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Performance of the Beam Gas Curtain as emittance monitor at the Large Hadron Collider

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The Beam Gas Curtain (BGC) is an instrument for transverse diagnostics in operation at the Large Hadron Collider (LHC). The transverse beam profile is obtained by imaging the fluorescence light resulting from the interaction between the beam and a thin supersonic neon gas jet. This technique can provide minimally invasive and absolute measurements of both proton and ion beams, throughout the full machine cycle. It is therefore a potential candidate to complement the limitations of existing LHC transverse diagnostic systems. This contribution highlights the results obtained during the ongoing LHC Run 3. The instrument configuration has been optimized for best performance by combining observations in two spectral ranges of the fluorescence signal: a yellow range, originating from the fluorescence of neutral neon atoms, and a UV range, emitted by ionic neon species. The measurements are consistent with those from other profile monitors within operational requirements and allow real-time tracking of the average beam emittance.

Finally, an overview of planned upgrades is presented, aimed at further improving system performance and progressing towards a fully operational instrument.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

Authors: BUTTI, Daniele (European Organization for Nuclear Research); ZHANG, Hao (Cockcroft Institute)

Co-authors: WELSCH, Carsten (Cockcroft Institute); PASQUINO, Chiara (European Organization for Nuclear Research); SCHNEIDER, Gerhard (European Organization for Nuclear Research); STRINGER, Oliver (Cockcroft Institute); SEDLACEK, Ondrej (Cockcroft Institute); FORCK, Peter (GSI Helmholtz Centre for Heavy Ion Research); VENESS, Raymond (European Organization for Nuclear Research); Dr UDREA, Serban (GSI Helmholtz Centre for Heavy Ion Research); MAZZONI, Stefano (European Organization for Nuclear Research); LEFEVRE, Thibaut (European Organization for Nuclear Research)

Presenter: BUTTI, Daniele (European Organization for Nuclear Research)

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