



Contribution ID: 185

Type: poster

High Repetition Rate Laser Wakefield Acceleration

Wednesday, 27 September 2017 19:30 (1 hour)

Today, many LWFA experiments rely on targets, which operate with short bursts of gas to reduce gas load within the vacuum system to a minimum. However, even in burst mode it requires considerable time to reduce the pressure in the vacuum system to a level low enough for the next laser shot, which is one of the most limiting factors in electron repetition rate. Here, we show a design, which is implemented at the LUX beamline for plasma-driven undulator radiation. It allows for continuous flow operation of a capillary-type target. The system enables electron repetition rates, which are only limited by the repetition rate of the driver laser. Continuous flow operation minimizes pressure fluctuations inside the target and eliminates timing jitter issues between laser pulse and target gas bursts. Our concept features a differential pumping setup, specially designed for laser applications, and allows for direct online pressure measurement at the target inlets, which yields absolutely calibrated values.

Primary author: Mr DELBOS, Niels (University of Hamburg / Center for Free Electron Laser Science)

Co-authors: MAIER, Andreas (CFEL/UHH); Mr WERLE, Christian (University of Hamburg); Mr KIRCHEN, Manuel (University of Hamburg); Mr SCHNEPP, Matthias (University of Hamburg); TRUNK, Maximilian (University of Hamburg); Mr WINKLER, Paul (DESY); Mr MESSNER, Philipp (University Hamburg); Mr JALAS, Soeren (Center for Free-Electron Laser Science and Department of Physics, University of Hamburg); JOLLY, Spencer (Center for Free-Electron Laser Science & Department of Physics, Hamburg University, Hamburg, Germany); Mr LEROUX, Vincent (University of Hamburg)

Presenter: Mr DELBOS, Niels (University of Hamburg / Center for Free Electron Laser Science)

Session Classification: Wine and Poster Session 2 (WG4-WG5-WG6-WG7)

Track Classification: WG5 - High-Gradient Plasma Structures/Advanced Beam Diagnostics