

The LHCb RICH Upgrade: operations and performance

Thursday 18 July 2024 17:51 (15 minutes)

During the second LHC long shutdown, the LHCb experiment underwent a major upgrade in order to be able to operate at the instantaneous luminosity of $2 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$, reading data at the full LHC bunch crossing rate. The RICH system of LHCb has been completely refurbished installing new photon detectors (Multi-anode Photomultiplier Tubes) equipped with a custom developed read-out chain. In order to reduce the unprecedented peak occupancy, the full optics and mechanics of the RICH1 detector has been re-designed to distribute the Cherenkov photons over a larger surface of the photon detectors planes. The overview of the RICH upgrade programme is described including the design, installation, commissioning and early operations phase. The validation of the newly installed detectors and the performance studies employing datasets collected during 2022 and 2023 data-taking with pp, pAr, PbPb and PbAr collisions are presented.

Alternate track

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Session Classification: Operation, Performance and Upgrade (incl. HL-LHC) of Present Detectors

Track Classification: 11. Accelerator: Physics, Performance, and R&D for Future Facilities