Abstract Submitted
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Overview of LDX Results[1] J. KESNER, A.C. BOXER, J.L. ELLSWORTH, I. KARIM, MIT PSFC, D.T. GARNIER, A.K. HANSEN, M.E. MAUEL, E.E. ORTIZ, Columbia University — The levitated dipole experiment (LDX) is a new research facility that is investigating plasma confinement and stability in a dipole magnetic field configuration as a possible catalyzed DD fusion power source that would avoid the burning of tritium. We report the production of high beta plasma confined by a laboratory superconducting dipole using neutral gas fueling and electron cyclotron resonance heating (ECRH). The pressure results from a population of anisotropic energetic trapped electrons that is sustained by microwave heating provided sufficient neutral gas is supplied to the plasma. The trapped electron beta was observed to be limited by the hot electron interchange (HEI) instability, but when the neutral gas was programmed so as to maintain the deuterium gas pressure near 0.2 mPa, the fast electron pressure increased by more than a factor of ten and the resulting stable high beta plasma was maintained quasi-continuously for up to 14 seconds. Low frequency (<10 kHz) fluctuations are sometimes observed at low neutral base pressure.

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