Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Probe Measurements of Electrostatic Fluctuations in LDX[1] E.E. ORTIZ, M.E. MAUEL, D.T. GARNIER, A.K. HANSEN, Columbia University, J. KESNER, A. BOXER, J.L. ELLSWORTH, I. KARIM, MIT PSFC — High-frequency ($\sim$ 1 MHz) and low-frequency ($\sim$ 5 kHz) electrostatic fluctuations have been observed in high-beta plasmas created in the LDX experiment. The high-frequency mode is characterized by frequency-sweeping at the drift-resonance of trapped energertic electrons and identifies the instability as the hot electron interchange (HEI) mode. The HEI mode limits plasma pressure, but it is stabilized when the rate of neutral fueling exceeds a threshold. The fluctuations often appear with coherent structures that have been detected on fast high-impedance electrostatic probes. Magnetic fluctuations of the HEI in the high-beta LDX have been measured, and the phase-relationship between the magnetic and electric fluctuations help to determine how the mode modulates the energetic electron distribution. Measurements that characterize these modes are compared to fast magnetic measurements in an attempt to put together a coherent picture of plasma behavior during these modes, including the consequences of these instabilities on plasma formation and pressure limits are presented.

[1]This work is supported by U.S. DOE Grants DE-FG02-98ER54458 and DE-FG02-98ER54459

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Date submitted: 22 Jul 2005 Electronic form version 1.4