

Performance study of the MOSS chip for the ITS3 detector

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The ALICE ITS3 is a novel vertex detector that will replace the innermost layers of ITS2 during Long Shutdown 3 (LS3). Composed of three fully cylindrical layers of wafer-sized 65 nm stitched Monolithic Active Pixel Sensors (MAPS), the ITS3 enables high-resolution tracking of charged particles generated in heavy-ion collisions. As stitched sensor prototypes produced in the ER1 phase of the ITS3 project, the Monolithic Stitched Sensors (MOSS) were manufactured in mid-2023. These laboratory and beam test results for the MOSS chip validates the stitched sensor design, as well as the pixel matrix performance within the ITS3 requirements. The MOSS chip demonstrates the feasibility of the ITS3 detector concept and provides insights for further optimisation and development.

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