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**Measurement of non-linear coupling and energy transfer in plasma turbulence in a Hall effect thruster**[1] ZACHARIAH BROWN, BENJAMIN JORNS, Univ of Michigan - Ann Arbor — The nonlinear coupling coefficient and the energy transfer from multi-wave interactions are determined from measurements of plasma turbulence in a Hall effect thruster. The crossed electric and magnetic fields in Hall thrusters generate a large electron velocity, while the ions are relatively stationary, that gives rise to an instability known as the Electron Drift Instability (EDI). It is theorized that this instability is responsible for the anomalously high electron mobility across magnetic fields observed in these devices. Recent particle-in-cell simulations have demonstrated that this wave driven transport is strongest due to oscillations at long wavelengths that develop from a non-linear energy cascade from the initial, small wavelengths. Using the analysis technique of Ritz, we experimental show that this theorized non-linear effect does occur in these devices.

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