

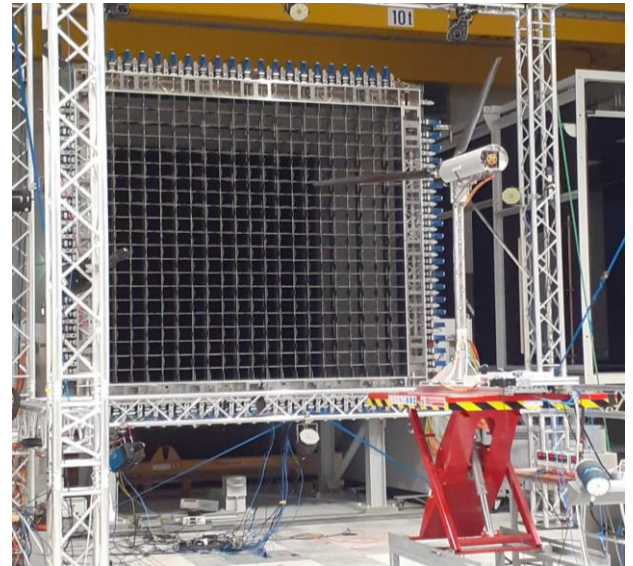
Internship/Bachelor thesis: ‘Experimental study of dynamic inflow phenomena

Background

Dynamic inflow is the aerodynamic effect of the unsteady response of loads to sharp changes in rotor loading. This leads to overshoots or damping of the loads in comparison to the anticipated ones. There is ongoing research taking place in the institute, where the Model Wind Turbine Oldenburg 1.8 setup in the WindLab’s wind tunnel is employed. The dynamic inflow due to conditions, such as pitch steps or wind gusts, have already been studied.

Task

A measurement campaign is under preparation for June 2021. One of the objectives is to study the dynamic inflow due to rapid changes of the rotor speed. The student is expected to plan, assist conducting and evaluate a set of relevant measurements.



Work steps

- Review of relevant literature and familiarization with the experimental setup.
- Drafting of the project plan and experimental matrix.
- Setup and running of the relevant measurements.
- Processing and evaluation of the acquired data
- Presentation of the project work and results.

Requirements

- Interest and commitment to be involved in lab work.
- Background in experimental fluid mechanics, aerodynamics and/or wind energy.
- Good Matlab skills.

Place	ForWind – University of Oldenburg
Begin	ASAP
Duration	2-6 months (Depends on the project type)
Supervision	Apostolos Langidis apostolos.langidis@uol.de

Literature

Berger F et al. 2018. “Scaled Wind Turbine Setup in a Turbulent Wind Tunnel.” Journal of Physics: Conference Series 1104 (1) 12026. <https://doi.org/10.1088/1742-6596/1104/1/012026>.

Berger F et al.2020. “Comparison of a Radially Resolved Dynamic Inflow Pitch Step Experiment to Mid-Fidelity Simulations and BEM.” Journal of Physics: Conference Series 1618 (September): 052055. <https://doi.org/10.1088/1742-6596/1618/5/052055>.