

Bachelor thesis: Differential image thermography of a transitive boundary layer

AG TWiSt – Turbulenz, Windenergie und Stochastik

Your Topic:

- ▼ The state of the boundary layer forming around a body subject to fluid flow is critical to many aspects of the body's fluid dynamic properties. For example, the drag coefficient of an object changes drastically when the boundary layer transitions from the laminar to the turbulent state. Understanding and characterizing this transition and describing it using models is therefore of great interest. For some years now, differential thermography has been increasingly used to measure boundary layer flow, which allows direct conclusions to be drawn about the state of the boundary layer from temperature measurements.
- ▼ The tasks of the project are divided into different areas. First of all, a method is to be developed to heat or cool the object to be examined as homogeneously as possible. This is necessary to create a temperature difference between the environment and the object, which makes differential thermography possible.

After the object can be homogeneously heated, different flow situations are to be measured by means of the available temporally high-resolution thermography camera. Thus a data basis over a parameter space as large as possible is to be created.

The final step of the work is the evaluation of the data. The measured boundary layer states are to be compared. Based on the covered parameter space, a model for the description of the laminar-turbulent transition shall be developed.

The long-term goal of this work is to integrate the developed model into simulations in order to be able to describe the laminar-turbulent transition more precisely and thus optimize the results of, for example, load simulations.

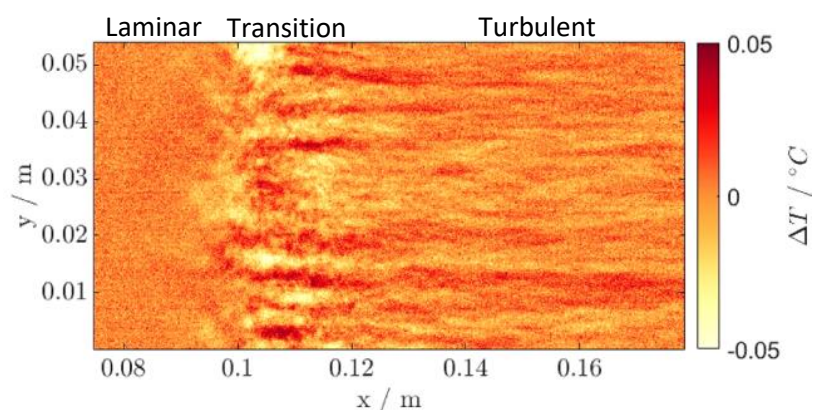


Fig. 1: Thermography measurement of a laminar-turbulent transition

Your profile:

- ▼ You should be at the end of your bachelor's degree in physics (or comparable) and highly motivated. You should also be interested in aerodynamics and enjoy experimental work..

Your next step:

- ▼ Come for a visit to our labs and get an impression of our pleasant working atmosphere and our research focus.
- ▼ Your contact is Tom Wester in the WindLab (room W33-2-226, email tom.wester@uol.de).