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Undervoltage Breakdown Threshold Criteria JAMES COOLEY, EDGAR CHOUEIRI, Princeton University — Undervoltage breakdown, the process by which a pulse of electrons induces a discharge gap to break down when it is near but has not achieved its self-breakdown conditions, is discussed. Specifically, threshold criteria that determine the number of electrons required to induce breakdown both to glow and arc discharges are presented. Numerical and theoretical predictions of these criteria are compared with experimental results. Undervoltage breakdown is the phenomenon that governs discharge initiation in gas-fed pulsed plasma thrusters, the device of primary interest to the authors. The phenomenon is also relevant to several other applications including psuedospark switches and other command-triggering devices as well as gas avalanche particle detectors.

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