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The LHCb RICH Detector Upgrade

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LHCb is one of the four main experiments at the Large Hadron Collider (LHC) at CERN, focused on the study of CP violation and rare decays of b and c quarks. The Ring-Imaging Cherenkov (RICH) system is a crucial component of the LHCb experiment providing identification of charged particles over a large momentum range (2-100 GeV/c) and angular acceptance (15-300 mrad). The LHCb RICH performed extremely well during Run 1 and the current Run2. LHCb will upgrade many of its detector systems during the second LHC long shutdown (2019-2020) in order to sustain a five-fold increase in instantaneous luminosity up to $2 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$. In order to reach the planned 40 MHz continuous data taking, a substantial change in the LHCb trigger and read-out schemes will be implemented. The RICH detectors will be upgraded by installing new photo-detectors, electronics and modified optics and mechanics. The status of the RICH upgrade program will be reviewed, including tests of the complete photo-electronic chain in the lab and in dedicated test-beams.

Experimental Collaboration

on behalf of the LHCb RICH Collaboration

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