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ABSTRACT:

Plasma Jet for Biomedical Applications: Interaction with Surfaces

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Plasma jet generated in helium or argon based mixtures in dielectric barrier discharge reactors and delivered in ambient air through the so-called plasma plume are very common and efficient setups developed by tens of teams for various biomedical applications. First works on the physics of such plasma jets operated in the kHz regime, mainly focused on the propagation of ionization wave in capillaries, estimation of the temperature and basic diagnostics of reactive species generation in the gaseous phase (through optical emission spectroscopy) and in liquid exposed samples for mainly nitrite, nitrate and hydrogen peroxide concentration measurements.

Nevertheless, the key influence of the target of the plasma plume features and consequently the reactive species generation and electric field characteristics should be considered when such plasma source is to be used for most of biomedical applications. The presentation will report on such influence of the relevant targets on the gas flow-plasma discharge interplay, the generation of reactive species diagnosed with laser induced fluorescence, absorption and emission spectroscopies and the modulation of the transient electric fields measured with a time resolved optoelectronics sensor.