

Abstract Submitted  
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**High Beta Observations of the Hot Electron Interchange Instability**<sup>1</sup> E.E. ORTIZ, M.E. MAUEL, D.T. GARNIER, A.K. HANSEN, Columbia University, J. KESNER, A. BOXER, J.L. ELLSWORTH, I. KARIM, R. BERGMANN, MIT PSFC — High frequency ( $f > 1$  MHz) electrostatic fluctuations have been observed in high-beta plasma created in the Levitated Dipole Experiment (LDX). We have previously identified these fluctuations as the Hot Electron Interchange (HEI) instability.<sup>2</sup> New observations have been made in the presence of the magnetic levitation fields. We find the HEI mode is characterized by frequency sweeping at the drift-resonance of trapped energetic electrons. The fluctuations often appear with coherent structures that have been detected on fast high-impedance electrostatic probes and edge Mirnov sensors. We observe phase shifts using multiple probes that will enable us to determine the toroidal mode number ( $m$ ) and a higher sampling rate reveals frequency sweeping as high as 40 MHz. Measurements that characterize these modes now incorporate 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.

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<sup>2</sup>E. Ortiz, *et al.*, to appear in *J. Fus. Energy*, (2006).

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