



Contribution ID: 98

Type: **Live Presentation**

Phase 2 Upgrade of the ATLAS Inner Tracker

Tuesday 22 February 2022 16:00 (20 minutes)

The ATLAS experiment is currently preparing for an upgrade of the Inner Tracking for High-Luminosity LHC operation, scheduled to start in 2027. The radiation damage at the maximum integrated luminosity of 4000/fb implies integrated hadron fluencies over $2 \times 10^{16} \text{ n}_{eq}/\text{cm}^2$ and tracking in very dense environment call for a replacement of the existing Inner Detector. An all-silicon Inner Tracker (ITk) is proposed with a pixel detector surrounded by a strip detector. After an extensive prototyping phase, all the institutes involved in the ITk are currently in pre-production phase, moving toward production mode. In this contribution we present the design of the ITk Detector and its expected performance. An overview of the current status of the various detector components, both pixel, strip and the other common items, focusing on the preparation for production, with its more challenging aspects, will be summarized.

Primary experiment

ATLAS

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Session Classification: Large Detector Systems

Track Classification: Semiconductor Detectors