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First simulations for the EuAPS betatron radiation source

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X-rays production through betatron radiation emission from electron bunches is a promising resource for several research fields. In the framework of EuPRAXIA project, EuAPS (EuPRAXIA Advanced Photon Sources) project has the purpose to provide a compact, plasma based line designed to exploit internal injection processes occurring in laser-plasma interaction to drive electron betatron oscillations, thanks to plasma-generated fields. The user-oriented character of the project requires advanced diagnostic devices to assure the desired operation conditions. Since emitted radiation spectrum, intensity, coherence and polarization are strongly dependent on the self-injected beam properties, accurate preliminary simulations of the process are mandatory to evaluate the optimal diagnostic devices specs. QUASI-3D cylindrical azimuthal modes decomposition based PIC simulations have been carried on, together with reduced physics beam envelope based models, giving inspection on the accuracy/computational cost ratio. We present simulated betatron radiation spectra and properties for some cases of interest.

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Footnotes

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Yes

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