I-LGAD has a non-segmented deep p-well (the multiplication layer). Therefore, I-LGADs should ideally present a constant gain value over all the sensitive region of the device without gain drops between the signal collecting electrodes; in other words, I-LGADs should have a 100% fill factor by design. We have experimentally confirmed this feature on a strip-like segmented i-LGAD and compare it against a conventional strip-like LGAD and PIN devices. Tracking performance was determined with MIPs using the AIDA telescope at the SPS H6 test beam line. Finally, a timing resolution of tens of picoseconds was determined using a dedicated laser test-stand.

**Primary authors:** VILA ALVAREZ, Ivan (Instituto de Física de Cantabria (CSIC-UC)); GARCIA ALONSO, Andrea (Universidad de Cantabria (ES)); CURRAS RIVERA, Esteban (Universidad de Cantabria (ES)); GOMEZ, Gervasio (Universidad de Cantabria (ES)); GONZALEZ SANCHEZ, Javier (Universidad de Cantabria (ES)); Dr DUARTE CAMPDERROS, Jordi (Universidad de Cantabria (ES)); FERNANDEZ GARCIA, Marcos (Universidad de Cantabria (ES)); JARAMILLO ECHEVERRIA, Richard (Universidad de Cantabria (ES)); Dr HIDALGO VILLENA, Salvador (Instituto de Microelectronica de Barcelona (IMB-CNM-CSIC)); PELLEGRINI, Giulio (Centro Nacional de Microelectrónica (IMB-CNM-CSIC) (ES)); CARULLA ARESTE, Maria del Mar (Instituto de Microelectronica de Barcelona IMB-CNM); MOLL, Michael (CERN); OTERO UGOBONO, Sofia (CERN/Universidade de Santiago de Compostela (ES)); CENTIS VIGNALI, Matteo (CERN)

**Presenter:** VILA ALVAREZ, Ivan (Instituto de Física de Cantabria (CSIC-UC))