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Quality assurance tests and techniques to investigate and increase hermetic sealing of ATLAS Phase II RPC detectors

Wednesday 11 September 2024 14:00 (20 minutes)

The Phase II upgrade of the ATLAS Muon Spectrometer plans to install approximately 1000 new-generation Resistive Plate Chambers (RPCs). This upgrade will enhance detector coverage, increase hit efficiency and timing precision, improving the trigger precision and robustness.
The chamber production is ongoing and gas volumes are commercially produced in Italy. To investigate and improve the integrity of the gas volumes, their mechanical property and the gas tightness, several techniques have been proposed and applied.
This talk describes experiences on ATLAS gas gaps with thermal cycling (TC) performed between -30℃ and +30℃, and the subsequent impact in the context of gas leaks, as well as techniques to investigate and improve gas tightness.
The goal is to produce leak-tight detectors preventing the emission of gases having impact on global warming.

Author: SHAH, Aashaq (University of Cambridge (GB))

Presenter: SHAH, Aashaq (University of Cambridge (GB))

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