

Abstract Submitted
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Thermal, Electrical, and Optical Measurements of Electrical Discharges in Saline CAMERON MOORE, Colorado State University, ARLEN WARD, Department of Mechanical Engineering, Colorado State University, Fort Collins, Colorado 80523, KAZUNARI SATO, GEORGE COLLINS, Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, Colorado 80523 — We report measurements of electrical discharges in saline that are electrically excited at 100 kHz from a commercial electrosurgical system. Using a one-dimensional thermocouple array, we estimate that these discharges in saline, in contrast to prior work, induce local temperatures > 100 C. Simultaneous measurement of voltage, current, and optical emission of Na* at 589 nm show that these discharges have frequent arcs, and that these arcs dominate energy flow into the saline. Finally we present measurements of Stark splitting of the sodium D1 and D2 resonant emission lines and from these data estimate the thickness of sheath-like region where most of the applied voltage is dropped.

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