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Title:Design of a quasi-isochronous storage ring for THz light source

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Abstract:A quasi-isochronous storage ring is designed by manipulating lattice parameters to introduce a negative dispersion function to the dispersion section. This quasi-isochronous storage ring is designed for a THz synchrotron radiation source. The simulation of the optics function and beam emittance shows its feasibility, and the tracing result of particles indicates that the designed ring has a good particle dynamic aperture. In addition, a three-dimensional model of the vacuum chamber used for photon radiation in the quasi-isochronous mode is also designed. The eigenmodes of the chamber are simulated, and characteristic parameters such as quality factor, power loss and characteristic impedance are also calculated. The result shows that the vacuum chamber has little effect on the circulating beam.

Number of references:12

Main heading:Storage rings

Controlled terms:Dispersions - Lattice constants - Light sources - Three dimensional - Vacuum Uncontrolled terms:Beam emittance - Characteristic impedance - Characteristic parameter -

Circulating beam - Dispersion function - Dynamic aperture - Eigen modes - Particle dynamics -Phase slips - Photon radiation - Power-losses - Quality factors - Synchrotron radiation source -Three-dimensional model - Vacuum chambers

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