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Exploring the nonlinear dynamics performance for Hefei Advanced Light Facility from the linear optics

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Hefei Advanced Light Facility (HALF) is a 2.2 GeV diffraction-limited storage ring designed with a modified hybrid six-bend achromat (H6BA) lattice. The present baseline lattice has a relatively large dynamic aperture and a reasonable Touschek lifetime. But it is better to further improve the nonlinear dynamics performance when considering the effect from errors and insertion devices. For a HMBA lattice, there are generally very few optimization knobs when linear optics fixed. So, in this paper, the optimization potential of nonlinear dynamics will be explored for HALF in the linear optics optimization. And several lattice solutions with larger dynamic apertures or momentum apertures will be obtained.

Footnotes

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Author: YANG, Penghui (University of Science and Technology of China)

Co-authors: XU, Jianhao (University of Science and Technology of China); WEI, Bingfeng (University of Science and Technology of China); HUANG, Yuejing (University of Science and Technology of China); BAI, Zhenghe (University of Science and Technology of China)

Presenter: XU, Jianhao (University of Science and Technology of China)

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