Abstract Submitted
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3D Gyrokinetic Theory of Electromagnetic Lower-Hybrid Drift Instabilities in a Harris Current Sheet with Guide Field[1] KURT TUMMEL, University of California, Irvine, LIU CHEN, University of California, Irvine and Zhejiang University, China, ZHENYU WANG, Auburn University — Electromagnetic fluctuations in the lower-hybrid drift(LHD) frequency range have been observed in current sheets in the magnetosphere, magnetopause, and laboratory plasmas. In theory and simulations, the lower hybrid drift instabilities typically dominate the linear phase of current sheet dynamics, appearing as quasi-electrostatic, edge-localized, electron-scale waves that propagate nearly perpendicular to the magnetic field. In current sheets with strong drift velocities, fluctuations in the LHD frequency range are observed near the current sheet center, with longer wavelengths and stronger magnetic fluctuations than conventional LHDIs. Analyses of these modes have used fluid theory or the local approximation to handle the electron response. We have adopted a gyrokinetic-electron, unmagnetized kinetic-ion model to study the electromagnetic effects in a 3D nonlocal analysis of an ion-scale Harris current sheet with a guide field. Both numerical and analytical results will be presented and compared with those of direct simulations.

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