

The simulation charged particle acceleration on SQUID

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Purpose

The purpose of this numerical research include 1. produce the mono-energetic electron beam by laser wakefield in plasmas, 2. the electron beam spin depolarization during the magnetic reconenction.

Outline

The mono-energetic electron beam is critical for the free electron lasing. To obtain the optimized electron beam quality and benchmark with the experimental results, many numerical simulations are investigated by kinetic Particle-in-cell (PIC) code.

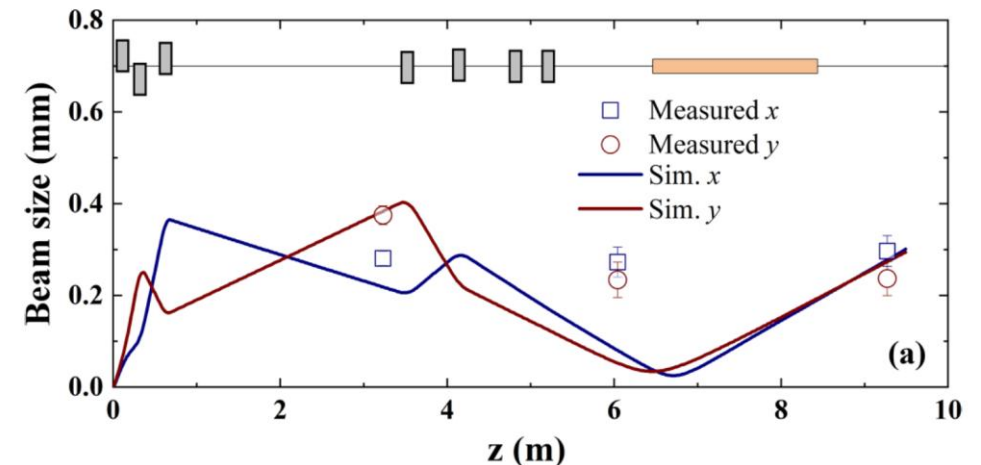
Result

The numerical results obtained via SQUID are well consistent with the experimental measurements. The predicted FEL radiation intensity and wavelength also agree with the real undulator amplification results.

Computing system:	SQUID General Purpose CPU nodes
node-hour	20,230 node-hour
memory used	100 GB
parallelize	6 nodes

Acknowledged Publication:

1. *Physical Review Research* **8**, 013207 (2026).
2. *Plasma Phys. Control. Fusion*, **67**, 105019 (2026).



Beam transportation results obtained in simulations comparing with the experimental measurements.