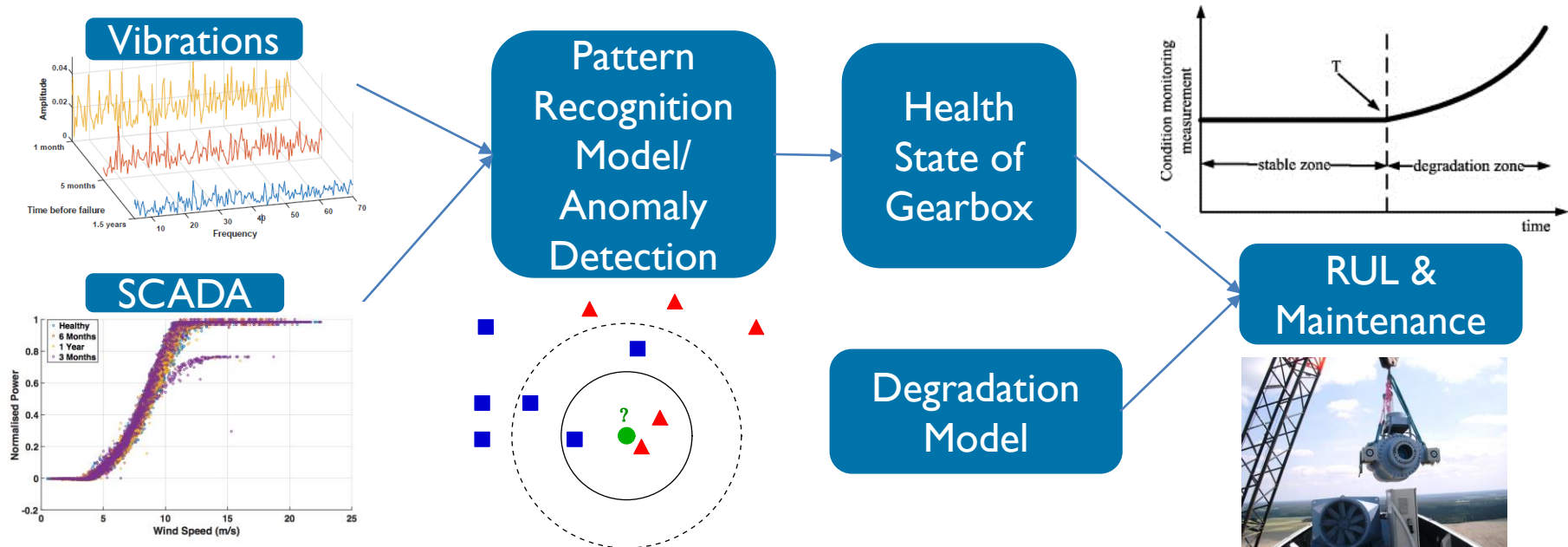
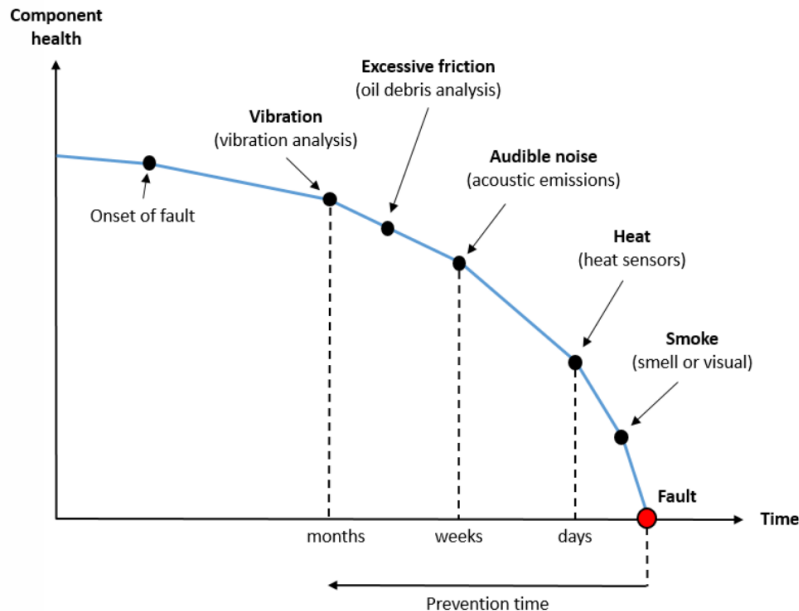


# 2<sup>nd</sup> & 3<sup>rd</sup> Year Elevator Pitches

# Failure and Remaining Useful Life Prediction of Wind Turbine Gearboxes using Condition Monitoring Data



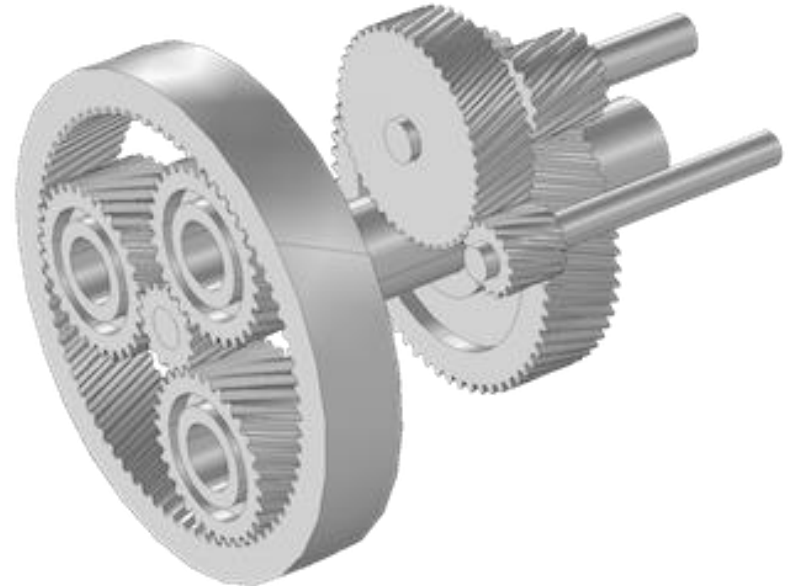
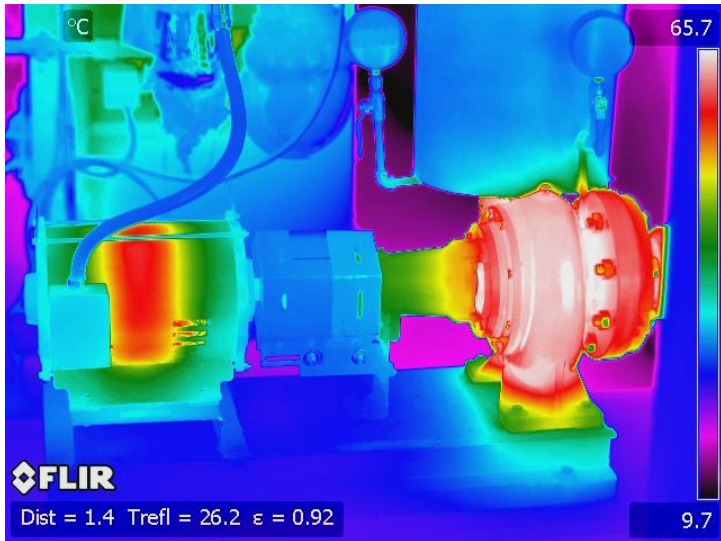
# Failure and Remaining Useful Life Prediction of Wind Turbine Generators



**Aim:** Reduce O&M costs by facilitating predictive and condition-based maintenance strategy

**Method:** Combination of vibration analysis, SCADA analysis and machine learning techniques

# Thermal Modelling of Wind Turbine Gearbox for Condition Monitoring



# Impact of Complex Wind on Wind Turbine Fatigue

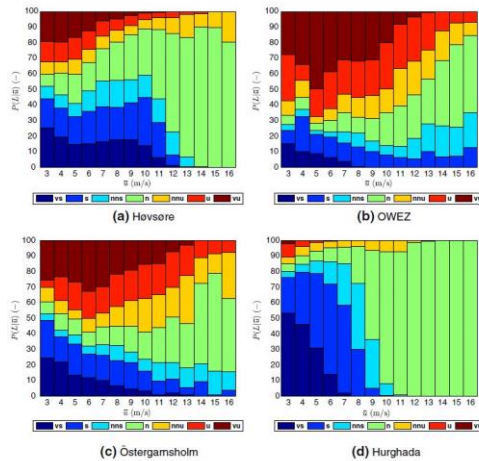


Fig 1 - Stability vs Windspeed at 4 wind farm sites<sup>[1]</sup>

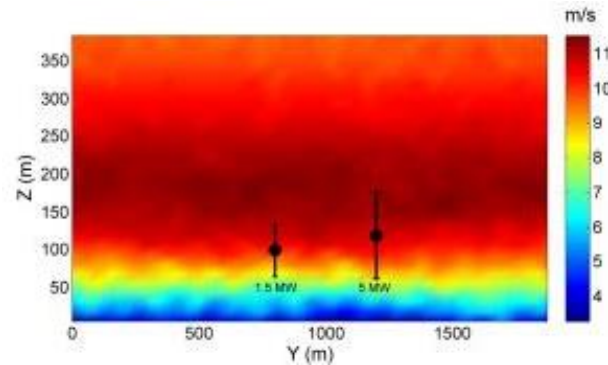


Fig 2 – LES demonstration of a low level jet<sup>[2]</sup>

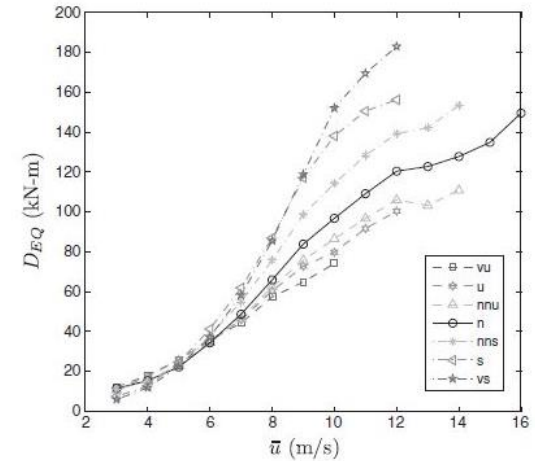


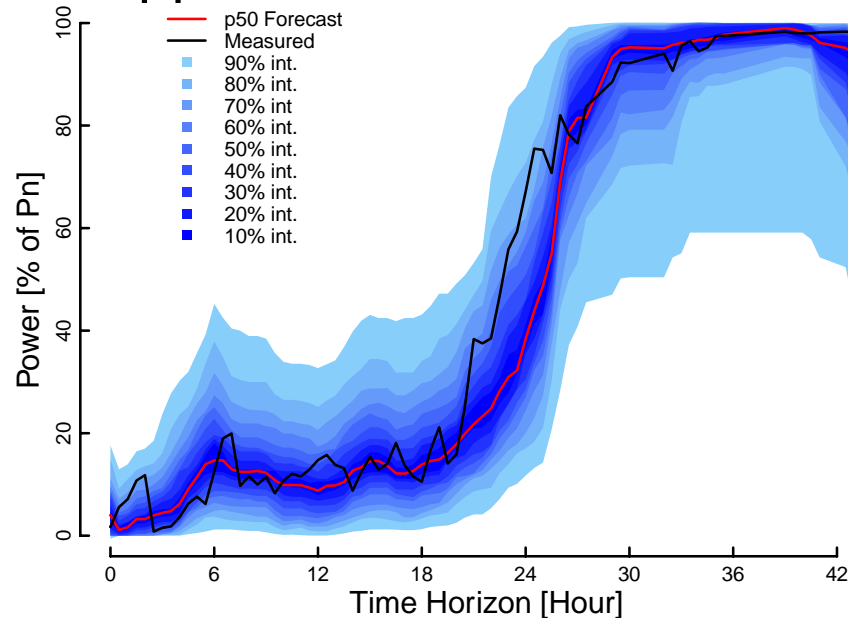
Fig 3– Stability impact on rotor loads<sup>[1]</sup>

## References

1. Ameya Sathe, J Mann, T. K. Barlas, Wim Bierbooms, and G van Bussel. Influence of atmospheric stability on wind turbine loads. *Wind Energy*, 16:1013–1032, 2013
2. Chungwook Sim, Sukanta Basu, Lance Manuel. The Influence of Stable Boundary Layer Flows on Wind Turbine Fatigue Loads. 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition 5 - 8 January 2009, Orlando, Florida

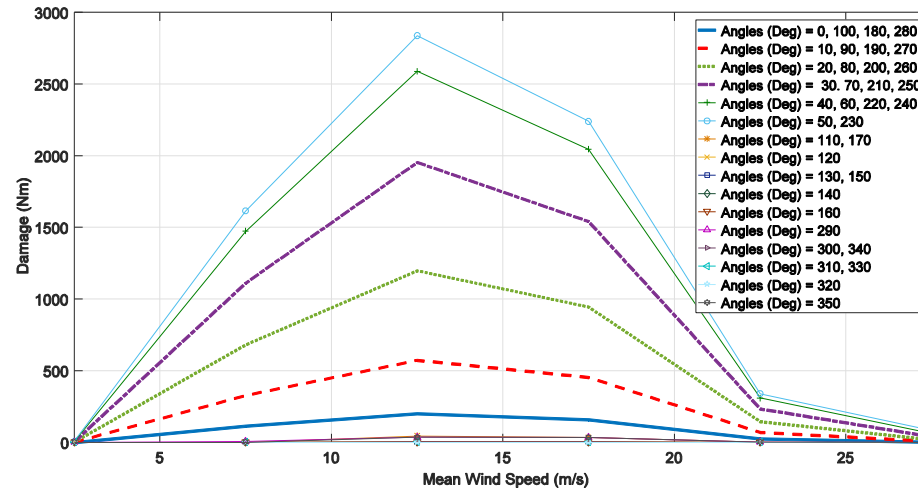
**PhD:** Topics in High Dimensional Energy Forecasting

**Poster:** A Hierarchical Approach to Probabilistic Wind Power Forecasting



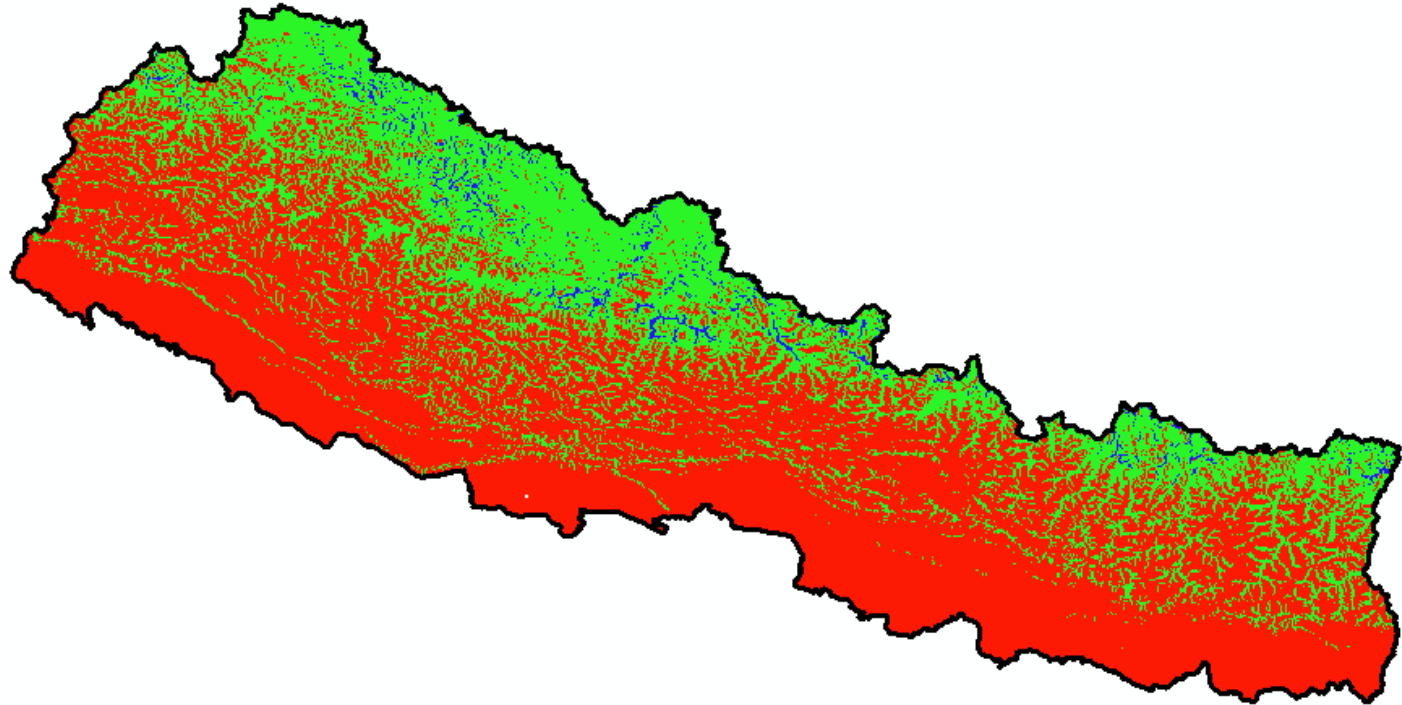
Example Probabilistic Forecast at Gordonbush wind farm

# Does the Shape of the Wind Rose Influence Wind Turbine Tower Fatigue?



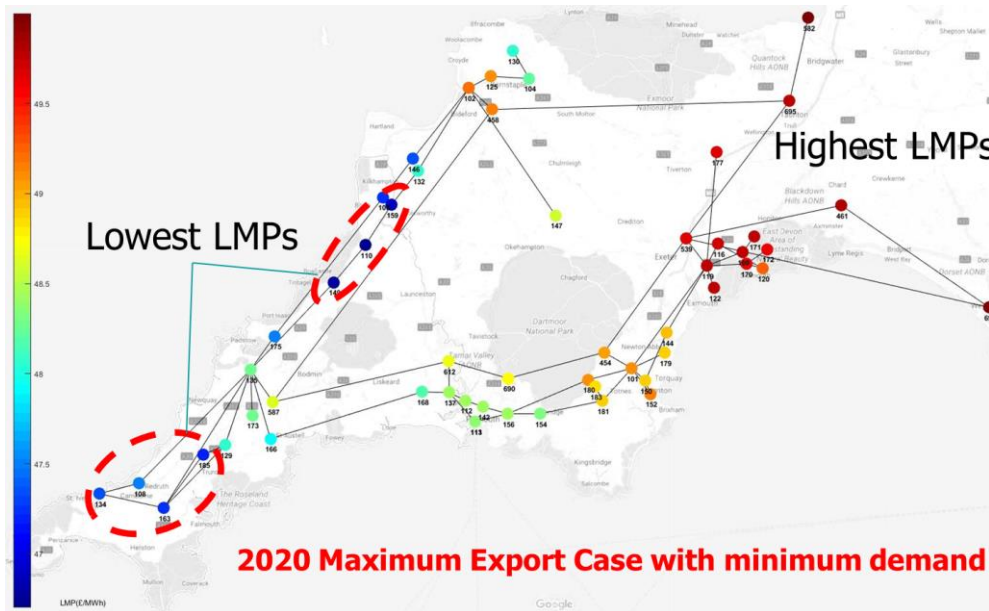
Potential applications within fatigue analysis, tower design and controller design.

# Off-grid Small Wind Turbine Market Assessment Methodology for the Developing World





# Local Electricity Market Development for Distributed Wind Generation

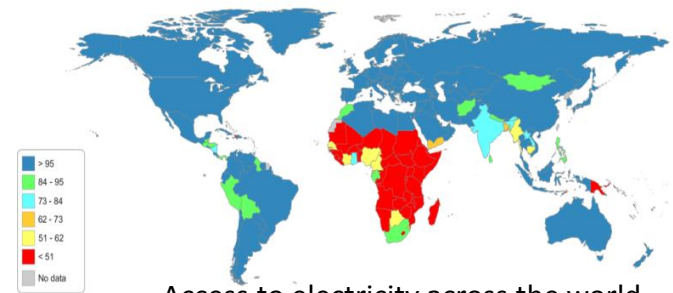


GOAL: Prove case for Locational Marginal Pricing for regional markets

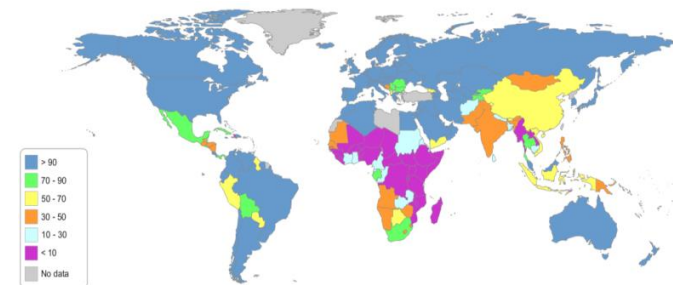
WHY: Price signals for subsidy free renewables and storage.

# Ifeoluwa Garba

Impact of optimised energy systems and policies on sustainable urban development in developing countries.



Access to electricity across the world

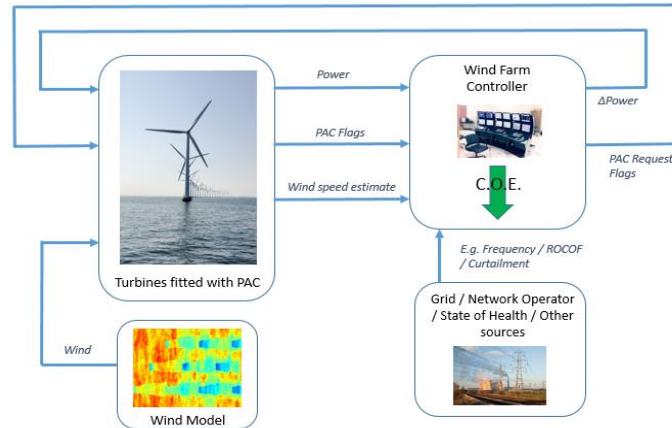


Access to clean cooking fuel across the world

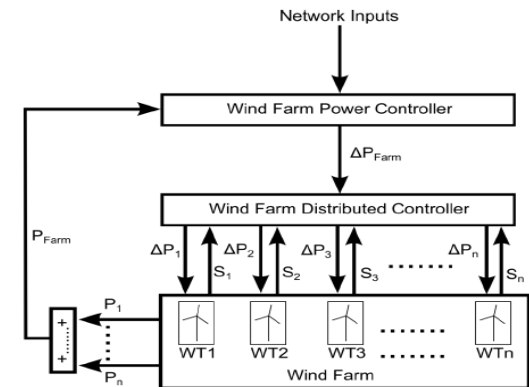
## “Application of Wind Farm Control and Wind Farm Layout for the Optimisation of Wind Farm Power and Loads”



Photo by Christian Steiness / Vattenfall  
(Horns Rev Offshore Wind Farm, Denmark)  
Original Image Link: <http://i.imgur.com/qruVcnu.jpg>

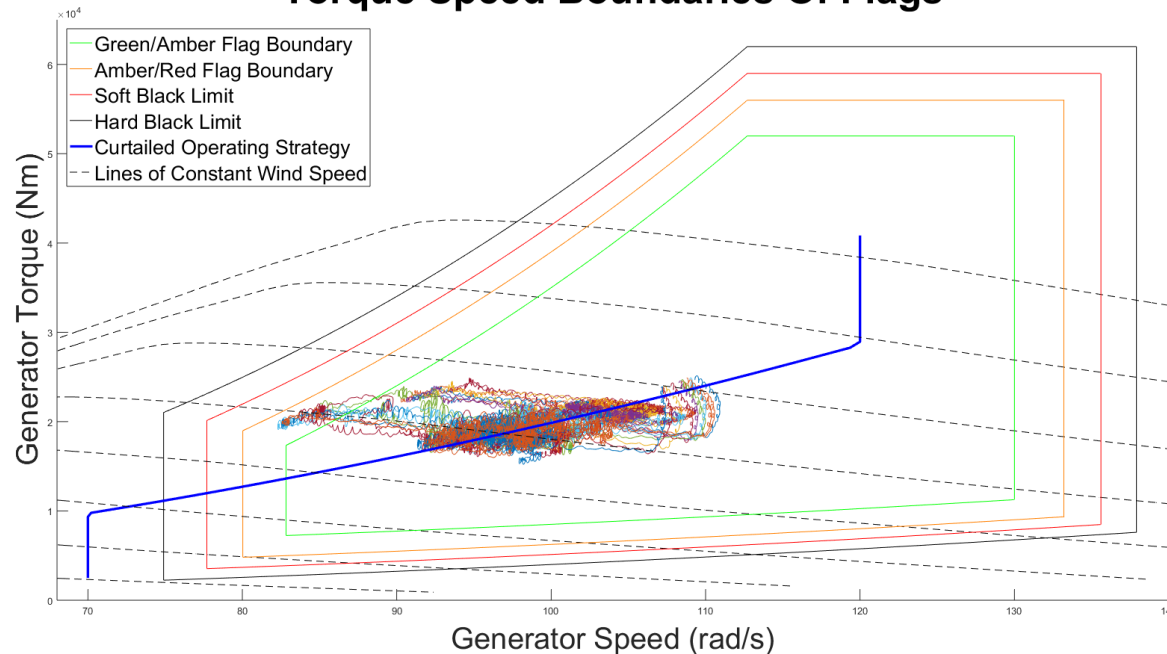


*Illustration of the components of the StrathFarm wind farm model*

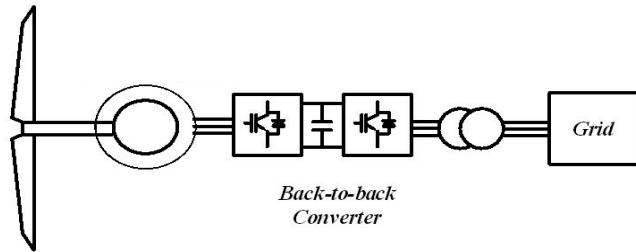


- Investigation and assessment of the benefits for power systems from wind farm control □

**Torque Speed Boundaries Of Flags**



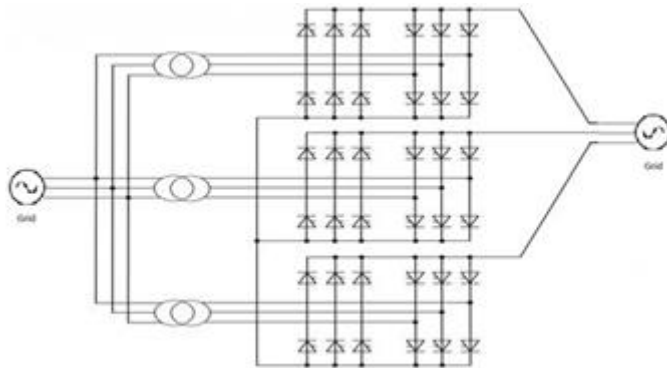
# Robust Power Transmission Solutions



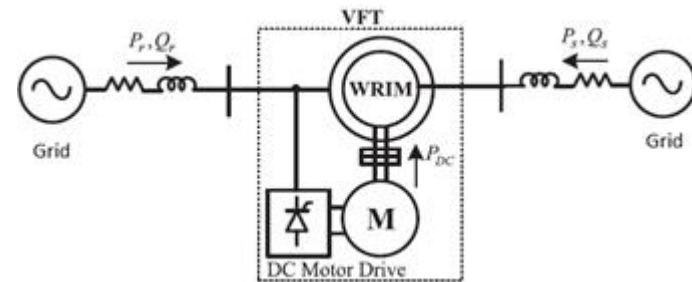
**HVDC**



**HVAC**

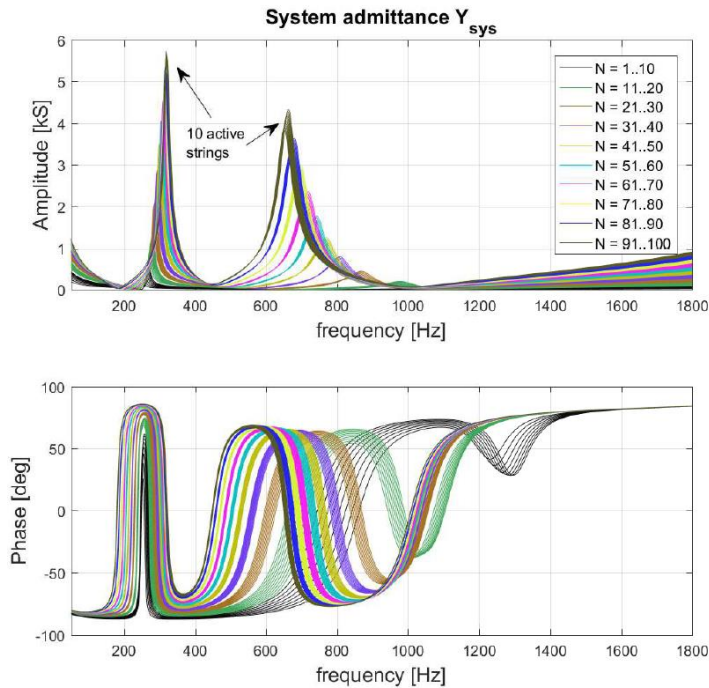


**Cycloconverter**

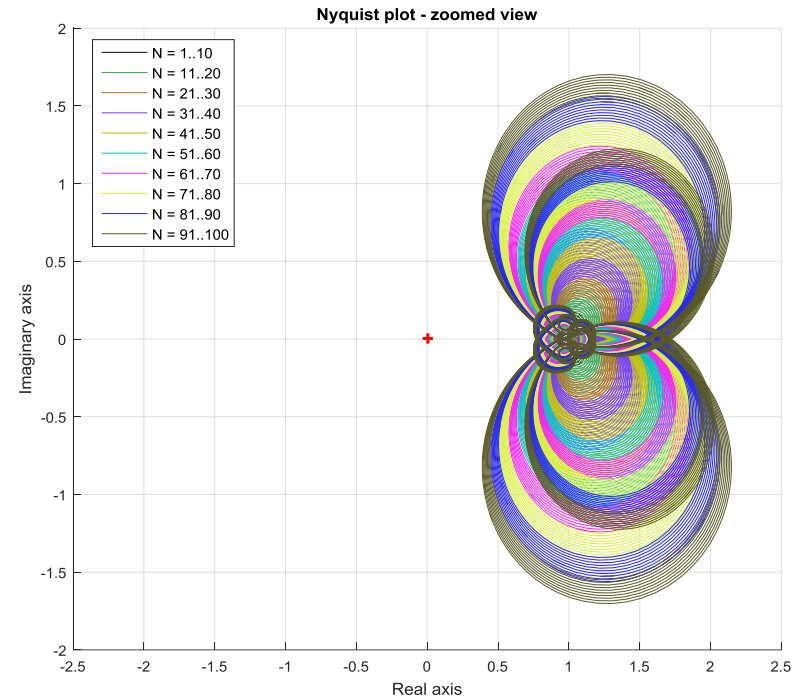


**VFT**

# Robust controller immune to system impedance



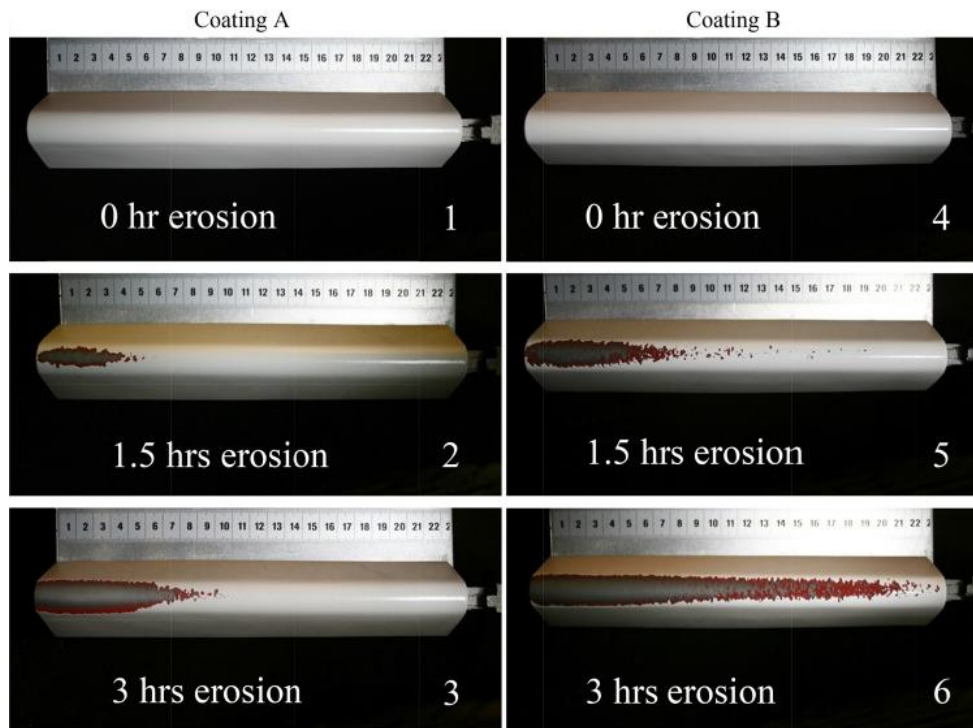
Resonance analysis



Proposed controller – stability assessment



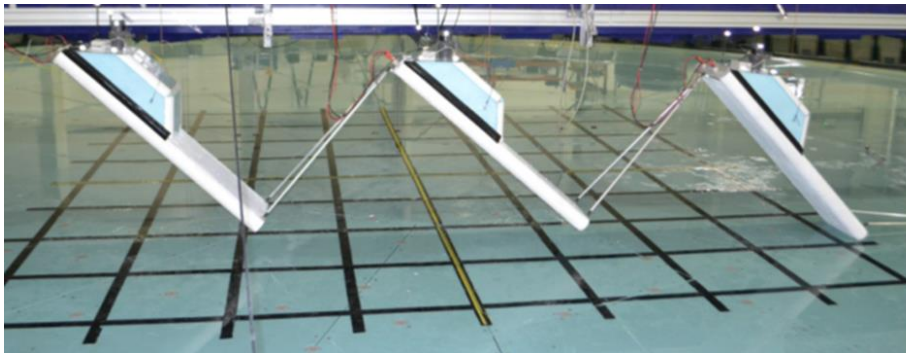
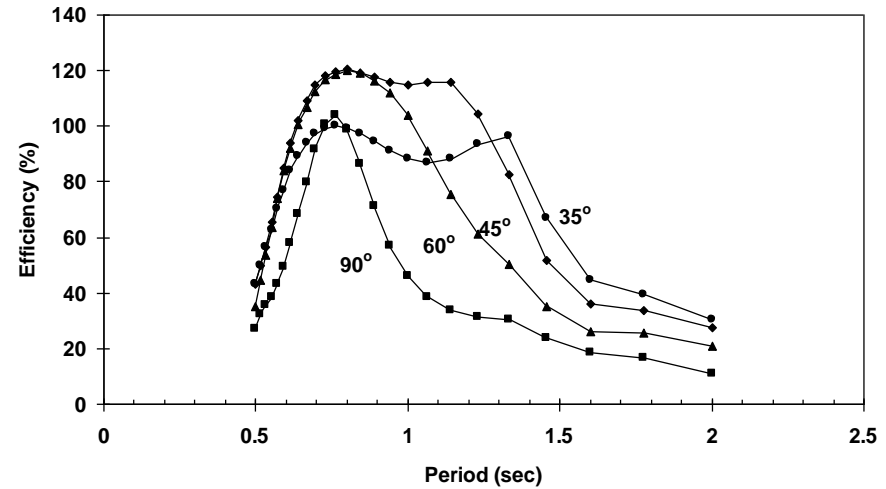
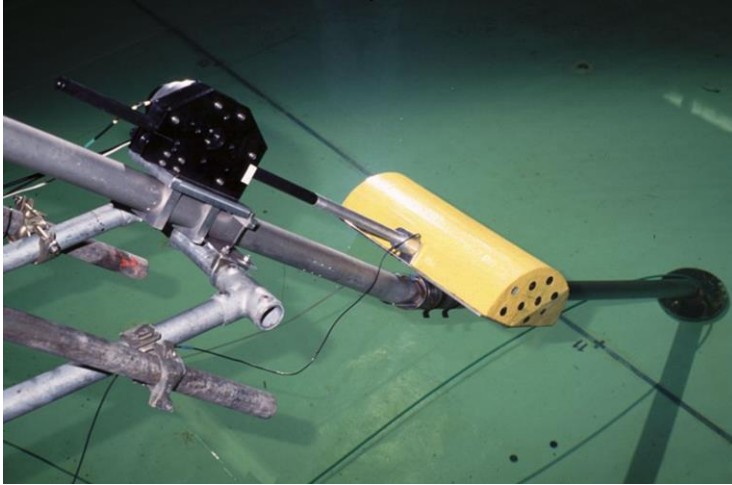
# Erosion of Wind Turbine Blade Coatings



Zhang, S., Dam-Johansen, K., Nørkjær, S., Bernad, P.L., Kill, S. (2015) Erosion of wind turbine blade coatings – Design and analysis of jet-based laboratory equipment for performance evaluation



Keegan, M.H., Nash, D.H. and Stack, M.M. (2013). On erosion issues associated with the leading edge of wind turbine blades.



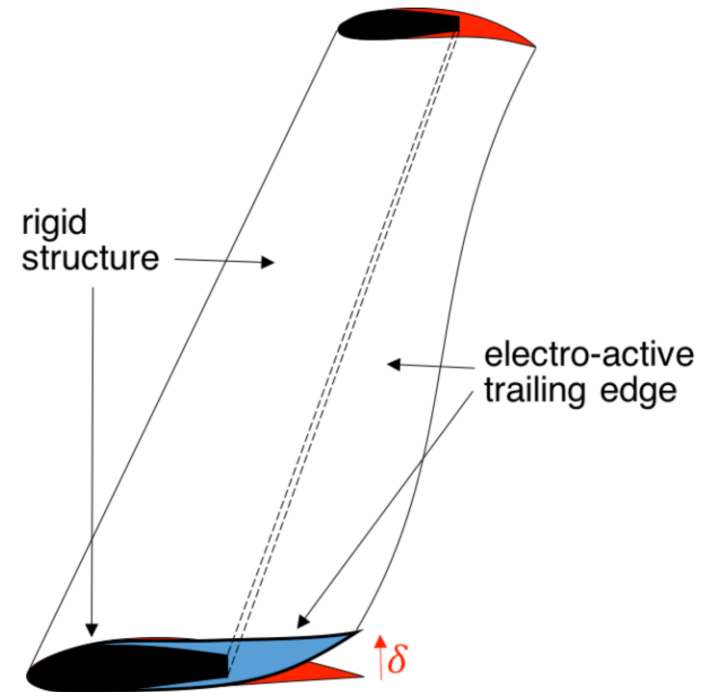
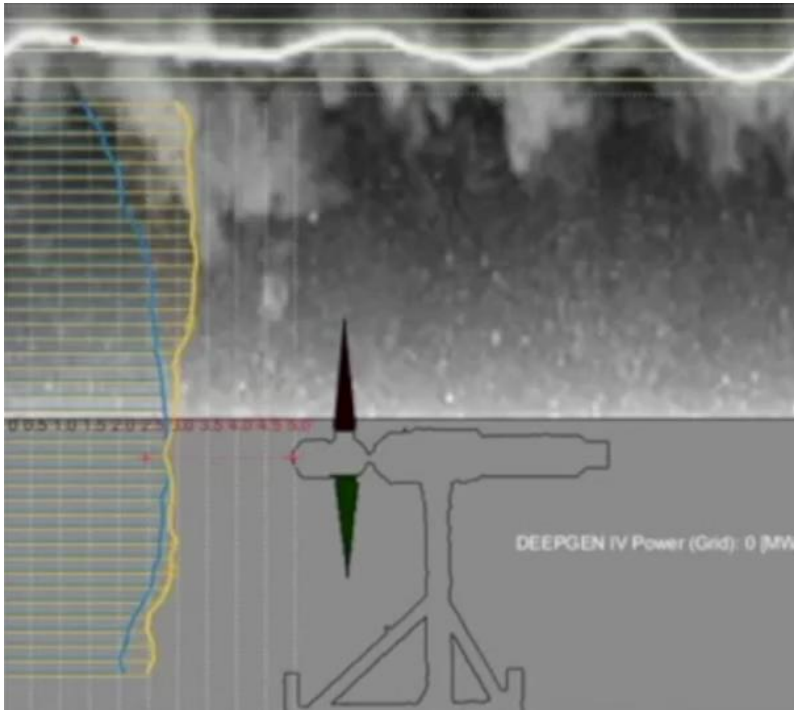
*Incoming Waves*





# Gabriele Pisetta

## Fatigue loads alleviation by morphing blades for tidal turbines



## Airborne Wind Energy – Rotary Kite Designs

