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ITS3: A truly cylindrical inner tracker for ALICE

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After the successful installation and first operation of the upgraded Inner Tracking System (ITS2), which consists of about 10 m^2 of monolithic silicon pixel sensors, ALICE is pioneering the usage of bent, wafer-scale pixel sensors for the ITS3 for Run 4. Sensors larger than typical reticle sizes can be produced using the technique of stitching. At thicknesses of about $30 \mu\text{m}$, the silicon is flexible enough to be bent to radii of the order of 1 cm. By cooling such sensors with a forced air flow, it becomes possible to construct a detector with minimal material. The reduction of the material budget and the improved pointing resolution will allow new measurements, in particular of heavy-flavour decays and electromagnetic probes. In this presentation, we will report on the sensor developments, the performance of bent sensors in test beams, and the mechanical studies on truly cylindrical layers.

Experiment/Theory

ALICE

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Track Klassifizierung: Future experimental facilities