

Wind Energ. Sci. Discuss., doi.org/10.5194/wes-2018-26-RC1, 2018 © Author(s) 2018. This work is distributed under the Creative Commons Attribution 4.0 License.

Interactive comment on

“Determination of optimal wind turbine alignment into the wind and detection of alignment changes with SCADA data” by Niko Mittelmeier and Martin Kühn

Answers to comments of anonymous Referee #1 by

Niko Mittelmeier and Martin Kühn, May 16, 2018

Dear Referee,

Thank you very much for reviewing our paper and addressing improvements and clarification. We have worked through all your comments and our responses are marked as *******/ Response **/****.

Section 2.1, line 21, "In consequence, old turbines in the fleet may often..." -> This sentence could be clarified by stating at the end something like "since the wind direction is derived from the sum of the yaw position and the nacelle measured wind direction."

*******/ You are right. It is helpful to mention, that the relative wind direction is called yaw error and include the formula at the end of this sentence. We have reworked Section 2.1 as follow:

“The true wind direction ϑ can be derived from the nacelle position ϕ and **the relative wind direction on the nacelle, referred to as** yaw error γ , with

$$\vartheta = \phi + \gamma. \tag{1}$$

The nacelle position ϕ is the angle between the rotor axis and the marking of the true north as displayed in Fig. 1 (a). Turbines are aligned to the true north after commissioning, but the equipment to measure the rotation of the nacelle is often not accurate enough and leads to a drift of the true north marking during operational lifetime (Bromm et al., 2018). In consequence, old turbines in the fleet may often not show a correct true wind direction **since the wind direction is derived from the sum of the yaw position and the yaw error γ (Eq. 1)**. This is not a problem for the yaw controller using only relative wind direction but for reanalysis purposes or sector management these data need to be corrected.“

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Section 2.1, another point to developing a good yaw controller is that wind conditions are site specific, and a yaw controller that works well at one place may not be as good at another place. So, some adaptability needs to be included in a yaw controller design. Perhaps this is something to note in this section.

***/ Yes, you are right. We will include the following sentence:

“This behaviour is site dependant and different settings for different locations can be favourable. ,,

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Section 3.3, line 14 "afore mentioned" change to "aforementioned"

/ Changed /

Section 4.2, (page 17) line 1, insert a space between "... v_2.Figure 14" so that it is

"...v_2. Figure 14".

/ Changed /

Section 4.4, line 7, "... filtered to be always above 8° ." change to "... filtered to be always above 8° C."

/ Changed /

Section 4.4, line 23, "A one per cent slope..." change to "A one percent slope..."

/ Changed /

Acknowledgements line 10, "...grateful for all colleagues how helped..." change to "...grateful for all colleagues who helped..."

/ Changed /

Otherwise, a great paper!

/ Thank you! /