

OPTICAL STUDIES OF DOUBLE DIELECTRIC BARRIER PLASMA ACTUATORS*

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The optical characteristics of double barrier surface discharges are studied using an intensified charge-coupled device (ICCD) camera and a monochromator in atmospheric pressure air. The spatial and temporal images were recorded both parallel and perpendicular to the actuator surface. For optical emission spectroscopy (OES) analysis, the optical fiber of a monochromator replaced with an ICCD camera at the same positions. Nitrogen molecular second positive and first positive bands lines were observed. The discharge temperatures were calculated by matching the experimental spectrum with SPECAIR¹ lines. The electron temperatures were found to be 12000 ± 500 K and the rotational (gas) and vibrational temperatures of molecular nitrogen were found to be 300 ± 50 K and 3000 ± 500 K respectively. The electron temperature of discharge was calculated as 11200 K via the Boltzmann plot method using the Oxygen atomic lines.

i) C. O. Laux, T.G. Spence, C.H. Kruger and R.N. Zare, Plasma Sources Sci. Technol. **12**,1255-138, (2003). (<http://www.specair-radiation.net/>).

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