

ATLAS Silicon Microstrip Tracker Operation

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The completed SCT has been installed inside ATLAS. Since then the detector was operated for many months under realistic conditions. Calibration data has been taken and analysed to determine the noise performance of the system. In addition, extensive commissioning with cosmic ray events has been performed both with and without magnetic field.

The current status of the SCT will be reviewed, including results from the latest data-taking, and from the detector alignment. The SCT commissioning and running experience will then be used to extract valuable lessons for future silicon detector projects.

Summary

The ATLAS experiment at the CERN Large Hadron Collider (LHC) has started taking data last autumn with the inauguration of the LHC. The SemiConductor Tracker (SCT) is the key precision tracking device in ATLAS, made up from silicon micro-strip detectors processed in the planar p-in-n technology.

The completed SCT has been installed inside the ATLAS experimental hall. Since then the detector was operated for many months under realistic conditions. Calibration data has been taken and analysed to determine the noise performance of the system. In addition, extensive commissioning with cosmic ray events has been performed both with and without magnetic field. The cosmic muon data has been used to align the detector, to check the timing of the front-end electronics as well as to measure the hit efficiency of modules. Sensor behaviour in magnetic field Lorentz angle has been also studied from the data taken. For the initial running with unfocussed LHC beam operation with undepleted sensors is foreseen. Efficiency and noise determination for various bias voltages was also performed. One recent cosmic ray event with hits in the entire Inner Detector (Pixels, SCT and TRT) is shown in Figure 1.

The current status of the SCT will be reviewed, including results from the latest data-taking periods and from the detector alignment. We will report on the commissioning of the detector, including overviews on services, connectivity and observed problems. The SCT commissioning and running experience will then be used to extract valuable lessons for future silicon strip detector projects.

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