

Abstract Submitted
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Power dissipated in a non-thermal atmospheric pressure plasma jet measured by miniaturized electrical probes¹ JUDITH GOLDA, VOLKER SCHULZ-VON DER GATHEN, Experimental Physics II, Ruhr-Universitt Bochum, Universittsstrae 150, 44780 Bochum, Germany — Non-thermal atmospheric pressure plasma jets are used in bio-medicine, because they generate reactive species at a low gas temperature. Knowledge and control of plasma parameters is required for stable and reliable operation. Therefore, measuring dissipated power in these plasmas is necessary. However, this is challenging because the delivered sender power is often orders of magnitudes higher than the power dissipated in the discharge itself. To measure this dissipated power, we built miniaturized electrical probes directly attached to the jet device [1]. We observed that the dissipated power is a more comprehensive parameter than the common parameter voltage: For example, gas temperature and emission line intensities rose exponentially with increasing voltage but linearly with increasing power. Our analyses further revealed that a substantial proportion of the dissipated power is transformed into heat. In conclusion, miniaturized electrical probes give a fundamental insight into the energy balance of atmospheric pressure plasmas. In the future, these probes can also be adapted to different types of atmospheric pressure plasmas.

[1] Golda, J et al., J. Phys. D: Appl. Phys. 49, 084003 (2016)

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