

# Characterization of RD53A pixel modules with passive CMOS sensors

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Both the current upgrades to accelerator-based HEP detectors (e.g. ATLAS, CMS) and also future projects (e.g. CEPC, FCC) feature large-area silicon-based tracking detectors. We are investigating the feasibility of using CMOS foundries to fabricate silicon radiation detectors, both for pixels and for large-area strip sensors. The availability of multi-layer routing will provide the freedom to optimize the sensor geometry and the performance, with biasing structures in poly-silicon layers and MIM-capacitors allowing for AC coupling. A prototyping production of strip test-structures and RD53A compatible pixel sensors was recently completed at LFoundry in 150nm CMOS process.

This presentation will focus on the characterization of pixel modules, studying the performance in terms of charge collection, position resolution, hit efficiency with measurements performed in the laboratory and with beam tests. We will report on the investigation of RD53A modules with 25x100mm<sup>2</sup> cell geometry.

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