

Abstract Submitted  
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**Cold atmospheric plasma jet in humid environment**<sup>1</sup> LI LIN, The George Washington University, APS ID: 61282184, MIKHAIL SHNEIDER, Princeton University, APS ID: 61148038 , MICHAEL KEIDAR, The George Washington University, APS ID: 60048324 — The medical application of cold atmospheric plasma jet (CAPJ) is currently a hot research topic, especially for its selectivity during cancer treatment with limited healthy cell damage. However, the plasma jet in atmospheric is extremely sensitive to the surrounding environment, such as the Relative Humidity (RH). A CAPJ was tested with the RH varied from 35% to 80% and the discharge voltage varied from 4500V to 7000V. Two major trends of spatial averaged electron density ( $n_e$ ) and Optical Emission Spectrum (OES) intensities of the CAPJ were found. When the discharge voltage is high, the increment of RH decreases  $n_e$  but increase OES intensities. However, when the discharge voltage is low, both of them are reduced. The phenomena imply how RH reduces the electric field of a streamer and shifts the electron energy distribution function passing through an ionization threshold. These results suggest that the concentration of reactive species in CAPJ for cancer treatment may be reduced in actual surgery comparing with its values in the laboratory due to the high RH at the vicinity of tissue. An accurate RH control is thus required for a consistent plasma jet performance.

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