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Measurements of LGAD Segmented Devices for high energy physics

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The High Luminosity LHC upgrade, foreseen for the third long shutdown of LHC, is pushing the challenge for detectors able to sustain up to a fluence of $2 \cdot 10^{16}$ 1MeV $n_e q/cm^2$.

One of the new technologies under development is called Low Gain Avalanche Detectors (LGAD), whose concept is to generate a high electric field region inside the semiconductor material.

Charge carriers crossing this region may acquire high enough energy to generate secondary ionization initializing a multiplication chain.

The higher charge collected by LGAD devices is expected to neutralize the radiation induced signal degradation, moreover it allows to reduce the sensor thickness, and therefore the detector material budget, preserving a good charge to noise ratio.

Results of recent production of LGAD sensors from CNM (Centro Nacional de Microelectrónica, Barcelona) will be presented. Both diode TCT studies and electrical characterization of pixel devices will be discussed.

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