Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

**Characterization of Nanosecond Repetitively Pulsed Discharges by Infra-Red Laser Absorption Spectroscopy** JULIEN JARRIGE, DIANE L. RUSTERHOLTZ, GABI D. STANCU, DEANNA A. LACOSTE, CHRISTOPHE O. LAUX, Laboratoire EM2C, Ecole Centrale Paris — Nanosecond repetitively pulsed discharges (NRPD) have received great attention for their potential in new industrial applications such as plasma-assisted combustion. It has been shown that NRPD can stabilize and improve the efficiency of turbulent lean flames. In this work, we present time-resolved in-situ laser absorption spectroscopy (LAS) measurements in a pin-to-pin reactor containing methane-air mixtures. NRPD (with a frequency in the range 1-30 kHz) are operated in the spark regime. A Quantum Cascade Laser and a tunable Differential Frequency Generator system are used to perform infrared absorption with a time resolution of a few tens of nanoseconds. The production of nitrogen oxides and the decomposition of methane are monitored during a single pulse. The gas temperature increase is determined by comparing experimental absorption spectra with HITRAN simulations.

Julien Jarrige
Laboratoire EM2C, Ecole Centrale Paris

Date submitted: 11 Jun 2010 Electronic form version 1.4