



Contribution ID: 226 Contribution code: FRAI01

Type: Invited Oral Presentation

Fully structured light with seeded free-electron lasers

Friday 23 August 2024 08:45 (35 minutes)

Light with precisely tailored structure in all degrees of freedom is called fully structured light. We present an experimental demonstration of coherent FSL EUV light with the 'star' type polarization topology at the FERMI free electron laser (FEL) in Trieste, Italy. Control of the polarization is obtained through the overlap of radiation emitted in orthogonally polarized helical undulators with different transverse phase distributions. The spatial polarization structure was mapped by imaging the light downstream of a polarizer which showed different distinct polarization states distributed across the spatial positions of the radiation. These states showed near complete coverage of the Poincare sphere, in good agreement with predictions.

Footnotes

Funding Agency

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Session Classification: Advanced FEL modes and science applications

Track Classification: Advanced FEL modes and science applications