

Topic for a bachelor-/ master thesis:

Making the invisible visible: Automated localisation of flow transitions by means of image processing methods

Course of studies: Systems Engineering, Production Engineering, Engineering and Management, Electrical Engineering, Physics or similar



Fig. 1: Research wind turbine in Bremen

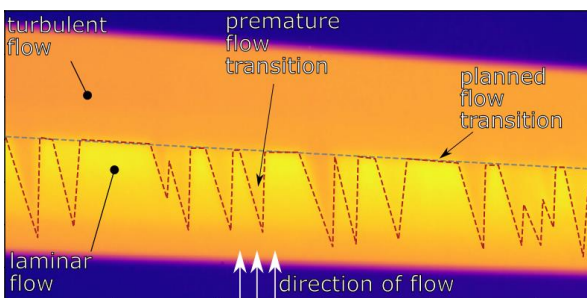


Fig. 2: Thermographic image of a section of a rotor blade with laminar-turbulent flow transitions

The flow behaviour of rotor blades of wind turbines is influenced dynamically by ambient conditions and the condition of the rotor blades. The transition from laminar to turbulent flow can, for example, occur more prematurely than the planned flow transition due to contaminations or erosion of the rotor blade's leading edge.

These flow transitions can be visualised at large distances and without stopping the wind turbine using thermography (see Fig.2).

Objective of this thesis is to analyse thermographic images using image processing methods to detect flow transitions robustly and precisely.

Main focus areas:

- Development of algorithms to detect flow transitions
- Mapping of flow transitions onto rotor blade geometry

Your profile:

- Interest in signal- and image processing
- good programming skills (MATLAB/ Python)
- autonomous and responsible way of working

In cooperation with:



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