Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Radiation from Weibel and Kelvin-Helmoltz unstable scenarios
JOANA L. MARTINS, EDUARDO P. ALVES, RICARDO A. FONSECA, LUIS O. SILVA, GoLP/Instituto de Plasmas e Fusao Nuclear - Laboratorio Associado, Instituto Superior Tecnico, Lisbon, Portugal — Weibel and Kelvin-Helmoltz instabilities can be relevant for astrophysical and laboratory scenarios, e.g. in connection with shocks. In astrophysical scenarios they have been proposed as possible mechanisms for the generation and amplification of magnetic fields respectively. The identification of their radiation signatures can contribute to understand observations and experimental measurements. In this work, the radiation signatures from the Weibel and the Kelvin-Helmoltz instabilities are explored through particle-in-cell (PIC) simulations and the post-processing of particle trajectories, and compared with theoretical models. Simulations are performed in different geometries in 2D and compared with 3D simulations, in electron/positron and electron/proton scenarios, and the radiation spectra associated with these instabilities are determined. These spectra are then analyzed in detail and their features (e.g. isotropy/anisotropy, peak energy) are compared and correlated with the evolution of the self-consistent fields associated with each unstable scenario.

Joana L. Martins
GoLP/Instituto de Plasmas e Fusao Nuclear - Laboratorio Associado,
Instituto Superior Tecnico, Lisbon, Portugal

Date submitted: 25 Jul 2011 Electronic form version 1.4