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Preliminary study on the collective effect in a high-current and low-energy storage ring

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High-current and low-energy storage ring is an essential part of accelerator for industrial application. However, high intensity poses great challenge to beam stability through collective effects, which can be exacerbated at low energy. In this paper, we present a preliminary study on various collective effects in an application-oriented storage ring. The classical theory is reviewed, and numerical analysis is performed on Touschek scattering, intra-beam scattering, resistive-wall, beam-ion and so on. In addition, Particle tracking is carried out using elegant, mbrack2, etc. Lastly, techniques to improve the current threshold are also discussed.

Footnotes

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