



Contribution ID: 34

Type: **not specified**

ATLAS ITk Strip Detector for High-Luminosity LHC

The High Luminosity Large Hadron Collider (HL-LHC) will operate at an ultimate peak instantaneous luminosity of $7.5 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ which corresponds to approximately 200 inelastic proton-proton collisions per beam crossing (pile-up). It will be operational for more than 10 years and in that time ATLAS aims for a total data set of 4000 fb^{-1} . To operate at the higher data rates, withstand the radiation levels, and maintain low occupancy in the high pile-up environment, the current ATLAS Inner Detector (ID) will be replaced by a new Inner Tracker (ITk). The ITk will be an all-silicon tracking system that consists of a pixel detector at small radius close to the beam line and a large area strip tracker surrounding it.

This contribution focuses on the strip region of the ITk. The central part of the strips tracker will be composed of rectangular “short” ($\sim 2.5 \text{ cm}$) and “long” ($\sim 5 \text{ cm}$) strip sensors. The forward regions of the strips tracker consist of 6 disks per side, with trapezoidal shaped microstrip sensors of various lengths and strip pitches. In response to the needs of the strip region for the ITk, highly modular structures are being studied and developed, called staves for the central region and petals for the forward regions (end-caps). These structures integrate large numbers of sensors and readout electronics, with precision light weight mechanical elements and cooling structures.

A strong prototyping effort has been put in place over the course of the last years in order to optimize the ITk strips system. This contribution summarizes the R&D activities performed by the numerous institutes within the Strips ITk collaboration showing the transition from R&D to final production.

Primary author: BLUE, Andrew (University of Glasgow (GB))

Presenter: BLUE, Andrew (University of Glasgow (GB))