

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Sheath instability around an electron-emitting object GIAN LUCA DELZANNO, LANL, GIOVANNI LAPENTA, KU Leuven — In this work, we analyze the stability of the electrostatic sheath of an electron emitting object, for sheath profiles characterized by a potential barrier. We show that such profiles can be unstable to the Rayleigh-Taylor instability, driven by the favorable combination of the density gradient (of the emitted electrons) and electric field in the sheath [1]. We present an analytical theory based on a simplified fluid model which elucidates various aspects of the instability. We also present nonlinear results from a kinetic PIC code, showing that this instability is associated with periodic oscillations of the sheath profiles. [1] G.L. Delzanno, G. Lapenta, Sheath stability of an electron emitting, positively charged wall, in preparation (2010).

Gian Luca Delzanno
LANL

Date submitted: 16 Jul 2010

Electronic form version 1.4