Abstract Submitted
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Reactive Species Processes in Plasma-, Gas-, and Liquid-Phase[1] STEPHAN REUTER, JOERN WINTER, MALTE HAMMER, ANSGAR SCHMIDT-BLEKER, SYLVAIN ISENI, HELENA TRESP, MARIO DÜNNBIER, KAI MASUR, KRISTIAN WENDE, ZIK plasmatis at the INP Greifswald, KLAUS-DIETER WELTMANN, INP Greifswald — Especially for the field of plasma medicine, plasmas interacting with liquids are of great interest for environmental, chemical, and biomedical applications. In this work we present optical diagnostics on atmospheric pressure plasma jets interacting with liquids. Combining the diagnostic results with numerical simulations yields an understanding of fundamental processes such as air species diffusion into the jet effluents or the influence on humidity. Especially for plasma treatment of physiological liquids in ambient air, atmospheric species play a key role. To achieve a desired reactive component output, the generation processes from these ambient air species are controlled. Plasma jets are characterized by planar laser induced fluorescence spectroscopy, by absorption and emission spectroscopy, and by flow simulations. With the gained knowledge we are able to tailor the reactive component composition and to influence plasma jet-liquid interaction. We show that reactive species generation within plasma treated liquid can be tuned and apply the findings to biological cells to investigate the effect of reactive oxygen and nitrogen species (RONS). The plasma treated liquids are investigated regarding their pH value, OH radicals, nitrate and nitrite, and H_2O_2 content. From the tailored plasma treatment a significant insight into the relevant transport processes in plasma treatment of liquids has been gained.

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