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## Linac-driven beam physics at Eupraxia@SPARC\_LAB

*Monday, 20 May 2024 16:00 (2 hours)*

EuPRAXIA@SPARC\_LAB is a multi-disciplinary user facility currently under construction at the Laboratori Nazionali di Frascati of the INFN as part of the EuPRAXIA collaboration. This facility features a multi-GeV plasma-based accelerator with high-quality electron beams, intended for piloting two Free Electron Laser (FEL) beamlines for experiments —one in the VUV and the other in the XUV-soft X-rays spectral region. The paper discusses the machine beam physics of EuPRAXIA@SPARC\_LAB, which has been investigated by means of start-to-end simulations, and its stability and reliability, important factors for a successful and consistent FEL emission. Additionally, the paper includes experimental results obtained at SPARC\_LAB, a test facility that is currently operational at Laboratori Nazionali di Frascati. This facility is specifically oriented towards research in plasma acceleration physics. The combination of numerical simulations and experimental results provides a comprehensive overview of the EuPRAXIA@SPARC\_LAB facility, its capabilities and its performance.

### Footnotes

### Funding Agency

### Paper preparation format

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### Region represented

Europe

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