



Contribution ID: 28

Type: Oral

## The LNF flagship project EuPRAXIA@SPARC\_LAB: a novel FEL radiation source based on a plasma accelerator

*Monday, 28 October 2024 14:10 (45 minutes)*

Plasma acceleration is paving the way for new compact accelerators aiming at reducing the scale of the facilities needed by free electron laser (FEL) or high energy physics by employing accelerating gradients much larger than conventional RF structures. The EuPRAXIA Design Study is dedicated to realizing a distributed FEL facility powered by plasma acceleration in the European framework (it is included in the ESFRI roadmap).

As part of the EuPRAXIA project, Frascati National Laboratories propose hosting a cutting-edge facility named EuPRAXIA@SPARC\_LAB, tailored to meet these specific requirements with a unique combination of a high-brightness X-band RF linac driving a plasma-accelerator-based FEL. We plan to realize a FEL in the XUV (3-15 nm) and we are studying the possibility to have a second beamline beamlines in the VUV (50-150 nm). We are preparing a Technical Design Report, while the building is in the executive drawing phase.

We present the status of the new LNF flagship project EuPRAXIA@SPARC\_LAB, that will be challenging for timing and synchronization both on the electron part (for the beam driven plasma acceleration) and on the FEL photon part (for the time resolved user experiments).

**Primary author:** VILLA, Fabio (Istituto Nazionale di Fisica Nucleare)

**Presenter:** VILLA, Fabio (Istituto Nazionale di Fisica Nucleare)

**Track Classification:** Other