Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Parametric study of gravito-MHD waves CORA REPETTI, GIAN LUCA DELZANNO, XIANZHU TANG, LANL — Quasi-periodic oscillations (QPO) are commonly observed in the gamma-ray flares by magnetars, the neutron stars with internal magnetic field as high as 10^{16} G. The QPOs can have very low frequencies, e.g. tens of Hertz. To understand the source of QPO and the damping mechanism in such frequency range, it is of interest to examine the characteristics of gravito-MHD waves in such a plasma where sound wave is close to the light speed and hence far greater than the Alfven speed. To this end, we consider a planar geometry and study the dispersion relation of the system for arbitrary angles between the equilibrium magnetic field and gravity and by changing the relative strength of the sound and Alfven speeds. Gravity does not change the number of characteristic MHD waves. Furthermore, in the limit when the sound speed of the system is much larger than the Alfven speed, the system supports two low-frequency waves (with phase velocity proportional to the Alfven speed) and one high-frequency wave (with phase velocity proportional to the sound speed). The behavior of such waves in a spherical geometry, especially the emergence of discrete modes as opposed to a continuum, will be explored. Work supported by LANL LDRD.

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Date submitted: 16 Jul 2010 Electronic form version 1.4