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Electron parameters between high voltage pulses in nanosecond repetitively pulsed discharges. JARED MILES, Wright Patterson AFB, CHASE MURRAY, Wright State University, STEVEN ADAMS, Wright Patterson AFB — Electron parameters are extremely important in nanosecond repetitively pulsed discharges (NRPD's). This work focuses on a burst of multiple pulses applied at high frequencies (>100 kHz) in an atmospheric air pin to pin discharge, and the electron activity occurring between pulses. Recently, electrons have been measured long after the voltage drops to zero, up to 20 s after the initial nanosecond voltage pulse. In atmospheric air conditions, the electron density should quickly reduce to zero, yet certain conditions resulting from NRPD's are contributing to the greatly reducing the decay rate. Hydrodynamic effects have been observed which greatly reduce the gas density after the first pulse, thus affecting the decay rate. Here, emission spectroscopy is performed to see evidence of different reactions occurring between pulses that could contribute to the electron production, thus contributing to the decay rate. Electron density and temperature measurements taken via Thomson scattering will also be discussed, and the electron decay rate will be calculated from the experimental measurements.

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