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Planar Edgeless Silicon Detectors for the TOTEM Experiment

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Microstrip edgeless silicon detectors have been successfully produced and tested. These detectors are fabricated with standard planar technology, reach full sensitivity in 50 μm from the cut edge and can operate with high bias at room temperature.

These detectors employ a newly conceived terminating structure, which, although is extremely reduced with respect to the conventional ones, still prevents the breakdown and the surface current injection at high bias. Moreover they are fully efficient up to a fluence of about $1.5 \times 10^{14} \text{ p cm}^{-2}$, if operated with moderate cooling. The mass production of these detectors for the TOTEM Experiment has been successfully completed. Their installation in the Roman Pots is ongoing and will allow the TOTEM Experiment to detect leading protons at 10σ from the beam at the LHC.

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