

Abstract Submitted
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Experiments correlating antenna impedance and wave propagation in the NRL Space Physics Simulation Chamber¹ DAVID BLACKWELL, WILLIAM AMATUCCI, US Naval Research Lab, DAVID WALKER, CHRISTOPHER COTHRAN, ERIK TEJERO, Global Strategies Group North America, Inc. — We have demonstrated in previous work that an electrically short exciter in a plasma will have the largest energy deposition around the plasma-sheath resonant frequency which is about half the electron plasma frequency ω_{pe} . When the exciter is electrically long, there is the possibility of competing channels of absorption from resonances associated with antenna radiation resistance. This brings up questions when operating in a parameter space where both energy deposition mechanisms are present: a) If both plasma-sheath and resonant wavelength coupling are present, can we control which is dominant, and b) is it advantageous to do so if the goal is to drive large amplitude waves? Presented are results of experiments controlling the antenna plasma sheath and electrical length to overlap the two modes of coupling. Concurrently we can monitor the propagated wave amplitude as we attempt to preference one mode versus the other. Results are expected to shed light on questions of antenna design and its relation to power deposition.

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