Associate Professorship of Sustainable Future Mobility
TUM School of Engineering and Design
Technical University of Munich

Uncertainty quantification for measurements at the hydrogen aero-engine combustor test rig

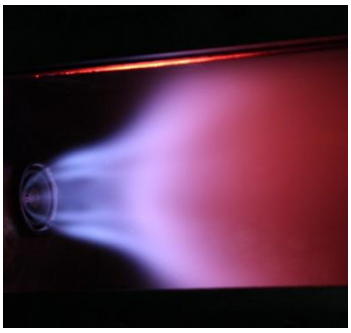
Type: Masterarbeit / Semesterarbeit
Content: theoretical/numerical
Possible start: now

Assistant Professorship for Sustainable Future Mobility

Our group carries out research in the areas of novel concepts in aviation, propulsion, and Hyperloop technology as well as safety technology. We use the principles of technical thermodynamics as a focus in research supported by elements of fluid mechanics, heat and mass transfer, acoustics, chemical reaction kinetics and systems dynamics.

Job Description

You will contribute to research on thermoacoustic characterization of hydrogen-capable combustion systems. The thesis focuses on the uncertainty quantification of experimentally identified Flame Transfer Functions (FTFs) obtained using the Multi-Microphone Method (MMM). Based on recent developments in Bayesian inference and uncertainty propagation, you will develop a workflow to quantify measurement uncertainties, propagate them through FTF identification and model fitting, and assess their impact on thermoacoustic stability predictions.



Your Tasks

- Literature review on experimental Flame Transfer Function identification and uncertainty quantification.
- Implementation of uncertainty estimation and propagation methods for FTF measurements in MATLAB.
- Validation of the framework using experimental FTF data and analysis of the results.

Our Requirements

- Background in thermoacoustics, acoustics, combustion, or system identification
- Knowledge of Matlab
- Interest in statistics, uncertainty quantification, and data analysis
- Independent and structured way of working; good English skills

Contact

If you are interested in working in our team, please send your application together with a motivation and a record of performance to Adrian Hochmuth (adrian.hochmuth@tum.de). If you have any questions, do not hesitate to contact us.