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Longitudinal beam dynamics I

Wednesday, 21 June 2023 12:00 (1 hour)

This talk gives a first introduction of longitudinal beam dynamics for both linear and circular accelerators. It covers the basic methods of acceleration in a linac. For radio-frequency (RF) acceleration, it introduces the concepts of synchronicity and the oscillation around the synchronous particle, including the criterium for stability of the oscillations.

For circular accelerators, the cyclotron is explained, then the lecture focuses more on synchrotrons, their operation principle and their longitudinal beam dynamics. It reviews the synchrotron oscillations, their stability conditions and their representation in longitudinal phase space.

Presenter: TECKER, Frank (CERN)