

Abstract Submitted
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Production and Study of High-Beta Plasma in LDX¹ D.T. GARNIER, A.K. HANSEN, E.E. ORTIZ, M.E. MAUEL, Columbia University, A. BOXER, J.L. ELLSWORTH, I. KARIM, J. KESNER, S. MAHAR, E. MIMOUN, A. ZHUKOVSKY, MIT — In this poster, the first experiments using the Levitated Dipole Experiment (LDX) are summarized. Long-pulse, quasi-steady state microwave discharges lasting up to 12 seconds have been produced that are consistent with equilibria having peak beta values of 10%. Detailed measurements have been made of discharge evolution, plasma dynamics and instability, and the roles of gas fueling, microwave power deposition profiles, and plasma boundary shape. In these initial experiments, the high-field superconducting floating coil was supported by three thin supports and later the coil will be magnetically levitated. The plasma was created by multi-frequency ECRH, and a population of energetic electrons, with mean energies above 50 keV, dominated the plasma pressure. Creation of high-pressure, high-beta plasma is possible only when intense hot electron interchange instabilities are stabilized by sufficiently high background plasma density.

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