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BGC monitor: first year of operation at the LHC

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The Beam Gas Curtain (BGC) monitor was installed in the beam one of the Large Hadron Collider (LHC) during Long Shutdown 2 (LS2) and the Year-End Technical Stop (YETS) 2022. The monitor detects the fluorescence signal generated due to the interaction between the charged particle beams in the LHC and the neon atoms in the supersonic gas curtain. This provides 2D images of the primary beam.
In the 2023 run, it was demonstrated that transverse beam profile measurement for both, proton beam and lead ion beams in the LHC is possible across injection, energy ramp-up and top energy operation. The BGC has shown the potential to be an operational instrument and efforts to integrate the monitor into the main machine control system are being undertaken. In this contribution, we will present measurement results and discuss the operational experience including observed gas loads to the LHC, observed impact on beam losses and demonstrated resolution of the monitor. Finally, we will also discuss future plans for the continued optimization of this monitor and the installation of a second monitor into beam two.

Footnotes

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