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High Power RF Heating in the LDX Experiment[1] MICHAEL MAUEL, D. GARNIER, M. DAVIS, Columbia University, J. KESNER, P. MICHAEL, P. WOSKOV, MIT Plasma Science and Fusion Center — Exploration of higher-density plasmas created with high-power RF heating is key objective of the next phase of the LDX research program. This poster describes the use of a 1 MW HF Band (4 to 26 MHz) radio-frequency transmitter in a two-part program. First, we will evaluate axisymmteric ($m = 0$) antenna and match-box designs and make low-power 1 kW measurements. Secondly, we will apply high power (> 100 kW) RF heating at a range of frequencies with the objective to create, sustain, and investigate high-density ($n > 10^{19}$ m^{-3}), high-beta dipole confined plasma with $T_i \approx T_e$. The RF heating expected in LDX has been modeled using full-wave electromagnetic calculations in realistic geometry and boundaries. Following the method of Jaeger and co-authors [2], we calculate the electric fields from both the near-field of the antenna and waves launched in the plasma. The linear antenna loading, reactive power flow, and heating deposition is calculated, and we predict acceptable loading throughout the HF band.

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[2]Jaeger, *et al.*, *Computer Physics Communications*, **40**, 33-64, (1986).

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