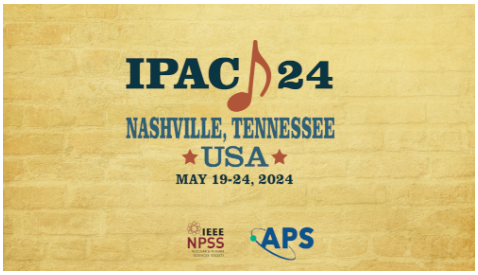

Contribution ID: **1791** Contribution code: **MOPG62** Type: **Poster Presentation**

Coherent spectrotemporal shaping of fresh slice attosecond X-ray free-electron lasers

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

X-ray free-electron lasers (XFELs) have emerged as a promising counterpart to high harmonic generation sources for scientific applications requiring high power attosecond X-ray pulses. To date, attosecond XFELs have specialized in producing isolated pulses enabling the study of nonlinear ultrafast science in the impulse regime. We present a method to coherently shape the spectrotemporal characteristics of attosecond X-ray free-electron laser pulses, offering a path towards broader coherent bandwidths and more versatile control of pulse amplitude and phase. We show that with undulator tapering in a fresh slice reamplification scheme, it is possible to produce phase-stable pulse pairs with tunability in color and temporal separation, phase-stable pulse trains, and flexibly chirped pulses. Our method enables bandwidth broadening for attosecond X-ray FELs and offers a path towards sub-100 as pulse duration at soft X-ray wavelengths.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

North America

Primary author: ROBLES, River (Stanford University)

Co-authors: LARSEN, Kirk (SLAC National Accelerator Laboratory); CESAR, David (SLAC National Accelerator Laboratory); DRIVER, Taran (SLAC National Accelerator Laboratory); DURIS, Joseph (SLAC National Accelerator Laboratory); FRANZ, Paris (Stanford University); SUDAR, Nicholas (SLAC National Accelerator Laboratory); CRYAN, James (SLAC National Accelerator Laboratory); MARINELLI, Agostino (SLAC National Accelerator Laboratory); ZHANG, Zhen (SLAC National Accelerator Laboratory)

Presenter: ROBLES, River (Stanford University)

Session Classification: Monday Poster Session

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