

Abstract Submitted  
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**Novel voltage-based temperature measurement method for dielectric barrier discharges**<sup>1</sup> ROBERT BANSEMER, Leibniz Institute for Plasma Science and Technology (INP), ANSGAR SCHMIDT-BLEKER, Leibniz Institute for Plasma Science and Technology (INP), Greifswald, Germany, URSULA VAN RIENEN, Institute of General Electrical Engineering, University of Rostock, Germany, KLAUS-DIETER WELTMANN, Leibniz Institute for Plasma Science and Technology (INP), Greifswald, Germany — For a multitude of processes based on dielectric barrier discharges (DBD), gas temperature is a crucial control parameter. One notable example is the production of ozone or different nitrogen oxides from air depending on pressure and temperature. In order to provide a means to control processes such as the species production, the suitability of a temperature determination based on changes of the gas-gap voltage in DBD has been evaluated. The method is destined for sine-driven devices and is based on a dependence of the gas-gap voltage on the gas density and hence on temperature and pressure in the active zone. It was found that the proposed method allows reaching a precision adequate for the designated purpose while being non-intrusive and working both in a stationary as well as in a flowing process gas. No equipment besides the setup for capturing the Lissajous-figure is needed. The method has been validated by thermistor measurements. Furthermore, computational fluid dynamics simulations were performed to investigate the temperature distribution within the device under test.

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Robert Bansemer  
Leibniz Institute for Plasma Science and Technology (INP)

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