Contribution ID: **2083** Contribution code: **TUPL032** Type: **Poster Presentation**

Laser plasma accelerator-based soft X-ray FEL development at ELI-Beamlines

Tuesday 9 May 2023 16:30 (2 hours)

Modern linac-based free electron lasers (FEL) opened a new area of scientific research in physics, chemistry, biology and material sciences. In recent years laser plasma accelerator (LPA) technology has made great progress towards compact electron 'GeV-energy scale'accelerators. Combination of compact LPA accelerator with well-established technologies to build dedicated electron beam transport and undulator beam-line opens a possibility to extend ability of existing FEL facilities delivering a photon beam with unique and novel properties for the worldwide photon user community. Development of the laser-plasma accelerator based soft X-ray FEL at ELI-Beamlines (Czech Republic) will extend ERIC-ELI capabilities in multiple science fields such as laser technology, plasma accelerators and photon science technology. In the frame of this report we will present a conceptual solution of the entire setup from the high-power high-repetition rate laser up to the photon beamline aiming to deliver to the user area the coherent photon beam with the wavelength in the soft X-ray range (3÷4.5 nm for the fundamental harmonic) and the peak brilliance, comparable with existing soft X-ray FELs. Challenges, R&D program needed in order to develop such user-oriented setup and connection with the EuPRAXIA (European Plasma Research Accelerator with eXcellence in Applications) project will be discussed.

Funding Agency

This work has been supported by the project "Advanced Research Using High Intensity Laser Produced Photons and Particles"(ADONIS) from the European Regional Develop Fund

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Author: Dr MOLODOZHENTSEV, Alexander (ELI Beamlines Czech Republic)

Co-authors: GREEN, Tyler (ELI Beamlines Czech Republic); MAI, Dong Du (ELI Beamlines Czech Republic); ZIMMERMANN, Petr (ELI Beamlines Czech Republic)

Presenter: ZIMMERMANN, Petr (ELI Beamlines Czech Republic)

Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A06: Free Electron Lasers