Quenching of electronically excited states of molecular nitrogen 
in nanosecond repetitive pulsed discharges in atmospheric pressure air
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spectrally resolved emission measurements of the N$_2$ C-B transition, and thermo-
couple measurements along the post-discharge region have been carried out to inves-
tigate 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 tem-
perture to the measured temperatures. The simulation reveals that a significant 
amount of atomic oxygen is produced through dissociative quenching of electroni-
cally excited nitrogen by molecular oxygen.