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The Inner Tracking System upgrade for ALICE

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Major upgrades of the ALICE experiment are underway and will be completed during the LHC Long Shutdown 2 to enhance the physics capacities of ALICE for LHC Run3 and Run4. One key part of this upgrade is the new Inner Tracking System (ITS2), a CMOS monolithic active pixel sensor based pixel detector. The upgraded Inner Tracking System consists of three innermost layers (50 μm thick sensors) and four outermost layers (100 μm thick sensors) covering 10 m^2 and containing 12.5 billion pixels with a pixel pitch of 27 μm x 29 μm . The smaller pixel size, the thinner sensor in combination with a lightweight support structure and the increased number of layers of the ITS2 compared with the former inner tracker, as well as smaller radius and thinner wall beam pipe configuration, will result in a significant improvement of impact parameter resolution and tracking efficiency.

The assembly of the full detector and services were completed in December 2019. A comprehensive commissioning phase in laboratory is currently ongoing. In this talk, the motivation and concept of this upgrade will be summarized. The assembly verification and detector commissioning status and plans, as well as the detector performance during the commissioning, will be discussed in detail.

Primary author: Dr LIU, Jian (University of Liverpool (GB))

Presenter: Dr LIU, Jian (University of Liverpool (GB))

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