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Obtaining picosecond x-ray pulses on fourth generation synchrotron light sources

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In this study we investigate the advantages and challenges of applying the two frequency crab cavity short pulse scheme to multi-bend achromat (MBA) lattice based fourth generation synchrotron light sources. Using the Advanced Photon Source Upgrade (APS-U) lattice as a concrete example, we show that short pulses with duration of 1˜10 ps (FWHM) can be generated with modest deflecting voltages. A longitudinal radio-frequency (RF) cavity whose frequency is a half-integer multiple of the fundamental RF frequency is used to provide bunch lengthening and shortening for certain buckets. The proposed system parameters and the expected performance are shown.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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