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EUPRAXIA at SPARC_LAB: Beam Dynamics studies for the X-band Linac

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In the framework of the Eupraxia Design Study an advanced accelerator facility EUPRAXIA at SPARC_LAB has been proposed to be realized at Frascati (Italy) Laboratories of INFN. Two advanced acceleration schemes will be applied, namely an ultimate high gradient 1 GeV X-band linac together with a plasma acceleration stage to provide accelerating gradients of the GeV/m order.

A FEL scheme is foreseen to produce X-ray beams within 3-10 nm range. A 500-TW Laser system is also foreseen for self-injection and ion production experiments and a Compton backscattering Interaction is planned together with extraction beamlines at intermediate electron beam energy for neutron beams and THz radiation production. The electron beam dynamics studies in the linac are here presented together with the preliminary machine layout.

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