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Transport and control of LWFA electron beam towards the FEL amplification at COXINEL

Monday, 14 September 2015 18:00 (20 minutes)

COXINEL [1] is a project within the frame of ERC advanced grand at synchrotron SOLEIL in collaboration with the Laboratory of Optical Applications (LOA) in France. It aims at demonstrating Free Electron Laser (FEL) amplification using Laser Wakefield Acceleration (LWFA) towards more compact FEL facility. The transport and the control of the electron bunches created by the LFWA is a challenging task due to the strong initial beam divergence and the large energy spread. A specific beam manipulation scheme was recently proposed for the COXINEL setup, which takes benefit from the intrinsically large chromatic emittance of such beams [2]. This submission summarizes the benchmarking of two different tracking codes (including nonlinear dynamics and collective effects) for the COXINEL setup: one which was developed at the synchrotron SOLEIL and ASTRA [3]. A detailed description of the beam transport and the obtained results will be presented and discussed.

[1] M.E. Couprie et al., Proc. of IPAC 2014, THPRO003, Dresden, Germany.
[2] A. Loulergue et al., New J. Phys. (2015), 023028.
[3] K. Floettmann, ASTRA, http://www.desy.de/~mpyflo.

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