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The CMS Tracker Upgrade for High Luminosity LHC

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The High Luminosity phase of the Large Hadron Collider (HL-LHC) will significantly increase its instantaneous luminosity by one order of magnitude, thus enabling unprecedented precision studies of the Standard Model (SM) and searches for Physics beyond the Standard Model (BSM).

To capitalize on this opportunity and address the challenges posed by high pile-up environments, the Compact Muon Solenoid (CMS) experiment is developing a completely new silicon-based tracking system. The Inner Tracker (IT), featuring 3D pixel sensors, will provide excellent secondary vertex discrimination resolution. The Outer Tracker (OT), utilising novel “pT modules” sensors, will reconstruct particle tracks at 40 MHz and feed them into the Level 1 (L1) trigger system, allowing increasing the L1 selection capabilities in a fashion that was not possible before in CMS.

This presentation will provide an overview of the CMS Tracker Upgrade project, focusing on ongoing and future activities essential for achieving the required Tracker performance to target the HL-LHC goals.

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