IPAC'24 - 15th International Particle Accelerator Conference



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Axially symmetric e-lens based on McMillan map

Monday 20 May 2024 16:00 (2 hours)

In this work, we investigate the transverse dynamics of a single particle in a model integrable accelerator lattice, based on a McMillan axially symmetric electron lens. Although the McMillan e-lens has been considered as a device potentially capable of mitigating collective space charge forces, some of its fundamental properties have not been described yet. The main goal of our work is to close this gap and understand the limitations and potential of this device. We classify possible regimes with stable trajectories and provide set of canonical action-angle variables, along with an evaluation of the dynamical aperture, Poincar\'e rotation numbers as functions of amplitudes, and spread in nonlinear tunes.

Footnotes

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North America

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