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Collective effects

Friday, 13 May 2022 08:45 (1 hour)

The performance of most accelerators is linked to the amount and/or the density of the particles in the beam. The collective interactions of the charged particles within the beam usually sets the limit on these quantities, their understanding and mitigation is therefore crucial to maximise the performance of the machines. In this lecture we will address the basic principles of the various mechanisms of interactions that can deteriorate the beam quality, such as beam instabilities driven by electromagnetic wake fields or electron clouds, non-linear effects driven by space-charge forces or beam-beam interactions as well as scattering effects.

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