

Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Pulsed-DC DBD Plasma Actuators¹ ALAN DUONG, RYAN MCGOWAN, KATHERINE DISSER, THOMAS CORKE², ERIC MATLIS³, University of Notre Dame — A new powering system for dielectric barrier discharge (DBD) plasma actuators that utilizes a pulsed-DC waveform is presented. The plasma actuator arrangement is identical to most typical AC-DBD designs with staggered electrodes that are separated by a dielectric insulator. However instead of an AC voltage input to drive the actuator, the pulsed-DC utilizes a DC voltage source. The DC source is supplied to both electrodes, and remains constant in time for the exposed electrode. The DC source for the covered electrode is periodically grounded for very short instants and then allowed to rise to the source DC level. This process results in a plasma actuator body force that is significantly larger than that with an AC-DBD at the same voltages. The important characteristics used in optimizing the pulsed-DC plasma actuators are presented. Time-resolved velocity measurements near the actuator are further used to understand the underlying physics of its operation compared to the AC-DBD.

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Date submitted: 28 Jul 2016

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