Topics for Theses and Student Projects at LWET

General Information

- The topics listed in this document are suggestions for theses and student projects including
  - Bachelor theses,
  - Software Lab Projects / Pre-Theses and
  - Master theses.
- The specific task will be concretized in consultation with the student.
- Interested students are asked to contact the responsible person stated under contact via phone or e-mail.

Contact: Prof. Uwe Ritschel
☏ (0381) 498-9571
✉ uwe.ritschel@uni-rostock.de

OKI – Raum 105
Justus-von-Liebig-Weg 2
18059 Rostock

Chair of Wind Energy Technology
Fakultät für Maschinenbau und Schiffstechnik

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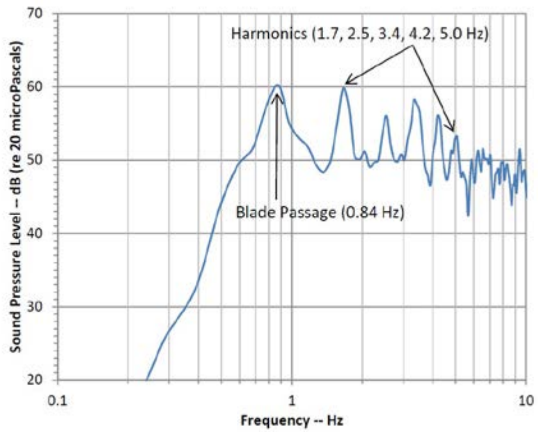
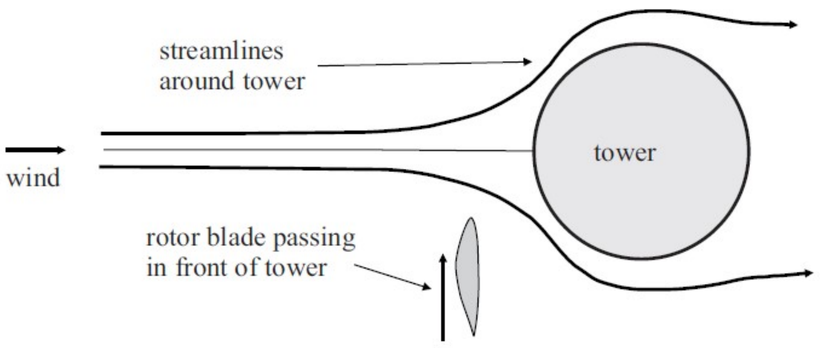
Measurement and Analysis of Infrasound from Wind Turbines

Scope

- measurements with an acoustic camera and infrasound sensors (low pressure microphones) n the vicinity of a test facility under different atmospheric conditions and operational states
- Investigation for connection between higher and lower frequencies By comparing the results of the infrasound sensor and the acoustic camera



4 Autospectrum of wind turbine infrasound at a distance of 622 meters



Blade-tower interaction

Literature

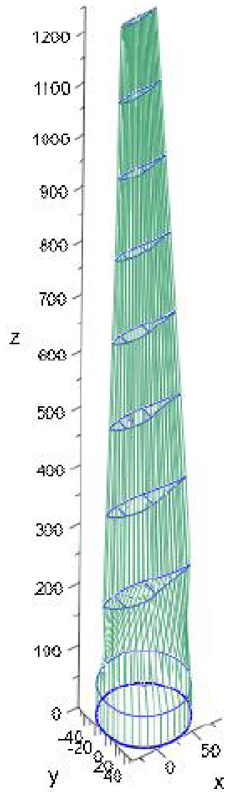
1. Carman, R. A. (2015, August). Measurement procedure for wind turbine infrasound. In INTER-NOISE and NOISE-CON Congress and Conference Proceedings (Vol. 250, No. 1, pp. 6143-6153). Institute of Noise Control Engineering.
2. Hansen, C., Zajamšek, B., & Hansen, K. (2016). Infrasound and low-frequency noise from wind turbines. In Fluid-Structure-Sound Interactions and Control (pp. 3-16). Springer, Berlin, Heidelberg.

Contact: M.Sc. Arash Ebrahimi
☏ (0381) 26053 – 061
✉ arash.ebrahimi@uni-rostock.de

Am Strom 1-4
18119 Rostock

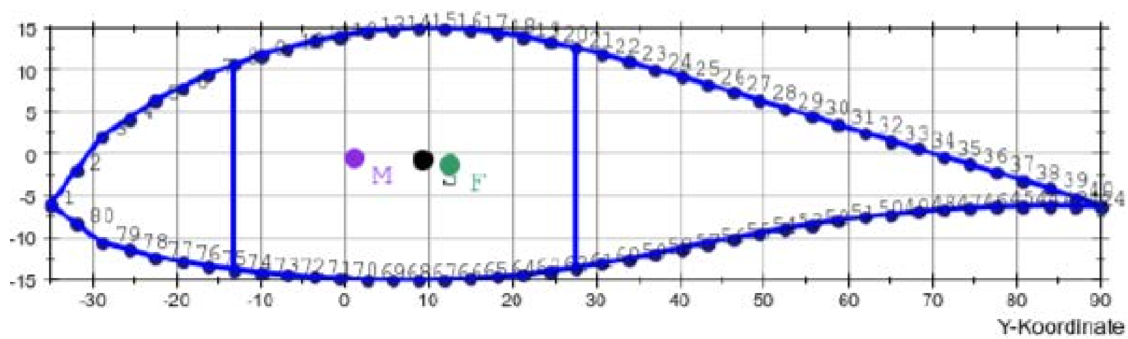
Institut für Windtechnik, Energiespeicherung und Netzintegration gGmbH

Computer Tools for Calculation of Mass and Stiffness data of Rotor Blades



Scope

- Enhancement of a MATLAB tool for calculating the profile data of thin-walled rotor blades
- Programming of an object oriented computer tool for calculating the cross section stiffness and mass data for rotor blade airfoils in C#



Contact: PD Dr.-Ing. habil. Evgueni Stanoev
☎ (0381) 498-9383
✉ evgueni.stanoev@uni-rostock.de
OKI – Raum 13
Justus-von-Liebig-Weg 2
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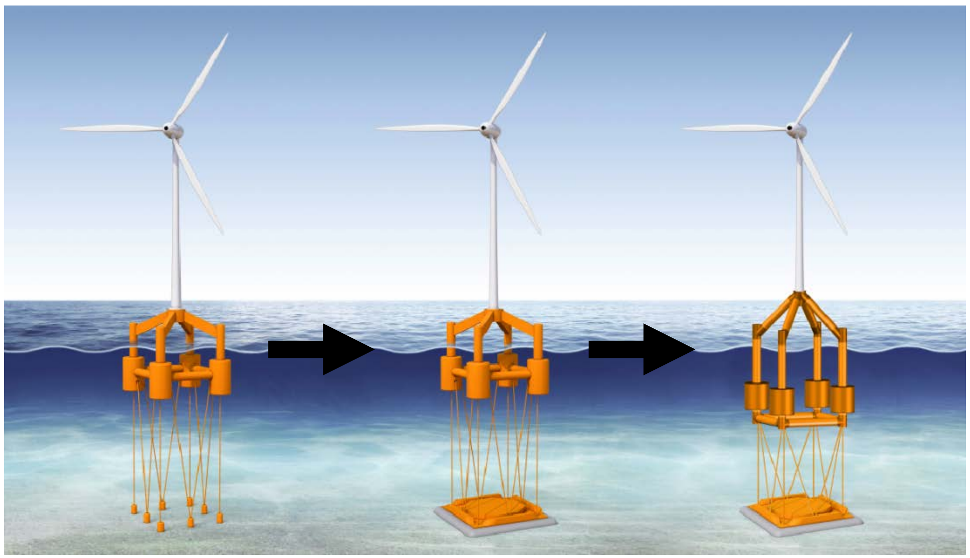
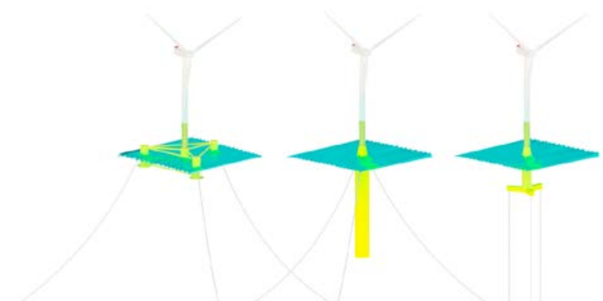
Design Optimization & Concept Development for Floating Wind Turbines



Scope

- Concept development for the design of innovative substructures and their single parts
- Parameter study based design optimization with Bentley Moses
- Design of various floating substructures with ANSYS Aqwa



Contact: M.Sc. Hauke Hartmann
☏ (0381) 498-9580
✉ hauke.hartmann@uni-rostock.de

Stelzengang – Raum 132
Albert-Einstein-Str. 2
18059 Rostock

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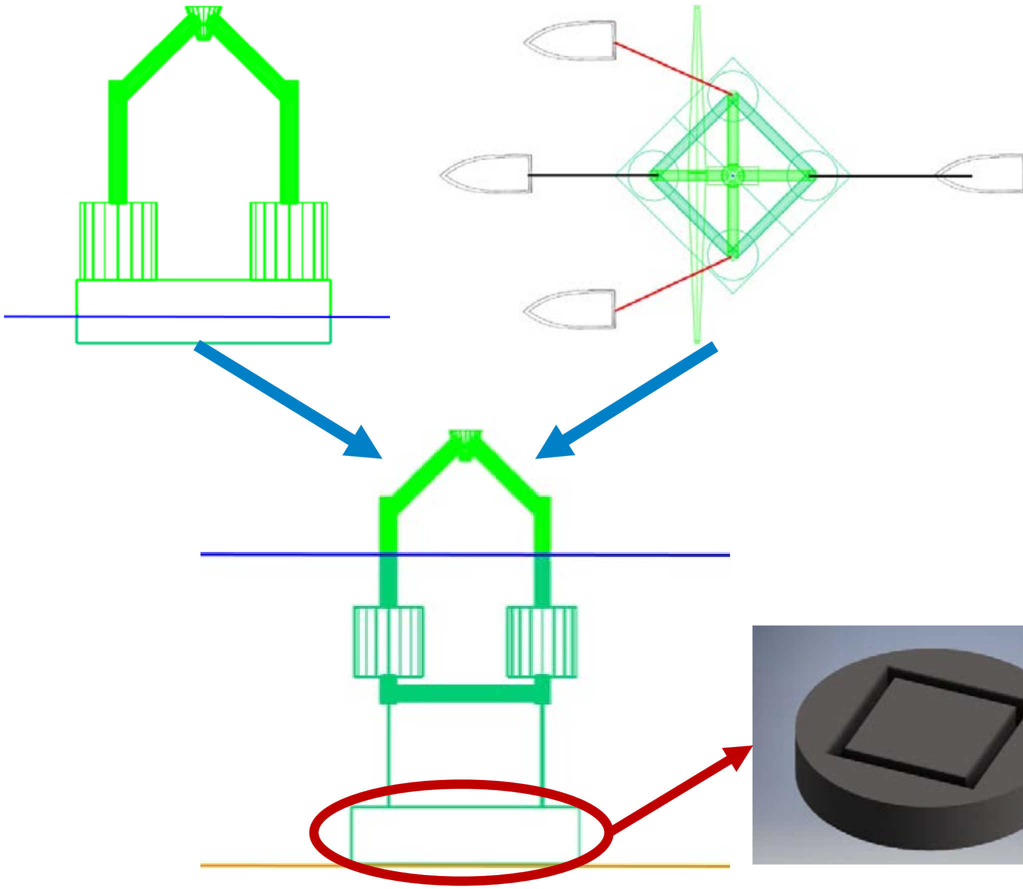
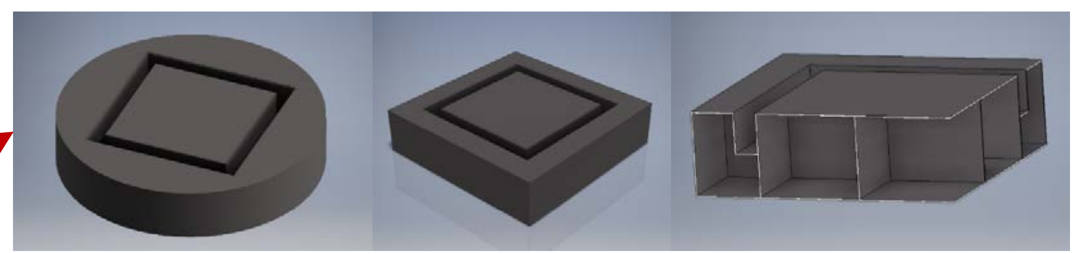
Installation of Floating Offshore Structures



Installierte Substruktur



Scope

- Simulation of hydrodynamic effects during the installation process with ANSYS Aqwa and via CFD
- Design and optimization of gravity based anchor systems using ANSYS Aqwa
- Performing feasibility studies for installation concepts

Contact: M.Sc. Hauke Hartmann
☏ (0381) 498-9580
✉ hauke.hartmann@uni-rostock.de

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Albert-Einstein-Str. 2
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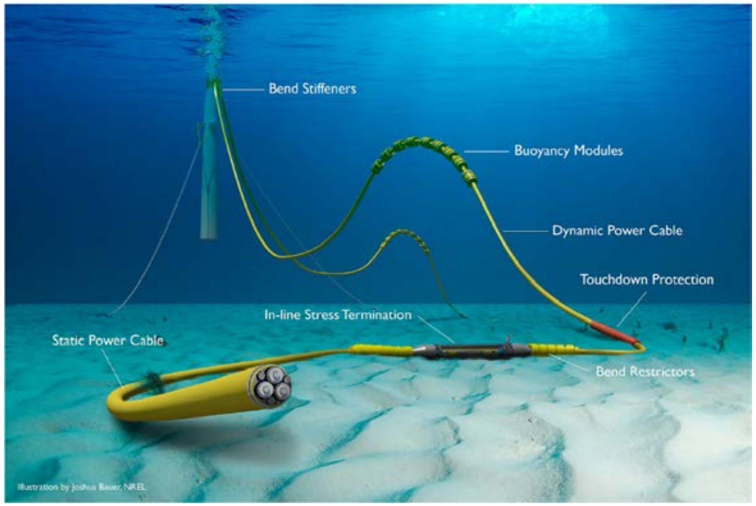
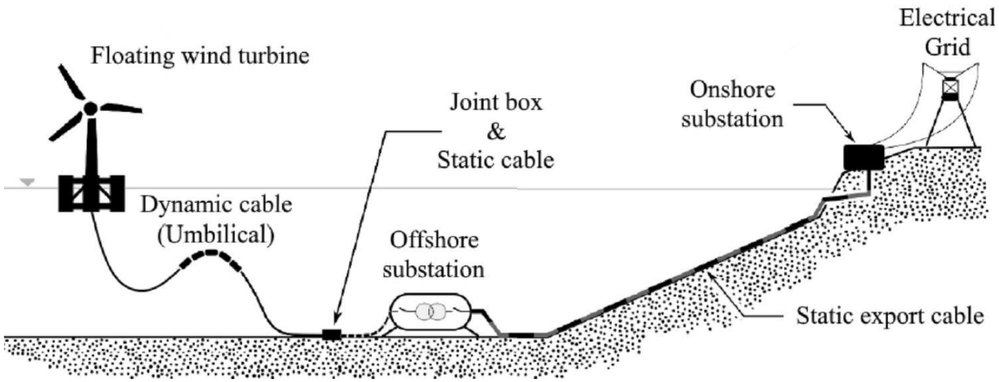
Dynamic Power Cables for Floating Offshore Wind Turbines

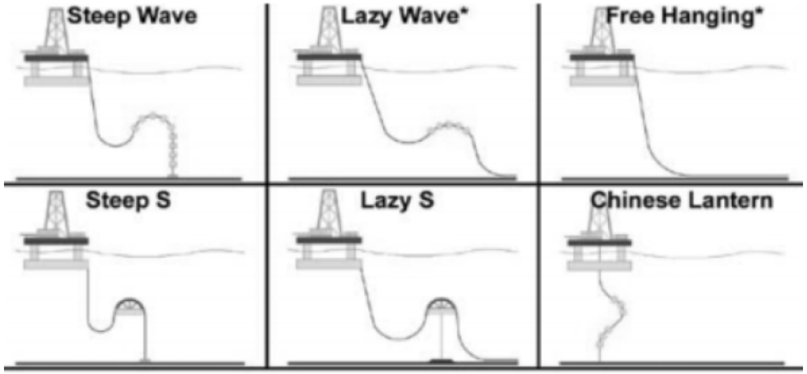
Scope

- Development of appropriate cable models and implementation in OpenFAST and FAST.Farm
- Determination of design loads for the cable
- Comparison and Optimization of different cable shapes with suitable algorithms, e.g. genetic algorithm
- Conducting parameter studies





Quelle: K. Krügel, Hydrodynamic design of umbilical systems for floating offshore wind applications, Presented at the FOWT 2017 Conference on March 15th 2017 (2017)



Quelle: Clausen, T., & D'Souza, R. (2001). Dynamic risers key component for deepwater drilling, floating production. Offshore, 61(5), 89-90.

Contact: M.Sc. Paul Schünemann
☏ (0381) 498-9575
✉ paul.schuenemann@uni-rostock.de

Stelzengang – Raum 132
Albert-Einstein-Str. 2
18059 Rostock

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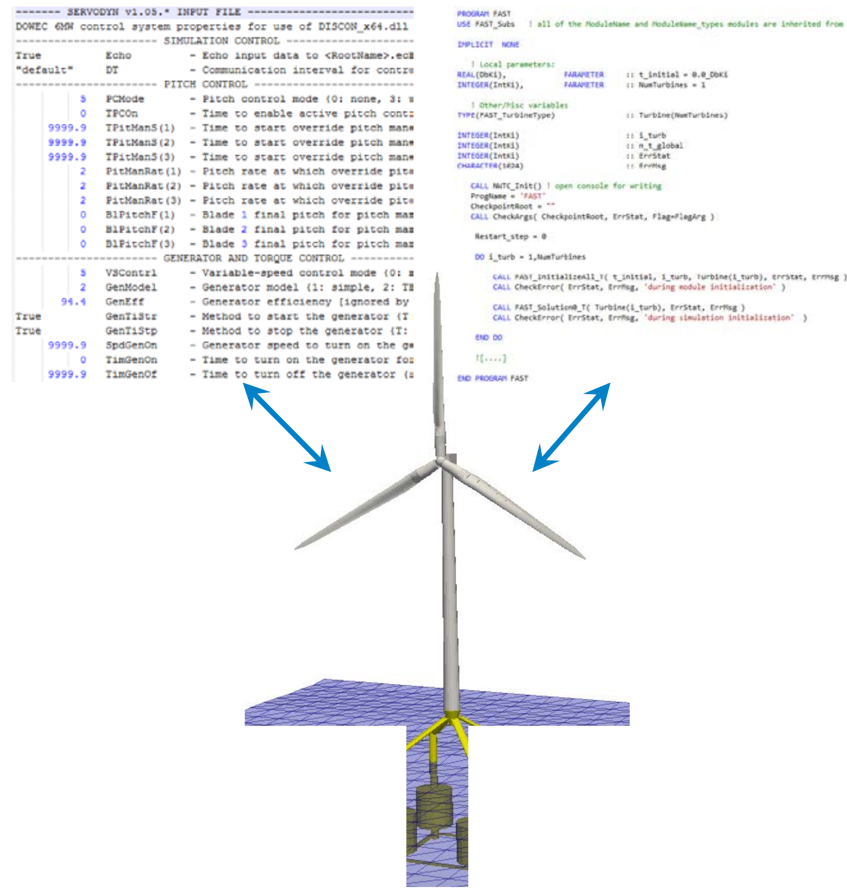
Investigation of Operational Loads of Floating Wind Turbines

Scope

- Modal analysis of floating wind turbines
- Investigation of the dynamic behaviour of platform and wind turbine with OpenFAST
- Comparison of different mooring models (quasistatic, dynamic) in OpenFAST
- Study on the impact of certain simulation parameters of OpenFAST
- Implementation of substructures in ANSYS Aqwa and coupling with OpenFAST



Contact: M.Sc. Paul Schünemann
☏ (0381) 498-9575
✉ paul.schuenemann@uni-rostock.de

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Albert-Einstein-Str. 2
18059 Rostock

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