Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

A Basic Experiment on the Production and Identification of ETG Modes[1] XIAO WEI, VLADIMIR SOKOLOV, AMIYA K. SEN, Columbia University — One of the strongest candidates for the anomalous electron energy transport is believed to be electron temperature gradient (ETG) mode [1, 2]. However, the high frequency (few MHz) and short wave length ($k_\perp \rho_e < 1$) make the direct observation of ETG modes difficult in experiments. Using a DC bias heating scheme of the core plasma, we are able to produce the drive parameter $\eta_e = dln\,T_e/dlnn$ from 1 to 6 ($T_e \sim 20eV$ in the center and $\sim 1eV$ on the edge) in Columbia Linear Machine (CLM). A high frequency mode at $\sim 2MHz$has been observed. Its azimuthal wave number in $m \sim 30$ has been measured. These values are consistent with the results of a simple kinetic dispersion relation on appropriate $\vec{E_0} \times \vec{B}$ Doppler shift. The problem of the measurement of the small parallel wave number with the large azimuthal wave number has been resolved by a novel diagnostic method. The scaling of ETG fluctuation level versus η_e, as well as the radial structure of the mode will be reported.

[1] W. Dorland et al., *Phys. Rev. Lett. 85, 5579 (2000).*
[2] *R.E. Waltz, J. Candy and M. Fahey, Phys. Plasmas 14, 056116 (2007).*

[1]This research was supported by U.S. Department of Energy Grant No. DE-FG02-98ER-54464.

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Date submitted: 05 Jul 2007 Electronic form version 1.4