

Abstract Submitted  
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**Voltage-Current Characteristics of Plasma Pressure Sensor**<sup>1</sup> ERIC MATLIS, THOMAS CORKE, CURTIS MARSHALL, University of Notre Dame, SIVARAM GOGINENI, Spectral Energies, LLC, UNIVERSITY OF NOTRE DAME TEAM, SPECTRAL ENERGIES TEAM — A pressure sensor based on the use of plasma as the sensing element is being developed. This is an AC-driven, continuous-wave plasma which is encapsulated between two metallic bare electrodes with a small air gap on the order of 0.03 mm. The sensor uses a non-equilibrium discharge at less than 20 Watts of power. This devices features an amplitude modulated carrier to measure both mean and dynamic pressure. The frequency response is limited only by the carrier frequency which can be as high as 1 MHz. Glow-to-Arc transition is controlled with the use of a capacitive and resistive circuit in series with the discharge. A pressure chamber is used to document the plasma power characteristics as the ambient pressure is controlled from atmospheric to 100 psi. Plasma power is controlled so as to maintain the plasma in the normal and abnormal glow regimes. The phase angle between voltage and current is recorded as a function of pressure. This analysis will aid in the development of a feedback control and calibration of the pressure sensor.

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