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Progress on the Kinetic MHD model JIANHUA CHENG, CIPS, University of Colorado at Boulder, YANG CHENG, CIPS, University of Colorado. at Boulder, SCOTT PARKER, CIPS, University of Colorado at Boulder — We have developed a Lorentz force ion, fluid electron kinetic MHD hybrid model.[1] Here we implement the algorithm in the GEM gyrokinetic turbulence code. Numerically, for some applications, relatively large ion Larmor radius and gyrofrequency motivates the use of Lorentz force ions. An implicit algorithm,[2] which extends the GEM code to use Lorentz force ions and drift kinetic electrons has already been developed and work is already underway to include gyrokinetic electrons. Based on this ion model but with isothermal fluid electrons, we will use GEM to reproduce our previous results on shearless Alfven waves, ion sound waves and the Whistler waves.[3] This model will be used to investigate the linear stability of 1-D Harris model with a guide field. Eventually we will add gyrokinetic electrons. Work is under way to implement the Harris equilibrium in GEM.[4,5]

[1]D. Barnes, *et al*, Phys. Plasmas **15**, 055702 (2008)
[2]Yang Chen, Scott E. Parker, to be submitted (2008).
[3]D. Barnes, *et al*, Phys. Plasmas **15**, 055702 (2008)
[4]X. Y. Wang, *et al*, Phys. Plasmas **15**, 072103 (2008).
[5]E. G. Harris, Nuovo Cimento, **23** 115 (1962).

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