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Linear optics correction of an asymmetric storage ring lattice

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The SSRF storage ring has been upgraded to an asymmetric lattice containing two super-bend cells, two double-mini- β optics (DMB) cells and a superconducting wiggler (SCW) in 2019. Due to the destruction in structural symmetry, the restoration of linear optics becomes an essential issue in commissioning and routine beam dynamics maintenance. During the initial commissioning, the linear optics were well corrected with the LOCO method even though the SCW had not yet been installed. Recently, it has been found that the setups of some quadrupole power supplies tend to exceed the limits and deviate significantly from the intrinsic theoretical values, and the beta-functions and the tunes cannot be commendably recovered, leading to degradation of the storage ring performance. In this paper, the linear optics correction of the SSRF storage ring is introduced, the difficulties of the linear optics correction in asymmetric lattice are investigated, and the improved correction method and related application results are introduced.

Footnotes

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