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Electron Temperature and Density Measurements of Continuous-Wave Microwave-Driven Free Space Plasma[1] ADRIAN LOPEZ, University of Michigan, REMINGTON REID, Air Force Research Laboratory, ERIN THORNTON, University of North Texas — An experimental setup to study continuous-wave microwave-driven free space plasma discharges was designed and constructed at the Air Force Research Laboratory at Kirtland AFB, NM. Free space plasma is generated by a multi-kW, 4.7 GHz microwave system at pressures ranging from 100 to 200 mTorr. A precision gas flow system controls the composition of the gas used to generate the plasma. Gas pressure, gas composition (mixtures of Ar, N_2, and O_2), and the power of the microwave beam are varied to study their effects on the stability, uniformity, location (relative to the beams geometric focus), and parameters of the plasma. Measurements of the electron temperature, electron energy distribution function and electron density of the free space plasma generated under various operational conditions will be presented.

[1]Distribution A: Approved for public release: distribution unlimited. AFMC-2018-0068

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