

Laboratory measurement and progress in Low Gain Avalanche Diodes

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We report on the status of the Ultra fast silicon Detector (USFD). USFD are silicon detectors based on the Low Gain Avalanche Diodes (LGAD); they LGAD have internal moderate gain (~10 order of magnitude), they exhibit fast and large signal and the signal is about 10 larger than the standard silicon detector. Thanks to their properties they are good candidates for time applications.

We will concentrate the discussion discuss the results on USFD and LGAD developed by the two international center manufacturers: the Institute of Microelectronics of Barcelona (CNM) and the Fondazione Bruno Kessler of Trento (FBK).

CNM has produced the first 50µm thin LGAD sensor with thickness = 50µm; in this contribution we focused the attention on sensors products for the two CERN experiments TOTEM and CT-PPS.

In this presentation we will show the preliminary IV curves of these detectors as measured in Turin.

FBK has produced many different LGAD structures with thickness = 300µm; we will show the internal gain measurements performed in Turin and the its comparison of these measurements with the gain simulated with the simulations carried over by the University of Trento.

We will also present results on the FBK production of LGAD MultiPad structures with readout segmentation either on n-side or on p-side segmentation; the difference between n-side and p-side LGAD segmentation is the segmented internal gain layer for the first one and the single internal layer for the second one.

In this contribution we will show the preliminary results about the read-out signal for these two different LGAD structure.

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