

Upgrade of the ALICE Inner Tracking System

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Svetlana Kushpil on behalf of the ALICE Collaboration.

The ALICE (A Large Ion Collider Experiment) detector was constructed to study the properties of hot and dense hadronic matter formed in relativistic nuclear collisions. During the second long LHC shutdown in 2018-2019, the collaboration plans to upgrade the current vertex detector, the Inner Tracking System (ITS), in order to increase the reconstruction accuracy of secondary vertices and to lower the threshold of particle transverse momentum measurement. The upgrade strategy of ITS is based on the application of new Monolithic Active Pixel Sensors (MAPS) designed in 0.18 μm CMOS technology. The 50 μm thick chip consists of a single silicon die incorporating a 18 μm high-resistivity silicon epitaxial layer (sensor active volume) and matrix of charge collection diodes (pixels) with readout electronics. Radiation hardness of the upgraded ITS is one of the crucial elements in the overall performance of the system. A wide set of MAPS structures with different read-out circuits was produced and is being studied by the ALICE collaboration to optimize the pixel sensor functionality. An overview of the ALICE ITS upgrade and the expected performance improvement will be presented together with selected results from thorough campaign that includes several irradiation and beam tests.

Presentation type

Section talk (10+5 min)

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