Schlieren Imaging of Laser-induced Ignition and flame propagation by single and successive laser pulses

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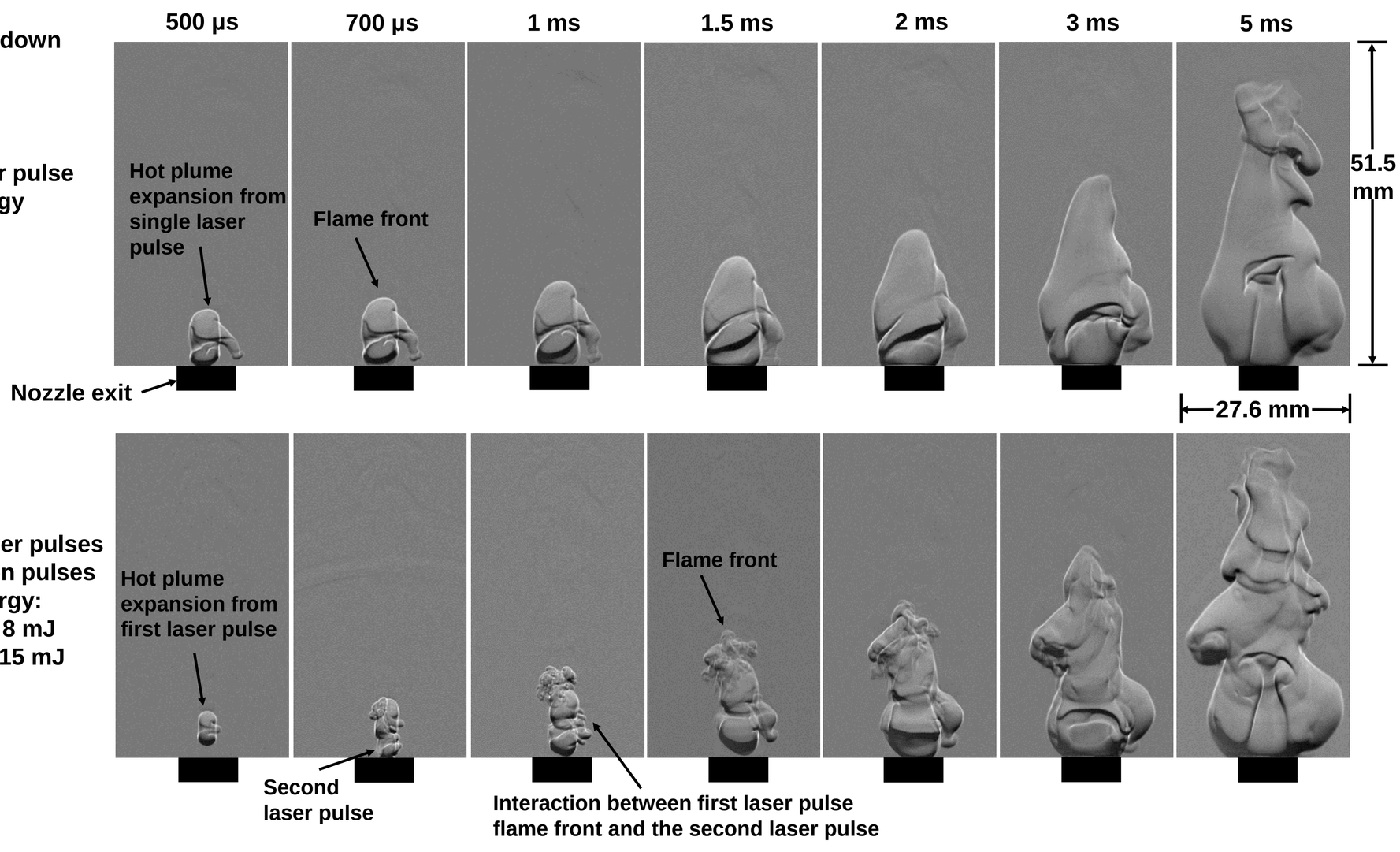
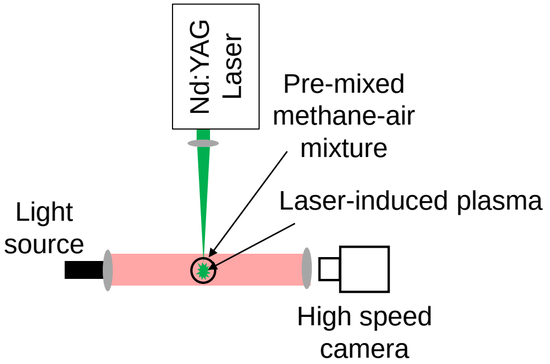


Abstract

Schlieren images are shown of laser-induced ignition by a single laser pulse and by successive laser pulses separated by 600 µs. Laser-induced sparks were produced over a nozzle with 4 m/s stoichiometric methane-air flow. Images were taken perpendicular to the laser beam path. Initially the ignition area for successive laser pulses is much smaller than that of a single laser pulse, but as the two laser pulses interact, they produce a turbulent flame structure which increases flame propagation speed. At 1 ms after the first pulse, the successive laser pulse flame propagation has extended further downstream than single laser pulse flame propagation.

Experimental Setup



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