

Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Hybrid model simulations of He/O₂ micro atmospheric pressure plasma jets¹ YUE LIU, Brandenburg University of Technology Cottbus-Senftenberg, IHOR KOROLOV, Ruhr-University Bochum, JAN TRIESCHMANN, Brandenburg University of Technology Cottbus-Senftenberg, LENA BISCHOFF, GERRIT HBNER, Ruhr-University Bochum, JULIAN SCHULZE, Ruhr-University Bochum, DALIAN UNIVERSITY OF TECHNOLOGY, THOMAS MUSSENBROCK, Brandenburg University of Technology Cottbus-Senftenberg — We build a hybrid model to investigate the helium micro atmospheric pressure plasma jet with a small amount of oxygen admixture. The model treats electrons kinetically based on the Particle-in-cell/ Monte Carlo Collision (PIC/MCC) algorithm, while various heavy species based on the fluid equations. The simulation results show good agreements with multiple experimental diagnostics, including the electron heating dynamics, the helium metastable density, and the atomic oxygen density. We demonstrate that voltage waveform tailoring allows us to control and enhance the generation of reactive species, which are highly relevant for a variety of biological and technological applications.

¹This work is supported by the German Research Foundation in the frame of SFB 1316 (project A4).

Yue Liu
Brandenburg University of Technology Cottbus-Senftenberg

Date submitted: 04 Jun 2020

Electronic form version 1.4