



## Master-Thesis / Bachelor-Thesis

### Development and Flow-Velocity Characterization of a Setup for Flame Retardants in Boundary Layer Flames

#### Entwicklung und Charakterisierung der Strömungsgeschwindigkeiten eines Aufbaus für Flammenschutzmittel in Grenzschichtflammen

#### Motivation:

A new Topic at the Institute for Reactive Flows and Diagnostics (RSM) is the application of laser diagnostics for the investigation of the effect of flame retardants in flames close to a wall and boundary layer flames.

Flame retardants in polymers are released during combustion and take effect through diverse mechanisms at the surface of the polymer or in the burning gas-phase. In this way flame retardants can reduce the flammability of materials and inhibit the spread of fires and save lives.

This project aims to recreate the scenario of a flame retardant being released from a polymer-surface during a fire. To understand the effect of flame retardants on a flame along a surface a new setup is to be developed, in which a gas can be injected homogeneously from an inlet in a wall. Through this a boundary layer flame can be created and the effect of flame retardants injected into this flame can be investigated.

The goal is to achieve a system that can be investigated experimentally and provide validation for numerical analysis. The design shall therefore be characterized by measuring the velocities of the gas flows using laser diagnostics. For this a PIV (Particle Image Velocimetry) approach is to be set up.

The topic is suitable for a Bachelor- or Master-Thesis and the tasks will be adapted accordingly.

#### Tasks:

- Familiarization with the topic & the measurement technique
- Concept development and construction for the inlet design
- Setting up a PIV-system
- Characterizing the inlet

#### Prerequisites:

- Working independently
- Interest in lab work
- CAD-knowledge is helpful
- Basic knowledge in optical measurement techniques is helpful

**Interested? Then get in touch with me!**

**Begin: By agreement / 1<sup>st</sup> April 2023**

Reactive Flows and  
Diagnostics (RSM)

Reaktive Strömungen und  
Messtechnik



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