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Generating the strong field terahertz radiation at shanghai soft X-ray free electron laser

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Coherent, wide-tunable frequency and high intensi-ty terahertz (THz) source is under preparation at the Shanghai Soft X-ray free-electron laser facility (SXFEL). The electron bunches modulated by frequen-cy beating light can generate coherent, wide-tunable, high intensity THz radiation from 0.1 to 30 THz through wigglers. The electromagnetic wiggler with peak magnetic field up to 1.75 T is adopted and the parameters of the wiggler are optimized to ensure the generation of strong field THz radiation. Due to the limitation of layout space of the SXFEL, the length of wiggler is limited within 5 meters. By properly in-creasing the charge of the electron beam, the THz pulse energy can be kept at mJ level under the proposed different parameters of the wiggler. In this article, we will present the possible layout of THz source on the SXFEL and the S2E simulation of THz radiation of mJ magnitude within the 5-meter wiggler.

Footnotes

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