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Gas temperature and N2(A) density measurements in the afterglow of pulsed nanosecond discharge EUGENE MINTOUSSOV, LPP Ecole Polytechnique, France, DEANNA LACOSTE, Ecole Centrale, Paris, France, SCOTT JAMES PENDLETON, University of Southern California, USA, GABI STANCU, CHRISTOPHE LAUX, Ecole Centrale, Paris, France, NIKOLAY POPOV, SINF, Moscow State University, Russia, SVETLANA STARIKOVSKAIA, LPP Ecole Polytechnique, France — In the present work the experiments combining (i) electrical measurements of current, voltage, reduced electric field and electron density in a nanosecond time scale, (ii) gas temperature, densities of N2(A) and O-atoms in a microsecond time scale have been suggested. Temperature increase was measured by emission spectroscopy technique in the afterglow of pulsed nanosecond discharge in air and nitrogen for 3-9 Torr, with delays 1.5 and 2.5 microseconds relative to the discharge. The typical values of heating for this timescale are 60-80 K. The preliminary calculations are in reasonable agreement with experiments. Cavity ring-down spectroscopy (CRDS) technique has been used to measure N2(A) temporal behavior for different (0,1, and 2) vibrational levels. The experiments demonstrate that N2(A) density decay in nitrogen occurs significantly slower than in air.

Eugene Mintoussov
LPP Ecole Polytechnique

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