Abstract Submitted
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Plasma chemistry and reactive species generation in radio-frequency micro atmospheric pressure plasma jets[1] Y. LIU, THOMAS MUSSENBROCK, Brandenburg University of Technology, L. BISCHOFF, G. HUEBNER, I. KOROLOV, J. SCHULZE, Ruhr University Bochum — One of the biggest advantages of radio frequency micro atmospheric pressure plasma jets (μAPPJs) is the application of various reactive species to plasma surface treatments. Those reactive species are generated through complex plasma chemical reactions. In this work, based on two dimensional fluid dynamic simulations and experiments, electron heating dynamics mode transitions have been studied in helium oxygen gas mixture. More importantly, we address that mode transitions are sensitive to the electronegativity, i.e., the rate constant of the negative ion generation reaction. By comparison with experimental results, we predict a more reasonable rate constant of a 3-body attachment reaction from two databases in simulations, which is the main generation of O_2^-. Moreover, the control of the electron heating dynamics by using voltage waveform tailoring is demonstrated to play a significant role for the density and the distribution of reactive neutral species.

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