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The present and future Inner Tracking System of the ALICE experiment

Wednesday, 1 September 2021 17:30 (30 minutes)

The ALICE Inner Tracking System (ITS) has recently been replaced with a full silicon-pixel detector constructed entirely with CMOS monolithic active pixel sensors.
It consists of three inner layers (50 m thick sensors) and four outer layers (100 m thick sensors) covering 10 m2 and containing 12.5 billion pixels with a pixel size of 27 μm x 29 μm.
Its increased granularity, the very low material budget (0.35% X0/layer in the inner barrel) as well as a small radius of the innermost layer combined with a thin beam pipe, will result in a significant improvement of impact-parameter resolution and tracking efficiency at low pT with respect to the previous tracker.
The commissioning of the ITS within the ALICE apparatus has recently started. After a first phase of standalone tests and detector performance optimization the ITS has recently been included in the global commissioning activities.
Exploiting the flexibility of silicon when thinned down to thicknesses of O(50um), and the possibility of producing MAPS sensors of wafer size by a process known as stitching, the ALICE project is aiming at building detector elements that are large enough to cover full tracker half-layers with single bent sensors.
The ALICE ITS3 project is planning to build a new vertex tracker based on truly cylindrical wafer-scale sensors, with <0.05% X0 per layer and as close as 18 mm to the interaction point. R&D on all project aspects (incl. mechanics for bent wafer-scale devices, test beams of bent MAPS, design of stitched sensors) is rapidly progressing with the aim for installation during LHC LS3.
In this talk, the first results of the performance of the new ALICE ITS detector, studied during commissioning, will be presented, together with an overview of the ITS3 R&D status.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

ALICE LHC

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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