



Contribution ID: 100

Type: talk

## Angstrom wavelength FEL driven by 5 GeV LWFA beam with external injection

*Tuesday, September 17, 2019 6:20 PM (20 minutes)*

In this contribution we report simulations assessing the feasibility of driving a Free Electron Laser (FEL) at the Angstrom wavelength level by a plasma boosted, high brightness electron beam.

A 500 MeV, 30 pC bunch, accelerated by a conventional Radio Frequency linac, is injected in a laser driven plasma wave and its energy boosted up to 5 GeV and more. A large beam charge portion retains the initial properties, in terms of brightness, allowing to trigger FEL instability. The bunch is matched into a 1.5 cm wavelength undulator, producing radiation at 1.1 Angstrom.

We assess stability of the acceleration process retrieving robustness against variation of many initial parameters.

This scheme is relevant both for EuPRAXIA and for related projects, like EuPRAXIA@SPARC\_LAB.

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**Session Classification:** WG1 - Plasma acceleration physics II and high rep rates

**Track Classification:** WG1 - Electron beams from plasmas