Abstract Submitted
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Overview of the Levitated Dipole Experiment D.T. GARNIER, M.S. DAVIS, M.E. MAUEL, Columbia University, J.L. ELLSWORTH, J. KESNER, P.C. MICHAEL, P. WOSKOV, MIT PSFC — The Levitated Dipole Experiment (LDX) investigates plasmas confined in the closed field line dipole magnetic geometry where the plasma stability is provided by compressibility and where plasma convection leads to peaked profiles and may allow for $\tau_E > \tau_p$. Recent experiments have demonstrated a substantial density pinch driven by low frequency interchange turbulence leading to a stationary density profile with near equal number of particles per flux tube. Over the past year, transient transport experiments using modulated ECRH and gas puffing have lent corroborating evidence for this result. Analysis of data from multi-channel photodiode arrays indicate that incoherent broadband turbulence is responsible for the turbulent pinch, while observed quasi-coherent turbulence exists with supercritical density gradients and provides insufficient transport to maintain stationary profile. Ongoing upgrades the the LDX diagnostic capability include the addition of a swept heterodyne interferometer to measure the peak density, additional interferometer channels at 90 GHz, and installation of a Thomson scattering diagnostic. In preparation for of the installation of a 1 MW ICRF transmitter, a time-of-flight neutral particle analyzer will be installed to measure ion temperature and initial ICRF antenna coupling experiments will be performed.

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