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Fluka simulation for the HE-LHC machine (IR7)

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The High Energy LHC (HE-LHC) machine with center-of-mass energy of 27 TeV ($\approx 2 \times \text{LHC}$) and stored beam energy of 1.3 GJ ($\approx 3.7 \times \text{LHC}$) is meant to use the FCC-hh magnet technology in the present tunnel. Particle-tracking calculation followed by shower calculation allows quantifying the power deposition along the beam line. The HE-LHC's betatron cleaning insertion features a similar design as the LHC machine and aims to sustain, for at least 10 seconds, the impact of about 1.9 MW, corresponding to a beam lifetime of 12 minutes. In order to assess the loss effect on the dispersion suppressor cold magnets, a three-step simulation approach was applied, investigating the role of two local collimators (TCLDs). Moreover, in this study, the implications of the dogleg removal from the long straight section were studied.

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