Abstract Submitted
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Absolute ozone measurements for a low-energy pulsed plasma needle[1] CHUNQI JIANG, University of Southern California, VINCENT PUECH, LIONEL MAGNE, PASCAL JEANNEY, Université Paris-Sud, USC TEAM, UNIVERSITÉ PARIS-SUD TEAM — Applications of an atmospheric-pressure, nanosecond pulsed plasma jet for biomedical and dental disinfections have motivated numerous diagnostic studies in understanding of the underlying physics and chemistry during the plasma bactericidal processes. In this work, we present spectroscopic studies of a 3 cm long needle-like He-O_2 plasma jet. Rotational temperature of the plasma jet was measured to be about 300 K with optical emission spectroscopy. Ozone, as a typical bactericidal species, was detected in the plasma. Optical absorption spectroscopy identifies the absolute concentration ozone to be 10^{15} cm^{-3} when the plasma was powered with 140 ns, 6 kV pulses at 1.5 kHz. The production of ozone increases with pulse voltage and pulse repetition rate. O_2 concentration in He was also found affecting the ozone generation. In addition, two-photon laser induced fluorescence radially resolves an ozone profile in a diameter of 1 mm produced by the plasma needle.

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