

Publications and reports 2012

Scientific publications and conference papers

Frøysa, Haugan and Nielsen (2012), The Norwegian Centre for Offshore Wind Energy (NORCOWE), OCEANS 2012 Yeosu (conference paper)

Bakhoday Paskyabi, Fer, Jenkins (2012), Surface gravity wave effects on the upper ocean boundary layer: modification of a one-dimensional vertical mixing model. *Continental Shelf Research* 38:63-78, 2012.

Jenkins, Bakhoday Paskyabi, Fer, Gupta, Adakudlu (2012), Modelling the effect of ocean waves on the atmospheric and ocean boundary layers. *Energy Procedia* 24, 166-175, 2012

Barstad, I., Sorteberg, A. and Mesquita, M. dS. 2012. Present and future wind power potential in Northern Europe based on down-scaled global climate runs with adjusted SST and sea-ice cover. *J. Renewable Energy*, 44, 398-405.

Fitch, A., C., Olson, J. B., LundqUoSt, J. K., Dudhia, J., Gupta, A. K., Michalakes, J. and Barstad, I. 2012. Local and mesoscale impacts of wind farms as parameterised in a mesoscale NWP model. *Month. Weather Rev.*, 140, 3017-3038.

Barstad, I. and Jenkins, A. D. 2012. Challenges in modelling offshore wind – How to address them using observations. *Modern Energy Rev.*, 4.

Eliassen, L., Jakobsen, J.B. and Ohrai C. (2012), Offshore wind profile and fatigue life of offshore wind turbines, The Proceedings of The Twenty-second (2012) International Offshore and Polar Engineering Conference, Rhodes, Greece, June 17-22, Vols. 1-4: 330-336, ISBN 978-1 880653 94-4

Eliassen, L., Knauer, A., Nielsen, F.G., and Jakobsen, J.B. (2012), Cascade Analysis of a Floating Wind Turbine, EAWC: Science of Making Torque Conference, Oldenburg, Oct 9-11.

N. Nikitas, J.H.G. Macdonald, J.B. Jakobsen, T.L. Andersen (2012), Critical Reynolds number and galloping instabilities – Experiments on circular cylinders, *Experiment in Fluids*, 52: 1295-1306.

J.B. Jakobsen, T.L. Andersen, J.H.G. Macdonald, N. Nikitas, G.L.L. Larose, M. G. Savage, B. R. McAuliffe (2012), Wind-induced response and excitation characteristics of an inclined cable model in the critical Reynolds number range, *Journal of Wind Engineering & Industrial Aerodynamics*, in press, <http://dx.doi.org/10.1016/j.jweia.2012.04.025>.

O. Mikkelsen, J.B. Jakobsen (2012), Buffeting and aeroelastic response analysis of a long-span suspension bridge in time-domain, paper for the 10th UK Conference on Wind Engineering, Southampton, September 10-12.

Tiusanen, R., Jännes, J. and Liyanage, J.P. (2012) RAMSI management model and evaluation criteria for NORDIC offshore wind assets, *VVT Technology* 47

Tiusanen, R., Jännes, J. and Liyanage, J.P. (2012) "Identification and evaluation of RAMS+I factors affecting the value-added by different offshore wind turbine concepts in Nordic context", Paper to be presented at ISOPE2012, Rhodes, Greece, June 17-22

Choux, M., Tyapin, I. and Hovland, G. (2012) "Extended Friction Model of a Hydraulic Actuated System", Annual Reliability and Maintainability Symposium (RAMS2012), Nevada, USA, Jan 23-26 2012.

Choux, M., Tyapin, I. and Hovland, G. (2012) "Leakage-Detection in Blade Pitch Control Systems for Wind Turbines", Annual Reliability and Maintainability Symposium (RAMS2012), Nevada, USA, Jan 23-26 2012.

Kostandyan, E.E. and Sørensen, J.D. (2012) "Reliability of Wind Turbine Components-Solder Elements Fatigue Failure". Annual Reliability and Maintainability Symposium (RAMS2012), Jan 23-26 2012.

Kostandyan, E.E. & J.D. Sørensen (2012): "Physics of Failure as a Basis for Solder Elements Reliability Assessment in Wind Turbines". Accepted for Reliability Engineering & System Safety

Kostandyan, E.E. & J.D. Sørensen (2012): "Weibull Parameters Estimation Based on Physics of Failure Model" to be presented at Industrial and Systems Engineering Research Conference, ISERC 2012,.

Kostandyan, E. E. & K. Ma (2012) "Reliability Estimation with Uncertainties Consideration for High Power IGBTs in 2.3 MW Wind Turbine Converter System" submitted to the European Symposium on Reliability of Electron Devices, Failure Physics and Analysis, ESREF 2012.

Kostandyan E.E., Sørensen J.D., (2012), Structural Reliability Methods for Wind Power Converter System Component Reliability Assessment, Proceedings on the 16th IFIP WG 7.5 Conference on Reliability and Optimization of Structural Systems, Yerevan, Armenia (in press).

S. Christiansen, T. Bak, and T. Knudsen, "Damping wind and wave loads on a floating wind turbine," *IEEE Transactions on Control Systems Technology* - submitted, 2012.

S. Christiansen, T. Bak, and T. Knudsen, "Minimum thrust load control for floating wind turbine," *IEEE Multi-Conference on Systems and Control*, 2012.

S. Christiansen, T. Knudsen, and T. Bak, "Extended onshore control of a floating wind turbine with wave disturbance reduction", *The Science of Making Torque from Wind* - submitted, 2012.

S. Christiansen, S. M. Tabatabaeipour, T. Bak and T. Knudsen, Wave Disturbance Reduction of a Floating Wind Turbine Using a Reference Model-based Predictive Control. Submitted to ACC 2013.

Tabatabaeipour, S. M., Odgaard, P. F., Bak, T. (2012) Fault detection of a benchmark wind turbine using interval analysis. In Proceedings of American Control Conference, pages 4387–4392.

Tabatabaeipour, S. M., Stoustrup, J. and Bak, T. (2012) Control reconfiguration of linear parameter varying systems using virtual actuator and sensors. Accepted for presentation at Safeprocess, August, Mexico City, Mexico.

Rosa, P., Casau, P., Silvestre, P., Tabatabaeipour, S. M. and Stoustrup, J. (2012) A set valued approach to FDI and FTC: Theory and implementation issues. Accepted for Presentation at Safeprocess, August, Mexico City, Mexico.

Casau, P., Rosa, P., Tabatabaeipour, S. M., Silvestre, P. and Stoustrup, J. (2012) Fault detection and fault tolerant control of wind turbines using set values observers. Accepted for presentation at Safeprocess, August, Mexico City, Mexico.

Tabatabaeipour, S. M., Odgaard, P.F., Bak, T., Stoustrup, J. (2012) Fault detection of wind turbine with uncertain parameters: A set-membership approach, *Energies*, 5(7):2224–2248.

Tabatabaeipour, S. M. (2012) Active fault detection and isolation: a set-membership approach. Submitted to *International Journal of Systems Science*.

T. Bakka, H.R. Karimi and N.A. Duffie, "Gain Scheduling for Output H^∞ Control of Offshore Wind Turbine", ISOPE 2012 – The 22nd International Offshore (Ocean) and Polar Engineering Conference & Exhibition, Greece, June 17-22, 2012.

T. Bakka, H.R. Karimi, "Mixed H_2/H^∞ Control Design for Wind Turbine Systems with Pole Placement Constraints", Proceedings of the 31st Chinese Control Conference, July 25-27, 2012, Hefei, China, p. 4775-4780.

T. Bakka, H.R. Karimi, "Robust Output Feedback H^∞ Control Synthesis with Pole Placement for Offshore Wind Turbine Systems: An LMI Approach", accepted and to be presented at the IEEE Multi-conference on Systems and Control, October 3-5 2012.

T. Bakka, H.R. Karimi, Robust H^∞ Dynamic Output Feedback Control Synthesis with Pole Placement Constraints for Offshore Wind Turbine Systems, submitted to *Mathematical Problems in Engineering*.

T. Bakka, H.R. Karimi, "Multi-objective Control Design with Pole Placement Constraints for Wind Turbine System", *Vibration Control*, ISBN 979-953-307-807-5, InTech publisher.

Nguyen, T.H., Prinz, A., Friisø, T., Nossun, R. (2012) "Smart Grid for offshore wind farms: Towards an information model based on the IEC 61400-25", *IEEE ISGT PES*, Jan 16 - 19, Washington D.C., USA .

Nguyen, T.H., Prinz, A. (2012) "Using semantics to facilitate data integration of offshore wind farms", *IEEE MELECON 2012*, Mar 25 - 28, Tunisia.

Nguyen, T.H., Rasta, K., Trinugroho, Y.B.D., Prinz, A. (2012) "Using Enterprise Service Bus for offshore wind farm data handling", *IADIS Applied Computing 2012*, Oct 19 – 21, Madrid, Spain. Accepted

Nguyen, T.H., Prinz, A., Friisø, T., Nossun, R., Tyapin, I. (2012) "A framework for data integration of offshore wind farms", submitted to *Renewable Energy*.

Sarkar, A and Gudmestad, O. T. (2012): "On the possibility of using a pendulum type liquid column damper (PLCD) for controlling the vibration of a structure - theoretical and experimental study", Submitted April 2012 to *Engineering Structures*.

Sarkar, A and Gudmestad, O.T. (2012): "Study on a new methodology proposed to install a monopile", *Proc. ISOPE, Greece. ISOPE 2012-TCP-0805*

Sarkar, A and Gudmestad, O. T. (2012): "Study on a new method for installing a monopile and a fully integrated offshore wind turbine upper structure - by using the SSIP structure", Submitted August 2012 to Journal of Marine Structures

Kjelland, M. B, Tyapin I, Hovland, G and Hansen, M.R; (2012) "Tool-Point Control for a Redundant Heave Compensated Hydraulic Manipulator", IFAC Workshop on Automatic Control in Offshore Oil and Gas Production (ACOOG 2012), Trondheim, Norway. 1. June

Kjelland, M.B and Hansen, M.R (2012) "Tool Point Tracking for Redundant Hydraulic Actuated Manipulator using Velocity Control", 7th FPNI Ph.D. Symposium on Fluid Power, Reggio Emilia, Italy. 27-30 June

Heggelund, Y., Skaar, I.M., & Jarvis, C. "Interactive design of wind farm layout using CFD and model reduction of the steady state RANS equations." Proceedings of the 11th World Wind Energy Conference, Bonn, Germany, 3-5 July 2012.

Liu, H. & Chen, Z., "Aggregated Modelling for Wind Farms for Power System Transient Stability Studies", Asia-Pacific Power and Energy Engineering Conference, March 2012, Shanghai, China

Liu, H. & Chen, Z., "Fault Ride-through and Grid Support of Permanent Magnet Synchronous Generator-based Wind Farms with HVAC and VSC-HVDC Transmission Systems", International Energy Conference & Exhibition, September 2012, Florence, Italy

Krogstad, P.-Å. and Eriksen, P.E. "Blind test" calculations of the performance and wake development for a model wind turbine, Renewable Energy 50 (2012) 225-33

Bakhoday Paskyabi, M., and I. Fer (2012), Upper ocean response to large wind farm effect in the presence of surface gravity waves, Energy Procedia, 24, 245-254.

Reuder, J., Jonassen, M. O., & Olafsson, H. (2012). The Small Unmanned Meteorological Observer SUMO: Recent developments and applications of a micro-UAS for atmospheric boundary layer research. Acta Geophysica, DOI: 10.2478/s11600-012-0042-8, OnlineFirst.

Reuder, J., & Jonassen, M. O. (2012). First results of turbulence measurements in a wind park with the Small Unmanned Meteorological Observer SUMO, Proceedings of the 9th Deep Sea Offshore Wind R&D Seminar, 19./20.01.2012, Energy Procedia, 24, 176-185.

Flügge, M, Edson, J. B., & Reuder, J. (2012). Sensor movement correction for direct turbulence measurements in the marine atmospheric boundary layer, Proceedings of the 9th Deep Sea Offshore Wind R&D Seminar, 19./20.01.2012, Trondheim, Energy Procedia, 24, 159-165.

Dahlgren, T.G., M-L Schläppy, A. Shashkov, M. Andersson, Y. Rzhannov, and I. Fer (2012). Assessing impact from wind farms at subtidal, exposed marine areas. In: Marine Renewable Energy and Environmental Interactions, Eds. M. A. Shields and A.I. L. Payne, Springer, accepted.

Reports

Hansen, T., Torvanger, Ø., Design of an Offshore Vertical Axis Wind Turbine Part 1. Rotor size and geometry of the VAWT. Internal NORCOWE Research Report

Hansen, T. (2012). Design of an Offshore Vertical Axis Wind Turbine Part 2. Energy capture and forces on the VAWT. NORCOWE Research Report

Dahlgren et al, Assessing impact from wind farms at subtidal, exposed marine areas. Internal NORCOWE Report Kippersund,

R. a., & Lohne, K. D., Ultrasonic condition monitoring of wind turbine blades, Internal NORCOWE Report Heggelund, Y., Skaar,

I. M., & Jarvis, C., CFD Model Reduction for Wind Farm Layout Assessment, Internal NORCOWE Report Prakash, R & Hansen,

T., Simulating a Model Wind Turbine using Navier-Stokes CFD -- Part two, Internal NORCOWE Report Saprónova, A.,

Forecasting wind speed with Hybrid Self Organizing Map (SOM) type artificial neural network (ANN), Internal NORCOWE Report

Saprónova, A., Intelligent Power System Grid Integration -- Literature review, Internal NORCOWE Report

Sælen, L. & Kahli, M., Modelling in FLACS Wind CMR-Wind, Internal NORCOWE Report

Sand, I.Ø. & Hallanger, A., BEM-WTM Ext to Wind Shear, Internal NORCOWE Report

Commercial results (patent applications)

Sarkar, A and Gudmestad, O T: "Pendulum type liquid column damper (PLCD) for controlling the vibration of a structure"

Sarkar, A and Gudmestad, O T: "Installation technique for an offshore structure which is afloat with external buoyancy elements, onto a single submerged foundation by the use of a float-over-pulling(FOB) method".