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Plasma parameter variations during liquid droplet injection into low pressure plasmas DAISUKE OGAWA, LAWRENCE OVERZET, MATTHEW GOECKNER, The University of Texas at Dallas — The direct injection of liquid droplets into low pressure plasmas results in a complex interaction between the evaporating gas, liquid droplets and plasma species. While similar to dusty plasmas, the fact that the droplets are liquid allows their (potentially fast) evaporation in time. This difference can cause wide variations in the reactor state as a function of time after the injection. In this presentation, we show some of those variations and investigate how the liquid evaporation and gas chemistry change affects the plasma parameters. In order to better understand the effects of fast injections at low pressures, we injected argon (gas), nitrogen (gas), hexane (gas), and hexane liquid droplets into the same argon plasma. We will show in-situ measurements of the plasma parameters, (electron density, electron temperature), RF power and optical emission intensity. Specifically, we see that the injection of droplets can very quickly decrease the electron density in the glow even though charging of the droplets could not possibly be the reason and the RF power to the glow is not decreasing commensurately. The injection of gases, even hexane gas, does not result in such a dramatic reduction.

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