

Abstract Submitted  
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**Convection-Diffusion Model for Atmospheric Pressure Plasma Jets: Obtaining Off-Axis Data from On-Axis Measurements** ANSGAR SCHMIDT-BLEKER, MARIO DÜNNBIER, JÖRN WINTER, ZIK plasmatis at the INP Greifswald e.V., KLAUS-DIETER WELTMANN, INP Greifswald e.V., STEPHAN REUTER, ZIK plasmatis at the INP Greifswald e.V. — An analytical convection-diffusion model for atmospheric pressure plasma jets is presented. The model can be applied both for ambient air species diffusion and for heat transfer into a jets effluent. Using on-axis data from experiments as input, the model can be used to extrapolate the measured quantities to the complete domain for laminar flows and near-axis region for turbulent flows. The method is applied to experimental data obtained from molecular beam mass spectrometry as well as from a VUV absorption spectrometry method using the plasma jet itself as a VUV emitter. The measurements are conducted on a turbulent atmospheric pressure argon plasma jet with a protective gas nozzle, allowing for the creation of a shielding gas curtain around the plasma jets effluent. The results obtained from the hybrid analytical-experimental method are compared to computational fluid dynamics simulations.

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