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X-ray frequency combs generation using echoenabled harmonic generation free electron laser

Sunday 1 June 2025 14:00 (2 hours)

Optical frequency comb (OFC) technology provides precise measurement tools for optical frequencies, leading to revolutionary changes in the field of optics.OFCs consist of a series of uniformly spaced spectral lines resembling the teeth of a comb, and they have found widespread applications in timing, precision spectroscopy, and fundamental physics.Extending this technology into the EUV to X-ray domain to achieve ultra-high precision detection of molecular and atomic structures has been a significant challenge faced by the scientific community.The next generation of light sources—free electron lasers—holds promise for addressing this challenge.By positioning different groups of undulators at various harmonic resonances within the EEHG-FEL, periodic modulation of the electron beam will be formed, which, with the appropriate parameter settings, will enable the generation of fully coherent optical frequency combs.

Footnotes

Paper preparation format

Word

Region represented

Asia

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