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Optimization of Hot Electron ECE Diagnostics on LDX[1] S.H. NOGAMI, University of San Diego, P.P. WOSKOV, J. KESNER, PSFC MIT, D.T. GARNIER, M.E. MAUEL, Columbia University — The Levitated Dipole Experiment (LDX) is evaluating the dipole magnetic field configuration for fusion confinement with a levitated 1.1 MA, 68 cm mean diameter, 560 kg superconducting coil (F-coil) inside a 5 m diameter vacuum vessel. Highly peaked plasmas ($\sim 1/r^4$) are generated by up to 17 kW electron cyclotron resonance heating at 2.45, 6.4, and 10.5 GHz. The high magnetic field gradient around the outside of the dipole coil where the plasma is confined represents a new regime for modeling ECE diagnostics. Millimeter wave radiometers at 110, 137, and 165 GHZ in use on LDX can view ECE harmonics from the 2nd through the 55th depending on the location of the radiometers with respect to the plasma. A study of the viewable harmonics from each of the available radiometers at various positions and proximities to the plasma is necessary to determine the interpretation of the ECE in terms of the hot electron temperatures and densities and the optimum receiver placement for the best measurements.

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