

Student Project / Thesis



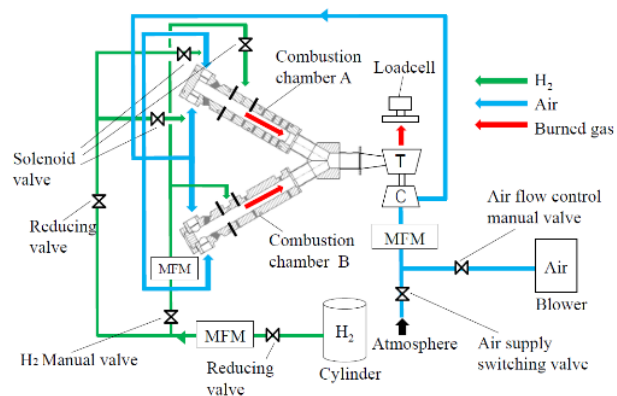
Chair of
Aero Engine Design

Title of the research:

Adapting a partial H₂ driven pressure gain combustor system for a significant increase in gas turbine efficiency

Description:

Pressure gain combustion has shown its potential to increase gas turbine efficiency significantly. However, due to the unsteady nature of pressure gain combustion, the exhaust flow of this hydrogen-driven combustion is characterized by highly unsteady flow which is deteriorative for the downstream turbine. The question of extracting energy from such an unsteady hot exhaust flow can be answered by minimizing the exhaust flow fluctuation while preserving the flow energy to a level that the conventional turbomachines can work efficiently with. In this regard, the current joint research with Tokyo Metropolitan University is headed toward investigating the turbine effectiveness in the Pulse Detonation Combustion (PDC)-Constant Pressure Combustion (CPC)-turbine configuration with the goal to not only provide a detailed view of the flow inside the expander but also gain a detailed understanding of the interaction between PDC tubes, CPC chamber, plenum and turbine by identifying the most affecting parameters on the whole performance of the PDC driven engine.



Combined PDC-CPC setup at TMU

Start: As soon as possible.

Expected qualifications:

- Fundamental knowledge on turbomachinery
- Basic CFD knowledge and CFD software e.g., ANSYS CFX
- Ability to work as a team and independently
- Knowledge on combustion would be an advantage

What we offer:

- Working in an international team
- Joint supervision by TMU and BTU members
- Possibility of a short research stay at Tokyo Metropolitan University
- Possibility of extending the research as a master thesis
- Co-authoring research papers, e.g., in ASME TurboExpo or journals

If interested, please send an email to asli@b-tu.de, including CV and transcript.