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Further Experimental Identification of ETG Modes[1] XIAO WEI, VLADIMIR SOKOLOV, AMIYA K. SEN, Columbia University — The electron temperature gradient (ETG) mode, which is believed to be one of the strongest candidates for the anomalous electron energy transport [1, 2], is difficult to detect in experiments because of its high frequency (few MHz) and short wave length ($k_\perp \rho_e \sim 1$). Using a DC bias heating scheme of the core plasma, we are able to produce sufficiently strong electron temperature gradient in Columbia Linear Machine (CLM). A high frequency mode at $\sim 2MHz$, with azimuthal wave number $m \sim 15$, has been observed. This frequency is consistent with the result of a kinetic dispersion relation of slab ETG modes with appropriate $\vec{E} \times \vec{B}$ Doppler shift. The scaling of its fluctuation level with the temperature gradient scale length and the radial structure are found to be roughly consistent with theoretical expectations. The parallel wave number of the mode can be varied via changing the position of the endplate by at least 30% and the scaling of the fluctuation level with $k_\parallel$ will also 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).*

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