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Collective Effects II

Wednesday 4 October 2023 13:45 (1 hour)

Collective effects in particle accelerators are one of the key constituents for determining the ultimate particle accelerator performance. Their role is becoming increasingly important as particle accelerators are being pushed ever closer towards the intensity and beam brightness frontiers. They are slightly peculiar in their nature as their impact and significance depend not only on external fields but also on the beam properties themselves. This results in a highly coupled and convoluted system. In these lectures we will give a brief overview over collective effects in particle accelerators in general. We will cover the topics in a highly conceptual and illustrative manner. The goal will be for the students to get an intuitive impression on the nature and the aftermath of collective effects. The lectures will cover different types of collective effects along with their manifestation in accelerators and briefly outline the limitations they impose along with a few means for potential mitigation techniques.

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