

The ALICE Inner Tracker Upgrade

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Abstract

The ALICE experiment, which is designed to study heavy ion collisions at the LHC, plans an upgrade of the Inner Tracking System (ITS) during the LHC shutdown in 2018/19. The new ITS will consist of seven layers made of silicon tracking detectors, covering the radii from 22 mm to 430 mm with a total area of ~ 10 m². Silicon pixel detectors will play a key role in both layouts under study to provide precise and unambiguous hit information in the high-density track environment of heavy ion collisions. Both hybrid and monolithic pixel technologies are under consideration for the innermost pixel layers. A key requirement of the new pixel layers is the need to limit the material budget to 0.3-0.5 % X_0 in order to improve the impact parameter resolution in the low p_T range by about a factor 3 compared to the present detector. This presentation will give an overview of the status of the different technologies under study, the technical requirements, the operating conditions and the constraints. The different technologies and architectures under consideration will be discussed; plans and first results from prototypes will be reported