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Longitudinal beam dynamics for different initial distributions at cSTART

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The compact STorage ring for Accelerator Research and Technology (cSTART) project aims to store electron bunches of LPA-like beams in a very large momentum acceptance storage ring. The project will be realized at the Karlsruhe Institute of Technology (KIT, Germany). Initially, the Ferninfrarot Linac- Und Test-Experiment (FLUTE), a source of ultra-short bunches, will serve as an injector for cSTART to benchmark and emulate laser-plasma accelerator-like beams. In a second stage a laser-plasma accelerator will be used as an injector, which is being developed as part of the ATHENA project in collaboration with DESY and Helmholtz Institute Jena (HIJ). With an energy of 50 MeV and damping times of several seconds, the electron beam does not reach equilibrium emittance within the storage time of about 100 milliseconds. Therefore, the initial phase space distribution influences the later dynamics and beam properties. We perform longitudinal particle tracking simulations to investigate the evolution of the bunch lengths and phase space densities for different initial beam distributions.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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