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Improved Resistive Plate Chambers for Phase-II upgrade of the CMS detector at LHC

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In anticipation of the High Luminosity LHC, an extensive upgrade is underway for the CMS Muon system to ensure its optimal performance in muon triggering and reconstruction. The indispensable role of Resistive Plate Chambers (RPC) as dedicated muon detectors stems from their exceptional timing resolution. To meet the requirements of Phase-II of the LHC, the RPC system will be expanded up to 2.4 in pseudorapidity. The forward Muon system's upcoming RE3/1 and RE4/1 stations will feature improved Resistive Plate Chambers (iRPC). Distinguished by a unique design and geometry, including a 2D strip readout, these iRPCs represent a significant advancement over the current RPC system. The enhancements include the use of thinner electrodes, a narrower 1.4 mm gas gap, and improved Front-End electronics (FEB) allowing a 30 fC threshold. Two iRPC chambers were installed in station 3 of CMS during the year-end technical stop 2023/2024. This talk provides a comprehensive summary of the iRPC project, showcasing recent results, including space and timing resolutions.

Collaboration

Compact Muon Solenoid at LHC/CERN

Role of Submitter

The presenter will be selected later by the Collaboration

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