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Discharge dynamics in a micro-plasma jet[1] T. GANS, Centre for Plasma Physics, Queen's University Belfast, Northern Ireland, L. SCHAPER, N. KNAKE, K. NIEMI, V. SCHULZ-VON DER GATHEN, J. WINTER, Center for Plasma Science and Technology, Ruhr-Universtity Bochum, Germany — Micro-plasmas operated at ambient pressure with dimensions of the confining geometry in the order of a few ten micrometers to a millimetre bear enormous potential for technological applications. However, fundamental discharge phenomena and energy transport mechanisms in these discharges are only rudimentary understood. The atmospheric pressure plasma jet (APPJ) is a homogeneous non-equilibrium discharge. A specially designed radio-frequency (rf) μ-APPJ provides excellent optical diagnostic access to the discharge volume and the interface to the effluent region. The discharge dynamics and energy transport mechanisms from the discharge core to the effluent region are investigated using phase resolved optical emission spectroscopy (PROES) and two-photon laser induced fluorescence spectroscopy (TALIF). PROES measurements give detailed insight into the dynamics of electrons sustaining the discharge. The TALIF measurements provide spatial profiles of absolutely calibrated atomic oxygen densities.

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