

# Performance of planar pixel modules for the Phase 2 Upgrade of the CMS Inner Tracker

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During Long Shutdown 3, the entire CMS Tracking System will be replaced to operate during the High Luminosity LHC running phase with considerably increased luminosity. The pixel sensor modules for the CMS Inner Tracker will have to fulfill stringent requirements to operate in an extremely harsh radiation environment and to cope with the high data readout rate.

An extensive campaign has taken place to characterize the first half-size pixel chip demonstrator (RD53A), which led to the submission and production of the first full-size prototype chip (RD53B\_CMS).

Sensor-readout chip assemblies have been extensively tested both in the laboratory and at the CERN and DESY testbeam facilities.

This study presents results on the analysis of testbeam data acquired with HPK planar pixel sensors interconnected with the RD53B\_CMS readout chip, irradiated to fluences up to  $1.0E16$  neq/cm<sup>2</sup>. For all investigated fluences, the requirement of reaching a hit efficiency  $> 99\%$  has been met, while keeping the percentage of pixels masked as noisy below 1%. Additionally, measurements of crosstalk levels observed in RD53B\_CMS assemblies equipped with final design pixel sensors will be presented.

## Collaboration

CMS

## Role of Submitter

I am the presenter

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