

Abstract Submitted
for the GEC05 Meeting of
The American Physical Society

Spatial and Temporal Behavior of Repetitive Plasma Discharges in Saline Solutions KENNETH STALDER, ArthroCare Corp., GAGIK NER-SISYAN, WILLIAM GRAHAM, Queen's University Belfast — Plasmas formed around multielectrode devices submerged in saline solution were investigated using fast, intensified charge-coupled detector imaging techniques. The images show that synchronous, bipolar, moderate-voltage (<300 volts rms) square-wave pulses at 100-kHz frequency applied to the electrodes cause intense and transient plasma regions to form randomly in both space and time on short (10 microsecond) time scales, even though they appear to be more stationary and constant on longer (seconds) time scales. Images from progressively longer exposures show that there is an increasing probability that the electrodes closest to the common ground electrode will develop discharges sometime during this period, but there is also a large variation in the intensity of the discharges surrounding each electrode. These observations support the notion that the dynamic and varying behavior of the thin vapor layer developed around the electrodes influences the nature of the microdischarges.¹

¹K. R. Stalder, D. F. McMillen and J. Woloszko, *J. Phys. D: Appl. Phys.* **38** 1728-1738 (2005).

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Date submitted: 14 Jun 2005

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