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3P42 - Broadband Power Measurements of High-Voltage, 10-ns Pulses for Plasma Ignition for Combustion

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Experiments have shown that transient plasma ignition (TPI) driven by nanosecond high-voltage pulses improves ignition and combustion efficiency [1]. To better understand the application through which nanosecond pulses affect combustion, the power and energy of transient plasma delivered to the combustion system are evaluated in order to optimize the pulse parameters. A broadband voltage-current measurement device was designed, fabricated and integrated in-line with the pulse transmission line and the plasma electrodes. Voltage and current were characterized for 10-ns (FWHM), >10 kV pulses with two different risetimes. A preliminary calibration of the V-I device showed that the 3-dB bandwidth of the voltage attenuator was 600MHz. In addition, a similar device can be developed for measurements of the impedance and dielectric properties for biological sample characterization [2].

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