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Determination of OH Radical Concentration in High Water Content Low Pressure DC Glow Discharge using Laser Induced Fluorescence MALIK TAHIYAT, TANVIR FAROUK, University of South Carolina — Experimental efforts using laser induced fluorescence (LIF) to quantify OH distribution in plasma discharge have so far involved trace water vapor either present as residual or added at a known trace concentration to a carrier gas. In one of our prior efforts, we conducted spatially resolved optical emission spectroscopy to determine OH, O, H_2 and H distribution in the interelectrode separation for a dc discharge operating in high water vapor content. In this research effort, LIF technique was employed to obtain spatially resolved measurement of the OH radicals for low pressure (1-15 Torr) dc discharges operating in high water vapor concentration (>90%). The OH distribution for different discharge currents was also determined. For each operating pressure, voltage-current characteristics and current density are determined and optical emission spectroscopy based temperature measurements are performed to identify the discharge regime of operation. These measurements will provide the necessary data for validating plasma kinetic schemes associated with water vapor.

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