Semester / Master Thesis

Institute of Rotorcraft and Vertical Flight

Design and Setup of a Measurement System of a Rotary Teststand for Forward Flight

(Testing, Measurement, Sensor Technology, Synchronisation, Real Time Computation)

Keywords: test, measurement, sensor, propeller, nonaxial inflow, structural dynamics, VTOL

Background: An increasing number of different VTOL configurations are being designed with propellers. For these concepts, the propellers often have to pass through a transition phase of the aircraft where they experience varying angles and speeds of inflow. This is not the design case for a normal propeller and therefore requires further investigation. In order to be able to investigate many different influencing factors of the propeller design, it is planned to build a rotary testing environment in nonaxial inflow conditions. To create these nonaxial inflow conditions, the test stand will be mounted on a driving vehicle. In the course of this thesis, the measurement system of the test stand shall be designed. This encompasses (depending on thesis start date and project progress) the definition of measurement requirements, sensor selection and positioning, synchronous data collection and storage as well as real time data display. Also the topics of shielding and grounding of the test stand will also be an important topic as the test stand will feature an electrical drive. Depending on the project progress the selected components will be purchased during the thesis timeframe and the integration of the measurement system into the test stand as well as the calibration and a first test campaign can also be included into the work if wanted.

Goal: The design and setup of a time synchronous and realtime capable measurement system for a rotary test stand in nonaxial inflow condition.

About us: We are three Phd students, who lead a VTOL propeller design project, looking for independent and highly motivated Master's students who want to develop their knowledge in the areas of propeller and inflow dynamics, testing, structural dynamics and propeller forces in nonideal inflow situations. These theses offer an excellent opportunity to participate in applied and industry-related research. If you are interested, please contact us personally. We will be happy to discuss all possibilities! We currently offer a large selection of theses.

Abilities: High motivation and the ability to familiarize yourself independently with new topics. Experience with electronics, sensor and measurement techniques as well as real time computing is beneficial, but not necessary.

Language:
Englisch/Deutsch
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