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Characterization of Secondary Radiation from LWFA in the EuAPS Project

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Laser WakeField Acceleration (LWFA) is a useful mechanism for generating secondary radiation in a compact accelerator setup. Different types of radiation can be produced by the relativistic electrons accelerated in this process. Betatron X-ray radiation is emitted by the electrons due to their transverse oscillations in the plasma channel, while THz radiation is emitted when the electrons leave the plasma-vacuum boundary.

In this context, we present the results of different experimental campaigns carried out at the INFN Frascati and at the CLPU in Salamanca to characterize the secondary radiation from the LWFA process, in particular the expected parameters of the betatron radiation in the framework of the EuPRAXIA Advanced Photon Source (EuAPS) project.

The latter will be the first user dedicated betatron radiation source developed at the INFN Frascati; it is designed to produce photons with 1-10 keV critical energy operating at 1 Hz in the self-injection regime under highly non-linear laser-plasma interaction conditions.

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