

Bio-applications of non-thermal plasma

Friday, 19 May 2023 10:30 (20 minutes)

Non-thermal plasma (NTP) possesses useful properties for interacting with biomaterials. Our NTP laboratory group focuses mainly on the study and generation of NTP and the explanation of its interactions with biological objects. For NTP generation, we mainly use the corona and related discharges. The NTP quality and intensity depend on the set up of electrode arrangement, power supply and can be adjusted to specific applications. Our devices range from very weak sources based on point-to-ring discharge, to relatively strong ones based on transient spark discharge. Additionally, we are developing portable, affordable and user-friendly NTP generation devices for practical applications in medicine, food production, or agriculture. Our laboratory investigates the interactions of NTP with biological materials, with a focus on microbial decontamination of sensitive materials such as the face masks and food products (improving food shelf life), treatment of infections such as onychomycosis (fungal nail infection), enhancement of seed quality and early plant growth, and modification of biosurfaces through the activation of biomolecular films.

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Session Classification: Atmospheric and Medical Plasmas

Track Classification: Atmospheric and Medical Plasmas