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Characterization of combined power plasma jet using AC high voltage and nanosecond pulse for reactive species composition control
KEISUKE TAKASHIMA, HIDEAKI KONISHI, TOSHIAKI KATO, TOSHIRO KANEKO, Department of Electronic Engineering, Tohoku University — In the application studies for both bio-medical and agricultural applications, the roles of the reactive oxide and/or nitride species generated in the plasma has been reported as a key to control the effects and ill-effects on the living organism. The correlation between total OH radical exposure from an air atmospheric pressure plasma jet and the sterilization threshold on *Botrytis cinerea* is presented. With the increase of the OH radical exposure to the *Botrytis cinerea*, the probability of sterilization is increased. In this study, to resolve the roles of reactive species including OH radicals, a combined power plasma jet using nanosecond pulses and low-frequency sinusoidal AC high voltage (a few kHz) is studied for controlling the composition of the reactive species. The nanosecond pulses are superimposed on the AC voltage which is in synchronization with the AC phase. The undergoing work to characterize the combined power discharge with electric charge and voltage cycle on the plasma jet will also be presented to discuss the discharge characteristics to control the composition of the reactive species.

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