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ARIA –A VUV beamline for EuPRAXIA@SPARC_LAB

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EuPRAXIA@SPARC_LAB is the new Free Electron Laser (FEL) facility under construction at the Laboratori Nazionali di Frascati of the INFN. The electron beam of EUPRAXIA@SPARC_LAB will be delivered by an X-band normal conducting linac followed by a plasma wakefield acceleration stage. It will be characterized by a small footprint and it will deliver ultra-bright photon pulses for experiments in the water window to the FEL user community [1, 2].
In addition to the Soft-X-rays beamline already comprised in the project [3], we are also considering the installation of a second photon beamline with seeded FEL pulses in the range between 50 and 180 nm. In this contribution, we will present the FEL generation scheme, the layout of the dedicated beamline and the layout and the potential applications of the FEL radiation in this long wavelength energy range. The scientific case will indeed span different experimental techniques, from absorption and photoemission spectroscopy, Raman spectroscopy and time-of-flight measurements on photo-fragmentation of molecules. This wealth of techniques finds application on molecules, biomolecules such as proteins, nucleic acids and viruses in gas phase, aerosols and adsorbed on surfaces.

[1] M. Ferrario, et al., Nucl. Instrum. Methods Phys. Res. Sect. A 909 (2018) 134. DOI: 10.1016/j.nima.2018.01.094
[2] A. Balerna, et al., Condensed Matter 4 (2019) 30. DOI: 10.3390/condmat4010030
[3] F. Villa, et al., Nucl. Instrum. Methods Phys. Res. Sect. A, 909 (2018) 294. DOI: 10.1016/j.nima.2018.02.091

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