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## Observational and Theoretical Study of Lower Hybrid Drift Waves

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One of the most important diamagnetic current driven instability transverse to the magnetic field is lower hybrid drift instability (LHDI) which excites lower hybrid drift waves (LHDW). LHDI gives rise to anomalous resistivity which further leads to onset of magnetic reconnection. Because of its high anomalous collision frequency, LHDI enhances the rate of transverse diffusion. The lower hybrid frequency (LHF) ranges between electron and ion cyclotron frequency which is a natural resonance. LHDW is generally observed in transition layer regions and magnetic reconnection sites, where the gradient in density occurs. We are presenting electromagnetic kinetic model including gradients in density and magnetic field, finite parallel wavenumber and non-thermal particle distribution function or kappa velocity distribution function. The effect of the aforementioned factors on the growth rate of LHDI in different plasma beta circumstances has been thoroughly investigated and will be discussed. Space observation of drift driven wave using MMS spacecraft will also be discussed.