



Contribution ID: 22

Type: **Talk**

Upgrading the CMS Muon System for High Luminosity LHC

Thursday 20 February 2025 17:20 (20 minutes)

The CMS Muon system is undergoing a comprehensive upgrade to prepare for the High Luminosity LHC (HL-LHC), ensuring optimal performance under increased particle rates and luminosity. Key upgrades include enhancements to existing detectors and electronics, as well as the addition of new muon stations to expand coverage and improve resolution. The upgrades include enhancements to both the front-end and back-end electronics for the Drift Tubes (DT) and Cathode Strip Chambers (CSC), as well as back-end electronics for the Resistive Plate Chambers (RPC). Additionally, new detectors, such as improved Resistive Plate Chambers (iRPC) and Gas Electron Multipliers (GEM), are being introduced. New on-board DT electronics will enhance resolution and trigger capabilities, while iRPC chambers will improve efficiency at high rates. Additionally, new GEM stations will extend pseudorapidity coverage and boost momentum resolution. Production and installation of these components are planned during upcoming technical stops, ensuring the CMS Muon system is fully equipped to meet the rigorous demands of the HL-LHC. This talk will provide an overview of the current progress, challenges, and test results, illustrating the CMS collaboration's preparation for the next phase of high-energy physics research.

Primary experiment

CMS collaboration

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Session Classification: Systems

Track Classification: Systems