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Hamiltonian preserving nonlinear optics

Wednesday 4 June 2025 16:00 (2 hours)

We present a method of constructing a nonlinear accelerator lattice that has at least one approximate integral of motion that is given upfront. The integral under consideration is a Hamiltonian in normalized (canonical) coordinates that is preserved by a lattice with a given accuracy. A connection between the integrator of a Hamiltonian in normalized coordinates and a real lens arrangement is established through the well know symplectic integration schemes. Based on the introduced concept when accelerator is considered as an analog computer, we to produce several nonlinear lattices and illustrate the method via the simulations. We demonstrate that the method is robust and can tolerate considerable deviations from the ideal configuration.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

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