

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Simulation and Investigation of Weibel Instability for LWFA and PWFA Electron Beams¹ BRIAN ALLEN, TOM KATSOULEAS, BING FENG, University of Southern California, ANATOLY MAKSIMCHUK, University of Michigan, VITALY YAKIMENKO, Brookhaven National Laboratory, PATRIC MUGGLI, University of Southern California — Weibel instability (or current filamentation instability) is of central importance for relativistic beams in plasmas for the laboratory, ex. fast-igniter concept for inertial confinement fusion, and astrophysics, ex. cosmic jets. Simulations, with the particle-in-cell code QuickPic, of beams produced by Laser Wakefield and RF accelerators show the appearance of Weibel instability. The appearance of the instability is investigated as a function of electron beam parameters (including charge, transverse size and length) and plasma parameters (density and length). We present preliminary simulation results, discuss further simulation refinements, suggest criteria and threshold parameters for observing the presence of Weibel and outline potential future experiments.

¹Work was supported by the US Department of Energy

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Date submitted: 18 Jul 2008

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