



Contribution ID: 69

Type: **Poster without speed talk**

Reduction of the electron beam divergence of laser wakefield-accelerators by integrated plasma lenses

We report on electron beam collimation using a passive plasma lens, integrated directly and conveniently into a laser wakefield accelerator stage operating in the high charge regime. The lens is created by reshaping the gas density profile of a super-sonic jet at the beam's exit side through an obstacle mounted above the jet. It reduces the beam's divergence by a factor of two to below 1 mrad (root-mean-square), while preserving the total charge of 170 pC and maintaining the energy spread. The resulting spectral-charge density, here defined as the charge per energy bandwidth and emission angle, of up to 7 pC/(MeVmrاد) played a key role in the recent experimental demonstration of free-electron lasing. The presented simple and robust gas shaping technique holds the potential to generate specific density profiles, essential for the application of adiabatic focusing or staging of accelerators.

Speed Talks

Normal

Primary author: CHANG, Yen-Yu (Helmholtz Zentrum Dresden Rossendorf)

Co-authors: LABERGE, Maxwell (Helmholtz Zentrum Dresden Rossendorf); UFER, Patrick (Helmholtz Zentrum Dresden Rossendorf); GHAITH, Amin (Helmholtz Zentrum Dresden Rossendorf); IRMAN, Arie (Helmholtz Zentrum Dresden Rossendorf); DEBUS, Alexander (a.debus@hzdr.de); SCHRAMM, Ulrich (HZDR); SCHOEBEL, Susanne (HZDR); PAUSCH, Richard (HZDR)

Presenter: CHANG, Yen-Yu (Helmholtz Zentrum Dresden Rossendorf)

Session Classification: Poster session

Track Classification: Accelerator Research and Development