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Measurement of ozone production scaling in a helium plasma jet with oxygen admixture BRIAN SANDS, UES, Inc. (AFRL), BISWA GANGULY, Air Force Research Laboratory — Capillary dielectric barrier plasma jet devices that generate confined streamer-like discharges along a rare gas flow can produce significant quantities of reactive oxygen species with average input powers ranging from 100 mW to >1 W. We have measured spatially-resolved ozone production in a He plasma jet with O_2 admixture concentrations up to 5% using absorption spectroscopy of the O_3 Hartley band system. A 20-ns risetime, 10-13 kV positive unipolar voltage pulse train was used to power the discharge, with pulse repetition rates varied from 1-20 kHz. The discharge was operated in a transient glow mode to scale the input power by adjusting the gap width between the anode and downstream cathodic plane. Peak ozone number densities in the range of 10^{16} - 10^{17} cm^{-3} were measured. At a given voltage, the density of ozone increased monotonically up to 3% O_2 admixture (6 mm gap) as the peak discharge current decreased by an order of magnitude. Ozone production increased with distance from the capillary, consistent with observations by other groups. Atomic oxygen production inferred from O-atom 777 nm emission intensity did not scale with ozone as the input power was increased. The spatial distribution of ozone and scaling with input power will be presented.

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