



Contribution ID: 852 Contribution code: WEPC37

Type: **Poster Presentation**

Nonlinear dynamic optimization for HLS

Wednesday, 22 May 2024 16:00 (2 hours)

Hefei Light Source (HLS) is a dedicated synchrotron light source with an electron beam energy of 800 MeV. Due to the limited circumference of 66.13 m, the current lattice adopts Double-Bend Achromat (DBA) with 4 super periods. The natural emittance is 38 nm-rad. To improve the light source performance, we reselect the work point, based on the new work point, we optimize the beam nonlinear dynamic, including dynamic aperture(DA), momentum aperture(MA), which strongly connect beam lifetime and injection efficiency. The optimization only changes the strength of quadrupoles and sextupoles, while remaining the same drift length and magnet length, after the optimization, we have produced lattice with larger dynamic aperture and momentum aperture for new working point with positive chromaticities. The detail optimization is reported in this paper.

Footnotes

Funding Agency

Paper preparation format

Region represented

Asia

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Session Classification: Wednesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A24 Accelerators and Storage Rings, Other