

Abstract Submitted
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Antenna Coupling and Whistler Wave Propagation Experiments at the NRL SPSC¹ D.D. BLACKWELL, W.E. AMATUCCI, G.I. GANGULI, G.R. GATLING, US Naval Research Lab, Washington DC, C.S. COMPTON, C.D. COTHRAN, E.M. TEJERO, D.N. WALKER, SFA Inc., Crofton MD — We present results of recent whistler wave propagation experiments in the Space Physics Simulation Chamber facility at the Naval Research Lab. The waves are driven and detected using balanced dipole and loop antennas connected to a network analyzer which measures the amplitude and phase of the wave in two dimensions (r and z). In addition the frequency of the signals is also swept over a range of several hundred megahertz, providing a very comprehensive picture of the near and far field antenna radiation patterns over a variety of plasma conditions. The magnetic field is varied from a few Gauss to 200 Gauss, with the density variable over at least three decades from 10^7 - 10^{10} cm⁻³. Observations to be presented are the efficacy of resonant vs non-resonant antenna coupling in driving large amplitude waves, ducting of waves with density channels, and wave propagation in linear and non-linear regimes.

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