

EXPERIMENTAL STUDIES ON THE DISCHARGE CHARACTERISTICS OF A MULTI-ELECTRODE PLASMA ACTUATOR *

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Originated in the mid-1990s, active flow control by employing a surface dielectric barrier discharge (DBD), which is the so called plasma actuator, has attracted more and more attentions of the researchers in the world in order to reduce the turbulence and acoustic noise, augment the heat transfer rate, etc. In this paper, the surface DBDs are produced with a novel design of the actuator configuration, as shown in Fig. 1(a), by employing a high-voltage alternating-current (HVAC) power supply with the frequencies ranging from 1 to 30 kHz and maximum power output of 120 W. The experimental results show that with the introduction of the floating electrodes 1, 2 and 3, a large area of glow discharges can be obtained, as shown in Fig. 1(b), which is different from the cases presented in Ref. [1]. The discharge characteristics of the plasma actuators under different operation conditions are presented in this paper.

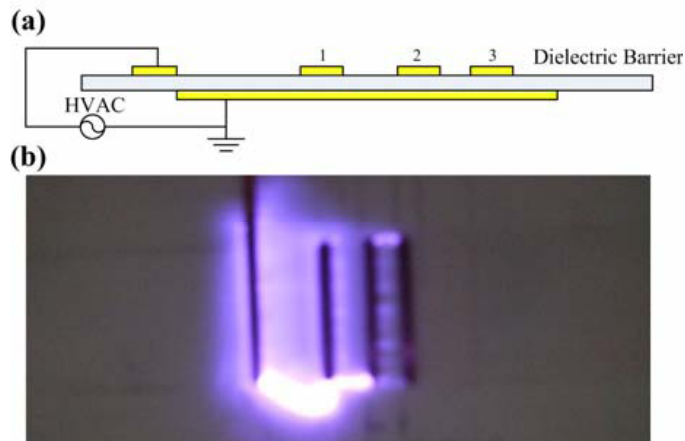


Figure 1. Schematic diagram of the plasma actuator (a) and the typical discharge images (b)

1. E. Moreau, "Airflow Control by Non-Thermal Plasma Actuators", J. Phys. D: Appl. Phys., 2007, 40, 605–636

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