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The affects of micro-droplet injection on low pressure plasmas¹ DAISUKE OGAWA, IQBAL SARAF, M. GOECKNER, L. OVERZET, The University of Texas at Dallas — Directly injecting liquid micro-droplets into low pressure plasmas opens a variety of possibilities including the ability to use new precursors for film deposition. Understanding how the injection of these droplets affects the plasma is important to an overall optimization. Toward that end, results of microwave interferometry and optical emission spectroscopy will be presented in conjunction with film microscopy and analysis. Our initial results show that the time dependent electron density as well as optical emission intensity in capacitively coupled plasmas can change substantially when injecting liquid micro-droplets. For example: There is a fast decrease in the electron density as the droplets enter the plasma (msec time-scale). This decrease in the electron density appears to be much faster than the pressure rise caused by the evaporation of the micro-droplets (~ 40 msec). In addition, there is a very slow rise back to the original state (~ 5 sec time scale) which is liquid dependent. Neither result is unexpected. Both will be discussed in the presentation.

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