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Modeling of plasma channels for laser plasma accelerators

Wednesday 13 August 2025 16:00 (2 hours)

Structured plasma channels are an essential technology for driving high-gradient, plasma-based acceleration and control of electron and positron beams for advanced concepts accelerators. Laser and gas technologies can permit the generation of long plasma columns known as hydrodynamic, optically-field-ionized (HOFI) channels, which feature low on-axis densities and steep walls. By carefully selecting the background gas and laser properties, one can generate narrow, tunable plasma channels for guiding high intensity laser pulses. We present on the development of 1D and 2D simulations of HOFI channels using the FLASH code, a publicly available radiation hydrodynamics code. We explore sensitivities of the channel evolution to laser profile, intensity, and background gas conditions. We examine experimental measurements of plasma channels and their comparison to model predictions. Lastly, we discuss ongoing work to couple these tools to community PIC models to capture variations in initial conditions and channel influence on wakefield accelerator applications.

Please consider my poster for contributed oral presentation

No

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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