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Optical links for the ATLAS Pixel detector

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Optical links are necessary to satisfy the high speed readout over long distances for advanced silicon detector systems. We report on the optical readout used in the newly installed central pixel layer (IBL) in the ATLAS experiment. The off detector readout employs commercial optical to analog converters, which were extensively tested for this application. Performance measurements during installation and commissioning will be shown. With the increasing instantaneous luminosity in the next years, the next layers outwards of IBL of the ATLAS Pixel detector (Layer 1 and Layer 2) will reach their bandwidth limits. A plan to increase the bandwidth by upgrading the off detector readout chain is put in place. The plan also involves new optical readout components, in particular the optical receivers, for which commercial units cannot be used and a new design has been made. The latter allows for a wider operational range in term of data frequency and light input power to match the on-detector sending units on the present pixel detector. We will report on the design and testing of prototypes of these components and the plans for the expected installation the Pixel Detector readout chain in 2015.

Collaboration

ATLAS

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