Abstract Submitted
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Time-Resolved Studies of Pulsed Plasmas[1] JOSE LOPEZ, WEIDONG ZHU, Stevens Institute of Technology, BISWA N. GANGULY, US Air Force Research Laboratory, Propulsion Directorate, WPAFB, PETER BLETZINGER, JAMES M. WILLIAMSON, Innovative Scientific Solutions, Inc., ABRAHAM BELKIND, Stevens Institute of Technology, KURT H. BECKER, Center for Environmental Systems, SIT — A periodic reversal of the voltage applied to an electrode during the application of pulsed direct current (DC) power has been shown to diminish the buildup of charge due to the attraction of oppositely charged particles in the reverse pulse. This technique has been widely used to reduce arcing caused by charge buildup, especially in reactive magnetron sputtering of dielectric films. A more recent application has been the application of very short DC pulses of voltages much higher than the breakdown voltage to dielectric barrier discharges (DBD). The resulting very high, but short-lived electric fields can enhance radical generation and the intensity of UV radiation emitted by the plasma. In an effort to better understand the effects of frequency, pulse width, and duty cycle on magnetron sputtering and DBDs, time-resolved electrical measurements and optical plasma emission spectroscopy and imaging were carried out using a fast intensified CCD (ICCD) camera. The effects of the pulsed DC power on the physical processes of both types of plasmas will be discussed in this work.

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