Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

MRI Dispersion for a Helicon Plasma COURTNEY KAITA, University of Michigan-Ann Arbor, HANTAO JI, Princeton Plasma Physics Laboratory, CAMI COLLINS, University of Wisconsin-Madison — The magnetorotational instability (MRI) is a basic MHD instability that occurs when a weak magnetic field is present in a differentially rotating disk. MRI is a likely reason for fast angular momentum transport in astrophysical accretion disks. A cohesive understanding of MRI with a range of plasma parameters pertaining to the wide variety of accretion disk systems has become an increasingly pressing concern. In the helicon plasma MRI experiment, plasma is created by a spiral antenna in an axial magnetic field produced by a solenoid. A radial potential difference is applied between a three-ring electrode system which creates plasma rotation through ExB drift. In this experiment, the ion gyro-orbit is much larger than for electrons. The Hall term due to different ion and electron velocities is added to the MHD model, resulting in additional two-fluid effects in the MRI dispersion relation. The characteristic MRI growth rates for the given experimental parameters are examined.

Courtney Kaita
University of Michigan-Ann Arbor

Date submitted: 17 Jul 2009 Electronic form version 1.4