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ATLAS ITk Pixel demonstrators

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For the HL-LHC upgrade the current ATLAS Inner Detector is replaced by an all-silicon system. The Pixel Detector will consist of 5 barrel layers and a number of rings, resulting in about 14 m2 of instrumented area. Due to the huge non-ionizing fluence (1e16 neq/cm2) and ionizing dose (5 MGy), the two innermost layers, instrumented with 3D pixel sensors (L0) and 100μm thin planar sensors (L1) will be replaced after about 5 years of operation. All hybrid detector modules will be read out by novel ASICs, implemented in 65nm CMOS technology, with a bandwidth of up to 5 Gb/s. Data will be transmitted optically to the off-detector readout system. To save material in the servicing cables, serial powering is employed for low voltage.
Large scale prototyping programs are being carried out by all sub-systems.
The talk will give an overview of the layout and current status of the development of the ITk Pixel Detector.

Collaboration

ATLAS ITk

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