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**Optical Emission Measurements of Dual Frequency Capacitively Coupled Plasmas** ERIC BENCK, KRISTEN STEFFENS, National Institute of Standards and Technology — Dual frequency capacitively coupled plasma sources are becoming increasingly important in semiconductor manufacturing processes. An imaging spectrometer combined with a high speed intensified CCD camera was used to obtain spatially and temporally resolved measurements of the optical emission from dual frequency (2 MHz / 13.56 MHz or 2 MHz / 27.12 MHz) plasmas created in a Gaseous Electronics Conference (GEC) reference reactor. The vertical distribution of the argon 750.4 nm transition was measured at the radial center of the discharge. For a single powered electrode the temporal distributions of the Ar excitation rate were also calculated. Significant changes in the temporal and vertical optical emission distributions were observed with changing feed gas (Ar, $CF_4$, and $O_2$) and gas pressure (100 mTorr to 1000 mTorr). The temporal distributions were insensitive to the amplitude of the lower frequency bias voltage. Changing from a single powered electrode to two separate powered electrodes also had a significant impact on the time resolved optical emission.

Eric Benck
National Institute of Standards and Technology

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