

The EuPRAXIA@SPARC_LAB project: a plasma-based accelerator user facility for the next decade

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The EuPRAXIA@SPARC_LAB facility is the beam driven pillar of the EuPRAXIA project which is expected to provide by the end of 2028 the first European Research Infrastructure dedicated to demonstrating usability of plasma accelerators delivering high brightness beams up to 1-5 GeV for users.

Among the possible EuPRAXIA@SPARC_LAB applications the realization of a short wavelength Free Electron Laser (FEL) able to provide radiation in the “water window” of the e.m. spectrum for bio-physical investigations is one of its main goals. Another interesting X-ray radiation source based on betatron radiation will be implemented by the end of 2025 in the framework of the PNRR initiatives. In addition the production of high-quality electron beam as the one required to drive an FEL is expected to be also a fundamental milestone towards the realization of a plasma driven future Linear Collider (LC).

In this talk we report about the recent progress in the context of the EuPRAXIA collaboration with reference to the recent breakthrough results obtained at the test facility SPARC_LAB at INFN-LNF and the new perspectives offered by the Italian Next Generation Eu program (PNRR).

Summary

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