

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Turbulence from inverted density-to-temperature gradients in LHD¹ W. HORTON, X.R. FU, University of Texas at Austin, K. TANAKA, National Institute for Fusion Science, UNIVERSITY OF TEXAS AT AUSTIN COLLABORATION, NATIONAL INSTITUTE FOR FUSION SCIENCE COLLABORATION — Recent experiments in Large Helical Device(LHD) show interesting “ears” in the plasma density profiles – density peaks at $r/a \approx 0.8$. The local maximum produces an inner region with negative $\eta_e = L_n/L_T$ and an outer region with positive η_e . The linear analysis shows that electron temperature gradient(ETG) mode is very unstable in the negative η_e region. We perform gyrokinetic simulations of ETG modes in cylindrical geometry with and without curvature effects using density and temperature profiles from LHD experiments. Fluctuations measured by 2D-PCI also found the waves rotating in the electron direction inside the ear and in the ion direction outside the density ear as expected from the dispersion relation and standard radial electric field in these discharges. We also investigate ITG/TEM and other possible modes in these experiments.

¹Work Supported by DoE-IFS Grant and the NIFS, Toki, Japan.

W. Horton
University of Texas at Austin

Date submitted: 18 Jul 2012

Electronic form version 1.4