

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Electron Densities Inferred Using Optical Images of Standing Wave Patterns Observed in Plasmas Created with Focused, High-Power Microwave Beams. RENINGTON REID, AFRL, SHAWN HAMPTON, University of North Texas, ADRIAN LOPEZ, AFRL — Plasmas are initiated and sustained in the focal region of a high-power microwave beam operating with up to 9.5 kW CW beam power at 4.7 GHz. Under certain conditions the plasmas formed are steady-state and may be maintained for several hours. Direct measurements of the electron density using electrostatic probes have proven problematic because of the disturbance to the beam caused by the probe. An appealing alternative has been found using optical imaging. The stable plasmas exhibit regular axial variations in temperature and density believed to result from standing-waves within the plasma. Because the wavelength of the standing-waves is determined by the refractive index of the plasma careful imaging of the waves may be used to calculate the density.

Remington Reid
Air Force Research Lab - Kirtland

Date submitted: 02 Jul 2019

Electronic form version 1.4