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Experimental Antenna Impedance Measurements in a Magnetized Plasma¹ DAVID BLACKWELL, DAVID WALKER², SARAH MESSER³, WILLIAM AMATUCCI, US Naval Research Lab, Washington DC — The characteristic impedances of two antennas immersed in a magnetized plasma have been measured by monitoring the reflection coefficient Γ using a network analyzer. The first antenna is spherical, the second an electric dipole. Previous theoretical and experimental studies have focused almost exclusively on very weakly magnetized ($\omega_c \ll \omega_p$) plasmas or short ($L \ll \lambda$) antennas. Here we present results which are an extension of this work and of our previous unmagnetized plasma antenna impedance experiments into higher density, strongly magnetized plasmas. Where applicable, experimental impedance curves are compared with analytic results. The experimental work was performed in the large volume Space Physics Simulation Chamber (SPSC) at NRL where the plasma is characterized by electron densities and temperatures of $n_e = 10^6$ - 10^{11} cm⁻³ and $T_e = 0.5$ eV.

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