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Precision Timing at High-Luminosity LHC with the CMS MIP Timing Detector

Tuesday, July 18, 2023 12:15 PM (25 minutes)

The MIP Timing Detector (MTD) is a new sub-detector planned for the Compact Muon Solenoid (CMS) experiment at CERN, aimed at maintaining the excellent particle identification and reconstruction efficiency of the CMS detector during the High-Luminosity LHC (HL-LHC) era. The MTD will provide new and unique capabilities to CMS by measuring the time-of-arrival of minimum ionizing particles with a resolution of 30 - 40 ps at the beginning of HL-LHC operation. The information provided by the MTD will help disentangle ˜200 nearly simultaneous pileup interactions occurring in each bunch crossing at LHC by enabling the use of 4D reconstruction algorithms. The MTD will be composed of an endcap timing layer (ETL), instrumented with low-gain avalanche diodes, as well as a barrel timing layer (BTL), based on LYSO:Ce crystals coupled to SiPMs. In this talk, we will present an overview of the MTD design, highlight the new physics capabilities provided by the MTD, describe the latest progress toward production, and show test beam results demonstrating the achieved target time resolution.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

CMS

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

No

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