Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Finite β Effects on TEM Turbulence[1] D.R. ERNST, Mass. Inst. of Technology, J. LANG, PPPL, W.M. NEVINS, LLNL, P.N. GUZDAR, Univ. Maryland, J. CANDY, R.E. WALTZ, General Atomics — This work explores the β dependence of trapped electron mode turbulence and associated electron thermal energy and particle transport, using the GS2 (continuum), GEM (particle), and GYRO (continuum) codes. Leadership class computing facilities enable us to extend to shorter wavelengths that contribute significantly to electron thermal transport, which can increase with β in ITG dominated cases.[2] Analytic work on zonal flow modulational instabilities with finite β suggests interesting and non-monotonic β dependence, arising from competition between drift wave and drift-Alfvén wave pumps.[3] Finally, our previous TEM zonal flow studies[4] found that convergence was poor for $\eta_e > 3$, despite including wavenumbers $k_\alpha \rho_s \leq 4$. Additional physics, such as electromagnetic effects, could potentially resolve this.

[1]Supported by U.S. Dept. of Energy DE-FG02-91ER-54109, DE-FC02-99ER54966, and other DoE grants.
[2]J. Candy, Phys. Plasmas **12**, 072307 (2005). See posters by R. Waltz and W. Nevins, this conference.
[3]P. N. Guzdar *et al.*, Phys. Plasmas 8(9) 3907 (2001).
[4]D. R. Ernst, J. Lang, W. M. Nevins *et al.*, Phys. Plasmas 16, 055906 (2009).

Darin Ernst
Massachusetts Institute of Technology

Date submitted: 21 Jul 2009 Electronic form version 1.4