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Voltage Waveform Tailoring in microscopic atmospheric pressure radio-frequency plasma jets[1] IHOR KOROLOV, Ruhr-University Bochum, Germany, ANDREW GIBSON, University of York, Heslington, UK, LENA BISCHOFF, GERRIT HBNER, Ruhr-University Bochum, Germany, JEROME BREDIN, University of York, Heslington, UK, ZOLTAN DONKO, PETER HARTMANN, Hungarian Academy of Sciences, Budapest, Hungary, THOMAS MUSSENBROCK, Brandenburg University of Technology, Cottbus, Germany, TIMO GANS, DEBORAH O'CONNELL, University of York, Heslington, UK, JULIAN SCHULZE, West Virginia University, Morgantown, USA; Ruhr-University Bochum, Germany
— Microscopic atmospheric pressure plasma jets are important tools for biomedical applications and surface modifications. They are typically operated at a single driving frequency with limited control of the electron power absorption dynamics and the Electron Energy Distribution Function (EEDF). For such applications the generation of reactive species, e.g. reactive oxygen and nitrogen species, at low temperatures plays a key role. Based on experiments and kinetic Particle-in-Cell/Monte Carlo simulations, we demonstrate that Voltage Waveform Tailoring (VWT) allows to control the spatio-temporal excitation/ionization dynamics and the EEDF as the basis to optimize the generation of selected reactive particle species.

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Ihor Korolov
Ruhr-University Bochum, Germany

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