

Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Ultra-intense laser-plasma interaction toward Weibel-mediated collisionless shocks formation ANNA GRASSI, LULI, UPMC, University of Pisa, M GRECH, F AMIRANOFF, LULI, A MACCHI, University of Pisa, C RICONDA, LULI — The rapid developments in laser technology will soon offer the opportunity to study in the laboratory the processes driving Weibel-mediated collisionless shocks, typical of various astrophysical scenarii. The interaction of an ultra-intense laser with an overdense plasma has been identified as the preferential configuration. Yet, the experimental requirements still need to be properly investigated. High performance computing simulations are a necessary tool for this study. In this work, we present a series of kinetic simulations performed with the PIC code SMILEI, varying the laser and plasma parameters. In particular, we will study the effect of the laser polarisation and plasma density to obtain the best conditions for the creation of a collisionless shock. The role of the electrons heated at the interaction surface and of particles accelerated via the Hole Boring (laser-piston) mechanism on the generation of the current filamentation instability and the subsequent shock front formation will be highlighted.

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Date submitted: 20 Jul 2016

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