

NAWEA 2015 Symposium Agenda

Day 0 (Pre Meeting Activities): Monday June 8th, 2015

8:00 am – 10:00 am	FAST Training Session Location: 115 Goodwin Hall Jason Jonkman Senior Engineer, National Wind Technology Center https://nwtc.nrel.gov/FAST8	
8:00 am – 5:00pm	WISDEM Training Session Location: 125 Goodwin Hall Katherine Dykes National Renewable Energy Laboratory https://nwtc.nrel.gov/WISDEM	
10:00 am – 12:00 pm	SOWFA Training Location: 115 Goodwin Hall Matthew Churchfield Senior Engineer, National Wind Technology Center https://nwtc.nrel.gov/SOWFA	
12:00 pm – 1:30 pm	Lunch (on own)	
1:30 pm – 5:00 pm	Graduate Student Symposium¹ Organizer: Matthew Lackner , University of Massachusetts, Amherst Location: Goodwin Hall	
	Session A Goodwin 155 Rif Mohamed , University of Calgary, Canada <i>Modifications to RANS Turbulence Model For Use In Urban Wind Resource Assessment</i>	Session B Goodwin 244 Casey Fontana, Wytan Carswell, Sanjay Arwade , University of Massachusetts, Amherst, Don Degroot , University of Massachusetts <i>The Role of Damping in Offshore Wind Turbine Dynamics</i>
	Pavithra Premaratne , Iowa State University, <i>Analysis of Turbine Wake Characteristics by Using Proper Orthogonal Decomposition(POD) and Triple Decomposition Methods</i>	Carl Shapiro, Luis Martinez-Tossas, Charles Meneveau, Dennice Gayme , John Hopkins University <i>Studying Wind Farm Frequency Regulation Using High Fidelity Wind Farm Simulations</i>

¹ Details and order of the presentations in the Graduate Student Symposium may change in the final program.

	<p>Miguel Talavera, New Mexico State University, Fangjun Shu, New Mexico State University <i>Experimental Study of Turbulence Influence on Wind Turbine Performance</i></p>	<p>Samuel Evans, David Bradney, Philip Clausen, The University of Newcastle, Australia <i>Structural Modelling of Blades for Small Wind Turbines</i></p>
	<p>Mohamed Hammam, University of Calgary, Canada <i>Engineering Model Off Unsteady Aerodynamics of Horizontal Axis Wind Turbines</i></p>	<p>Heather Thomson, Willett Kempton, University of Delaware <i>A Cost Benefit Analysis of Electricity Generation</i></p>
	<p>Haoxuan Yan, University of Calgary, Canada <i>Computational Modelling of Solidity Effects on Blade Elements with an Airfoil Profile for Wind Turbines</i></p>	<p>Nicholas Ward, Susan W. Stewart, Pennsylvania State University <i>An Evaluation of Power Performance for a Small Wind Turbine in Turbulent Wind Regimes</i></p>
	<p>Dongyun Shin, Daniel Cadel, Todd Lowe, Virginia Polytechnic Institute and State University <i>Flare Reduction Technique for Near-Surface Airfoil Boundary Layer Measurements with Laser Diagnostics</i></p>	<p>Siddarth Bhela, Kwa-sur Tam, Virginia Polytechnic Institute and State University <i>A Game-Theoretic Framework to Investigate the Conditions for Cooperation Between Energy Storage Operators and Wind Power Producers</i></p>
	<p>Claire Verhulst, Charles Meneveau, Johns Hopkins University <i>Characterizing Long-Time Variations in Fully Developed Wind-Turbine Array Boundary-Layers Using Proper Orthogonal Decomposition</i></p>	<p>Ryan King, Peter Hamlington, University of Colorado at Boulder, Katherine Dykes, Peter Graf, National Renewable Energy Laboratory <i>Adjoint Optimization of Wind Turbine Locations for Systems Engineering</i></p>
	<p>Jocelyn Kluger, Themis Sapsis, Alexander Slocum, Massachusetts Institute of Technology <i>Combined Offshore Wind, Wave, Storage System Power and Cost Predictions</i></p>	<p>Mamdouh Abdulrahman, David Wood, University of Calgary, Canada <i>Wind Farm Layout Optimization Considering Turbine Selection and Hub Height Variation</i></p>
4:00 pm – 6:00 pm	<p>Registration Location: Goodwin Hall Foyer</p>	
5:00 pm – 6:00 pm	<p>Welcome Reception Location: Goodwin Hall Foyer</p>	
	<p>Dinner on Your Own</p>	

Agenda NAWEA 2015 Symposium Day 1: Tuesday June 9th, 2015	
8:00 am – 9:00 am	Check-in, Registration and Continental Breakfast Location: Goodwin Hall Foyer
9:00 am – 10:30 am	Opening Session and Keynote Addresses Location: 190 Goodwin Hall Eric Paterson and William Devenport , Virginia Tech, <i>Welcome</i> Shashank Priya , Director of Materials and Sustainable Energy, Virginia Tech Maurice Jones , Secretary of Commerce and Trade, State of Virginia. Hannah Hunt , American Wind Energy Association. Bob Thresher , NAWEA Director, National Renewable Energy Laboratory.
10:30 am – 11:00 am	Break – Networking and Refreshments, Posters Location: Goodwin Hall Foyer
11:00 am – 12:00 pm	Plenary Speakers Location: 190 Goodwin Hall Line Gulstad , Director at Plant Siting & Forecasting, Vestas Wind Systems A/S. <i>Driving model development through wind turbine performance – a data driven approach</i> Prof. Habib Dagher , Director, Advanced Structures and Composites Center, University of Maine. <i>Floating Offshore Wind Turbine Technology: Lessons Learned from the Deployment of the VoltturnUS 1:8</i>
12:00 pm – 1:30 pm	Lunch - Posters Location: Goodwin Hall Foyer

1:30 pm – 3:00 pm	<p>1A: Research, Development, Technology: Aerodynamics Chair: Anupam Sharma, Iowa State University Location: 115 Goodwin Hall</p>	<p>1B: Electrical Integration Chairs: Tom Acker, Northern Arizona University Paul Veers, NREL Location: 125 Goodwin Hall</p>
	<p>Anas Abdulrahim, Ezgi Anik, Oguz Uzol, METU Center for Wind Energy <i>Effects of Tip Injection and Mie Vanes on the Performance of a Model Wind Turbine Rotor</i></p>	<p>Daniel Kirk-Davidoff, MDA Information Systems LLC & University of Maryland, College Park, Stephen Jascourt, MDA Information Systems LLC <i>Simulating the Variability of Renewable Generation and Demand in RTOs at 35% Penetration</i></p>
	<p>Kenneth Brown, Nick Molinaro, Tim Meyers, Aurélien Borgoltz, William Devenport, Virginia Polytechnic Institute and State University, Jonathan Luedke, David Pesetsky, GE Power and Water <i>Sensitivity of Wind Turbine Airfoil Sections to Geometry Variations Inherent in Modular Blades</i></p>	<p>Christopher Clack, University of Colorado, Boulder, Alexander MacDonald, National Oceanic and Atmospheric Administration Anneliese Alexander, Cooperative Institute for Research in Environmental Sciences, Adam Dunbar, James Wilczak, Yuanfu Xie, National Oceanic and Atmospheric Administration <i>National Energy with Weather System (NEWS) Simulator Results</i></p>
	<p>Carlos Noyes, The University of Virginia <i>Analysis of Tower Shadow Effects on the UAE Rotor Blades</i></p>	<p>Chris Pattison, Andrew Smith, Texas Tech University, Kim Mortstock, Chris Elkinton, DNV GL, <i>Co-Location of Wind & Solar Power Plants and Their Integration Onto the US Power Grid</i></p>
	<p>Matthew Kuester, Ken Brown, Timothy Meyer, Nanyaporn Intaratep, Aurélien Borgoltz, William Devenport, Virginia Polytechnic Institute and State University <i>Aerodynamic Validation of Wind Turbine Airfoil Models in the Virginia Tech Stability Wind Tunnel</i></p>	<p>Invited Speaker: Dr. Eyad Abed, NSF, Program Director: Energy, Power, Control and Networks (EPCN), also Professor of Electrical and Computer Engineering at the University of Maryland, College Park <i>NSF Program in Energy, Power, Control and Networks (EPCN)</i></p>
3:00 pm – 3:30 pm	<p>Break – Networking and Refreshments, Posters Location: Goodwin Hall Foyer</p>	
3:30 pm – 5:00 pm	<p>2A: Research, Development, Technology: Aerodynamics Chair: Anupam Sharma, Iowa State University</p>	<p>2B Panel Session: Recognizing the Environmental and Public</p>

	<p>Location: 115 Goodwin Hall</p>	<p>Health Benefits of Wind Energy through Public Policy Chair: Suzanne Tegen, NREL Location: 125 Goodwin Hall</p>
	<p>Aaron Rosenberg, Iowa State University <i>A Fixed-Wake Vortex Line Method for Aerodynamic Analysis and Optimization of Multi-Rotor Wind Turbines</i></p>	<p>This session will consist of three presentations and a discussion on the new DOE Wind Vision, the EPA Clean Power Plan, and policies that could help attain human health and environmental benefits by supporting clean renewables. We will discuss questions such as: Do the societal benefits of the DOE Wind Vision outweigh the costs, and if so how can that be reflected in effective public policy going forward? What role can wind play in the EPA Clean Power Plan? What roles can the Southeast play in the Wind Vision and in the Clean Power Plan?</p> <p>Agenda <i>The DOE Wind Vision: Costs, Benefits and Other Impacts</i> – Ed DeMeo, Renewable Energy Consulting Services</p> <p><i>EPA Clean Power Plan and the Role of Wind</i> – Jonas Monast, Nicholas Institute for Environmental Policy Solutions</p> <p><i>Policy Options: Governors’ Wind Energy Coalition (GWC)</i> – Larry Pearce, GWC</p> <p>Panel and Audience Discussion</p>
	<p>Liselle Joseph, Virginia Polytechnic Institute and State University <i>Aerodynamic Effects of Surface Condition on Wind Turbine Blade Sections</i></p>	
	<p>Carlos Noyes, Eric Loth, Jay Fuhrman, The University of Virginia <i>Wind Turbine Tower Fairing Geometries to Decrease Shadow Effects</i></p>	
	<p>Robert Ehrmann, Marc Guadayol, Dhiraj Arora, ALSTOM Power Inc. <i>Turbine-Mounted LIDAR Validation</i></p>	
5:00 pm	<p>NAWEA Education Committee Meeting Location: 115 Goodwin Hall</p>	
6:00 pm – 7:00 pm	<p>Social Hour Location: Inn at Virginia Tech</p>	
7:00 pm – 9:00 pm	<p>Conference Banquet Location: Inn at Virginia Tech Latham Ballroom</p>	

Agenda
NAWEA 2015 Symposium
Day 2: Wednesday June 10th, 2015

8:00 am – 9:00 am	Check-in, Registration and Continental Breakfast Location: Goodwin Hall Foyer	
9:00 am – 10:00 am	Plenary Speakers Location: 190 Goodwin Hall Stewart Glegg , Director of the Center for Acoustics and Vibration, Florida Atlantic University. <i>The Impact Of Offshore Wind Turbines on Underwater Ambient Noise Levels.</i> Jim Manwell , Director of the Wind Energy Center, University of Massachusetts, Amherst.	
10:00 am – 10:30 am	Break – Networking and Refreshments, Posters Location: Goodwin Hall Foyer	
10:30 am – 12:00 pm	3A: Research, Development, Technology: Acoustics Chair: Jon Luedke, G E Power & Water Location: 115 Goodwin Hall	3B: Environmental & Siting: Effect on the Wind Plant Chair: Bob Thresher, NREL Location: 125 Goodwin Hall
	Seung Joon Yang, James D Baeder , University of Maryland <i>Aerodynamics and Aeroacoustics of Spanwise Wavy Trailing Edge Flatback Airfoils: Considering Structural Benefits</i>	Hui Hu , Iowa State University <i>An Experimental Investigation on the Surface Water Transport and Ice Accreting Process Pertinent to Wind Turbine Icing Phenomena</i>
	Ian Clark, William Deavenport, W. Nathan Alexander , Virginia Polytechnic Institute and State University, Stewart Glegg , Florida Atlantic University, Justin Jaworski , Lehigh University, Conor Daly, Nigel Peake , University of Cambridge <i>Bio-Inspired Trailing Edge Noise Control</i>	Kai Wei , University of Massachusetts, <i>Impact of Hurricane Wind/Wave Misalignment on the Analysis of Fixed-Bottom Jacket Type Offshore Wind Turbines</i>
	Jinlong Wu, William Deavenport, Eric Paterson, Rui Sun, Heng Xiao , Virginia Polytechnic Institute and State University <i>Large Eddy Simulation of Trailing Edge Acoustic Emissions of an Airfoil</i>	Malika Grayson , Cornell University, <i>Optimizing Building Geometry to Increase the Energy Yield in the Built Environment</i>

	<p>Kevin Disotell, The Ohio State University Pourya Nikoueeayan, Jonathan Naughton, University of Wyoming James Gregory, Ohio State <i>Application of Fast Pressure-Sensitive Paint to an Oscillating Wind Turbine Airfoil</i></p>	<p>Brian Colle, Matthew Sienkiewicz, Stony Brook University, Cristina Archer, Dana Veron, University of Delaware <i>The IMPOWR (Improving Mapping and Prediction of Offshore Wind Resources) project: Evaluation of WRF PBL Schemes</i></p>
12:00 pm – 1:30 pm	<p>Lunch - Posters Location: Goodwin Hall Foyer</p>	
1:30 pm – 3:00 pm	<p>4A: Panel Session: Workforce Development & Education Chair: Jim Manwell, University of Massachusetts, Amherst Location: 115 Goodwin Hall</p>	<p>4B: Environmental & Siting: Effects on the Environment Chair: Bob Thresher, NREL Location: 125 Goodwin Hall</p>
	<p>Moses Kärn, <i>European Academy of Wind Energy and the European Wind Energy Master Program - Examples and Experiences in Germany and Europe</i> Tom Acker, Northern Arizona University, <i>Graduate Education Programs in Wind Energy in North America and Europe</i> Panel discussion <i>US and European Education: Next Steps for International collaboration</i></p>	<p>Patrick Gilman, DOE Wind & Water Power Technologies Office <i>Wind and Wildlife Interactions Research Issues</i></p>
	<p>Suzanne Tegen, NREL, <i>Introduction and NREL Education and Workforce Development Report</i> Remy Pangle, Jonathan Carter, Kyle Gipson Kyle, James Madison University. <i>Engaging a Multidisciplinary Group of Students in Wind Energy Education</i> Jonathan Miles, Blaine Loos, Remy Pangle, James Madison University, <i>One Team's Participation in the Inaugural Collegiate Wind Competition</i> Chris Pattison, Andrew Swift, Texas Tech University, Kim Mortstock, Chris Elkinton, DNV GL. <i>Integrating Real World Case Studies into Wind Energy Graduate Education</i> Panel discussion <i>University Programs in Wind Energy Education and NAWEA - next steps</i></p>	<p>Rob Suryan, Oregon State University <i>Design and Development of an Integrated Avian and Bat Collision Detection System for Wind Turbines</i></p>
		<p>Biswanath Samanta, Georgia Southern University <i>Noise and Vibration Issues of Wind Turbines and Their Impacts – A Review</i></p>
		<p>Katerin Ramirez, David Turcotte, University of Massachusetts Lowell <i>Sustainability of the Wind Turbine Blade Manufacturing Process: A Bio-based Alternative</i></p>

3:00 pm – 3:30 pm	Break – Networking and Refreshments, Posters <i>Location: Goodwin Hall Foyer</i>	
3:30 pm – 5:00 pm	5A: Research, Development, Technology: CFD & Analytical methods Chair: Jon Luedke , G E Power & Water <i>Location: 115 Goodwin Hall</i>	5B : Atmospheric Science & Forecasting Chair: Joel Cline , DOE <i>Location: 125 Goodwin Hall</i>
	R Ganesh Rajagopalan , Iowa State University, Kanchan Guntupalli , Sukra Helitek Pvt. Ltd. India, Mathew Fischels , Iowa State University, Luke Novak , Sukra Helitek Pvt. Ltd. India <i>An Analytical Procedure for Evaluating Aerodynamics of Wind Turbines in Yawed Flow</i>	Jiale Li, Xiong Yu , Case Western Reserve University <i>Model and Procedures for Reliable Near Term Wind Energy Production Forecast</i>
	Jiri Furst , University of Prague David Wood , University of Calgary <i>Modifications of the K-Kl-ω Transition Model Based on Pohlhausen and Falkner-Skan Profiles</i>	Jennifer Rinker, Henri Gavin , Duke University, Andrew Clifton , National Renewable Energy Laboratory <i>Temporal Coherence in Turbulent Wind Simulation and Atmospheric Data</i>
	Mazhural Islam , University of Calgary, Canada <i>CFD Analysis of NACA4415 Airfoil with $\gamma - Re_{\theta}$ Model Considering Natural Transition</i>	James Duncan, Brian Hirth, John Schroeder , Texas Tech University <i>Utilizing Radar Measured Velocity Fields to Forecast Turbine Wind Speeds</i>
	Heng Xiao, William Devenport, Rui Sun, Yu Liu , Virginia Polytechnic Institute and State University <i>A Novel Rough Wall Boundary Condition for LES of High Reynolds Number Flows</i>	James Wilczak , NOAA/ESRL, Laura Bianco, Irina Djalalova , CIRES/University of Colorado, Daniel Gottas, Paul Neiman , NOAA/ESRL, Joseph Olson , CIRES/University of Colorado <i>Meteorological Analysis of Large Power-Error Events in the Wind Forecast Improvement Project (WFIP) Data Set</i>
5:15 pm – 6:45 pm	Social Hour, Stability Wind Tunnel Tour <i>Location: Randolph Hall</i>	
7:00 pm	NAWEA Board Meeting <i>Location: 115 Goodwin Hall</i>	

Agenda
NAWEA 2015 Symposium
Day 3: Thursday June 11th, 2015

8:00 am – 9:00 am	Check-in, Registration and Continental Breakfast Location: Goodwin Hall Foyer	
9:00 am – 10:00 am	Plenary Speakers Location: 190 Goodwin Hall Joel Cline , Program Manager, Department of Energy Headquarters – Wind and Water Power Program. Jim Brasseur , Professor of Mechanical Engineering, Bioengineering, and Mathematics, Penn State. <i>High Performance Computing Analysis of Wind Turbine Response to Atmospheric Eddy Passage</i>	
10:00 am – 10:30 am	Break – Networking and Refreshments, Posters Location: Goodwin Hall Foyer	
10:30 am – 12:00 pm	6A: Research, Development, Technology: Advanced Methods Chair: Anupam Sharma, Iowa State University Location: 115 Goodwin Hall	6B: Atmospheric Science & Forecasting Chair: Joel Cline, DOE Location: 125 Goodwin Hall
	Lin Ma, Suhyeon Park , Virginia Polytechnic Institute and State University <i>Non-Intrusive Sensing of Air Velocity, Humidity, and Temperature Using Tunable Diode Laser Absorption Spectroscopy</i>	Melinda Marquis , NOAA/ESRL, Joseph Olson , James Kenyon , Yelena Pichugina , Aditya Choukulkar , Robert Banta , Univ. of Colorado/CIRES and NOAA/ESRL James Wilczak , NOAA/ESRL Laura Bianco , Irina Dlalalova , Katherine McCaffrey , Univ. of Colorado/CIRES and NOAA/ESRL, Richard Eckman , NOAA/ARL, Jacob Carley , I.M. Systems Group and NOAA/NCEP, Joel Cline , DOE Wind and Water <i>Wind Forecast Improvement Project2, Improving Model Physics in Complex Terrain – NOAA’s Plans for Improving the Rapid Refresh and High Resolution Rapid Refresh Models</i>

	<p>Xin Lei, Peter Sandborn, Navid Goudarzi, Roozbeh Bakhshi, Amir Kashani-Pour, University of Maryland-CALCE <i>Using Maintenance Options to Optimize Wind Farm O&M</i></p>	<p>Yelena Pichugina, Colorado University, Boulder/NOAA, Robert Banta, Alan Brewer, NOAA, Aditya Choukulkar, Colorado University/NOAA, Melinda Marquis, NOAA, Michael Hardesty, Ann Weickmann, Colorado University, Boulder/NOAA, Scott Sandberg, NOAA <i>Offshore Low-Level Jet Properties from Offshore Lidar Measurements in the Gulf of Maine</i></p>
	<p>Todd Baert, University of Windsor Rupp Carriveau, Phil McKay, David S-K Ting, Turbulence and Energy Laboratory Robert Kent, University of Windsor <i>Windtelligence: The Development of a Wind Farm Performance Management System</i></p>	<p>Sue Haupt, National Center for Atmospheric Research <i>NCAR's Recent Advances in Wind Power Forecasting</i></p>
	<p>Daniel Cadel, K. Todd Lowe, Virginia Polytechnic Institute and State University <i>Spatially Resolved Wind Tunnel Wake Measurements at High Angles of Attack and High Reynolds Numbers Using a Laser-Based Velocimeter</i></p>	<p>Larry Berg, Atmospheric Science and Global Change Division, Ben Yang, Yun Qian, Po-lun Ma, Pacific Northwest National Laboratory, Sonia Wharton, Vera Bulaevskaya, Lawrence Livermore National Laboratory, William Shaw, Pacific Northwest National Laboratory <i>Understanding Model Uncertainty—An Application of Uncertainty Quantification to Wind Energy</i></p>
12:00 pm – 1:30 pm	<p>Lunch - Posters Location: Goodwin Hall Foyer</p>	
1:30 pm – 3:00 pm	<p>7A: Research, Development, Technology: Control Chair: Todd Griffith, SANDIA Location: 115 Goodwin Hall</p>	<p>7B: Atmospheric/Turbine/Wake Interactions Chair: James Brasseur, Penn State Location: 125 Goodwin Hall</p>
	<p>Carlo Luigi Bottasso, Stefano Cacciola, Johannes Schreiber, Technische Universitaet Muenchen <i>Detection of Wake Impingement in Support of Wind Plant Control</i></p>	<p>Xiaolei Yang, Daniel Foti, University of Minnesota, Christopher Kelley, Sandia National Laboratories, Fotis Sotiropoulos, University of Minnesota <i>Large-Eddy Simulation of Swift Turbines Under Different Wind Directions</i></p>
		<p>Peter Argyle, Simon Watson, Loughborough university <i>On the Effects of Directional Bin Size When Simulating Large Offshore Wind Farms with CFD</i></p>

	<p>Chao Qin, Eric Loth, University of Virginia Sang Lee, Patrick Moriarty, National Renewable Energy Laboratory <i>Investigation of Dynamic Loading for 13.2 MW Downwind Pre-Aligned Rotor</i></p>	<p>Walter Gutierrez, Guillermo Araya, Texas Tech University, Praju Kiliyanpilakkil, Sukanta Basu, North Carolina State University, Arquimedes Ruiz-Columbie, Texas Tech University, Murat Tutkun, Institute for Energy Technology, Kjeller, Norway, Luciano Castillo, Texas Tech University <i>Assessing the Structural Impact of Low Level Jets over Wind Turbines</i></p>
	<p>Santiago Novoa, Luciano Castillo, Texas Tech University <i>Design of Closed Loop Control for a Wind Turbine System Coupled to A CV Transmission System</i></p>	<p>Balaji Jayaraman, James Brasseur, Pennsylvania State University <i>The Forcing of Wind Turbine Rotors by True Weather Events as a Function of Atmospheric Stability State</i></p>
3:00 pm – 3:30 pm	<p>Break – Networking and Refreshments, Posters Location: Goodwin Hall Foyer</p>	
3:30 pm – 5:00 pm	<p>8A: Research, Development, Technology: Offshore Chair: Todd Griffith, SANDIA Location: 115 Goodwin Hall</p>	<p>8B: Atmospheric/Turbine/Wake Interactions Chair: James Brasseur, Penn State Location: 125 Goodwin Hall</p>
	<p>Di Zhang, Eric Paterson, Virginia Tech <i>System-Level Simulation of Floating Platform and Wind Turbine Using High-Fidelity and Engineering Models</i></p>	<p>Hui Hu, Zhenyu, Wang, Iowa State <i>A Wind Tunnel Study on the Aeromechanics of Dual-Rotor Wind Turbines</i></p>
	<p>Aristos Christou, Patrick McCluskey, Yizhou Lu, Tatiana Delorm, University of Maryland <i>Comparisons of Offshore Wind Turbine Reliability</i></p>	<p>Richard Stevens, Ben Hobbs, Johns Hopkins University, Andres Ramos, Universidad Pontificia Comillas, and Charles Meneveau, Johns Hopkins University <i>Combining Economic and Fluid Dynamic Models to Determine the Optimal Spacing in Very Large Windfarms</i></p>
	<p>Gordon Stewart, Matthew Lackner, University of Massachusetts, Amherst, Sanjay Arwade, Univ. of Massachusetts, Andrew Myers, Spencer Hallowell, Northeastern University <i>Convergence of Extreme Loads for Offshore Wind Turbine Support Structures</i></p>	<p>Ozan Tugluk, METU Center for Wind Energy, Nilay Sezer-Uzol, TOBB University of Economics and Technology, Oguz Uzol, Middle East Technical University <i>Freewake Simulation and POD Analysis of Two Non-Aligned Turbines in a Row</i></p>
	<p>Evan Gaertner, <i>Modeling Dynamic Stall for a Free Vortex Wake Model of a Floating Offshore Wind Turbine</i></p>	<p>Cristina L. Archer, Shengbai Xie, Niranjana Ghaisas, University of Delaware, Charles Meneveau, Johns Hopkins University</p>

	<i>Benefits of Vertically-Staggered Wind Turbines from Theoretical Analysis and Large-Eddy Simulations</i>
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Poster Session Contributions Location: Goodwin Hall Wednesday	
Kenneth Brown, William Devenport, Aurélien Borgoltz,	Virginia Polytechnic Institute and State University <i>Exploiting the Characteristics of Kevlar-Wall Wind Tunnels for Conventional Aerodynamic Measurements with Implications for Testing of Wind Turbine Sections</i>
Liselle Joseph,	Virginia Polytechnic Institute and State University <i>Transition Detection for Low Speed Wind Tunnel Testing Using Infrared Thermography</i>
Keonhui Kim, Moses Kang,	Chonbuk National University, Korea, Eduard Muljadi, NREL, Yong Cheol Kang, Chonbuk National University, Korea <i>Stepwise Inertial Control Scheme of a Doubly-Fed Induction Generator to Prevent a Second Frequency Dip</i>
Lin Ma, Haoting Wang, Fan He,	Virginia Polytechnic Institute and State University, <i>Thermal management of energy storage systems based on battery modules</i>
Sara Salehyar, Qiang Zhu,	University of California, San Diego <i>Coupled Time-Domain Aero-Hydro-Elastic Simulations of Offshore Floating Wind Turbines</i>
Henry Murray, William Alexander, William Devenport,	Virginia Polytechnic Institute and State University <i>Small Scale Rotor Testing to Characterize the Ingested Turbulence Into Wind Turbines</i>
Yue Wu, Qingchun Lei, Lin Ma,	Virginia Polytechnic Institute and State University <i>High Speed and Multidimensional Flow Characterization Based on Nonintrusive Optical Techniques</i>