Automatic wind alignment of wind turbines

How to detect a change in the alignment of Tur-Bines?
Current methods to detect a change in the alignment of tur-bines are based on wind direction in situ comparisonin case of redundancy of the device on the nacelle or by compar-ing wind direction measurements nearby (e.g.,other turbines,met masts or lidars). The absolute wind directions of one or more wind vanes in the neighborhood are compared.

Which control system allows a correct alignment of a wind turbine?
The control system that allows a correct alignment of the wind turbine with respect to the incident wind is the yaw control. A detailed explanation about the yaw control system of a 5 kW wind turbine is introduced in the work of Yücel and Özder [14].

Do upwind horizontal axis wind turbines need to be aligned?
Upwind horizontal axis wind turbines need to be alignedwith the main wind direction to maximize energy yield. Attempts have been made to improve the yaw alignment with advanced measurement equipment but most of these techniques introduce additional costs and rely on alignment tolerances with the rotor axis or the true north.

What is a wind turbine yaw control strategy?
The objective of the designed control strategy is to achieve,after a training stage,a fully autonomous performanceof the wind turbine yaw control system for different input wind scenarios while optimizing the electrical power generated by the wind turbine and the mechanical loads due to the yaw rotation.

What are the advantages of a new wind turbine alignment method?
With this new method,two mayor advantages are achieved,compared to the marked solutions mentioned in the introduction. Firstly,the turbine alignment is not relying on multiple wind direction measurementswhich reduces uncer-tainties caused by the challenge of finding true north.

Why is it difficult to align a turbine with the wind direction?
Achieving a good alignment of the turbine with the wind direction is difficult for the following reasons. On standard turbines,wind speed and wind direction measurements take place behind the rotor. This leads to flow distortioncaused by the rotor blades and the nacelle.

Wake effect can decrease power output of a wind farm by 10-20% per annum [12,[15][16][17]. Moreover, turbulence resulted from wake, increases dynamic loading on downstream turbines which can ...

According to the comparison of yaw errors, the yaw direction optimised by YS-VWL is closer to the actual wind direction, which improves the accuracy of wind alignment as shown in Figure 22. It can be seen that

since ...

The world"s first electric power generating wind turbine was manufactured by Charles Brush in 1888, and it delivered 12 kW of power reliably for 20 years . The battle to ...

Consequently, CW lidars are extensively applied to detect wind profiles (Köpp et al., 1984;Peña et al., 2009), assess wind resources (Bingöl et al., 2009;Sempreviva et al., ...

ters and one wind vane) to detect an alignment change of the wind direction measurement device during operation. Re-sults and discussion of a demonstration case with a test wind turbine ...

Thermal Growth. Wind turbine generators experience significant temperature fluctuations due to variable wind speeds and operational loads. As a result, components like ...

Wind turbine misalignment and alignment degradation during the operational lifetime of a wind turbine are both common issues that wind farm operators battle with. Since the individual ...

to detect an alignment change of the wind direction measurement device during operation. R esults and discussion of a 10 demonstration case with a test wind turbine operating with ...

Alignment of wind turbine generator and gearbox. We offer shaft alignment systems specially developed for alignment of wind turbines. The bracket kits included make it possible to align ...

Darrieus-type vertical axis wind turbines (or VAWTs) have the main rotor shaft arranged vertically and the main components can be located at the base of the turbines. ...

Abstract Wind turbines cause contamination of weather radar signals that is often detrimental and difficult to distinguish from cloud returns. Because the turbines are ...

It is shown that standard turbine equipment is able to align a turbine with sufficient accuracy and changes to its alignment can be detected in a reasonably short time, ...

Abstract. In this work, a new algorithm is presented to correct for pitch misalignment imbalances of wind turbine rotors. The method uses signals measured in the fixed frame of the machine, ...

to detect an alignment change of the wind direction measurement device during operation. Results and discussion of a 10 demonstration case with a test wind turbine operating with ...

2kw 48v 96v Automatic Alignment Direction Wind Turbine Generator 2000w Product Overview. Brand: OULU Product Series: FD series Wind Turbine Generator Product Model: FD3.2-2000 Rated Power: 2000 w

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Rated ...

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