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IRPWIND ScanFlow project

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IRPWIND ScanFlow project

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ScanFlow

The ScanFlow project is short for the full project title:
"High-resolution full-scale wind field measurements of the ECN's 2.5 MW aerodynamic research wind turbine using DTU's 3D WindScanner and SpinnerLidar for IRPWind's and EERA's benchmark".

Objective

The objective of ScanFlow is to establish a unique turbine power performance and induction zone benchmark experiment.

Methodology

The methodology is to operate a DTU developed high-resolution nacelle 2D SpinnerLidar installed at a research wind turbine at ECN and, concurrently, operate three DTU ground-based short-range WindScanner lidars to perform 3D wind velocity field observations.

The scientific progress beyond previous experiments will be to achieve data from three vertical planes 10-minute averages of all three wind components. Furthermore we will also observe turbulence along one horizontal transect from 1Hz data. The baseline inflow i.e. when the turbine is not in operation and the induction zone from the operating row of turbines will be observed and quantified by a novel solution.

Furthermore the rotor plane equivalent wind speed can be reverse- calculated to wind speed from wind power production at 1 Hz fast production data and compared to WindScanner turbulence observations as well at turbulence data from the meteorological mast.

Test site

The ECN Wind turbine Test site allows for full scale wind turbine and wind farm related research, development and technology. The test site consists of flat, agricultural terrain with single farm houses and occasionally rows of trees. The average wind speed at 80m is 7.5 m/s and the main wind direction is South-West. The site comprises 5 modern, full scale research turbines (Nordex) with a hub height and rotor diameter of 80m and rated power of 2.5MW. The area is shown below.
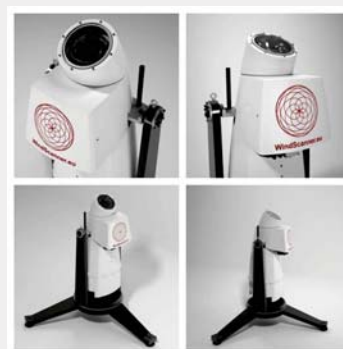
Please see Poster G62 for further information!

Measurements

The observations with the SpinnerLidar started early December 2016 and will end late January 2017. During January 2017 the three short-range lidars will measure.
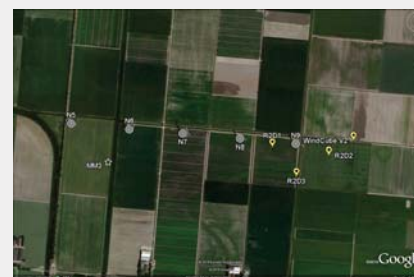
Data access

www.irpwind-scanflow.eu
Please see Poster G62 for further information!

WindScanners from windscanner.eu

ECN Test Site with 5 research turbines in flat agricultural terrain.

Preparing to drive from DTU to ECN with the SpinnerLidar

Preparation at ECN with the SpinnerLidar

Hoisting the the SpinnerLidar to the Nordex wind turbine at ECN

14th Deep Sea Offshore Wind R&D Conference, EERA DeepWind'2017