Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Complementary approaches to model an RF plasma jet at atmospheric pressure[1] F. SIGENEGER, J. SCHÄFER, D. LOFFHAGEN, INP Greifswald, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany — A nonthermal plasma jet has been investigated by three complementary model approaches. The argon jet consists of two concentric capillaries and two cylindrical electrodes driven by an RF voltage at 27.12 MHz. Investigations of a single filament in the active zone between both capillaries by means of a two-dimensional phase-resolved fluid model yields spatial profiles The heating profile deduced from this approach is used for a comprehensive description of the jet including gas flow and reactions of precursor molecules as well as their transport in the effluent. The obtained radial profiles of particle fluxes of precursor fragments onto the substrate qualitatively agree with measured The third model is devoted to the phenomena of self-organization observed e.g. in the regular azimuthal rotation of the filaments. Using the heating profile from the first approach, a three-dimensional hydrodynamic model of gas flow and heating is used to reveal the relation between the inclination of the filaments and the azimuthal gas velocity component.

[1]The work has been partly supported by the German Research Foundation (DFG) within SFB TRR 24.

F. Sigeneger
INP Greifswald, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany

Date submitted: 10 Jun 2016 Electronic form version 1.4