Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Drift Wave Excitation in Linear ECR Plasma KUNIHIRO KAMATAKI, Y. NAGASHIMA, S. SHINOHARA, Y. KAWAI, M. YAGI, Kyushu University, K. ITOH, NIFS, S.-I. ITOH, Kyushu University — In hot plasmas, there has been considerable interest in turbulence, especially drift wave turbulence, because of its role in anomalous transport. Here, we show an experimental study of the drift wave instability in bounded linear Electron Cyclotron Resonance (ECR) plasma device (inner diameter i.d. is 400 mm and axial length L is 1200 mm). Plasma parameters were measured with Langmuir probes. ECR plasma was produced by launching a microwave with the frequency of 2.45GHz through a coaxial chamber (i.d.= 100 mm and L= 210 mm). By installing this, the plasma radius became smaller and the strong radial gradient in density was formed. In addition the axial boundary condition was determined by metals on both ends of chamber. By imposing these two boundary conditions, the drift wave was successfully excited. Furthermore, we found two modes were coexistent in Ar gas pressure P=1.0$\sim$1.6mTorr: the one was drift wave and the other was flute wave from the measurements of the axial wave number and the direction of azimuthal propagation. The drift wave was not observed when $P >$ 1.6mTorr. The present result suggests that the growth rate of drift instability is related to the ion-neutral collision frequency, which is proportional to gas pressure. The co-existence of two instability modes allows to study nonlinear interaction between them.

Yoshinobu Kawai
Kyushu University

Date submitted: 26 Aug 2005 Electronic form version 1.4