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Morgan Troedsson, Jens Rasborg, Steen A. Nielsen, Anders Olsson, Hans-Ole Olsen
Telemotoring of Wind Turbines for Your Condition-based Maintenance .................................................................................................. 1678
Edwin Becker
Stainless Steel Wind Tower Extending the Life of Wind Farms .................................................................................................................. 1679
Dilip Khatri, Uwe Rasch
Dynamic Motion Analysis of Catenary Moored Spar Wind Turbine in Extreme Environmental Condition .......................................................................................................................... 1680
A New Floating Concept - Sealock for Offshore Wind Turbines .................................................................................................................. 1681
N/A
Intelligent Wind Power Unit Applicable to Offshore Wind Farm ~ Performances and Acoustic Noise of Tandem Wind Rotor ~ .......................................................................................................................... 1683
Koichi Kuba, Toshiki Kanemoto, Nobuhiko Mihara, Youhei Hano, Akira Enishi
A Study on Influence of Heave Plate on Dynamic Response of Floating Offshore Wind Turbine System .......................................................................................................................... 1684
T. Ishihara, M. B. Waris, H. Sakegawa
A Comparison of Two Concepts for Floating Wind Turbines ........................................................................................................................ 1685
Tor Anders Nygaard, Karl Jacob Møus, Anders Myhr
The Monopod Bucket Foundation: Recent Experience and Challenges Ahead .......................................................................................................................... 1686
Christian LeBlanc, Kim Ahle, Søren A. Nielsen, Lars B. Ibsen
Synthetic Ester Fluid: A Total Solution to Offshore Transformer Technology ............................................................................................. 1687
James O'Brien
Fault Current Limitation on Offshore Wind Farm Electrical Systems ........................................................................................................ 1688
Scott Ware
Control Methods for Reducing Platform Pitching Motion of Floating Wind Turbines .................................................................................. 1689
H. Namik, K. Stol
Wind Turbines: PLM Solutions................................................................................................................................................................. 1690
Alain Floutier
Corrosion and Low Temperature Tests on Liquid-filled Transformers for Off-shore Applications ................................................................. 1691
Bram Cloet, Stefaan Tysebaert, Raymond Van Schenvensten
Model Development and Loads Analysis of a Wind Turbine on a Floating Offshore Tension Leg Platform ........................................................................................................................ 1699
D. Matha, J. Jonkman, T. Fischer, M. Kühn
Study of Viability to Implantation of Offshore Wind Parks in the Economic Sea Territories of Canary Islands .................................................................................................................................................................................. 1709
Devis Avila, Guacimara Alonso, Isidro Padron, Patricia G-Lebreros, Cesar Del Campo, Feliciano Garcia, Carlos Pérez-Labajo
Design Considerations for a Wind-powered Seawater Pump .......................................................................................................................... 1712
N. F. B. Diepeveen
Upwind Deep Water Support Structure Concept Comparison Study ........................................................................................................ 1720
W. de Vries
Offshore Wind Sector and Wind Energy Potential in Greece ........................................................................................................................ 1727
Konstantinos Gkarakis, Zacharias Spedos, Anastasios Yannopoulos, Ioannis Kiosses
Sea Bed Preparation Robot ........................................................................................................................................................................... 1737
K. Hansen, Nils Fog Gjersøe
Use of Regional Reanalysis over Europe (WindTrends) as Reference Data for Long-term Adjustments ........................................................................ 1748
Alejandro García Coque, Oriol Lacave i Clemente, Llorenç Lledó Ponsati
Wind Farm Design - When Other Wind Farms Are Close .......................................................................................................................... 1753
A. J. Brand
Comparing On-and-off-shore Aerodynamic Turbulence by Measurement ........................................................................................................ 1762
Daniela Schwab, Alois Peter Schaffarczyk
Remote Sensing Data Utilization for Offshore Wind Resource Assessment .......................................................... 1767
Seokwoo Kim, Hyun-Goo Kim, Moon-Seok Jang

Improvements in Offshore AEP Calculations ........................................................................................................ 1768
Paul van Lieshout

Systematic Wind Farm Measurement Data Reinforcement Tool for Wake Model Calibration .................................................. 1774

Comparison of Envisat/ASAR-estimated Offshore Wind Resource Maps around Shirahama with Those from Mesoscale Models MM5 and WRF ................................................................. 1784
Katsutoshi Kozai, Tersuo Ohsawa, Susumu Shimada, Yoko Takeyama, Charlotte Hasager, Merete Badger

A GIS Based Survey for Siting Offshore Wind Farms in Massachusetts ........................................................................ 1791
Meltem Duran, James Manwell, Jon McGowan

Error Factors in SAR Wind Retrieval for Inshore Areas .......................................................................................... 1801
Yoko Takeyama, Tersuo Ohsawa, Katsutoshi Kozai, Charlotte Hasager, Merete Badger

Investigation of Causes of Inaccurate Wind Speeds in WRF Simulation for and Offshore Site in Japan .................. 1811
Susumu Shimada, Tersuo Ohsawa

High-resolution Wind Data from Dynamical Downscaling: An Important Asset in Offshore Wind Research .......................................................... 1820
Michel dos Santos Mesquita, I. Barstad

A Study on Effective Usage of Mesoscale Model for Accurate Offshore Wind Simulation ........................................ 1827
Tersuo Ohsawa, Susumu Shimada, J. Tambke, B. Lange

Wave Forces on Offshore Wind Turbines with Varying Cross Section and Exposed to Asymmetrical and Breaking Waves .................................................................................................................. 1837
Helge Gravesen, Erik Damgaard Christensen, Jan Pedersen, Teit Schoenberg, Anders Helkjaer

Reference Wind Speed over the Dutch Part of the North Sea .................................................................................. 1845
A. J. Brand

Implementation of a Superelement Approach in a Design Tool for Offshore Wind Turbines with Arbitrary Support Structures .................................................................................................................. 1850
Fabian R. Vorpahl, Michael Blunk, Arno Van Wingerde, Hans-Gerd Busmann, Stefan Kleinheinsl

Offshore Transformer Platform Design for Safety .................................................................................................. 1859
Thomas Boehme, Lars Schiante Sorensen, James Brown, David Boye

Simulation Method for Joint Flexibility in Modern Offshore Support Structures .................................................... 1863
Kristina Wiemann, Louis Quesnel, Jan Wagener, Holger Huhn, Hans-Gerd Busmann

Floating Wind Turbine - Response Analysis with Rigid-body Model ........................................................................ 1869
Ivar Fylling, Knut Mo, Karl Merz, Neil Luscey

Integral Wind Turbine Design and Analysis in the Frequency Domain ........................................................................ 1878
F. J. Savenije, J. M. Peeringa

Offshore Wind Turbines and Coatings: The Perfect Match ...................................................................................... 1886
S. Armada, A. Bjørgum, O. Ø. Knudsen, C. Simon, M. Pilz

Large-eddy Simulations (LES) for Far-wake Effect Modeling of Offshore Wind Farms .................................................. 1891
Gerald Steinfeld, Siegfried Raasch, J. Tambke, J. Peinke, Detlevs Heinemann

Nonlinear Buckling Analysis of Slender Hybrid Connections in Offshore Wind Energy Converters ....................... 1901
Peter Schaumann, Stephan Lochte-Holtgreven

Scour Protection Performance of an Innovative Composite Rubber Mat at Offshore Wind Turbine Foundations .......................................................... 1910
B. J. A. Huisman, D. Rudolph, A. Kanand, M. Möschchen

Study on the Dynamic Analysis of Offshore Wind Turbine Substructures ............................................................. 1919
Kang-Su Lee, Choong-Yul Son, Mann-Eung Kim

Revisiting Monopile Design Using P-Y Curves - Results from Full Scale Measurements on Horns Rev ..................... 1926
Tue Hald, Christian March, L. Jensen, Christian LeBlanc Bakmar, Kim Ahle

Optimization of a Monopile Support Structure Using Offshore-specific Wind Turbine Controls ............................. 1936
T. Fischer, P. Rainey, Bossanyi, M. Kühn

A Geotechnical Reliability Based Method for Offshore Support Structure and Site Design ........................................ 1946
Jonathan Lewis, Jon McGowan, James Manwell

Determining the Embedded Pile Length for Large Diameter Monopiles .................................................................. 1955
Victor D. Krolis, Gerrit L. Van Der Zwaag, W. De Vries

Embodied Energy as a Metric for Assessing Foundation Types ......................................................................... 1963
Danny Bennett, Joseph Hobbs

Transformer Installations in Offshore Wind Power Farms ...................................................................................... 1973
Anders Thomsen, Anders Hjerling

An Investigation into Wind and Wave Loading on a 2MW and 5MW Offshore Wind Turbine ................................ 1979
Louise Devaney, Peter Stansby