Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Lower-hybrid-drift instabilities in current-sheet equilibriumin in presence of a guide field WENLU ZHANG, ZHIHONG LIN, LIU CHEN, University of California, Irvine, YU LIN, XUEYI WANG, Auburn University — Drift instabilities in one-dimensional current-sheet configuration in presence of a guide magnetic field, with lower-hybrid frequencies, are investigated. Nonlocal two-fluid stability analysis is carried out, and a class of unstable modes with multiple eigenstates are found by numerical means. It is found that the most unstable modes correspond to quasi-electrostatic, short-wavelength perturbations in the lower-hybrid frequency range, with wave functions localized at the edge of the current sheet where the density gradient is maximum. It is also found that there exist quasi-electromagnetic modes located near the center of the current sheet where the current density is maximum, with both kink- and sausage-type polarizations. These modes are low-frequency, long-wavelength perturbations. It turns out that the current-driven modes are low-order eigensolutions while the lower-hybrid-type modes are higher-order states, and there are intermediate solutions between the two extreme cases. Attempts are made to interpret the available simulation results.

Wenlu Zhang
University of California, Irvine

Date submitted: 12 Sep 2007 Electronic form version 1.4