

DEWEK 2008, 9th German Wind Energy Conference

The World's Leading Technical Wind Energy Conference
Bremen, 26-27 November 2008

J. P. Molly; DEWI Wilhelmshaven



ENGLISH

Welcome to the 9th German Wind Energy Conference DEWEK 2008 which will take place in Bremen for the second time. The last DEWEK conference two years ago was a great success, not only because of the many interesting technical and scientific papers and posters, but also because of the excellent conditions in the Bremen Congress Centre. That's why we continue to hold the congress there and with the confidence that it will be even more attractive than two years ago. The concept to offer a compact conference for engineers and scientists lasting only two days is very successful, especially in these times where everybody has to work hard to fulfil the needs of the rapidly increasing worldwide wind energy market. Time is money and in that respect DEWEK 2008 is the best opportunity to get maximum information in a minimum of time.

We received 172 paper proposals, 12% more than last time, which clearly shows the growing importance of research and development not only in Germany but also abroad. With abstracts from 20 countries DEWEK 2008 also proves its international reputation as R&D event. In spite of the increased number of proposed papers we will stick to only three parallel sessions. The scientific committee had the not very pleasant task to shift even more papers to the poster sessions than last time, because the total of 95 oral presentations could not be exceeded. A lot of R&D work is influenced by the far-shore application in Germany, which is

strongly supported by the German federal government. Therefore it is a great pleasure for us that the Federal Minister of Environment, Nature Conservation and Nuclear Safety, Mr. Gabriel, wishes us with his welcome address a very fruitful and successful conference.

This high interest underlines that the DEWEK 2008 is really the technical/scientific market place for the current on- and offshore wind energy development. The ongoing size growth of wind turbines with the expectation of a first 10 MW wind turbine in 2010 or 2011 has led engineers and scientists nearer and nearer to the boundaries of knowledge and material properties. Research has become a must in wind energy and it is absolutely necessary if the success story of wind energy shall go on with the very large wind turbines and the offshore applications. At DEWEK 2008 we will not only feel the breath of this exciting development but also can meet the engineers and scientists involved for an interesting exchange of ideas.

The accompanying exhibition in the attractive Hanse Hall supports the transfer of information and offers the direct contact with companies and universities. In times where engineers are urgently needed by the wind energy industry, this get together at DEWEK 2008 certainly is also a good opportunity for all the young engineers to find out the best working places for their future. The entrance to the exhibition therefore is free.

Again we will provide some side events for the participants of the conference. As last time the conference dinner will take place in the old town hall of Bremen. Most of you will remember the beautiful historic hall where the dinner was served at DEWEK 2006. To offer something new the conference dinner will be held this time at the ancient wine cellar of the town hall, 600 years old and also a very impressive location with its large old wine barrels in the vault of the building. So we only can recommend to you not to miss this conference dinner.

For the day after the conference we plan to visit in our traditional one day excursion the 5 MW wind turbine of our main sponsor Bard Engineering which will be installed at a near shore place in the Jade Bay near Wilhelmshaven. This wind turbine is not only interesting because of its size but also by the new foundation type used for deep water off-shore sites.

With this large variety of interesting subjects offered, the DEWEK 2008 conference is certainly an excellent opportunity not only for the experienced wind energy experts, but also for the many newly hired employees of companies, institutes, organisations and authorities, to get a quick and concentrated overview of the current status of wind energy research and technology.

In this spirit we warmly welcome you in Bremen and wish you an interesting conference.



Jens Peter Molly
(Managing Director)



Cristina A.C. Molly
(Organisation)



Bernd Neddermann
(Scientific Committee)

Please visit the conference website under www.dewek.de . Here you will find more details about the conference, the actual floorplan of the exhibition and the exhibitor registration form.

DEWEK 2008 Preliminary Conference Programme

Lectures

26.11.2008, Wednesday

08:00 Registration in the Foyer of the Conference Hall

Opening Session

Room 1: Borgward Saal
Chairperson: J. P. Molly

09:00 Opening Address

J. P. Molly, DEWI GmbH

R&D in the Field of Windenergy in Germany

J. Nick-Leptin, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Other speakers will be published later

10:30 Coffee Break

Session No. 1: Offshore & RAVE I *

Room 1: Borgward Saal
Chairpersons: N.N.

11:00 Research goes Offshore – RAVE Activities Launched at Alpha Ventus

M. Durstewitz, B. Lange, K. Rohrig, ISET

11:15 Reduction of Input Variability Using the Natural Combination Potential of Spacious Distributed Offshore Wind Farms in the German Baltic Sea and the German Bay (D)

M. Splett, J. Bendfeld, R. Lüttig, University of Paderborn

11:30 LIDAR Technology for the German Offshore Test Site "Alpha Ventus" – Joint Project in Measurement Development

A. Rettenmeier, O. Bischoff, D. Schlipf, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart; M. Wächter, ForWind - Carl von Ossietzky University, Oldenburg; S. Rahm,

DLR; H. Mellinghoff, DEWI GmbH; B. Siegmeier, Multibrid GmbH; L. Reeder, FGW

11:45 LIDAR Measurement and Modelling of Wind Turbine Far-Wake Dynamics (E)

J.-J. Trujillo, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart; F. Bingöl, G. Larsen, J. Mann, Risø DTU National Laboratory, Denmark

12:00 Joint Technology Development for Offshore Wind Turbines – The OWEA Project at "Alpha Ventus" (E)

M. Kühn, D. Kaufer, N. Cosack, T. Lutz, J.-J. Trujillo, Endowed Chair of Wind Energy (SWE), University of Stuttgart; P. Cheetham, Century Dynamics Ltd., Horsham, UK; D. Heinemann, ForWind - Carl von Ossietzky University, Oldenburg; A. Hofmann, Multibrid GmbH; B. Mazumder, M. Seidel, REpower Systems AG; T. Neumann, DEWI GmbH; P. Schaumann, ForWind - Leibniz University Hannover

12:15 Discussion

12:45 Lunch Break

* RAVE = Research at alpha ventus offshore test site

Session No. 2: Condition Monitoring

Room 2: Kaisen Saal
Chairpersons: N.N.

11:00 Online Wind Load Estimation for Offshore Wind Energy Plants (E)

M. Klinkov, C.-P. Fritzen, University of Siegen

11:15 Estimating Fatigue Load Spectra from Standard Wind Turbine Signals (E)

N. Cosack, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart

- 11:30 **Structural and Lifetime Condition Monitoring Systems for Wind Energy Plants**
H. Lange, P.E. Concepts GmbH
- 11:45 **Design and Operation of Integrated Monitoring Systems for Offshore Wind Turbines**
R. G. Rohrmann, W. Rücker, S. Thöns, S. Said, Federal Institute for Materials Research and Testing (BAM)
- 12:00 **Condition Monitoring Methods for Machine and Drive Train Components of Wind Energy Plants (E)**
P. Kraemer, C.-P. Fritzen, D. Lautenschlager, University of Siegen; U. Oertel, m-Sen GmbH
- 12:15 **Discussion**
- 12:45 **Lunch Break**

Session No. 3: Wind Resource & Measurements

Room 3: Lloyd
Chairpersons: N.N.

- 11:00 **A Study on Extreme Wind Speed in East Asia**
T. Takagi, H. Fukuda, R. Tanikawa, ITOCHU Techno-Solutions Corp, Japan; H. Matsumiya, HIKARU WIND Lab, Japan
- 11:15 **Wind Energy in Brazil - More than Necessary: Urgent**
L. Pinto, L. H. Macêdo, Engenho, Brasil; L. Fiuza, ABBEolica, Brasil
- 11:30 **Dynamic Behaviour of the Sphere Anemometer**
H. Heißelmann, M. Hölling, J. Peinke, ForWind, Oldenburg
- 11:45 **Comparison of Lidars, German Test Station for Remote Wind Sensing Devices**
A. Albers, A. W. Janssen, J. Mander, Deutsche WindGuard Consulting GmbH
- 12:00 **SEEWIND – Wind Energy Research from Bora to Koshava**
H. Winkelmeier, Energiewerkstatt, Austria; R. Cattin, Meteotest, Switzerland; P. Spengemann, DEWI GmbH
- 12:15 **Discussion**
- 12:45 **Lunch Break**

Session No. 4: Offshore Wind Conditions

Room 1: Borgward Saal
Chairpersons: N.N.

- 13:45 **Investigation of the Potential Improvement of Offshore Wind Power Forecast Based on Ensemble Weather Prediction by Using Offshore Specific Parameters**
Ü. Cali, Y.-M. Saint-Drenan, B. Lange, L. von Bremen, ISET; C. Möhren, J. Jørgensen, WEPROG
- 14:00 **Offshore Wind and Turbulence Characteristics – New Insights from the FINO 1 Data (D)**
S. Emeis, M. Türk, FZ Karlsruhe, IMK-IfU
- 14:15 **Evaluation of Current Offshore Wind Design Parameters from FINO 1-Data (Final Report on the OWID-Research Project)**
T. Neumann, DEWI GmbH; V. Riedel, DEWI North America Inc., Canada; K. Grigutsch, DEWI-OCC; M. Türk, FZ Karlsruhe, IMK-IfU
- 14:30 **Fine Tuning of Commonly Used Wake Models Using Data of a Large Offshore Wind Farm in the UK**
A. Gill, RWE Innogy GmbH, UK; J. Rosen, RWE Innogy GmbH; Tobias Hait, DEWI GmbH; Volker Riedel, DEWI North America Inc., Canada
- 14:45 **Five Years Operation of the First Offshore Wind Research Platform in the German Bight – Fino 1**
T. Neumann, A. Beeken, DEWI GmbH
- 15:00 **Discussion**
- 15:30 **Coffee Break**

Session No. 5: New Developments

Room 2: Kaisen Saal
Chairpersons: N.N.

- 13:45 **New Connections for Sandwich Towers of Wind Energy Converters**
P. Schaumann, C. Keindorf, ForWind - Leibniz University Hannover
- 14:00 **New Direct Drive Turbine Using Advanced Cooling with Evaporating CO₂ (D)**
B. Theobald, F. Klinger, University of Applied Sciences of Saarland

- 14:15 **REpower 3.xM104 – The next Evolutionary Step of Onshore Turbine Technology (E)**
O. Kijas, C. Draheim, A. Trede, REpower Systems AG
- 14:30 **Controls for Load Reduction (E)**
M. Städler, GE Energy; K. Pierce, GE Energy, USA
- 14:45 **InVentus – Technology Development of a Wind Driven Vehicle Using a Horizontal Axis Wind Turbine**
J. Lehmann, A. Miller, M. Capellaro, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart
- 15:00 **Discussion**
- 15:30 **Coffee Break**

Session No. 6: Simulation Wind Turbine

Room 3: Lloyd
Chairpersons: N.N.

- 13:45 **Modelling of a Hydraulic Pitch System in Matlab/Simulink and Integration into Simulation Code Flex5**
J. P. Otto, DeWind Inc.
- 14:00 **Advanced Drivetrain Simulation - Wind**
F.-D. Krull, Eickhoff Antriebstechnik GmbH; R. Hambrecht, Repower Systems AG
- 14:15 **Numerical Flow Simulation of a Horizontal Axis Wind Turbine Rotor to Investigate the Potential of Improving the Operating Performance under Use of Different Aerodynamic Modifications**
S. Wittig, cp.max Rotortechnik GmbH Co. KG
- 14:30 **Efficient Modelling of the Drive Train Dynamics in Wind Turbines**
M. Kochmann, M. Ristow, Germanischer Lloyd Industrial Services, Wind Energy
- 14:45 **CFD Analysis of HAWT - validation of the WMB method**
S. Gómez-Iradi, G.N. Barakos, The University of Liverpool, UK; X. Munduate, National Centre for Renewable Energy, CENER, Spain
- 15:00 **Discussion**
- 15:30 **Coffee Break**

Session No. 7: Wind Behaviour

Room 1: Borgward Saal
Chairpersons: N.N.

- 16:00 **Change of Wind Speed in Europe in Regional Climate Model Scenario Projections**
B. Hennemuth, H.-D. Hollweg, Max-Planck-Inst. for Meteorology
- 16:15 **CFD Modeling of the Vertical Wind Profile and the Turbulence Structure above Complex Terrain and Validation with SODAR and LIDAR Measurements (E)**
S. Bourgeois, R. Cattin, Meteotest, Switzerland; H. Winkelmeier, Verein Energiewerkstatt, Austria; I. Locker, The Natural Power Consultants, UK; A. Gravdahl, WindSim, Norway
- 16:30 **Weather Derivatives for Hedging the Loss on Wind Power Energy Businesses Caused by Prediction Errors (E)**
Y. Yamada, University of Tsukuba, Japan
- 16:45 **Increasing Power Wind Generation Through Optimization of the Dynamics of Control System Based on Accurate Forecasting of the Very Short-Term Wind**
P. Costa, Instituto Politécnico de Viana do Castelo, Portugal; A. Carvalho, A. P. Martins, Universidade do Porto, Portugal
- 17:00 **Wind Flow Recirculation Downwind of a Forested Slope: A Turbine Failure Case Study**
C. Abiven, Natural Power Consultants Ltd, France
- 17:15 **Discussion**

Session No. 8: Power Performance

Room 2: Kaisen Saal
Chairpersons: N.N.

- 16:00 **Review and Analysis of Wind Farm Operational Data. Validation of the Predicted Energy Yield of Wind Farms Based on Real Energy Production Data.**
P. Spengemann, DEWI GmbH; V. Borget, DEWI France
- 16:15 **Influences of Vertical Wind Profiles on Power Performance Measurements**
U. Bunse, H. Mellinghoff, DEWI GmbH

- 16:30 **Operational Follow-up of Wind Turbines through the Analysis of 10-Minutes Production Data**
V. Borget, DEWI France; K. Moennich, DEWI GmbH
- 16:45 **Modelling of Turbulence Effect on Wind Turbine's Power Curve (E)**
D. Miguel, F. X. Sanz, M. Canal, L. Feigl, Ecotècnia ALSTOM POWER SYSTEMS WIND, Spain
- 17:00 **Dynamical Power Curve Estimation Using Different Anemometer Types (E)**
M. Wächter, J. Gottschall, J. Peinke, ForWind, Oldenburg; A. Rettenmeier, Endowed Chair of Wind Energy (SWE), University of Stuttgart
- 17:15 **Discussion**

Session No. 9: Grid Technology

Room 3: Lloyd

Chairpersons: N.N.

- 16:00 **Upgrading the Grid for Wind Energy – Optimization Before Reinforcement Before Building New Lines (E)**
L. Jarass, University of Applied Sciences Wiesbaden; G. M. Obermair, University of Regensburg
- 16:15 **Status and Development of LVRT Tests (E)**
J. Möller, K. Nohme, WINDTEST Kaiser-Wilhelm-Koog GmbH
- 16:30 **Offshore Grid Infrastructure with Gas Insulated Transmission Lines**
A. Drews, D. Heinemann, K. Köbke, ForWind - Carl von Ossietzky University, Oldenburg; L. Hofmann, C. Rathke, M. Siebert, P. Schaumann, ForWind - Leibniz University Hannover; H. Koch, D. Kunze, Siemens AG; H. Lohrenscheid, F. Wendt, ILF Consulting Engineers
- 16:45 **The New Technical Codes for Generators in German Distribution Networks – A Sound Basis for Further Growth of Renewable Energy Sources and Distributed Generation**
T. Kumm, VDE FNN; J. Bömer, K. Burges, Ecofys Germany GmbH; W. Bartels, RWE WVE Netzservice GmbH
- 17:00 **Bulk Power Transmission with HVAC Four-Core Submarine Cables**
H. Brakelmann, J. Brüggmann, A. Jensen, J. Stammen, University Duisburg-Essen
- 17:15 **Discussion**

Poster Exhibition with Authors Present

Room 4: Foyer, Poster Session - 17:30-19:00

The authors will be available for discussion of their posters and answering of questions. A simultaneous translation is not available.

DEWI-OCC Reception

Room 4: Foyer, Poster Session - 17:30-19:00

During the poster presentation, the DEWI-OCC will hold a reception for all conference participants and exhibitors.

Conference Dinner

Location: Bremer Ratskeller - 20:00

Bremer Ratskeller, Am Markt, 28195 Bremen

Tel: 0421/321676

www.ratskeller-bremen.de

27.11.2008, Thursday

- 08:00 **Registration in the Foyer of the Conference Hall**

Session No. 10: Windpower Forecasting

Room 1: Borgward Saal

Chairpersons: N.N.

- 08:30 **Short-Term Wind Power Prediction for Complex Terrain: Evaluating Different Downscaling Methods for Switzerland**
S. Dierer, B. Schaffner, J. Remund, METEOTEST, Switzerland; V. Stauch, C. Hug, Federal Office of Meteorology and Climatology (MeteoSwiss), Switzerland

- 08:45 **Introduction of a 3-Hour Short-Term Prediction Technique of Wind Speed**

M. Abderrazzaq, Yarmouk University, Jordan

- 09:00 **Improving Short-Term Forecast by Using Statistically-Corrected Wind Fields and Classification of Weather Situation**

A. Wessel, J. Dobschinski, B. Lange, ISET e.V.; J. Jiang, ForWind; A. Conz, H. Werner, Universität Kassel

- 09:15 **Estimation of Wind Power Prediction Intervals Using Stochastic Methods and Artificial Intelligence Model Ensembles**

J. Dobschinski, A. Wessel, B. Lange, K. Rohrig, Y. M. Saint-Drenan, ISET e.V.

- 09:30 **Optimized Ensemble Forecast Systems applied to Wind Power Prediction**

T. Petroligis, J. Tambke, ForWind - Carl von Ossietzky University Oldenburg; R. Hagedorn, ECMWF - European Centre for Medium-Range Weather Forecasts, UK

- 09:45 **Discussion**

- 10:15 **Coffee Break**

Session No. 11: Rotor Blade

Room 2: Kaisen Saal

Chairpersons: N.N.

- 08:30 **Can Small Rotor Blades Learn from the Large Ones and Where are the Differences? (E)**

H. Seifert, University of Applied Sciences Bremerhaven, fk-wind

- 08:45 **Testing of Rotor Blades of Wind Turbines**

F. Bürkner, A. M. van Wingerde, H.-G. Busmann, Fraunhofer Center for Wind Energy an Maritime Engineering (CWMT)

- 09:00 **Bend Twist Coupled Wind Turbine Blades: Modelling and Optimization (E)**

M. Capellaro, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart

- 09:15 **Rotor Blade Defect Detection Using Thermal and Ultrasonic Waves**

J. Aderhold, P. Meinlschmidt, H. Brocke, Fraunhofer Wilhelm-Klauditz-Institute for Wood Research (WKI); A. Jüngert, Institute of Construction Materials (IWB), University of Stuttgart

- 09:30 **Influence of Loads and Environmental Conditions on Material Properties over the Service Life of Rotor Blades**

F. Sayer, F. Bürkner, A. M. van Wingerde, H.-G. Busmann, Fraunhofer Center for Wind Energy an Maritime Engineering (CWMT); H. Seifert, University of Applied Science Bremerhaven, fk-wind

- 09:45 **Discussion**

- 10:15 **Coffee Break**

Session No. 12: Application

Room 3: Lloyd

Chairpersons: N.N.

- 08:30 **Structured Investment: Country Wide Portfolio Analysis (D)**

J. Sander, Sander + Partner GmbH, Switzerland

- 08:45 **Assessment of the Acoustic Noise Issues of Wind Farm Projects in the Light of the Experience Gained in Germany**

P. Dutilleux, J. Gabriel, DEWI GmbH

- 09:00 **Appropriate Failure Statistics and Reliability Characteristics**

S. Faulstich, B. Hahn, K. Rafik, ISET e.V.; H. Jung, IZP Dresden

- 09:15 **Safe Operation of Offshore Wind Energy Plants under Extreme Conditions**

B. Grashorn, U. Barth, University of Wuppertal - Methods of Safety Engineering and Incident Research

- 09:30 **The Influence of Wind Turbines on Radar Systems (Evaluation Methods and Solutions)**

A. Frye, EADS - Military Air Systems

- 09:45 **Discussion**

- 10:15 **Coffee Break**

Session No. 13: Offshore Foundation

Room 1: Borgward Saal

Chairpersons: N.N.

- 10:45 **Wave Loads on Large-Sized Concrete Foundations**

S. Kromminga, J. Grünberg, Leibniz Universität Hannover; J. Göhlmann, grbv, Ingenieure im Bauwesen GmbH & Co. KG

- 11:00 **First Experience with an Offshore Tripile Foundation**

A. Mitzlaff, IMS Hamburg; A. Baraev, A. Krüger, BARD Engineering GmbH; M. Bruhn, Cuxhaven Steel Construction

- 11:15 **Integrated Design of Offshore Wind Turbines for Compensation of Site Variability (E)**
T. Fischer, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart; U. Andersen, Denmark's Technical University (DTU), Denmark; A. Tono, University of Padua, Italy
- 11:30 **Support Structures for Offshore Wind Turbines - A Holistic Design Concept -**
R. Rolfes, P. Schaumann, T. Schlurmann, L. Lohaus, M. Achmus, G. Haake, Leibniz Uni. Hannover; H. Huhn, Fraunhofer-Gesellschaft
- 11:45 **Non-linear Modelling of Offshore Wind Turbine Foundations**
J. A. Nichols, T. R. Camp, Garrad Hassan & Partners Ltd., UK
- 12:00 **Discussion**
- 12:30 **Lunch Break**

Session No. 14: Design Loads

Room 2: Kaisen Saal
Chairpersons: N.N.

- 10:45 **PROTEST – Procedures for Testing and Measuring Wind Energy Systems, Drive Train Case Study**
H. Söker, R. Klosse, DEWI GmbH; J. Winkelmann, J. B. Franke, SUZLON Windkraft GmbH; J. Peeters, Hansen Transmissions Intern. nv, Edegem, Belgium; S. Hauptmann, Endowed Chair of Wind Energy (SWE), University of Stuttgart
- 11:00 **Assessment of Computational Approaches for the Evaluation of Dynamic Wind Turbine Loads by Comparison to Experimental Data (E)**
A. Heege, J. Betran, L. Bastard, L. Lens, J. L. Sanchez, SAMTECH Iberica, Spain; D. Castells, J. Puigcorb , ALSTOM Ecot cnia, Spain
- 11:15 **Strategy for User Orientated Simulation of Large Drive Trains to Calculate Realistic Load Conditions**
B. Schlecht, T. Rosenl cher, T. H hnel, M. H fgen, Technische Universit t Dresden
- 11:30 **Application of Load Generator Waveloads 2.0 in OWEC Simulation Frameworks**
T. Kossel, M. Kohlmeier, W. Zielke, Leibniz Universit t Hannover
- 11:45 **Turbulence Classification of Load Data by the Frequency and Severity of Wind Gusts**
O. Mo nux, K. Bleibler, DEWI GmbH
- 12:00 **Discussion**
- 12:30 **Lunch Break**

Session No. 15: Grid Integration

Room 3: Lloyd
Chairpersons: N.N.

- 10:45 **Characterisation and Modelling of the Variability of Power Output from Aggregated Wind Farms**
C. Quintero, K. Knorr, B. Lange, ISET e.V.; H.-G. Beyer, Hochschule Magdeburg-Stendal
- 11:00 **Integration of Large Wind Farms into the Power Supply System**
M. Wolff, R. Mackensen, B. Lange, B. Valov, ISET e.V.; D. Braams, Enercon GmbH R&D; S. Heier, Universit t Kassel; M. Rosin, E.ON Netz GmbH; C. Scholz, Vattenfall Europe Transmission GmbH; K. Biermann, Deutscher Wetterdienst
- 11:15 **Facilitating Massive Wind Power Integration in Europe by Improvements in Interconnection and Power Market Design (E)**
F. Van Hulle, EWEA, Belgium
- 11:30 **Network and Dispatch Implications of Extreme Wind Penetrations: Findings of the Irish "All Islands Grid Study"**
K. Burges, C. Nabe, Ecofys
- 11:45 **Environmental Assessment of High-Voltage Overhead Power Lines and Underground Cables in the German Coastal Region**
J. Rassmus, GFN mbH Kiel; and other
- 12:00 **Discussion**
- 12:30 **Lunch Break**

Session No. 16: Offshore & Rave II *

Room 1: Borgward Saal
Chairpersons: N.N.

- 13:30 **Prospects of a Collective Pitch Control by Means of Predictive Disturbance Compensation Assisted by Wind Speed Measurements (E)**
D. Schlipf, M. K hn, Endowed Chair of Wind Energy (SWE), University of Stuttgart

* RAVE = Research at alpha ventus offshore test site

- 13:45 **Wind Turbine Simulation Using a Coupled Free Wake and Multibody System Code**
S. Hauptmann, D. Kaufer, M. K hn, Endowed Chair of Wind Energy (SWE), University of Stuttgart
- 14:00 **Coupled Fluid-Structure Simulations of a Wind Turbine Rotor**
S. Streiner, Aero Dynamik Consult GmbH; S. Hauptmann, M. K hn, E. Kr mer, Endowed Chair of Wind Energy (SWE), University of Stuttgart
- 14:15 **A Pattern Recognition Approach to Analyse and Predict Wind Turbine Operating Characteristics Using SCADA Data**
T. Kr mer, F. Fe ber, Deutsche Windguard Dynamics; N. Ehlers, Technical University of Berlin
- 14:30 **Damage Identification of Structural Components of Offshore Wind Energy Plants (E)**
P. Kraemer, C.-P. Fritzen, University of Siegen
- 14:45 **Discussion**
- 15:15 **Coffee Break**

Session No. 17: Icing

Room 2: Kaisen Saal
Chairpersons: N.N.

- 13:30 **Measures Needed for the Successful Development of Wind Energy in Icing Climates**
G. Ronsten, WindREN, Sweden; B. E. K. Nygaard, The Norwegian Meteorological Institute, Norway; L. Makkonen, VTT, Finland; S. Dierer, Meteotest, Switzerland
- 13:45 **IEA Wind RD&D Task 19 – Wind Energy in Cold Climates**
E. I. Baring-Gould, NREL, USA; M. Durstewitz, ISET e.V.; R. Horbaty, ENCO, Switzerland; T. Laakso, P yry Energy, Finland; A. Lacroix, NRCan, Canada; E. Peltola, T. Wallenius, VTT, Finland; G. Ronsten, WindREN, Sweden; L. Tallhaug, Kjeller Vindteknikk, Norway
- 14:00 **Two Years of Monitoring of a Wind Turbine under Icing Conditions (E)**
R. Cattin, S. Kunz, A. Heimo, M. Russi, G. Russi, Meteotest, Switzerland
- 14:15 **Evaluation of Operational Data in Respect to Production Losses due to Icing**
A. Westerhellweg, DEWI GmbH
- 14:30 **Wind Turbine Rotor Ice and Lightning Detection and Measurement System (E)**
P. Rhead, M. Volanthen, M. Osborne, Insensys, UK
- 14:45 **Discussion**
- 15:15 **Coffee Break**

Session No. 18: Grid Management

Room 3: Lloyd
Chairpersons: N.N.

- 13:30 **Storage Potentials of Compressed Air Energy Storage Powerplants in Northern Germany**
U. Ehlers, WKN AG
- 13:45 **More Benefit from Renewable Energies Sources by Combination with Storage Devices and Cogeneration**
R. Mackensen, M. Speckmann, ISET e.V.
- 14:00 **Analysis of the Contribution of Load Management to the Cost Efficient Balancing of Wind Energy and the Mitigation of Grid Congestions (E)**
M. Klobasa, F. Sensfuß, Fraunhofer Institute for Systems and Innovations Research; T. Erge, B. Wille-Hausmann, Fraunhofer Institute for Solar Energy Systems
- 14:15 **Simulation of Time Series of Wind Power Output with 48 GW of Wind Power in Germany by 2020**
K. Knorr, D. Callies, B. Lange, K. Rohrig, ISET e.V.
- 14:30 **The Benefits of Wind – Hydro Regimes Complementarity to the Brazilian Interconnected System**
L. L. Sampaio, M. A. G. Drummond, J. H. G. Lima, S. F. Silva, Brazil
- 14:45 **Discussion**
- 15:15 **Coffee Break**

Session No. 19: Offshore

Room 1: Borgward Saal
Chairperson: J. P. Molly

- 15:45 **First Results of the Netherlands' Offshore Wind Energy Programme We@Sea (E)**
H. J. M. Beurskens, C. A. Westra, ECN and We@Sea Foundation, Netherlands

- 16:00 **Analysis of Logistics as a Competitive Factor in Offshore Wind Energy**
K. Lange, H. Schütt, Institute of Shipping Economics and Logistics Bremen; R. Heidmann, Logistik Service Agentur, Bremerhaven
- 16:15 **How to Build an Offshore Wind Farm?**
J.-J. Kuhlmann, Vestas Offshore A/S, Denmark
- 16:30 **Dynamic Simulation of the 'BARD Offshore 1' Wind Power Plant**
R. L. Hendriks, R. Völzke, Siemens AG; H. Roß, BARD Engineering GmbH; W. L. Kling, Delft University of Technology, Netherlands; F. Schwimmbeck, LOHER GmbH
- 16:45 **Optimizing the Offshore Wind Farm System's Performance (E)**
S. Greiner, H. Albers, Hochschule Bremen, Institut für Umwelt- und Biotechnik; T. Reck, Philotech GmbH
- 17:00 **Discussion**
- 17:15 **Closing the Conference**
J. P. Molly, DEWI GmbH

Posters

Room 4: Foyer (without simultaneous translation)

1 Application

- 1.1 **The Evaluation of Wake Effects on Output of Manjil Wind Farm**
K. Abbaspourrsani, M. Jamil, Materials and Energy Research Center (MERC), Iran; H. Golshahifar, Islamic Azad University, Iran
- 1.2 **Analysis of Proinfa Program Performance Focusing for Economic-Financial Brazilian Wind Projects Feasibility**
A. P. Petry, G. L. Piccoli, Federal University of Rio Grande do Sul-UFRGS, Brazil; J. M. L. Mattuella, Federal University of Rio Grande do Sul-UFRGS, Brazil
- 1.3 **Wind Energy in South Patagonia – Resource Measurements, Large- and Medium-Scale Grid Connections and Hybrid Systems**
R. Oliva, Universidad Nacional de la Patagonia Austral, Argentina
- 1.4 **The Modern Portfolio Theory Applied to Wind Farms Financing**
K. Mönnich, P. Spengemann, DEWI GmbH; P. Chaves, PhD Student at the University of Oldenburg, DEWI GmbH
- 1.5 **Direct Marketing of Wind Power – a Challenge**
T. Sperling, R. Hänsch, EuroWind GmbH

2 New Developments

- 2.1 **On the Influence of Assumption Errors on Bearing Life and Stress Rating**
H. Dinner, EES KISSsoft GmbH, Switzerland; M. Raabe, KISSsoft AG, Switzerland
- 2.2 **Numerical and Experimental Investigation of Spoilers and Stall Barriers in the Root Area of the Blade**
B. Gollnick, M. Petsche, C. Schubert, M. Knops, REpower Systems AG
- 2.3 **New 1 MW Turbine from VERGNET : Innovative Design for Farwind Locations**
P. Pesnel, VERGNET SA, FRANCE
- 2.4 **Mechanical Brakes for Wind Turbines Today and Tomorrow**
J. Edzards, J. Agardy, Hanning & Kahl GmbH & Co KG
- 2.5 **A Comparison Between the Impacts of PI and Fuzzy Logic Controllers on the Performance of WT Equipped with DFIG**
M. Abderrazzaq, M. Adnan Yagoup, Yarmouk University, Jordan
- 2.6 **Measurement of Length for Textile Pre-cuts in the Automated Production of Rotor-Blades**
D. H. Müller, J. H. Ohlendorf, M. Rolbiecki, K.-D. Thoben, University of Bremen, BIK; K. Schröder, University of Bremen, BIMAQ
- 2.7 **Cost Reduction for Wind Turbine Towers**
S. T. Wetzig, TEMBRA GmbH & Co. KG
- 2.8 **Epoxy-Based Matrix Systems and Adhesives for Rotor Blades**
S. Baitinger, A. Bohn, J. Bossaerts, C. W. Kensche, J. Meunier, E. J. Rühle, J.-P. Schumann, Hexion Specialty Chemicals

3 Full Size and Component Tests

- 3.1 **Influence of Material Strengths on Bearing Behaviour of Grouted Joint Connections under High-Frequent Amplitude Loading**
P. Schaumann, S. Lochte-Holtgreven, C. Keindorf, ForWind - Leibniz Universität Hannover
- 3.2 **Fatigue Analysis of a Wind Turbine Power Train**
E. El-Magd, A. Krapoth, N. Ghareeb

- 3.3 **Non-Destructive Surgery of Concrete Foundation and Concrete Towers of Wind Turbines**
H.-P. Zimmer, Concrete Care - Engineering Office Hans-Peter Zimmer
- 3.4 **Measurement of Fibre Position and Orientation in Textiles for the Production of Fibre Reinforced Plastics**
D. H. Müller; J.-H. Ohlendorf; M. Kochmann, University of Bremen, Bremen Institute for Engineering Design
- 3.5 **Out-of-Plane Waviness Influence on Tensile Properties of Uni-directional Composites**
A. S. Barros, Tecsis Tecnologia e Sistemas Avançados LTDA, Brazil; M. C. Rezende, Divisão de Materiais - AMR/IAE, Centro Técnico Aeroespacial – CTA, Brazil; E. Abramof, Laboratório Associado de Sensores e Materiais - LAS, Instituto Nacional de Pesquisas Espaciais - INPE, Brazil
- 3.6 **Certification of Wind Energy Converters with Enhanced UVRT Options**
K.-H. Weck, Zertifizierungsstelle der FGH e.V.; M. Schellschmidt, M. Kruse, ENERCON GmbH
- 3.7 **Investigations on Cross Talk Analysis for Rotor Blade Bending Measurements**
R. Klosse, H. Söker, DEWI GmbH

4 Simulation I (Wind Turbine)

- 4.1 **Identification of Wind Turbines in Closed Loop Operation. From Constant to Three Dimensional Turbulence Wind Speed**
M. Iribas Latour, CENER, Spain; I. D. Landau, Automatic Control Dept GIPSA-LAB ENSIEG, France
- 4.2 **Simulating Dynamics, Durability and Noise Emission of Wind Turbines in a Single CAE Environment**
G. Lethé, J. De Cuyper, J. Kang, LMS International, Belgium; M. Furmann, D. Kading, LMS International, USA
- 4.3 **Dynamic Loads on a Wind Turbines Rotor in Turbulent Flows**
T. Mücke, J. Peinke, ForWind, Oldenburg
- 4.4 **Direct Numerical Simulation of a Flow Around an Airfoil Using Spectral/HP Methods**
W. Medjroubi, J. Peinke, B. Stoevesandt, University of Oldenburg
- 4.5 **Control Strategy to Reduce Dynamical Power Train Loads of Wind Turbines with a Superposed Power Control**
C. Mehler, T. Völker, B. Orlik, University of Bremen, IALB
- 4.6 **A Simplified Model for Fatigue Load Calculations of Small Wind-Turbines with Vertical Axis of Rotation**
A. P. Schaffarczyk, CEwind Schleswig-Holstein; T. Kemena, University of Applied Sciences Kiel
- 4.7 **An Optimization Tool for Wind Turbine Rotors**
M. Hänler, U. Ritschel, Windrad Engineering GmbH
- 4.8 **Optimization of a Wind Turbine Simulation Model - Case Study: Measurement Campaign GE 1.5xle at Klondike, Oregon, USA**
N. Schüll, T. Honekamp, D. Schnorrenberg, GE Wind Energy GmbH
- 4.9 **Speed Control at Below Rated Region of Stall Regulated Wind Turbine**
N. Rosmin, S. J. Watson, M. Thomson, Loughborough University, UK
- 4.10 **Loads Analysis of a Wind Turbine in Extreme Climatic Conditions in China**
H. Wei, M. Kühn, Endowed Chair of Wind Energy (SWE), University of Stuttgart; L. Mingfu, Northwestern Polytechnical University, Xian, China

5 Simulation II (Wind)

- 5.1 **Comparison of Wind Field Simulations with Wind Turbine Production Data**
E.-M. Schmitt, Windtest Grevenbroich GmbH; H.-T. Mengelkamp, anemos Gesellschaft für Umweltmeteorologie mbH
- 5.2 **Weibull Parameter Prediction and Extrapolation of Wind Speed Variation to Higher Elevations**
V. Warudkar, S. Ahmed, S. Ahmed, Maulana Azad National Inst. of Technology, India; A. Tripathi, M.Tech.- Industrial Design, Student; S. Ganesan, Ph.D. Scholar
- 5.3 **Statistical Correction of Short-Term Wind Prediction**
J. Jiang, D. Heinemann, ForWind - University of Oldenburg; L. von Bremen, A. Wessel, B. Lange, ISET e. V.
- 5.4 **Estimating Wind Resources with a General Purpose CFD Code**
B. Hillmer, DeWind Inc., Deutschland; A. P. Schaffarczyk, CEwind, University of Applied Sciences Kiel

- 5.5 International Experience with ISETs Wind Power Management System in Austria, Egypt and Italy**
Lj. Adzic, B. Lange, R. Mackensen, K. Rohrig, F. Schlögl, ISET e. V.; C. Karner, Verbund - Austrian Power Grid AG, Austria
- 5.6 Weather System Clustering for Statistical Wind Power Prediction**
N. Saleck, J. Tambke, D. Heinemann, ForWind - University of Oldenburg; F. Bertsch, Humboldt-Universität zu Berlin; L. von Bremen, ISET e. V.
- 5.7 Comparing Time Series Based Wind Power Prediction for Single Wind Farms with Prediction for Areas**
F. Bertsch, N. Saleck, D. Heinemann, ForWind - University of Oldenburg
- 6 Measurements**
- 6.2 The Role of Ultrasonic Anemometry in Wind Energy**
A. Martinez, A. Cuerva, A. Sanz-Andrés, S. Franchini, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), E.T.S.I. Aeronáuticos, Universidad Politécnica de Madrid, Spain
- 6.3 Wind Tunnel Activities to Small Wind Turbine Performance Tests and Cup Anemometer Calibrations**
J. A. V. Alé, G. C. S. Simioni, P. S. Hack, L. F. Silva, Pontifical Catholic University of Rio Grande do Sul – PUCRS, Wind Energy Center – CE-EÓLICA, Brazil
- 6.4 Numerical Techniques for Sodar Measurements Validation**
F. Castellani, A. Garinei, University of Perugia, Italy
- 6.5 Quality Assurance in Measurements in Wind Energy Applications**
K. Nolopp, DEWI GmbH
- 6.6 The LAC-URGS Wind Tunnel: The Test Facility and its Role in the Wind Energy State of the Art in Brazil**
A. M. Loredo-Souza, Federal University of Rio Grande do Sul, Brazil; A. Silva, E. Pavinatto, Petrobras, Brazil
- 7 Grid Integration and Storages**
- 7.1 Wind Energy Extension Potential in the Münsterland**
J. Bendfeld, M. Splett, J. Voss, University of Paderborn; M. Linders, RWE Energy AG; U. Wernekinck, RWE Westfalen-Weser-Ems Verteilnetz GmbH
- 7.2 Possibilities of Reducing the Feed-in Fluctuations of Offshore Wind Farms by Biogas Plants**
J. Bendfeld, M. Splett, M. Tigges, J. Voss, University of Paderborn
- 7.3 Prospective Wind Power Development and Necessary Grid Extensions in Brandenburg**
H. Schwarz, K. Pfeiffer, Brandenburg University of Technology
- 7.4 A Study on Wind Power Generation Business with Battery System**
R. Tanikawa, I. Aoki, T. Takagi, N. Hayasaki, H. Fukuda, ITOCHU Techno-Solutions Corp, JAPAN
- 7.5 EMC Measurements on Wind Turbines**
K. Herrling, WINDTEST Kaiser-Wilhelm-Koog GmbH
- 7.6 Development of Wind Power Forecasting System for the Control Area of Power System in Japan**
N. Hayasaki, I. Aoki, R. Tanikawa, H. Fukuda, T. Takagi, ITOCHU Techno-Solutions Corporation, JAPAN
- 7.7 About Wind Energy Integration in an Electrical Energy System**
O. Capatina, I. Stoian, IPA Cluj Napoca, Romania; I. Vadan, Technical University Cluj Napoca, Romania
- 7.8 Power Quality and Electrical Characteristics of Renewable Energy Systems; Can we Use the Experience of the Wind Energy?**
F. Santjer, J. Herbrandt, DEWI GmbH
- 7.9 HyWindBalance: Integrating Wind Power by Combining Wind Farms and Hydrogen Storage Systems**
H.-P. Waldl, Overspeed GmbH & Co. KG; R. Steinberger, PLANET GbR
- 8 Operational Experiences**
- 8.1 Maintenance Support by Wearable and Mobile Computing Solutions**
M. Lawo, TZI Universität Bremen
- 8.2 Overview of Wind Energy Utilization in Mongolia**
D. Gansukh, RE-Project of GTZ /Integration Umwelt & Energie GmbH; O. Bavuudorj, NREC
- 8.3 Maintenance-Free Bolting-joints because of a New Mobile and Field Capable Maintenance-Method !!!**
P. Junkers HYTORC-S
- 8.4 Storage and Security Challenges of the Alpha Ventus Research Database**
P. Beenken, S. Schwassmann, H.-J. Appelrath, OFFIS - Institute for Information Technology
- 8.5 Robot to Inspect Rotor Blades of Wind Power Plants**
N. Elkmann, T. Felsch, T. Förster, Fraunhofer Institute for Factory Operation and Automation IFF
- 8.6 The Influence of Inaccurate Ice Detection on Wind Energy Yield**
J. Reimers, IGUS ITS GmbH
- 9 Offshore**
- 9.1 Two Years Operation of Offshore Metmast Arkona Becken Südost in the Baltic**
J. Bendfeld, R. Ditscherlein, M. Splett, J. Voss, University of Paderborn; A. Higgen, J. Krieger, Thales Instruments GmbH
- 9.2 Economic Analysis of Offshore Wind farms**
M. Papalexandrou, Ecofys International BV, Netherlands
- 9.3 How can Offshore Wind Contribute to the European Energy Portfolio?**
B. Mørup, Vestas Offshore A/S, Denmark
- 9.4 Trends in Finance for Wind**
E. Sejersen, Vestas Offshore A/S, Denmark
- 9.5 Tank Test Simulations for Installation and Operation of Offshore Wind Farms**
G. Clauss, TU Berlin; A. Baraev, A. Krüger, BARD Engineering GmbH; A. Mitzlaff, IMS Hamburg
- 9.7 Seawater Cooling for Offshore Wind Energy Systems**
J. Rürup, Rittal GmbH
- 9.8 Simulation of Neutrally Stratified Offshore Boundary Layer by Large Eddy Simulations**
B. Canadillas, T. Neumann, DEWI, GmbH
- 9.9 Wave and Current Measurements for Offshore Windfarms**
J. Bendfeld, R. Ditscherlein, M. Splett, J. Voss, University of Paderborn
- 10 Monitoring**
- 10.1 High Availability of Condition Monitoring Systems in the Offshore Wind Turbines and Control Centers**
Z. Marciniak, MARC Systems GmbH
- 10.2 Condition Monitoring – One Step too Late**
M. Hansen, J. Heitmann, Karberg & Hennemann GmbH & Co.KG
- 10.3 Integrated Service Concept for Rapid and Cost-Effective Rotor Imbalance Inspection**
M. Melsheimer, J. Liersch, N. Dahlke, K. Ohde, Deutsche WindGuard Knowledge GmbH
- 10.4 Assessment and Monitoring of Offshore Wind Energy Converters**
S. Thöns, W. Rucker, R. Rohrmann, Federal Institute for Materials Research and Testing, Berlin; M. Faber, Swiss Federal Institute of Technology, Switzerland
- 10.5 Higher Efficiency of Condition Monitoring by a Component-Integrated and Active System - Methodology, System Presentation and Experience**
P. Volkmer, A. Kühl, F. Müller, D. Schollbach, D. Volkmer, IGUS ITS Innovative Systeme GmbH
- 10.6 Economic Factors of the High Availability of the Condition Monitoring Systems in the Off-Shore Wind Farms**
Z. Marciniak, MARC Systems GmbH
- 11 Influence on Environment**
- 11.1 Environmental Permit Procedures for Offshore Wind Farms in an European Context – Differences in the Environmental Impact Assessment Process between Germany and the Netherlands**
U. Schadek, G. Storz, T. Strobach, planungsgruppe grün

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