Contribution ID: **231** Contribution code: **FRBI03** Type: **Invited Oral Presentation**

A novel single-shot characterization method for attosecond FEL pulses using self-referenced spectral interferometry

Friday 23 August 2024 12:00 (25 minutes)

The complete spectrotemporal characterization of attosecond X-ray free-electron lasers (FELs) is of great importance for the ultrafast scientific experiments. Currently, the lack of high-precision characterization methods has become a key bottleneck that limits the application of attosecond X-ray FELs to some extent. To address this issue, we proposed a novel method, demonstrated by a proof-of-principle experiment, for single-shot characterization of ultrashort FELs based on self-referenced spectral interferometry. A pair of replica pulses with suitable spectral shear can be generated by using the frequency-pulling effect, and then, the complete spectrotemporal information of attosecond FELs can be extracted from the spectral shearing interferogram of these two frequency-sheared pulses. Recently, we are planning to conduct ultrafast experiments at SXFEL in order to further validate this characterization method in the X-ray range. This would provide an excellent diagnostic approach for the optimization and fine-tuning of ultrafast FELs and future attosecond scientific experiments based on X-ray FELs.

Footnotes

Funding Agency

Authors: Prof. FENG, Chao (Shanghai Advanced Research Institute); XIAO, Yaozong (Shanghai Optoelectronics Science and Technology Innovation Center)

Presenters: Prof. FENG, Chao (Shanghai Advanced Research Institute); XIAO, Yaozong (Shanghai Optoelectronics Science and Technology Innovation Center)

Session Classification: Attosecond science - Nobel Prise session

Track Classification: Attosecond science –Nobel Prize session