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The new improved RPCs of CMS prevailing the challenges of High-Lumi LHC

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The LHC luminosity will significantly increase in the coming years. Many of the current detectors in different subsystems need to be replaced or upgraded. The new ones should be capable not only to cope with the high particle rate, but also to provide improved time information to reduce the data ambiguity due to the expected high pileup. The CMS collaboration have shown that the new improved RPCs, using smaller gas gap (1.4 mm) and low-resistivity High Pressure Laminate, can stand rates up to 2 kHz/cm2. They are equipped with new electronics sensitive to low signal charges. This electronics was developed to read out the RPC detectors from both sides of a strip and, using timing information, to identify the position along it. The excellent relative resolution of ~200 ps leads to a space resolution of few cm. The absolute time measurement, determined by RPC signal around 500 ps, will also reduce the data ambiguity due to the highly expected pileup at the Level 1 trigger. 4 demonstrator chambers have just been installed in the CMS cavern. These chambers were qualified in test beams at Gamma Irradiation Facility (GIF), located on one of the SPS beam lines at CERN. This talk will present the results of the tests done in GIF, as well as the brand new results from commissioning at CMS.

In-person participation

Yes

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