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Institut für Technische Verbrennung

RWTH AACHEN UNIVERSITY

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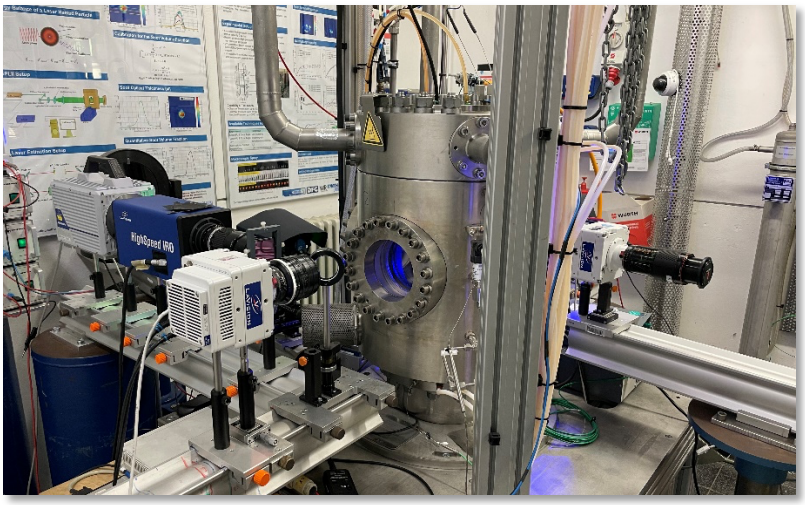
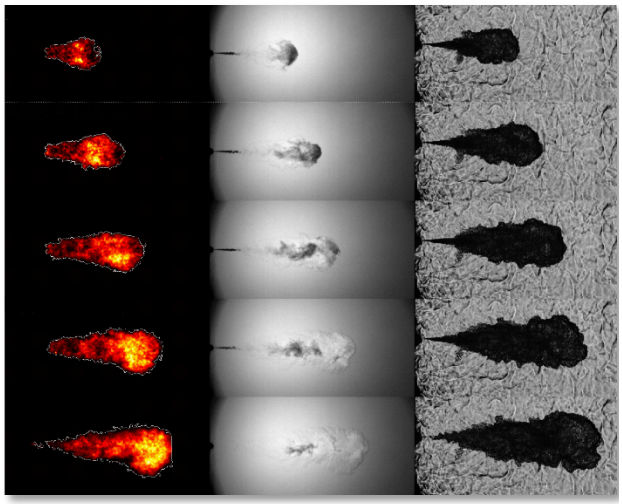
Project / Bachelor / Master thesis

Experimental investigations of low-temperature combustion in a high-pressure injection chamber in connection with an ion-current sensor system



High-pressure spray chamber



OH*, Schlieren & DBI

Considering the challenges for an emission-free future of mobility, bio-fuels offer a promising alternative to conventional fuels and open up a vast field of research in industry and science.

One approach for minimization of soot formation is to increase the overall oxygen content of the fuel. Modern e-fuels offer future-proof alternatives to conventional diesel fuel. In addition, modern combustion processes and control concepts can significantly contribute reduction of pollutants. Therefore, the testbench will be extended with an ion current sensor, which can be used for inner-cycle control.

Possible thematic areas of this work include the characterization of future fuels, fuel mixtures and alternative injection processes for spray-jet combustion under engine-relevant conditions. For experimental investigation the ITV high-pressure spray chamber is used, which allows detailed analysis of spray and combustion behaviour with temperature and pressure according to typical diesel engine conditions (p_{max} = 100 bar, T_{max} = 1000 K).

With the help of several optical measurement techniques (Schlieren, diffuse backlight illumination (DBI) and OH* chemiluminescence) typical spray variables as penetration length of liquid and gaseous phase and typical spray combustion variables as flame lift off length and soot volume are determined.

Your working tasks:
- Implementation and evaluation of a new measurement methodology/sensor technology
- Performance of experiments
- Evaluation of image data with MATLAB
- Insights to current research and technology
- Varied practical work on the test bench

Your profile:
- Enjoying experimental work
- Independent working methods
- Interest in programming (MATLAB)
- Proactivity and high learning ability

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For further information, please visit our website:
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