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EuPRAXIA@SPARC_LAB energy boosting to 5 GeV by LWFA and external injection

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We propose a possible setup able to produce 5 GeV electron beams in the framework of the existing layout of the EuPRAXIA@SPARC_LAB facility. Although placing the plasma module for reaching the target energy downstream the existing beam line may seem the most natural solution, it faces dramatic problems in therm of overall footprint and interference with foreseen equipment. Since a high power laser will be part of the base instrumentation present in the facility, we plan to meet the target energy employing the external injection scheme in a laser driven plasma module, allowing for a much more compact solution. Moreover, taking advantage of past experience and technical solutions, we propose to install the module in a new beamline, parallel to the main one, in order to ease the beam manipulation, implementation of beam diagnostics and, possibly, its exploitation in user oriented applications.

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