

Abstract Submitted
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Phase Contrast Imaging of Induced Airflow Topologies Produced by Dielectric Barrier Plasma Actuators¹ SIROUS NOURGOSTAR, NOAH HERSHKOWITZ, Nuclear Eng. and Eng. Physics, University of Wisconsin, Madison/WI, United States — In this experiment, spatial and temporal evolution of both flow and plasma fields in parallel and asymmetric atmospheric pressure dielectric barrier discharge plasma are analyzed with the help of the phase contrast imaging method, and a gated intensified CCD. Buoyancy plumes rising from resistively heated tungsten wires along with the phase contrast technique were used to study the induced flow topology. The experiment was carried out using several electrode diameters/widths, applied high voltages and frequencies. Correlation between the electrode dimension, size of induced swirls above the exposed electrode and induced body force are also identified. Time-resolved phase contrast imaging of buoyant plumes passing through the discharge was used to measure the instantaneous velocity of various flow fields.

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