

Abstract Submitted
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Visible and x-ray imaging of a laboratory dipole plasma¹ J.L. ELLSWORTH, A.C. BOXER, I. KARIM, J. KESNER, MIT PSFC, D.T. GARNIER, A.K. HANSEN, M.E. MAUEL, E.E. ORTIZ, Columbia University — Supported plasma experiments in the Levitated Dipole Experiment focus on producing hot electron, high beta plasmas in a dipole magnetic field. Plasmas were created using multifrequency electron cyclotron resonance heating, and we find that most of the plasma energy is stored in the fast electrons, $T_e \sim 50$ keV. Imaging of the plasma bremsstrahlung reveals that the fast electron population is anisotropic. This likely results from a combination of the electron cyclotron heating and the losses along the field lines to the supports on the internal coil. We expect the anisotropy to be substantially reduced during levitated operation. The presence of low frequency modes in the plasma may indicate that the plasma is toroidally asymmetric. A sixteen channel photodiode array sensitive to visible light is used to investigate the structure of these modes. A second array is under construction so that both toroidal and radial structure can be observed simultaneously. Results from x-ray and visible imaging diagnostics will be presented.

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