Advanced Wind Turbine Aerodynamic Noise Control

Flow Noise Group/School of Mechanical and Manufacturing Engineering

Additively manufactured porous structures embedded into wind turbine rotor blades has the potential to dramatically reduce noise levels and reduce the overall cost of a turbine.

UNSW Rotor Noise Test Rig.

State-of-the-art rotor noise measurement and control.

Competitive advantage

Additive manufacturing can create novel porous structures that can disrupt aerodynamic noise production from wind turbine blades

- Low-noise turbine blades creates competitive advantage over competitors
- Reducing tip noise allows higher tip speed, increasing power output, reducing gearbox torque thus reducing the overall cost of the turbine
- Reducing noise allows more turbines per unit area, increasing the size of wind farms, reducing complaints from residents and permits installation closer to communities and electrical transmission infrastructure.

Advanced Noise Control Capability

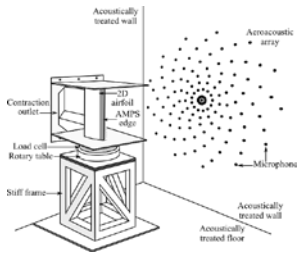
- The flexibility of additive manufacturing allows tailored and optimised noise control material to be placed within blade tips
- Our technique has reduced drag and better noise control compared with other technologies such as serrations.

Successful application

- Currently at prototype stage, applying to fixed blade and lab-scale rotor in the UNSW aerodynamics laboratory
- Dramatic levels of noise reduction achieved at prototype stage

Facilities and infrastructure

- World-leading aeroacoustics group (15 PhDs, postdocs, staff), multiple papers and textbook on wind farm noise control.
- Advanced aeroacoustic measurement and computational capabilities – anechoic wind tunnel, beamforming, aerodynamics, CAA.



UNSW Anechoic Wind Tunnel: Advanced ability to measure and treat aerodynamically generated noise sources.

Our experts

- Professor Con Doolan
- Dr Danielle Moreau
- Mr Chaoyang Jiang (PhD student)

More information

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