Contribution ID: **63** Type: **Poster (student)**

Development of a Plasma Cell Target for Higher Repetition Rates in Laser-Plasma Accelerators

Monday, 14 April 2025 17:00 (1h 30m)

This poster presents the development of an advanced plasma target designed for laser-plasma injectors and accelerators. It specifically focuses on gas cell targets with spatial confinement of a nitrogen/helium mixture. This design ensures controlled localized ionization injection, leading to high-quality electron beam production.

We compare fluid dynamics simulations with experimental measurements to assess dopant confinement and electron density in the cell. The impact of these characterizations on beam properties is further explored through numerical optimization using the fast PIC simulations carried out with the SMILEI code using envelope approximation and azimuthal mode decomposition of the laser pulse.

Additionally, we will discuss the thermal loads associated with operating at high repetition rates, analyzing the increased power dissipation from the laser in the gas cell.

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Session Classification: Poster Session

Track Classification: Plasma sources