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Upgrade plans of the CMS Muon System for High Luminosity LHC

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The CMS Muon System Upgrade is a significant part of the overall upgrade strategy for the Compact Muon Solenoid (CMS) experiment at the Large Hadron Collider (LHC), particularly for the High Luminosity LHC (HL-LHC) phase, which is expected to start around 2030. The HL-LHC will increase the LHC's luminosity by a factor of 5–7 beyond its original design, allowing it to collect more data and observe rarer processes but it also brings challenges like higher radiation levels and more pile-up events. The key goals of Muon system upgrade is to maintain high reconstruction efficiency, improve trigger capabilities, in addition expanding muon detector coverage into the forward region (high pseudorapidity) to improve physics reach. The muon system 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. This talk will provide an overview of the current progress, challenges, and test results, illustrating the readiness of the CMS Muon System for HL-LHC.

Secondary track

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