

The Opto-electrical conversion system for the data transmission chain of the ATLAS ITk Pixel detector upgrade for the HL-LHC

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The future High Luminosity era of the Large Hadron Collider, with its unprecedented instantaneous luminosity, will impose new challenges on the LHC experiments. ATLAS will replace its inner detector with a new all-silicon Inner Tracker (ITk), whose innermost layers will be based on pixel technology and are expected to produce a data output of about 11 Tb/s. A high-speed transmission chain with many parallel lines running at 1.28 Gb/s will transmit data from the detector to an opto-electrical conversion system. This Optosystem features custom-designed radiation-hard electronics devoted to signal equalisation, aggregation (to 10.24 Gb/s) and optical-electrical conversion.

In this talk, the ITk Pixel data transmission chain will be discussed, emphasising how the Optosystem fulfils the stringent design requirements and describing the ongoing and future tests to qualify the system.

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