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Technology Developments on Thin iLGAD Sensors for Pixelated Timing Detectors

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In this contribution, we will present the status of the technological developments at IMB-CNM to fabricate 50 ⬚m thick Inverse Low Gain Avalanche Detectors (iLGAD) for pixelated timing detectors.

The iLGAD sensor concept is one of the most promising technologies for enabling the future 4D tracking paradigm that requires both precise position and timing resolution. In the iLGAD concept, based on the LGAD technology, the readout is done at the ohmic contacts, allowing for a continuous unsegmented multiplication junction. This architecture provides a uniform gain over all the active sensor area (100% fill factor).

The soundness of this detection concept was successfully demonstrated in a first generation of 300 ⬚m thick iLGAD sensors. Currently, we are developing 50⬚⬚m thick pixelated iLGADs optimized for timing with an periphery design able to sustain higher electric fields and a simpler single-side manufacturing process.

This activity is carried out in the context of the RD50 and AIDAInnova projects with the participation of the CERN-SSD, IFAE, IFCA, IMB-CNM, NIKHEF, University of Hamburg, University of Santiago de Compostela and University of Zurich.

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