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Reconstruction of Pressure Profile Evolution during Levitated Dipole Experiments[1] M. MAUEL, D. GARNIER, Columbia University, A. BOXER, J. ELLSWORTH, J. KESNER, MIT Plasma Science and Fusion Center — Magnetic levitation of the LDX superconducting dipole causes significant changes in the measured diamagnetic flux and what appears to be an isotropic plasma pressure profile ($p_\perp \sim p_{||}$). This poster describes the reconstruction of plasma current and plasma pressure profiles from external measurements of the equilibrium magnetic field, which vary substantially as a function of time depending upon variations in neutral pressure and multifrequency ECRH power levels. Previous free-boundary reconstructions of plasma equilibrium[2] showed the plasma to be anisotropic and highly peaked at the location of the cyclotron resonance of the microwave heating sources. Reconstructions of the peaked plasma pressures confined by a levitated dipole incorporate the small axial motion of the dipole ($\pm$5 mm), time varying levitation coil currents, eddy currents flowing in the vacuum vessel, constant magnetic flux linking the superconductor, and new flux loops located near the hot plasma in order to closely couple to plasma current and dipole current variations.

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[2]I. Karim, et al., J. Fusion Energy, **26** (2007) 99.

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