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Overview and developments for the Phase-II upgrade of the inner tracker of the ATLAS experiment

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In the high luminosity era of the Large Hadron Collider (HL-LHC), the instantaneous luminosity is expected to reach unprecedented values, resulting in about 200 proton-proton interactions in a typical bunch crossing. To cope with the resultant increase in occupancy, bandwidth and radiation damage, the ATLAS Inner Detector will be replaced by an all-silicon system, the Inner Tracker (ITk), aiming to provide tracking coverage up to $|\eta| < 4$.

The ITk consists of an inner pixel and an outer strip detector. The total surface area of silicon in the new pixel system could measure up to 14 m², depending on the final layout choice, due in 2017. The strip detector will compromise up to 190 m² of silicon. In the collaboration a large effort is ongoing to evaluate the design both with simulation and experimental results. In the presentation highlight results of various components like sensors, modules and larger structures for both the pixel and strip detector will be shown.

Experimental Collaboration

ATLAS

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