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Innovative Resistive Plate Chambers for the CMS Phase 2 Upgrade: Project Summary, Construction, and Quality Assurance

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In view of the Phase-2 of the LHC physics program, called High Luminosity LHC (HL-LHC), the CMS muon system will be upgraded to maintain a robust muon triggering and reconstruction performance. Therefore RE3/1 and RE4/1 stations of the forward muon system will be equipped with new improved Resistive Plate Chambers (iRPC) as dedicated detectors for muon triggering in CMS. The new iRPC detectors have a different design and geometry w.r.t the present RPC system to improve the rate capability and survive the harsh background condition during HL-LHC. This talk summarizes the iRPC project including the iRPC design and production process, details of the ongoing detector production, quality control procedures at the production sites and results of performance studies with high energy muon beam under intense gamma radiation at the CERN Gamma Irradiation Facility (GIF++) facility.

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