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Gas flow dependence of ground state atomic oxygen in plasma needle discharge at atmospheric pressure[1] NIKOLAS KNAKE, Ruhr-Universitaet Bochum, YUKINORI SAKIYAMA, University of California, Berkeley, DANIEL SCHROEDER, Ruhr-Universitaet Bochum, DAVID GRAVES, University of California, Berkeley, VOLKER SCHULZ-VON DER GATHEN, Ruhr-Universitaet Bochum — We present measurements of two distinct atomic oxygen density patterns occurring close to an insulating surface in front of the plasma needle discharge at atmospheric pressure according to two different feed gas velocities. These atomic oxygen patterns are correlated to the distinct killing patterns of bacteria which previously have been reported for the plasma needle in literature. Two-photon absorption laser-induced fluorescence (TALIF) spectroscopy in combination with gas flow simulation was employed to obtain spatially resolved absolute density distributions. When the feed gas flow rate is low, atomic oxygen density peaks on the center. At the higher flow rate, atomic oxygen forms a ring-shaped density distribution. The peak density is in the order of 10^{21} m^{-3} in both cases.

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