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Biological decontamination of surfaces using guided ionization waves. JULIEN JARRIGE, CLEMENT ZAEPFFEL, ONERA — Atmospheric pressure plasma jets have received an increasing attention these last ten years in various domains, including biomedical applications and decontamination. Among these technologies, guided ionization waves (also called "plasma bullets") are very promising because of their ability to produce a highly non-equilibrium plasma. Reactive species can be generated in the open air over a long distance during the propagation of the wave (typically: several cm), while the background gas remains at ambient temperature. A non-thermal plasma system has been developed and tested for the biological decontamination of surfaces. It consists of a dielectric barrier discharge in a helium flow driven by high voltage pulses. The propagation of the ionization wave and the spatial distribution of the species have been characterized by high speed imaging and optical emission spectroscopy. The influence of the discharge parameters on the plasma properties is investigated. Results of decontamination on several bacteria are shown, and the decontamination efficiency is compared with the plasma properties.

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