

Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

Quenching of electronically excited states of molecular nitrogen in nanosecond repetitive pulsed discharges in atmospheric pressure air
MOON SOO BAK, MARK A. CAPPELLI, Stanford University — Temporally and spectrally resolved emission measurements of the N₂ C-B transition, and thermocouple measurements along the post-discharge region have been carried out to investigate the quenching of electronically excited states of molecular nitrogen produced in nanosecond repetitive pulsed discharges in air. To investigate kinetics in detail, 2-D kinetic simulations of this air plasma have been conducted. In the simulation, the plasma parameters such as initial electron number density, peak reduced electric field, and discharge diameters are determined by matching the simulated gas temperature to the measured temperatures. The simulation reveals that a significant amount of atomic oxygen is produced through dissociative quenching of electronically excited nitrogen by molecular oxygen.

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Date submitted: 14 Jul 2011

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