



Contribution ID: 146 Contribution code: TUP146-FRA

Type: Poster Presentation

## Generation of high-power attosecond X-ray FEL pulses carrying orbital angular momentum

*Tuesday 20 August 2024 20:40 (20 minutes)*

X-ray beams, carrying orbital angular momentum (OAM), are emerging as a powerful tool to probe matter. Recently, the self-seeded FEL with OAM (SSOAM) method has been proposed to generate high-power X-ray OAM pulses, which places the traditional optical elements in the linear regime of the FEL amplification process before saturation to reduce the thermal load of the optical element. In this work, we propose to utilize the SSOAM scheme to produce attosecond X-ray vortices with high intensity. Numerical simulations demonstrate the X-ray OAM pulses with peak powers of more than one hundred gigawatts and a pulse duration of the order of hundred attoseconds can be achieved using the proposed method.

### Footnotes

### Funding Agency

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**Session Classification:** Poster session

**Track Classification:** Advanced FEL modes and science applications