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Readout board proposal for the next generation of Pixel Detectors: reasons, status and results in ATLAS

At LHC, the design luminosity, $1034 \text{ cm}^{-2} \text{ s}^{-1}$, has already been reached during Summer 2016. LHC is planning, in the short term future, to further enhance the luminosity, resulting in a higher trigger frequency and an increased pileup. These factors constitute a challenge for the data readout since the rate of data to be transmitted depends on both pileup and trigger frequency. In the ATLAS experiment, the effect of the increased luminosity is most evident in the Pixel Detector, which is the detector closest to the beam pipe. In order to face the difficult experimental challenges, the readout system was upgraded during the last few years. The main purpose of the upgrade was to provide a higher bandwidth by exploiting recent technologies. The new readout system is composed by two paired electronic boards, Back Of Crate (BOC) and ReadOut Driver (ROD). In this presentation the main readout limitation related to increased luminosity will be discussed as well as the strategy and the technological solutions adopted in order to cope with the future operational challenges. In addition the general progress and achievement will be presented.

Experimental Collaboration

ATLAS

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