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A Preliminary Basic Experiment on the Production and Identification of Toroidal ETG Modes VLADIMIR SOKOLOV, ABED BALBAKY, AMIYA K. SEN, Columbia University — Production and identification of the slab branch of the Electron Temperature Gradient (ETG) mode and the measurement of the consequent electron thermal conductivity have been successfully made in a basic experiment in Columbia Linear Machine (CLM) [1,2]. A preliminary experiment on the transition of the slab mode to the toroidal (curvature) branch of ETG mode in CLM is reported. CLM was operated in the mirror configuration with cell length (50cm-100cm) and mirror ratio (1-2.2). The radius of curvature is $R_c \sim 1.3m$ and the critical ratio for the transition to toroidal mode has been achieved, $k_{\parallel}/2\varepsilon_n k_{\perp} < 0.1$ [3]. We first excite the slab ETG mode [1] and gradually increase the magnetic curvature drive by increasing the magnetic mirror ratio, and observe an increase of the ETG mode amplitude up to 2 times and a small change in mode frequency. Alternatively, we can shorten the mirror cell length via moving the mirror coil to increase the bounce average curvature drive and the mode amplitude.

- [1] X.Wei, V.Sokolov, and A.K. Sen, Phys. Plasmas 17, 042108 (2010).
- [2] V.Sokolov, and A.K. Sen, Phys. Rev. Lett. 107, 155001 (2011).
- [3] J.Y.Kim and W.Horton, Phys.Fluids B 3, 1167 (1991).

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