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Laser wakefield injector in the frame of EuPRAXIA

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The EuPRAXIA project aims to study the design of a linear electron accelerator based on high-gradient plasma acceleration. Both RF and laser plasma injectors are considered to generate electron beams at the 200 MeV level. Generated electrons bunches would then be further accelerated up to 5 GeV in a plasma structure and distributed to two user areas.

In particular, this project includes the design of the laser system, of the plasma structures which have to be suitable for staging, of the electron beam magnetic transport lines and of the undulator for a free electron laser in the X-UV range.

A comparative study of the various laser plasma injector considered for this project was carried out based on the experimental results published by the community as well as on the physical mechanisms that make it possible to reach the required beam parameters for the applications. The results of this study will be presented and discussed.

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