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**A Hybrid PIC/DSMC Model of Breakdown in Triggered Vacuum Spark Gaps** STAN G. MOORE, CHRISTOPHER H. MOORE, JEREMIAH J. BOERNER, Sandia National Laboratories — Triggered vacuum spark gaps (TVSGs) can be used as high voltage, high current switches with a fast switching time and a variable operating voltage, such as in pulsed power applications and crowbar circuits that protect against overvoltage conditions. Hybrid particle-in-cell (PIC) [1] and direct simulation Monte Carlo (DSMC) [2] methods can be used to simulate breakdown in TVSGs. In this talk, we present results of a one-dimensional hybrid PIC/DSMC model and show that changing the density and velocity of injected neutral particles (which can be related to the surface temperature) significantly changes both the time to breakdown and the existence of a short-lived starvation mode in the current waveform.

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[1] C. K. Birdsall and A. B. Langdon, *Plasma Physics via Computer Simulation*, McGraw-Hill, New York (2005).

[2] G. A. Bird, *Molecular Gas Dynamics and the Direct Simulation of Gas Flows*, Oxford University Press, Oxford, UK (1994).

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