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The ATLAS ITk Strip Detector System for the Phase-II LHC Upgrade

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The ATLAS ITk Strip Detector System for the Phase-II LHC Upgrade

The High Luminosity Large Hadron Collider (HL-LHC) is expected to provide an integrated luminosity of 4000 fb⁻¹, that will allow to perform precise measurements in the Higgs sector and improve searches of new physics at the TeV scale.

The HL-LHC higher particle fluences and will requested radiation hardness, the increased average proton-proton pile-up interactions, require a significant scaling of the existing Inner Detector. ATLAS is currently preparing for the HL-LHC upgrade, and an all-silicon Inner Tracker (ITk) that will replace the current Inner Detector, with a pixel detector surrounded by a strip detector. The strip system consists of 4 barrel layers and 6 EC disks. After completion of final design reviews in key areas, such as Sensors, Modules, Front-End electronics and ASICs, a large scale prototyping program has been completed in all areas successfully. We present an overview of the Strip System, and highlight the final design choices of sensors, module designs and ASICs. We will summarise results achieved during prototyping and the current status of pre-production on various detector components, with an emphasis on QA and QC procedures and the preparation for the production phase distributed over many institutes, which is foreseen to start in a few months.

Primary author: SPEAKER TBD BY ITK SPEAKERS COMM

Presenter: SCHARF, Christian (Humboldt University of Berlin (DE))

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