Abstract Submitted
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Low Power Flex Dielectric Barrier Plasma Source for Surface Decontamination.[1] SOPHIA GERSHMAN, Princeton Plasma Physics Laboratory, MARIA BELEN HARREGUY ALFONSO, New Jersey Institute of Technology, YEVGENY RAITSES, Princeton Plasma Physics Laboratory, GAL HASPEL, New Jersey Institute of Technology, SHURIK YATOM, PHILLIP EFTHIMION, Princeton Plasma Physics Laboratory, PLASMA COLLABORATIVE RESEARCH FACILITY COLLABORATION[2] — A surface dielectric barrier discharge using a flexible printed circuit design is investigated for surface decontamination for bacterial and non-biological contaminants. The device operates in ambient air without any additional gas flow and power density of <0.5 W/cm2. Using e-coli as a model bacteria we demonstrate a 4log10 reduction of the bacterial load on an inoculated glass surface in direct contact with the device. We also demonstrate a novel use of the device to improve the effect of a common disinfectant. Using a 3% hydrogen peroxide as a model disinfectant we demonstrate an improvement from a 2.4log10 with hydrogen peroxide alone to >6log10 with the addition of the plasma output from the dielectric barrier discharge. The synergistic action of the plasma bio active properties and hydrogen peroxide result in a dramatic improvement of surface disinfection. This opens new possibilities for using the low power flexible dielectric barrier plasma sources for surface disinfection and decontamination.

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