

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Lower Hybrid Instability and Coherent Formation of Electron Holes HAIHONG CHE, JAMES DRAKE, University of Maryland, MARC SWISDAK, PETER H. YOON, University of Maryland — Using particle-in-cell simulations and kinetic theory, we discover that lower hybrid instability can form not only oblique localized structures but also much stronger and more stable bipolar structures parallel to magnetic field. This is a direct result of nonlinear coupling between waves and particles which allows the perpendicular phase speed of lower hybrid waves to be in pace with the undergoing cross-field $\mathbf{E} \times \mathbf{B}$ drift of its trapped electrons. The coherent increasing of phase and group velocity strengthen the stability of the electron holes. The increasing phase speed of lower hybrid waves transfer the momentum from high velocity electrons to ions.

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Date submitted: 14 Jul 2009

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