Wind turbine loads & control

Department of Wind Energy
Organisational unit: Section

Publications:

Inflow measurements from blade-mounted flow sensors: Flow analysis, application and aeroelastic response
Publication: Research › Ph.D. thesis – Annual report year: 2018

Condition monitoring of a rotor arrangement in particular a wind turbine
Niemann, H. H., Poulsen, N. K., Mirzaei, M. & Henriksen, L. C. 8 Jun 2017
Publication: Research › Patent – Annual report year: 2017

Aeroelastic Analysis of Olsen Wings 14.3m Blade-Blatigue Project
Publication: Research › Report – Annual report year: 2017

Aeroelastic code validation - A mixed collection of examples
Larsen, T. J. 2017
Publication: Research › Sound/Visual production (digital) – Annual report year: 2017

Aeroelastic multidisciplinary design optimization of a swept wind turbine blade
Publication: Research › Journal article – Annual report year: 2017

A framework for medium-fidelity wake dynamics in moderately complex terrain
Larsen, G. C., van der Laan, P. & Ott, S. 2017
Publication: Research › Sound/Visual production (digital) – Annual report year: 2017

Analytical gradients of wind turbine towers fatigue loads
Publication: Research › Report – Annual report year: 2017

Benchmarking (Code2Code) of the 1Hs 3-Bladed Onshore VAWT
Publication: Research › Report – Annual report year: 2017

Characterization of a new open jet wind tunnel to optimize and test vertical axis wind turbines
Tourn, S., Pallarés, J., Cuesta, I. & Schmidt Paulsen, U. 2017 In : Journal of Renewable and Sustainable Energy. 9, 3, 14 p., 033302
Publication: Research › Journal article – Annual report year: 2017

Conceptual research of a downwind turbine, based on Suzlon 2.1MW onshore turbine
Wanke, G., Larsen, T. J., Hansen, M., Buhl, T., Madsen, J. I. & Bergami, L. 2017
Publication: Research › Sound/Visual production (digital) – Annual report year: 2017

Cross-Cutting Activities 2016 on Wind Turbine Noise, Summary Report
Publication: Research › Report – Annual report year: 2017
Design of a wind turbine swept blade through extensive load analysis
Publication: Research - peer-review › Journal article – Annual report year: 2016

Development of a Mechanical Passive Pitch System for a 500W Horizontal Axis Wind Turbine
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

Elastic deformations of floaters for offshore wind turbines: Dynamic modelling and sectional load calculations
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

Fault diagnosis and condition monitoring of wind turbines
Publication: Research - peer-review › Journal article – Annual report year: 2017

Fundamental aeroelastic properties of a bend–twist coupled blade section
Publication: Research - peer-review › Journal article – Annual report year: 2017

High-fidelity linear time-invariant model of a smart rotor with adaptive trailing edge flaps
Publication: Research - peer-review › Journal article – Annual report year: 2016

Identification of critical design load cases for a jacket supported offshore wind turbine
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

Identification of Critical Design Load Cases for a Jacket Supported Oshore Wind Turbine
Publication: Research - peer-review › Conference article – Annual report year: 2017

Inflow conditions and wake effects for wind turbines in forested terrain
Dellwik, E., Papetta, A., Arnqvist, J., Nielsen, M. & Larsen, T. J. 2017
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Inflow conditions and wake effects for wind turbines in forested terrain
Dellwik, E., Papetta, A., Arnqvist, J., Nielsen, M. & Larsen, T. J. 2017
Publication: Research - peer-review › Sound/Visual production (digital) – Annual report year: 2017

LIDAR Correlation to Extreme Flapwise Moment : Gust Impact Prediction Time and Feedforward Control
Publication: Research - peer-review › Report – Annual report year: 2017

Loads in wind farms under non-neutral ABL stability conditions: A full-scale validation study of the DWM model.
Larsen, G. C., Larsen, T. J. & Hansen, K. S. 2017
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Loads in wind farms under non-neutral ABL stability conditions: A full-scale validation study of the DWM model.
Publication: Research › Sound/Visual production (digital) – Annual report year: 2017
Wind turbine influence on surfers wind conditions at Hanstholm

A coupled near and far wake model for wind turbine aerodynamics

Aerial sensor for wind turbines Design, implementation and demonstration of the technology

Aeroelastic Optimization of a 10 MW Wind Turbine Blade with Active Trailing Edge Flaps

Aeroelastic Optimization of a 10 MW Wind Turbine Blade with Active Trailing Edge Flaps

Aeroservoelastic analysis of storm-ride-through control strategies for wind turbines

A LIDAR-assisted model predictive controller added on a traditional wind turbine controller

Analysis and design of bend-twist coupled wind turbine blades

A novel full scale experimental characterization of wind turbine aero-acoustic noise sources - preliminary results

Benchmarking aerodynamic prediction of unsteady rotor aerodynamics of active flaps on wind turbine blades using ranging fidelity tools

Calculating the sensitivity of wind turbine loads to wind inputs using response surfaces

Demonstration of a Basis for Tall Wind Turbine Design, EUDP Project Final Report

Publication: Research › Report – Annual report year: 2016
Demonstration of partial pitch 2-bladed wind turbine
Publication: Research › Report – Annual report year: 2016

DeRisk - Accurate prediction of ULS wave loads. Outlook and first results
Publication: Research - peer-review › Conference article – Annual report year: 2016

Design Load Basis for Offshore Wind turbines: DTU Wind Energy Report No. E-0133
Publication: Research › Report – Annual report year: 2016

Design of an aeroelastically tailored 10 MW wind turbine rotor
Publication: Research - peer-review › Conference article – Annual report year: 2016

Diagnosis of wind turbine rotor system
Publication: Research - peer-review › Article in proceedings – Annual report year: 2016

Dynamic behavior of parked wind turbine at extreme wind speed
Publication: Research - peer-review › Article in proceedings – Annual report year: 2016

Dynamics of the interaction between the rotor and the induction zone
Publication: Research - peer-review › Conference article – Annual report year: 2016

Effect of Turbulence on Power for Bend-Twist Coupled Blades
Publication: Research - peer-review › Conference article – Annual report year: 2016

Experimental and numerical study of a 10MW TLP wind turbine in waves and wind
Publication: Research - peer-review › Conference article – Annual report year: 2016

Experimental and Numerical Study of Rotor Dynamics of a Two- and Three-Bladed Wind Turbine
Publication: Research - peer-review › Journal article – Annual report year: 2016

Floating substructure flexibility of large-volume 10MW offshore wind turbine platforms in dynamic calculations
Publication: Research - peer-review › Conference article – Annual report year: 2016

Impact of a wind turbine on turbulence: Un-freezing turbulence by means of a simple vortex particle approach
In search for a canonical design ABL stability class for wind farm turbines

Investigation of wake interaction using full-scale lidar measurements and large eddy simulation: Investigation of wake interaction using full-scale lidar measurements and LES

Lidar configurations for wind turbine control

Mapping Wind Farm Loads and Power Production - A Case Study on Horns Rev 1

Modal dynamics of structures with bladed isotropic rotors and its complexity for 2-bladed rotors

Normalized performance and load data for the deepwind demonstrator in controlled conditions

Open access wind tunnel measurements of a downwind free yawing wind turbine

Open Access Wind Tunnel Measurements of a Downwind Free Yawing Wind Turbine

PI controller design of a wind turbine: evaluation of the pole-placement method and tuning using constrained optimization

Reduced design load basis for ultimate blade loads estimation in multidisciplinary design optimization frameworks

Reduction of fatigue loads on jacket substructure through blade design optimization for multimegawatt wind turbines at 50 m water depths
Steady State Comparisons HAWC2 v12.2 vs HAWCStab2 v2.12
Publication: Research - peer-review › Report – Annual report year: 2016

Timoshenko beam element with anisotropic cross-sectional properties
Publication: Research - peer-review › Article in proceedings – Annual report year: 2016

Trailed vorticity modeling for aeroelastic wind turbine simulations in stand still
Publication: Research - peer-review › Conference article – Annual report year: 2016

Using Pretwist to Reduce Power Loss of Bend-Twist Coupled Blades
Publication: Research - peer-review › Article in proceedings – Annual report year: 2016

Validation of buoyancy driven spectral tensor model using HATS data
Publication: Research - peer-review › Conference article – Annual report year: 2016

Validation of Superelement Modelling of Complex Offshore Support Structures
Publication: Research - peer-review › Article in proceedings – Annual report year: 2016

Vertical Axis Wind Turbine Design Load Cases Investigation and Comparison with Horizontal Axis Wind Turbine
Publication: Research - peer-review › Conference article – Annual report year: 2016

Wake dynamics in offshore wind farms
Publication: Research › Ph.D. thesis – Annual report year: 2016

Wake flow characteristics at high wind speed
Publication: Research - peer-review › Article in proceedings – Annual report year: 2016

Wake Influence on Dynamic Load Characteristics of Offshore Floating Wind Turbines
Publication: Research - peer-review › Conference article – Annual report year: 2016

Wind tunnel testing of the DeepWind demonstrator in design and tilted operating conditions
Publication: Research - peer-review › Journal article – Annual report year: 2016

Wind turbine wake measurement in complex terrain
Publication: Research - peer-review › Conference article – Annual report year: 2016
Wind turbine wake models developed at the Technical University of Denmark: A review
Publication: Research › peer-review › Journal article – Annual report year: 2016

WP8 Detailed Blade Modelling Implemented in Aero-Elastic load simulation
Publication: Research › Report chapter – Annual report year: 2016

Concurrent Aeroservoelastic Design and Optimization of Wind Turbines
Publication: Research › Ph.D. thesis – Annual report year: 2016

Experimental Vision Studies of Flow and Structural Effects on Wind Turbines
Najafi, N., Schmidt Paulsen, U., Mann, J. & Sjöholm, M. 2015 DTU Wind Energy. 139 p. (DTU Wind Energy PhD; No. 0055(EN)).
Publication: Research › Ph.D. thesis – Annual report year: 2016

Investigation of rotor imbalance on a NEG-Micon 80 Wind Turbine
Publication: Research › Report – Annual report year: 2016

LEX Project. Handbook - terms and definitions v. 4
Publication: Communication › Book – Annual report year: 2016

Fast Trailed Vorticity Modeling for Wind Turbine Aerodynamics and its Influence on Aeroelastic Stability
Publication: Research › Ph.D. thesis – Annual report year: 2016

Improving Yaw Alignment Using Spinner Based LIDAR
Publication: Research › Article in proceedings – Annual report year: 2010

Servo-elastic dynamics of a hydraulic actuator pitching a blade with large deflections
Publication: Research - peer-review › Journal article – Annual report year: 2007

Projects:

Wind Farm Layout Optimization in Complex Terrain
Project

Activities:
Inflow conditions and wake effects for wind turbines in forested terrain
Dellwik, E. (Invited speaker), Alkistis Papetta (Other), Johan Arnqvist (Other), Nielsen, M. (Other), Larsen, T. J. (Other)
27 Jun 2017
Activity: Talks and presentations › Conference presentations

TOPFARM: framework for coupling models to address wind farm optimization challenges
Verelst, D. R. (Speaker), Zahle, F. (Other), Rethore, P. (Other), Rinker, J. (Other)
27 Jun 2017
Activity: Talks and presentations › Conference presentations

VAWTs for offshore applications
Schmidt Paulsen, U. (Speaker), Siri Magrethe Kalvig (Panel member)
14 Dec 2016
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Retrospective aspects of DeepWind (ANFSCD) by Uwe Schmidt Paulsen
Schmidt Paulsen, U. (Keynote speaker)
23 Nov 2016
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

A review of state-of-the-art in torque generation and control of floating vertical-axis wind turbines
Schmidt Paulsen, U. (Keynote speaker)
7 Sep 2016 → 9 Sep 2016
Activity: Talks and presentations › Conference presentations

Larsen, T. J. (Speaker)
27 Apr 2016 → 28 Apr 2016
Activity: Talks and presentations › Conference presentations

Larsen, T. J. (Invited speaker)
27 Apr 2016 → 28 Apr 2016
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Industry meets science, Stavanger, Norway
Larsen, T. J. (Speaker)
6 Apr 2016
Activity: Talks and presentations › Conference presentations

Wind Turbine Loading
Larsen, T. J. (Invited speaker)
6 Apr 2016
Activity: Talks and presentations › Conference presentations