

Abstract Submitted  
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**Observation of the Early Transition from Slab to mixed Slab-Toroidal ETG Turbulence<sup>1</sup>** ABED BALBAKY, VLADIMIR SOKOLOV, AMIYA K. SEN, Columbia University — Parametric studies of the transition between the slab branch of electron temperature gradient (ETG) mode and the mixed slab-toroidal branch of the ETG mode in CLM are reported. CLM was operated in a mirror machine configuration with a cell length of 50-100 cm, and a mirror ratio of 1-2. For typical CLM parameters and a mode localized at  $r=2$  cm this provides a range for inverse radius of curvature  $R_c^{-1}$  between 0 and  $.006 \text{ cm}^{-1}$ . Under normal conditions theory predicts transition between slab and toroidal modes would occur when the parameter  $k_{\parallel}R_c/2k_{\perp}\rho \sim 1$  [1]. Recent experiments have obtained an experimental scaling of mode amplitude and frequency as a function of  $R_c^{-1}$ . They indicate that even for much more modest levels of  $k_{\parallel}R_c/2k_{\perp}\rho \sim .1$ , there are substantial increases in saturated mode, up to 5 times larger than the pure slab mode. Changes in real frequency in the mode are generally small, on the order of  $< 5\%$ .

[1] J.Y. Kim and W. Horton, Phys.Fluids B 3, 1167 (1991).

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Abed Balbaky  
Columbia University

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