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Status of COMPASS RICH-1 upgrade with MPGD-based Photon Detectors

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The RICH-1 Detector of the COMPASS Experiment at CERN SPS is undergoing an important upgrade for the physics run 2016: four new Photon Detectors, based on MPGD technology and covering a total active area larger than 1.2 square meters will replace the actual MWPC-based photon detectors 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 (a CsI layer is deposited on its top face) 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 reported at this Conference within a separate contribution.

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 componets.

In particular, the design and production of the detector components, the assembling and the validation tests of THGEMs and Micromegas and the engineering challenges of the detector installation are presented together with the expected performance of the upgraded COMPASS RICH-1.

Primary author: TESSAROTTO, Fulvio (TS)

Presenter: TESSAROTTO, Fulvio (TS)

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