



Contribution ID: 1956 Contribution code: MOPG51

Type: **Poster Presentation**

Attosecond research at the Linac Coherent Light Source

Monday, 20 May 2024 16:00 (2 hours)

Attosecond X-ray free-electron lasers can deliver isolated sub-fs pulses with a peak power that surpasses conventional table-top sources by more than six orders of magnitude in the soft X-ray region [1]. The intensity at the focus is sufficient for non-linear X-ray spectroscopy methods, and two-color configurations enable applications such as attosecond pump/attosecond probe experiments.

I will discuss the development of attosecond XFELs at the Linac Coherent Light Source: from the demonstration of isolated soft X-ray pulses with the XLEAP project, to the recent development of terawatt-scale pulses and attosecond pump/probe capabilities. I will also present our plans for attosecond science with the LCLS-II linac, which will enhance the available repetition rate by up to four orders of magnitude (up to 1 MHz [2]).

Footnotes

[1] J. Duris et al. Nat. Photonics 14.1 (2020): 30-36.

[2] P. Abbamonte et al. SLAC-R-1053. 2015.

Funding Agency

US Department of Energy, Basic Energy Sciences.

Paper preparation format

Region represented

North America

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Session Classification: Monday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A06 Free Electron Lasers