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Design of a tunable radio frequency elliptically polarized undulator for SXFEL user facility

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Circularly polarized free electron laser (FEL) pulses are strongly demanded to satisfy plenty of experiments, but static magnetic elliptically polarized undulators(EPU) are too limited to achieve shorter undulator periods. In this paper, the potential of polarization control using the radio frequency (RF) undulator afterburner is discussed for Shanghai soft X-ray FEL user facility(SXFEL-UF). The parameters of the afterburner in the 2nm undulator line are obtained by theoretical predictions and numerical simulations. Then the general description of the proposal, and the optimization of the RF undulator cavity are presented. The coupler design is still in progress, leaving more work to do for a proper rotating electromagnetic field.

Footnotes

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Author: GAO, Zhangfeng (Shanghai Synchrotron Radiation Facility)

Co-authors: FENG, Chao (Shanghai Advanced Research Institute); DENG, Haixiao (Shanghai Institute of Applied Physics); ZHANG, Kaiqing (Shanghai Synchrotron Radiation Facility); LIU, Tao (Shanghai Advanced Research Institute); HUANG, Xiaoxia (Shanghai Synchrotron Radiation Facility); QI, Zheng (Shanghai Advanced Research Institute)

Presenter: GAO, Zhangfeng (Shanghai Synchrotron Radiation Facility)

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