



The behaviour of non-thermal plasmas in interaction with targets

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Plasma seems to be a promising tool for a range of applications in medicine, which has been the driver of interdisciplinary research on this topic in recent years. The field have advanced tremendously and the research priorities shift, however it remains a fact that the interaction of plasma and biological substrates needs to be understood before plasma can be efficiently and safely used in medicine. This interaction has consequences for the targets, but also for the plasma.

Atmospheric pressure non-thermal plasmas used for this application are typically transient at the ns timescale, small, at low ionization degree, sometimes not reproducible in space and/or time and emit very little light. They are easily perturbed, and differently by different target types, depending on their electrical properties.

The work focuses on the fundamental properties of the plasma such as the electric field and electron properties as it interacts with targets of different types and properties. The accent is on the gas phase as well as the plasma-target interface. High- and low-permittivity targets were researched and have been shown to have an influence not only on the absolute values of electric fields and electron properties, but also on the temporal development of the plasma. In the case of the metallic target the plasma-surface interaction was significantly prolonged when compared to the low-permittivity and liquid target.