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Present status and future perspectives of the Endcap Timing Layer for the CMS MTD

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For the Phase 2 upgrade, the CMS experiment foresees the installation of a MIP Timing Detector (MTD) to assign a precise timestamp to every charged particle up to pseudorapidity $|\eta| = 3$, empowering the CMS detector with unique and new capabilities. The target timing resolution of MTD, 40 ps per track, will help reduce the challenging pile-up conditions expected at the High-Luminosity LHC down to current LHC levels. To match the requirements on radiation tolerance and occupancy, the forward region of the MTD, $1.6 < |\eta| < 3$, will be equipped with silicon low-gain avalanche diodes (LGADs) coupled to the Endcap Timing Read Out Chip (ETROC), currently under development. We will present the current status of LGAD sensor testing, their qualification from beam tests, bench measurements, and the performance of the final ETROC design. Finally, we will discuss the challenges and the road map necessary to achieve timely installation of ETL.

Collaboration

CMS Collaboration

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