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Analysis of PROES and OES measurements of 100 Hz pulsed Ar Capacitively Coupled Plasma[1] KEITH HERNANDEZ, MATTHEW GOECKNER, LAWRENCE OVERZET, University of Texas at Dallas — Findings are reported for Optical Emission Spectroscopic (OES) and Phase Resolved OES (PROES) measurements of a pulsed (100 Hz) capacitively coupled plasma (CCP) through Ar. OES spatiotemporal plots made from the Ar 750.4 nm spectral line and voltage measurements of the powered electrode were used to find three regions of interest (ROI) during the RF power on time. PROES measurements were made of these three ROI (plasma turn-on and approach to steady-state) and excitation rates were calculated using a kinetic model for the plasma environment. For the region of the steady-state the excitation rate is large for roughly 1/3 of the RF period, which is similar to that expected in continuous CCPs. The other two ROI (at the beginning of the power turn-on when the intensity is appreciable and at the time of maximum emission intensity) demonstrated excitation rates' profiles with additional heating contributions. These additions are consistent with the expected maximums in the electric field through the plasma which can be attributed to additional joule heating.

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