# Study Project / Master Thesis

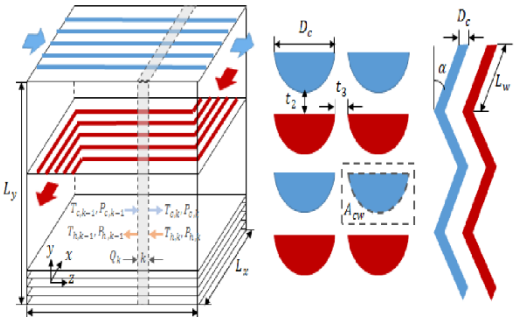
Chair of
Aero Engine Design

## Title of the research:

## Dynamic heat transfer modelling of heat exchanger

## Description:

This research aims to develop a transient heat transfer analysis tool, as a reduced order simulation approach, for aviation thermal management systems, with a focus on heat exchangers used in advanced propulsion architectures. The project will establish a dynamic modeling framework capable of capturing time-dependent thermal behavior in compact heat exchangers operating under rapidly changing flight and propulsion conditions. By integrating conjugate heat transfer modeling, the tool will simultaneously resolve heat transfer in both the fluid and solid domains, enabling more accurate prediction of thermal inertia, wall conduction effects, and transient performance. The resulting methodology will support the design and optimization of aviation heat exchangers, particularly for emerging hybrid-electric and highly integrated propulsion systems where dynamic thermal loads play a critical role.



Jiang et al. 2018
https://doi.org/10.1016/j.apenergy.2018.09.193

**Start:** As soon as possible.

## Expected qualifications:

- Fundamental knowledge on heat transfer and CFD
- Hands-on knowledge and skills with programming MATLAB, Modelica, Python
- Ability to work as a team and independently
- Having the Thermal Management Systems in HEPT Aviation module passed is desirable

## Further notes:

- There is a possibility of extending the research as a master thesis
- Possible conference/journal publication as co-author

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