7th European Advanced Accelerator Conference

EAAC2025

Contribution ID: **589** Type: **Poster (participant)**

# First results of the E302 experiment at the FACET-II facility.

*Tuesday, 23 September 2025 19:00 (1h 30m)*

Plasma-wakefield accelerators are capable of sustaining accelerating fields on the GV/m scale, making them well-suited for shrinking the size and cost of future linear colliders. The recently proposed efficiency–instability relation sets an upper limit on the achievable power transfer efficiency from the driver to the trailing bunch if the stability of the transverse phase space of the trailing bunch is to be preserved. Examining the relation between efficiency and strength of transverse instabilities is a main objective in the E302 experiment which aims to identify, measure, and mitigate the beam-breakup (BBU) instability in beam-driven plasma-wakefield acceleration. We will discuss data taken during the first experimental shifts at the FACET-II facility at SLAC, Menlo Park, CA in April 2025. The shifts focused on (1) measuring the instability using the dipole spectrometer at FACET-II with parallel-to-point imaging, and (2) seeding a transverse offset between the trailing and driving bunches using a transverse deflecting cavity.

**Primary author:** FINNERUD, Ole Gunnar (The University of Oslo)

**Co-authors:** Dr LINDSTRØM, Carl A. (University of Oslo); ADLI, Erik (University of Oslo, Norway)

**Presenter:** FINNERUD, Ole Gunnar (The University of Oslo)

**Session Classification:** Poster Session

**Track Classification:** PS1: Plasma-based accelerators and ancillary components