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Update on the High Luminosity LHC collimation performance with proton beams

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The High Luminosity Large Hadron Collider (HL-LHC) is an ongoing project to upgrade the LHC, to increase the instantaneous luminosity by a factor of five compared to the nominal LHC and reach an integrated luminosity of 3000˜fb^{-1} in the first ten years. One of the driving factors to achieve this goal is an increase of the bunch population from $1.15 \cdot 10^{11}$ to $2.2 \cdot 10^{11}$ protons. This places unprecedented demands on the performance of the collimation system, which needs to be upgraded to fulfil the HL-LHC performance goals. In this paper, the planned upgrades of the collimation system and the performance of the system with proton beams is reviewed, taking into account recent baseline changes. Tracking simulations in SixTrack coupled to FLUKA are used for the studies. The beam loss scenarios considered are betatron cleaning and asynchronous beam dumps.

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Footnotes

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