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Monolithic Active Pixel Sensor R&D in 65nm for high-resolution, minimal-mass, wafer-scale, bent tracking detectors

Thursday 18 March 2021 09:00 (18 minutes)

Material budget and distance to the interaction point are amongst the key sensor performance figures that determine the tracking and vertexing capabilities of inner tracking systems. To significantly improve these numbers, ALICE is carrying out the R&D for replacing its inner-most tracking layers by truly cylindrical layers made from wafer-scale, bent sensors (Inner Tracking System 3, "ITS3"). At target thicknesses of 20-40um, these sensors become flexible enough to be held in place using minimal mechanics made from carbon foam. The R&D for the central component of this development, the wafer-scale sensor, is being carried out together with the CERN EP R&D programme, and a first prototype submission in 65nm is currently being produced. At the same time, electrical and mechanical mock-ups (using existing ALPIDE sensors and black wafers) are used to verify the concept of bent MAPS. This contribution summaries the R&D roadmap focussing on the sensor development and will give an overview on results obtained from bent MAPS in beam.

Time Zone

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