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Terawatt-attosecond hard X-ray free-electron laser pulse generation at the European XFEL

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Despite significant advancements in generating attosecond pulses in the extreme ultraviolet and soft X-ray regimes, achieving high-power attosecond pulses at Ångstrom wavelengths has remained a considerable challenge. The generation of intense attosecond hard X-ray pulses is pivotal for probing the structural and electronic dynamics of matter with unprecedented precision. Recently, we proposed and experimentally demonstrated a new method to generate terawatt-attosecond pulses at Ångstrom wavelengths using X-ray free-electron lasers (FEL). This presentation will detail our recent experiments at the European XFEL, showcasing the successful production of stable high-power single-mode hard X-ray FEL pulses.

Footnotes

Funding Agency

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