



Contribution ID: 620

Type: **Oral contribution**

Measurement of the radius of a plasma column in presence of a relativistic proton bunch

Thursday, 25 September 2025 17:00 (20 minutes)

To reach large accelerating gradients, an important requirement for a plasma wakefield accelerator is to produce a uniform plasma density. The creation and characterization of the density can be challenging. Demeter et al. showed that the schlieren imaging technique is well suited to determine the geometrical properties of the AWAKE, 10m-long plasma column of Rubidium vapor. We describe an experimental investigation of the effect on the plasma of a relativistic proton bunch driving wakefields using an improved version of this diagnostic.

The schlieren imaging with near resonant probe light yields estimates of the radius of the plasma column of excited rubidium atoms ionized by an ultra-short, terawatt laser pulse. Moreover, this measurement is adequate to observe the effect on the plasma radius of the wakefields driven by the proton bunch.

Primary author: Dr RANC, Lucas (Max Planck Institut for Physics, Munich)

Co-authors: CLAIREMBAUD, Arthur (Max Planck Institut für Physik); PANNELL, Fern; DEMETER, Gábor (HUN-REN Wigner Research Centre for Physics, Budapest, Hungary); JAWORSKA, Helena (CERN); MEZGER, Jan (Max-Planck Institute for Physics); PAGE, Jedd (Max-Planck-Institut für Physik); TURNER, Marlene (CERN); BERGAMASCHI, Michele (Max-Planck-Institut für Physik/CERN); KEDVES, Miklos (HUN-REN Wigner Research Centre for Physics, Budapest, Hungary); VAN GILS, Nikita; MUGGLI, Patric (Max-Planck-Institut für Physik)

Presenter: Dr RANC, Lucas (Max Planck Institut for Physics, Munich)

Session Classification: PS8: Plasma sources and related diagnostics

Track Classification: PS8: Plasma sources and related diagnostics