Contribution ID: **95** Type: **Poster (participant)**

Modeling of the electron beam dynamics in an electron beam transport for a laser-plasma accelerator based free-electron laser

Tuesday, 15 April 2025 17:10 (1h 30m)

Achieving high-quality electron beam is crucial for the next generation Free Electron Laser (FEL) operating in the extreme ultraviolet (EUV) range of the radiation spectrum. In order to transport the laser-plasma-accelerator-based electron bunch without significant degradation in beam quality, the capture block of the electron beamline can be designed using either a set of quadrupole magnets or plasma-based focusing element, known as active plasma lens (APL). In the frame of this presentation, we compare the evolution of the electron bunch for both cases. The initial particle distribution was obtained from laser-plasma interaction code and serves as input for a start-to-end simulation. The obtained results demonstrate the active plasma lens as a suitable device for electron beam capture. Furthermore, the outcomes of the start-to-end simulations will be discussed in order to develop the entire electron beam transport suitable for a compact laser-plasma FEL, which will be developed at ELI-ERIC (ELI Beamlines).

Primary author: MICESKI, Mihail

Co-author: Dr MOLODOZHENTSEV, Alexander (ELI-Beamlines)

Presenter: MICESKI, Mihail

Session Classification: Poster Session

Track Classification: Applications