

Abstract Submitted
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ECRH in LDX with Many Microwave Frequencies¹ P. WOSKOV, J. KESNER, P. MICHAEL, MIT PSFC, D. GARNIER, M. MAUEL, M. DAVIS, Columbia University — The large magnetic field range from 0.007 to 3.2 Tesla on closed flux surfaces around the LDX floating coil makes LDX uniquely capable of using many frequencies for electron cyclotron resonance heating (ECRH) to breakdown, build up, and sustain a core plasma. There are five sources installed with a combined injected power of 27 kW: two 2.45 GHz magnetrons at 2.5 and 1.9 kW, a 6.4 GHz, 2.5 kW klystron, a 10.5 GHz, 10 kW klystron, and a 28 GHz, 10 kW gyrotron. With all sources operating, D₂ plasma density has increased to new highs near 10^{18} m^{-3} . Modeling with natural profiles shows strong ECRH absorption localized to discrete toroidal rings, each encompassing the plasma profile, that are located more inward with frequency. The relative size of the launched ECRH patterns to the absorption regions requires reflective trapping for complete absorption. Experimental observations show that higher frequencies are more efficient at generating density and lower frequencies are better at generating stored energy and energetic electrons.

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