

# Development of n-in-p planar pixel sensors with active edge for the ATLAS High-Luminosity Upgrade

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The foreseen luminosity-upgrades for the LHC pose severe constraints on the future ATLAS silicon tracker. The innermost layer of the new pixel system will have to withstand a total integrated fluence in excess of  $1 \times 10^{16}$  neq/cm<sup>2</sup>. Moreover, there are geometrical requirements that pose stringent limits on the layout of the new pixel modules, both in terms of thickness and of insensitive-region size.

We report here on the development of radiation-hard n-in-p planar pixel sensors, compatible with FE-I4 read-out chip, with small insensitive region at the edge; these devices are targeted at the innermost layers of the future ATLAS tracker.

The reduction in inactive area will be achieved thanks to heavily doped trenches at the detector edge, the "active edge" paradigm.

The sensors are being fabricated at FBK (Trento, Italy) in collaboration with LPNHE (Paris, France).

In the following the active edge process will be highlighted. We will also describe the sensors we want to produce with this first submission and we present first TCAD simulation results for these devices.

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