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Attosecond x-ray free-electron lasers

Friday 23 August 2024 11:00 (30 minutes)

Free-electron lasers are the brightest sources of attosecond x-ray pulses, improving the brightness by more than six orders of magnitude with respect to table-top high-harmonic sources. This huge increase in brightness has opened new avenues for attosecond science, leading to the demonstration of non-linear x-ray spectroscopy and x-ray pump/probe experiments with attosecond resolution. Furthermore, the ability to reach the hard x-ray spectral region paves the way for direct imaging of electronic processes with x-ray scattering. In my talk I will review the development of attosecond x-ray free-electron lasers: from the pioneering theoretical work on SASE, ESASE and chirp-tapered FELs, to the recent experiments the Linac Coherent Light Source and other XFELs worldwide. I will also give my personal view on the future of the fields and discuss ongoing developments in the context of plasma-based high-brightness electron sources.

Footnotes

Funding Agency

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Session Classification: Attosecond science - Nobel Prise session

Track Classification: Attosecond science –Nobel Prize session