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Radiation levels from a Beam Gas Curtain instrument at the LHC at CERN during ion operation

Tuesday 3 June 2025 16:00 (2 hours)

A prototype Beam Gas Curtain (BGC) monitor was installed on beam 1 at the Large Hadron Collider (LHC) at CERN to provide 2D images of the transverse beam profile during the ongoing Run 3 (2022 - to date) and in view of the High Luminosity LHC upgrade (HL-LHC). By design, the BGC operation generates collisions between the beam particles and an injected gas jet proportionally to the beam intensity and the gas density, possibly causing radiation-induced issues to the downstream LHC equipment. This operation has been studied for the proton run, and now the scenario for lead (Pb) ion beam is scrutinized. The radiation showers from the BGC are characterized using measured data from different LHC radiation monitors during the Run 3 BGC operation, along with Monte Carlo simulations with the FLUKA code. Finally, predictions of the expected radiation showers during operation of the BGC in the HL-LHC era are discussed.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

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