

Merging Conventional and Laser Wakefield Accelerators

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Laser wakefield accelerators deliver high quality electron beams in terms of emittance and bunch length. However there are also parameters which cannot compete with conventional machines, namely the spectral width as well as the shot to shot stability.

One reason for that is that there is no direct access to the injection mechanism of electrons into the plasma wakefield. Injecting a well-characterized electron beam produced by a conventional accelerator into a plasma wakefield could help to solve that problem: Measuring the difference in the electron spectrum in such a pump-probe type experiment should yield the possibility to directly reconstruct the field distribution.

From that point comparison with theoretical approaches as well as results from particle-in-cell codes could lead to a better understanding of the injection process.

At DESY in Hamburg there is a suited conventional accelerator for such a type of experiment, the Relativistic Electron Gun for Atomic Exploration (REGAE). We report on the status of the beamline extension at REGAE and the plans towards the external injection project with the goal to deduce the wakefield and further improve the stability of laser wakefield

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