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Portfolio

Double-Pulse Planar Fuel/Air-Ratio Measurement by Laser-Induced Fluorescence

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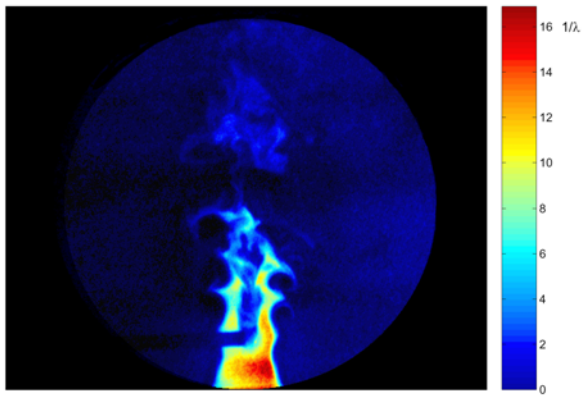

Fig. 1. Map of Fuel/Air distribution.


Fig. 2. Ignitable areas of Fig. 1.

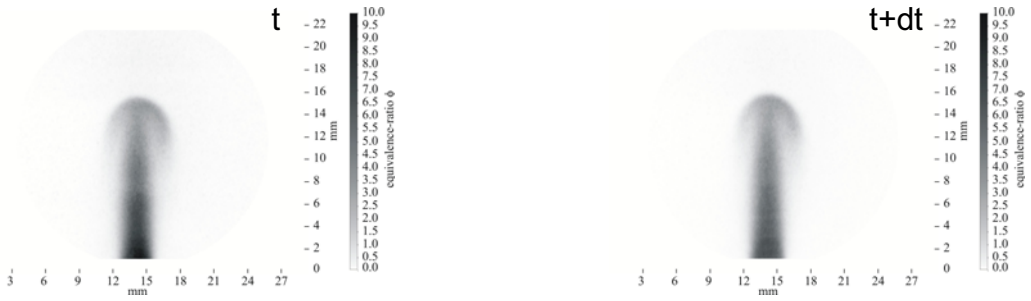

Fig. 3. FARLIF double-pulse image, dt = 2.5 ms.

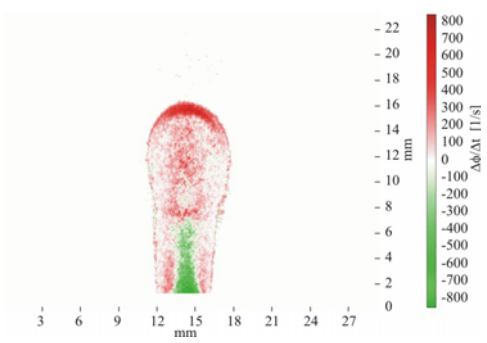

Fig. 4. Temporal derivative of Fig. 3.

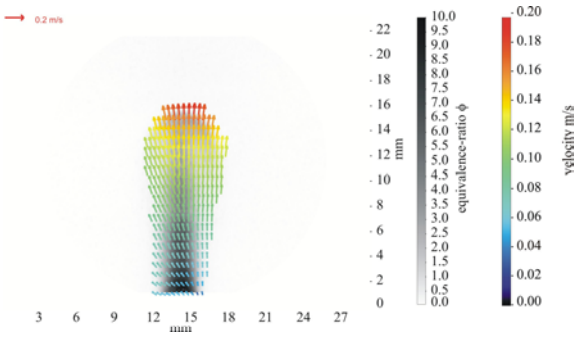

Fig. 5. Fluorescence motion analysis of Fig. 3.

These figures show results of double-pulse fuel/air-ratio measurements by LIF (FARLIF) after fluorescence excitation of a multi-component gasoline (Shell Euro-Super colorless) at 266 nm. This technique may be used to visualize the 2D fuel/air distribution (Fig. 1, mixing of fuel and air in the wake of a cylinder) and to identify ignitable areas (Fig. 2). By using two consecutive images with a small temporal delay (dt), this measurement concept visualizes mixture dynamics (Fig. 3, the change and movement of a rich fuel pulse). This may be used to calculate the temporal derivative of the fuel/air ratio (Fig. 4) and to analyze the motion of mixture structures using optical flow methods (Fig. 5).