Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Effects of Electron inertia on the Waves in Hall Magnetohydrodynamics B. DASGUPTA, DASTGEER SHAIKH, G.P. ZANK, The University of Alabama in Huntsville — Electromagnetic waves in Hall Magnetohydrodynamics (HMHD) exhibit a variety of complex and interesting features. Earlier works have shown the mode conversion of incompressible MHD shear Alfvén wave into a compressible, the fast wave becoming mostly electromagnetic and the slow wave becomes almost a fluid-dynamical wave. These features have been supported partially by numerical simulations of Shaikh & Zank (ApJ,640,L195,2006). Also, recent numerical simulations on solar wind turbulence show some interesting features for the power spectra, like the predominance of Whistler cascades in the range kde $<$ 1 , where k is the wave number and de is the electron inertial length. In this work, we first consider the linear dispersion relation for a complete two-fluid plasma with a finite electron mass. We analyze the different branches of the dispersion relation for different ranges of kde, i.e., kde $>$ 1 and kde $<$ 1, in addition to the ranges kdi $>$ 1 and kdi $<$ 1. The wave characteristics,revealing many significant features, are discussed.

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Date submitted: 22 Jul 2009 Electronic form version 1.4