

Abstract Submitted  
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**Investigation of Variable Excitation Frequency Capacitively Coupled Plasmas at Probing Frequencies up to 3 GHz<sup>1</sup>** ANDREI KHOMENKO, TAEHWAN SEO, SERGEY MACHERET, Purdue University — Tunable capacitors and inductors are key elements of any reconfigurable RF system. Weakly ionized plasma, and particularly CCP, devices are attractive for this because they can handle high power and because their properties can be electronically altered. In this work, we experimentally investigated two symmetric parallel-plate CCP devices: one in air, nitrogen, or argon at a pressure on the order of 1 Torr and with 2 cm gap between the electrodes, and a commercial Gas Discharge Tube (GDT) with 0.6 mm interelectrode gap. We developed a method and a setup that enabled the discharge to be sustained by a variable (10-250 MHz) excitation frequency source, and the real and imaginary parts of the device impedance to be measured at probing frequencies in the range of 300-3000 MHz. The results demonstrate wide tunability of both the magnitude and the sign of the reactance at any probing frequency by changing the excitation frequency and/or power.

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