Detailed flow field investigations of blade tips from modern high pressure turbine rotors using Particle Image Velocimetry (*PIV*)

TECHNISCHE UNIVERSITÄT DARMSTADT

Detailuntersuchungen des Strömungsfeldes von Rotorschaufelspitzen moderner Hochdruckturbinen unter Verwendung von Particle Image Velocimetry (*PIV*)

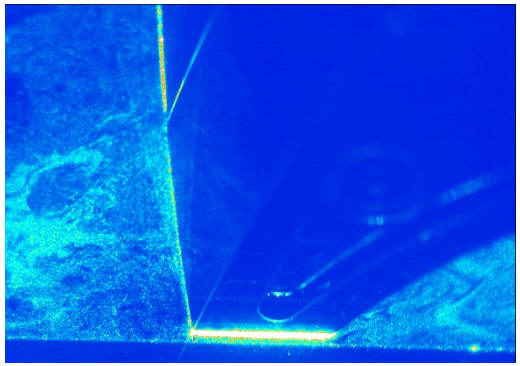
Bachelor-/ Master-Thesis (BTh/ MTh)

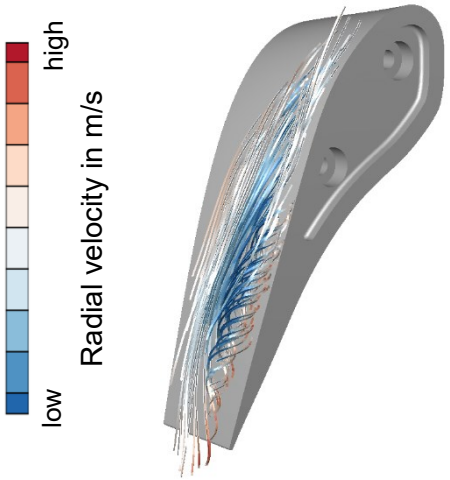
Background

The detailed knowledge of the flow field of a rotor blade tip is crucial to validate CFD-simulations. The 3D-trajectory of the tip leakage vortex, the main flow feature in the rotor blade tip area, is a significant indicator for the correctness of numeric setups.
One method to determine this flow field experimentally is PIV – an optical measurement technique. A high intense laser pulse illuminates tracer particles (top picture), which are artificially seeded to the flow field. Tracking the tracer particles provides the velocity field in the blade tip region.
The thesis includes preparation and execution of a measurement campaign, data and post processing.

Tasks

- Literature research and get-used-to PIV
- Preparation of the existing measurement system
- Execution of the measurement campaign
- Post processing and interpretation of the recorded data
- Documentation of the results





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Schwerpunkt

x	analytisch
	konstruktiv
x	experimentell
	numerisch