

ATLAS inner detector: the Run 1 to Run 2 transition, and first experience of Run 2

The ATLAS experiment is equipped with a tracking system, the Inner Detector, built using different technologies, silicon planar sensors (pixel and micro-strip) and gaseous drift-tubes, all embedded in a 2T solenoidal magnetic field. For the LHC Run II, the system has been upgraded; taking advantage of the long shutdown, the Pixel 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), a fourth layer of pixel detectors, installed in May 2014 between the existing Pixel Detector and a new smaller radius beam-pipe at a radius of 3.3 cm from the beam axis. To cope with the high radiation and pixel occupancy due to the proximity to the interaction point and the increase of Luminosity that LHC will face in Run-2, a new read-out chip within CMOS 130nm and two different silicon sensor pixel technologies (planar and 3D) have been developed. SCT and TRT systems consolidation was also carried out during long shutdown in 2013-2014. The DAQ system was expanded to cope with L1 trigger of 100 KHz at high pileup, new TXs were installed, the cooling system was refurbished. An overview of the refurbishing of the Inner Detector and of the IBL project as well as early performance tests using cosmic and beam data will be presented.

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