

Student job or a Master thesis

Adaptation of a traversing unit and investigating the influence of hot streaks on heat transfer in the TCF

High bypass ratio turbofan engines are commonly employed in aircrafts. For higher bypass ratio, turbine centre frames (TCF), located between the high pressure system (HP) and low pressure (LP) system, have to be designed as short as possible. Therefore, temperature inhomogenities originating from the combustion chamber have less time to mix out. Turbine centre frames have extensively been investigated at ITTM and current project is to address the effect of temperature non-uniformities (hot streaks) on to the behaviour of a TCF.



Figure 1: Sector cascade at ITTM

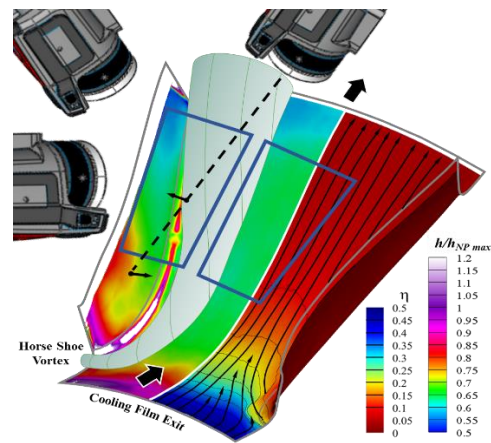


Figure 2: Heat transfer measurement principle

The main aim of this work is to set up a functional system that is going to enable heat transfer measurements in the TCF, using an infrared camera. The principle is illustrated in figure 2 from a similar study that can be found on the link: <https://doi.org/10.1007/s42452-021-04845-5>.

There is an existing traversing unit that needs to be adapted to fit into the test bench shown in figure 1. Traversing unit is controlled by Matlab, so experience in Matlab is necessary. In the case of a Master thesis, experiments are to be conducted and later post processed. Infrared camera and a specially designed TCF are used to determine the heat transfer coefficient. This is a state of the art project involving novel materials and measurement techniques. If you are interested in more details, please send an e-mail with brief description of your past studies and/or work and your questions.

Possible start: starting from January / February 2022.

Language: English and German

Duration: minimum 2 months for student job position; more for thesis

Supervisor: Ena Badžek, mag.ing.mech

E-mail: ena.badzek@tugraz.at