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Numerical optimization of the Diamond-II storage ring optics

Tuesday, 21 May 2024 16:00 (2 hours)

The design performance of the 3.5 GeV Diamond-II low-emittance electron storage ring has been studied as a function of the linear and nonlinear lattice tuning parameters. An alternative working point has been identified which optimizes the beam lifetime and the injection efficiency for off-axis injection. The simulations include misalignment and field strength errors, with the number of machine seeds tuned to achieve converging results whilst minimizing computational time. The optimization takes care to preserve the design beam emittance, energy spread, Twiss parameters and cell tunes. The results are presented for 2D parameter scans and multi-objective optimization techniques such as the Multi-Objective Genetic Algorithm (MOGA).

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Europe

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