



Contribution ID: 146

Type: **Poster**

P1.55: The Phase-2 Upgrade of the CMS Inner Tracker

Monday 26 June 2023 15:45 (1 minute)

The LHC machine is planning an upgrade program, the High Luminosity scenario (HL-LHC), which will smoothly bring the luminosity to about $5\text{-}7.5 \times 10^{34} \text{ Hz cm}^{-2}$, to possibly reach an integrated luminosity of $3000\text{-}4000 \text{ fb}^{-1}$ over about a decade.

In order to fully exploit the delivered luminosity and to cope with the demanding operating conditions, the whole silicon tracking system of the CMS experiment will have to be replaced and substantially upgraded before the HL-LHC start, expected in 2029. Both the CMS inner tracker (IT) and the outer tracker (OT) detectors will be replaced, and the new detector will feature increased radiation hardness, higher granularity and capability to handle larger data rates.

This talk will describe the most relevant achievements obtained in the last years in view of the construction of the upgraded IT pixel tracker. Design choices are discussed, along with some highlights on the technological approaches chosen and the latest results on the system testing of the prototypes.

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Session Classification: Poster (incl. coffee)