Contribution ID: **110** Contribution code: **THCBC01** Type: **Contributed Oral Presentation**

Overview of present and future hadron beam collimation

Thursday, October 23, 2025 11:30 AM (20 minutes)

The collimation system of the Large Hadron Collider (LHC) at CERN represents the state of the arc of multi-stage collimation systems. It provides an excellent cleaning performance that has so far ensured safe and efficient operation of the LHC with beam stored energies up to 430 MJ. However, further improvements are needed in view of the High-Luminosity upgrade of the LHC (HL-LHC) that will start operation in 2030. The performance of the LHC beam collimation is reviewed, addressing in particular a first-phase upgrade that was deployed for the LHC Run 3 (2022-2026). The remaining challenges for the HL-LHC and the solutions being implemented are then reviewed. Applications to future colliders under study are also discussed.

Footnotes

Work presented on behalf of the LHC collimation teams

Funding Agency

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Yes

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Session Classification: THCBC WGC contributed oral

Track Classification: WGC:Accelerator Systems