

Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

On-axis Molecular Beam Mass Spectrometer measurements of a cold atmospheric pressure plasma jet¹ JOERN WINTER, MARIO DUENNBIER, MARKUS WOLFRAM, ANSGAR SCHMIDT-BLEKER, ZIK plasmatis at the INP Greifswald e.V., KLAUS-DIETER WELTMANN, INP Greifswald, STEPHAN REUTER, ZIK plasmatis at the INP Greifswald e.V. — The measured on-axis molecular species densities in the effluent of a cold plasma jet operated at atmospheric pressure were performed for different distances (3...35 mm) with a molecular beam mass spectrometer (MBMS) (Hiden HPR 60). The investigated molecules are nitrogen ($M = 28$ u), oxygen ($M = 32$ u) and argon ($M = 40$ u). A stainless steel orifice with a diameter of $100\mu\text{m}$ in front of the first pump stage was used. After a calibration of the intensities of the mass spectrometer the absolute densities were calculated. These values are compared with a model of the gas flux and show excellent agreement. It is shown that because of the feed gas flow of the plasma jet the ambient air species (e.g. N_2 and O_2) are displaced in the case of small distances. For larger distances the diffusion of nitrogen and oxygen molecules into the effluent increases. Effects of composition distortion and pressure dependencies inside the MBMS were observed in the calibration curve and were taken into account.

¹This work was funded by German Ministry of Education and Research (grant number: 03Z2DN12).

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Date submitted: 15 Jun 2012

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