How do renewable fuels burn?

A promising approach to decrease combustion-related emissions is to use sustainably produced fuels from lignocellulosic biomass (biofuels, parts of the Fuel Science Center). Laminar flame speed is a key parameter to be considered in the design of energetic industrial systems.

The current work aims to investigate renewable energy carriers in a high-pressure combustion chamber. This requires the use of suitable optical measuring methods, and robust evaluation routines to derive accurate burning speeds. Flame front positions are measured using a Schlieren technique (cf. figures). A high-speed camera is used to capture the outward location of the propagating flames at a rate up to 25,000 frames per second.

Tasks
- Perform optical measurement (Schlieren technique)
- Evaluation & analysis of laminar flame speeds using MATLAB
- Independent work & planning

Requirements
- Teamwork & Initiative
- Self-motivation & commitment
- Knowledge of Technical Combustion subject

Schlieren images of two different fuels.