

Absorbers for beam dumping

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The FCC proton beams pose a severe challenge for the robustness of the beam dump and protection devices. Depending on the local β -function, already a single 50 TeV bunch can induce damage in typical absorber materials presently used at the LHC (e.g. Graphite or carbon composites). In order to safely absorb the FCC beams in a LHC-like dump, the beams need to be sufficiently diluted across the dump front face. In this study, we assess dilution kicker requirements and derive energy densities and temperatures in the dump core for different dilution patterns; in particular, we quantify the effect of overlapping shower tails from neighbouring bunches and neighbouring branches in the sweep pattern. In addition, we present first considerations on the energy deposition in protection devices in case of an asynchronous beam dump.

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