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The Pixel Detector of the ATLAS experiment for the Run2 at the Large Hadron Collider

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The Pixel Detector of the ATLAS experiment has shown excellent performance during the whole Run-1 of LHC. Taking advantage of the long shutdown, the detector was extracted from the experiment and brought to surface, to equip it with new service quarter panels, to repair modules and to ease installation of the Insertable B-Layer (IBL).

IBL is a fourth layer of pixel detectors, and will be installed in May 2014 between the existing Pixel Detector and a new smaller radius beam-pipe at a radius of 3.3 cm.

To cope with the high radiation and pixel occupancy due to the proximity to the interaction point, a new read-out chip and two different silicon sensor technologies (planar and 3D) have been developed.

Furthermore, the physics performance will be improved through the reduction of pixel size while, targeting for a low material budget, a new mechanical support using

lightweight staves and a CO₂ based cooling system have been adopted.

IBL construction is now completed.

An overview of the IBL project as well as the experience in its construction will be presented, focusing on adopted technologies, module and staves production, qualification of assembly procedure, integration of staves around the beam pipe and commissioning of the detector.

Summary

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