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Relative Electric Field Measurements within the Striation Pattern of a Steady-State Microwave Driven Plasma SHAWN HAMPTON, University of North Texas, Denton, TX, REMINGTON REID, ADRIAN LOPEZ, Air Force Research Laboratory, Kirtland AFB, NM — Using a focused continuous microwave beam to generate a plasma in a vacuum chamber the Air Force Research Lab (AFRL) is studying free-space plasmas. These plasmas are generated in a gas mixture of argon, oxygen, and nitrogen at pressures ranging from 100 mTorr to 200 mTorr. Previous studies from the AFRL reported that plasma in a stable mode exhibits periodic variations to electron temperature and density at intervals approximately half the free-space wavelength of the driving microwave beam. Using simulations the AFRL had hypothesized that this pattern was due to standing waves from the driving beam reflecting within the plasma. In this study, a coaxial probe has been used to measure the relative electric field strength in the striation pattern of the plasma. Changes in the electric field were interpreted against the variations in electron density and temperature. Gas composition and driving power of the beam were varied to see what impact these parameters would have on the electric field strength. Results from these relative electric field measurements and corresponding analysis will be presented.

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