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Development of an Imaging Protocol for Laser Driven X-ray Sources

Monday 8 September 2025 16:00 (2 hours)

The Extreme Photonics Applications Centre (EPAC) being built at the Central Laser Facility in the UK will utilise a 10Hz Laser Wakefield Accelerator (LWFA) to produce a tuneable x-ray source, with energies ranging from 3keV up to 10's of MeV while maintaining a micron-scale source size and ultra-short pulse duration. Combination of such characteristics opens an opportunity for cutting-edge high-resolution industrial imaging of dense materials: battery packs, historical artifacts and dynamic processes: crack propagation, motor engines running. The primary challenge in imaging with LWFA X-ray sources stems from shot-to-shot instabilities of flux, energies and pointing. We will present an imaging protocol developed using a combination of particle-in-cell, ray tracing and Monte Carlo simulations to simulate instabilities of EPAC and correct for them in x-ray radiographic and tomographic imaging.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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