

Abstract Submitted
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Stabilization of lean flames by nanosecond sparks SERGEY STEPANYAN, NICOLAS MINESI, ERWAN PANNIER, GABI-DANIEL STANCU, CHRISTOPHE LAUX, EM2C Laboratory, CNRS UPR288, CentraleSuplec, Universit Paris Saclay, PLASMA TEAM TEAM — Flame stabilization by plasma has been demonstrated for various combustors and using various types of plasma discharges. The mechanism of this stabilization is clearly related to the production of active species by the plasma and its heat release. However the exact roles of these factors have not been determined, particularly because of the complexity of the considered systems. The energy initially deposited in the plasma in the form of heat can be converted toward the production of active species or the development of hydrodynamic effects that enhance the combustion process. Measurements of active species number densities and temperatures during the combustion initiation must be performed simultaneously with measurements of the discharge parameters. In this work we use a nanosecond spark to stabilize a lean premixed methane turbulent flame ($Re=30000$). We will report on measurements of flame/gas temperature, electron temperature, and electron number density.

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