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Basic Experiments on the Production and Identification of Toroidal ETG Modes ABED BALBAKY, VLADIMIR SOKOLOV, AMIYA SEN, Columbia University — First parametric studies of the transition from the slab mode to toroidal (curvature) branch of ETG mode in CLM are reported along with comparison with theory. CLM was operated in the mirror configuration with cell length (50cm-100cm) and mirror ratio (1-2.3). This allows for $R_c \sim 1.2m$ and provides sufficient toriodicity to excite the toroidal branch of ETG, $\varepsilon_n = L_{Te}/R_c \sim .003 > \varepsilon_{crit} = k_\parallel/2k_\perp \sim .0005$ [1]. A simple fluid model has been developed to predict changes in ETG mode frequency and growth rate as a function of toriodicity. When operating near our maximum of $\varepsilon_n \sim .003$ our model predicts a shift in the mode frequency on the order of 30kHz, and a slight increase in growth rate. Experimentally we see a shift of 100kHz, and a modest increase in mode amplitude, which roughly agrees with the theoretical estimates. This level of agreement is very similar over our full range of possible curvatures.

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

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