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Published in:
Book of Abstracts. DTU's Sustain Conference 2015

Publication date:
2015

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Mikkelsen, T. K., Sjöholm, M., Angelou, N., Pedersen, A. T., & Vasiljevic, N. (2015). A new DTU-lead European Research Infrastructure for 3D Wind Field Measurements using Space and Time Synchronized WindScanners. In *Book of Abstracts. DTU's Sustain Conference 2015* [E-3] Technical University of Denmark.

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A new DTU-lead European Research Infrastructure for 3D Wind Field Measurements using Space and Time Synchronized WindScanners

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Modern wind turbines steadily increase in size and today wind turbines soar hundreds of meters into the sky. Their blades sweep through areas bigger than football fields.

Obviously, the wind can no longer be characterized from a single-point measurement but characterization require detailed knowledge of the dynamics of the entire 3D wind fields over the entire rotor plane upwind and in the turbine wakes.

WindScanner.eu provides a new open access and joint European research infrastructure for promoting research and innovation in atmospheric wind and turbulence via full-scale open air experimental investigations. Real-time measurements of the 3D wind velocity and turbulence vectors in the atmospheric boundary-layer are obtained using advanced remote sensing-based wind measurement techniques known as wind lidars.



Inflow and wakes around turbines exposed to wind and turbulence in complex terrain are scanned in 3D space and time from WindScanners.

Distributed European WindScanner nodes are now established as national/regional competence centers engaged with a central hub located at DTU Wind Energy regarding the continued development, coordination of applications and training of experts to operate the WindScanner wind measurement technology. The new joint European research infrastructure WindScanner.eu will lead and disseminate coordinated experimental research for large European-level wind energy measurement campaigns throughout Europe.

DTU Wind Energy leads and hosts the European central hub for coordinating access, planning operation, training and maintenance and disseminates instrument manufacturing plans to build the mobile WindScanners locally. The DTU hub will also maintain the scanners control software and data processing and secure data flow and management of host servers, and train experts and users from research community and industry. The open access experimental facility also serves atmospheric boundary-layer research, air safety, wind load measurements on buildings and bridges, 3D wind circulation field measurements in streets and the urban environment, etc. The talk addresses recent WindScanner based research activities and present several WindScanners experimental setups including 3D wind field measurements from recent WindScanner measurement campaigns. Cf. www.WindScanner.dk