

Abstract Submitted
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Multi-Color Soft X-ray Diagnostic Design for the Levitated Dipole Experiment (LDX)¹ M.S. DAVIS, D.T. GARNIER, M.E. MAUEL, Columbia University, J.L. ELLSWORTH, J. KRESNER, P.C. MICHAEL, PSFC MIT — We present a design for a new diagnostic to measure the warm plasma electron temperature on LDX using a “multi-color” soft X-ray diode array. The challenge is to select thin-film coatings that allow detection of soft X-rays while minimizing the signals from the more energetic, 20-60 keV, trapped electrons created by electron cyclotron resonance heating [Garnier, et al., Phys. Plasmas, 13 (2006) 056111]. The soft X-ray detector array presented here is designed to be sensitive to 0.5-5 keV bremsstrahlung emitted by the warm temperature of the higher density bulk plasma electrons. The array employs the “two-foil” method in which filters are used such that different detectors observe different parts of the bremsstrahlung spectrum. We present conceptual design plans for the LDX diagnostic and also present results from an existing soft X-ray diode array installed to measure the electron temperature of the dipole-confined plasma diagnostic in the Collisionless Terrella Experiment (CTX).

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