Contribution ID: **1054** Type: **Parallel Talk**

Physics opportunities with a MIP Timing Detector in CMS for HL-LHC

Thursday, 7 July 2022 12:23 (17 minutes)

Within the upgrade program of the Compact Muon Solenoid (CMS) detector at the Large Hadron Collider (LHC) for the HL-LHC data taking, the installation of a new timing layer to measure the time of minimum ionizing particles (MIPs) with a time resolution of ~30-40 ps is planned. The time information of the tracks from this new MIP Timing Detector (MTD) will improve the rejection of spurious tracks and vertices arising from the expected harsh pile-up conditions from machine operation. At the same time this detector will provide particle identification capabilities based on the time-of-flight, and will bring unique physics opportunities for interesting signatures such as those including long-lived particles. An overview of these possibilities is given, using the state of the art of the simulation and reconstruction of the MTD detector.

In-person participation

Yes

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Session Classification: Operation, Performance and Upgrade (Incl. HL-LHC) of Present Detectors

Track Classification: Operation, Performance and Upgrade (Incl. HL-LHC) of Present Detectors