

Experimental Investigation of Growl/Rumble in the Lean Burnout Zone of a Sequential Aero Engine Test Rig (RQL)

Type: Semester Thesis/Master's Thesis
Content: experimental
Possible start: now

Job Description

The "Flightpath 2050" report documents Europe's vision for aviation to drastically reduce pollutant emissions of NO_x. Rich-Quench-Lean combustors (RQL) are chamber designs with lower NO_x emissions and are currently in use with kerosene. With the technological improvements to sequential combustion, the risk of combustion instabilities, such as the Growl/Rumble phenomenon, rises. This phenomenon describes a low-frequency noise that can risk damaging engine components. Entropy and equivalence ratio waves are suspected as possible waves are considered the cause of this phenomenon.

This student thesis elaborates further on the investigation of Growl/Rumble in an RQL combustion chamber. During the thesis, an optical measurement technique will be used to visualize density gradients. With "Optical Flow" algorithms, the images are then postprocessed.



Figure 1: Lean combustion zone in the RQL combustion test rig

Your Tasks

- Get to know the RQL test rig
- Setting up the postprocessing code
- Helping with measurement campaign
- Interpretation of the measurement data

Our Requirements

- Basic knowledge of fluid mechanics and thermodynamics
- Ability to work independently
- Optional: Knowledge of acoustics

Our Offer

- Gain insight into the fascinating research field of combustion instabilities/thermoacoustics
- Working on highly relevant topics within an international research team

Contact

If you have any questions or are interested in working with our team, please send your application to Thuy An Do (thuyan.do@tum.de).