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The novel photon detectors based on MPGD technologies for the upgrade of COMPASS RICH-1

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The RICH-1 Detector of the COMPASS Experiment at CERN SPS has been upgraded for the physics run 2016: four new photon detectors, based on MPGD technologies and covering a total active area larger than 1.2 square meters replace the previously used photon detectors, namely MWPCs with CsI photocathodes, in order to cope with the challenging efficiency and stability requirements of the new COMPASS measurements. The new detector architecture consists in a hybrid MPGD combination: two layers of THGEMs, the first of which also acts as a reflective photocathode (its top face is coated with a CsI film) are coupled to a bulk Micromegas on a pad segmented anode; the signals are read-out via capacitive coupling by analog F-E based on the APV25 chip. The related R&D is shortly recalled. All aspects of the COMPASS RICH-1 photon detectors upgrade are presented and large emphasis is dedicated to the engineering aspects, the mass production and the quality assessment of the MPGD components. In particular, the design and production of the detector components, the assembling and the validation tests of THGEMs and Micromegas and the challenges of the detectors installation and operation are presented. The preliminary performance figures of the upgraded RICH-1 are provided.

Talk on behalf of the COMPASS RICH Group.

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