2. Flame Structures during Acceleration Processes

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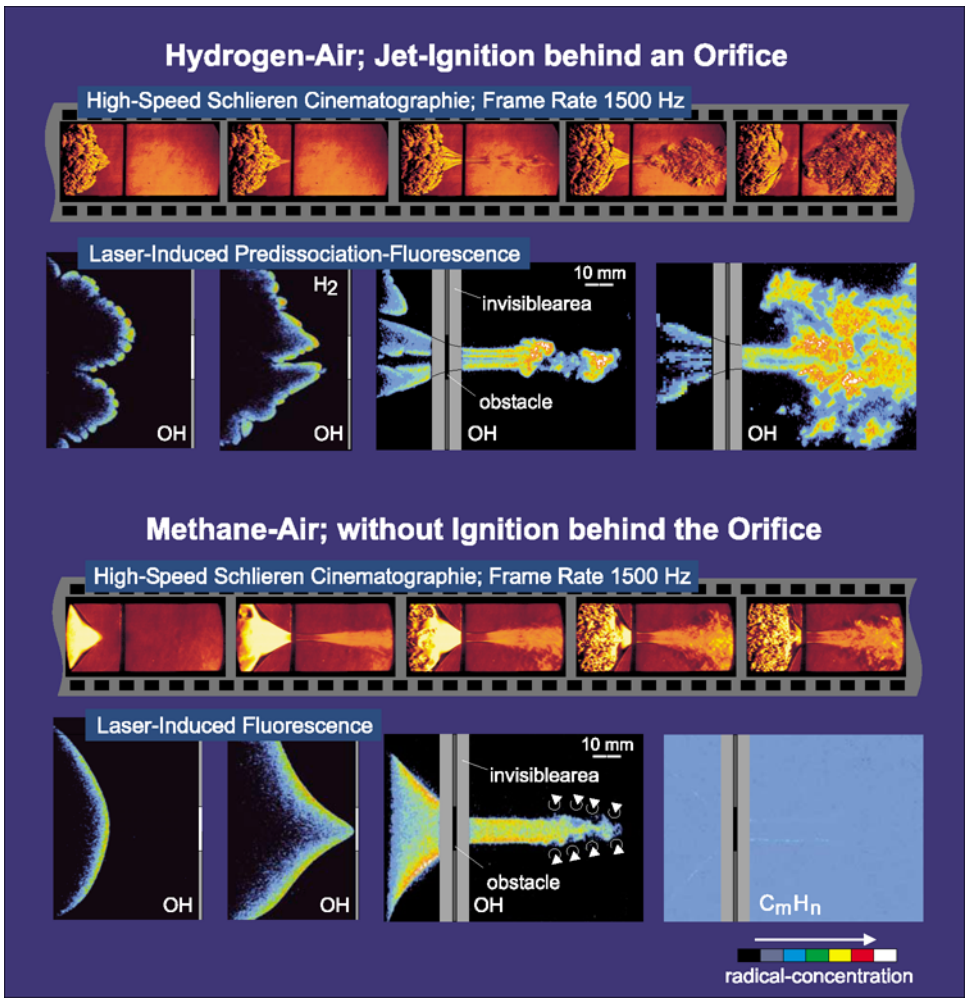

The influence of turbulence on the combustion process has been investigated by many researchers. Nevertheless, there is still a lack of reliable data concerning the structure of turbulence induced by single building-typical obstacles in front of the flame and their influence on the flame structure, the flame velocity, and therefore the resulting pressure release.
Highly sophisticated laser optical measurement techniques, such as the Laser-Doppler-Velocimetry (LDV) and the Laser-Induced Predissociation-Fluorescence (LIPF) are applied to investigate turbulent flame propagations.
Schlieren sequences that visualise the integral density gradient of a lean hydrogen-air flame (upper row) and a stoichiometric methane-air flame (lower row) are compared to the corresponding images obtained from LIPF measurements. With this optical technique a thin layer of the flame is investigated during an exposure time of only 17 ns. Thereby, specific radicals (e. g. OH, C_mH_n,...) generated inside the reaction zone are detected.