

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

A Basic Physics Study of Zonal Flows in CLM VLADIMIR SOKOLOV, XIAO WEI, AMIYA K. SEN, KHARE AVINASH, Plasma Research Laboratory, Columbia University — A basic physics experimental study of zonal flows [1] associated with ITG (ion temperature gradient) drift modes has been performed in the Columbia Linear Machine. The difficult problem of detection of zonal flows (ZF) has been solved via a novel diagnostic using the paradigm of FM (frequency modulation) in radio transmission. Using this and Discrete Short Time Fourier Transform, we find a power spectrum peak at ITG (carrier) frequency of $\sim 120kHz$ and FM sidebands at frequency of $\sim 2kHz$. We have definitively identified ZF with azimuthal (poloidal) and axial (toroidal) symmetry and very low frequency. However, the stabilizing effect of ZF on the parent ITG modes appears to be small and no significant isotopic effects are seen. A theoretical model for the above will be presented. The research was supported by U.S. Department of Energy Grant No. DE-FG02-98ER-54464.

[1] P.H. Diamond, S-I Itoh, K.Itoh and T.S.Hahm, Plasma Phys.Controlled Fusion 47, R35 (2005).

Vladimir Sokolov
Plasma Research Laboratory, Columbia University

Date submitted: 20 Jul 2005

Electronic form version 1.4