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High Precision Online Luminosity Measurement using the CMS Phase 2 Upgrade of the Inner Tracker

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The High-Luminosity LHC poses a challenge to the luminosity measurement accuracy, creating the need for the development of a new high precision online luminosity measurement system at CMS, using radiation hard detector technologies.
This work investigates the exploitation of the Tracker Endcap Pixel Extension (TEPX) for online luminosity measurement. In addition to the 750 kHz L1 physics trigger, an extra 75 kHz of trigger bandwidth from the TEPX will be allocated for luminosity. This accounts for about 110 Gb/s of acquired data that need processing in a dedicated back end system, using real-time implementations of algorithms for luminosity measurement.

Summary

This work investigates the exploitation of the upgraded Phase 2 CMS Tracker Endcap Pixel Extension (TEPX) for online luminosity measurement for the High-Luminosity LHC.

Primary author: Mr RUEDE, Alexander (CERN/KIT-IPE)

Presenter: Mr RUEDE, Alexander (CERN/KIT-IPE)

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