

Comment on wes-2021-80

Anonymous Referee #2

Referee comment on "Evaluation of different power tracking operating strategies considering turbine loading and power dynamics" by Florian Pöschke and Horst Schulte, Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-80-RC2>, 2021

The investigated problem is indeed very irrelevant for wind turbine control. The article includes interesting results but their presentation and discussion should be improved. Please find my brief comments below and note that they are built on top of Reviewer #1 inputs:

- Introduction: There are many studies in this area as Reviewer #1 indicated. One addition to the previous suggestions is Christos Galinos et al. 2018 J. Phys.: Conf. Ser. 1104 012019 (https://backend.orbit.dtu.dk/ws/portalfiles/portal/160566480/Galinos_2018_J_Phys_3A_Conf_Ser_1104_012019.pdf) where the effect of turbine derating strategies are also investigated, mainly focusing on wake. Novelty with respect to all the listed previous studies should be clarified.
- Operating strategies: It is indeed not clear if down-regulation is activated below rated as well as "With $\omega_{opt}(v)$ and $T_{opt}(v)$ being the optimal (or limited above rated power) rotational speed and generator torque depending on the current effective wind speed $v...$ " reads as if the limits are introduced above rated only. Should be clarified.
- Control design: The need for linearization (and how does it capture dynamics really?) and its process should be clarified. Why not use the entire C_p surface if in the end a 'nonlinear description' is generated? The discretization induces additional uncertainties for your results and could potentially be avoided.
- Control design: How does "... the observer estimates the current effective wind speed by a measurement of the rotational speed"? Especially for OS1, where the rotational speed is kept at optimum, majority of the wind speed dynamics is reflected on the pitch activity. Another set of equations is needed to explain the approach utilised for the wind speed observer.
- Results: Subsection 4.1.1 should be combined with 4.1 for a better flow in the article.
- Results (Section 4.1) Figure 3(a): What is ΔP_d here? It seems like an isolated case within Figure 4, should be stated in the caption and the text for clarity.
- Results (Section 4.1) Figure 4: It is the most interesting result of the study in terms of load analysis and not discussed in the text at all. The behaviour should be analysed in detail and comparatively with respect to delta set-points.
- Conclusions: Suggested rewording "... where a de- or acceleration..." --> "... where a deceleration or acceleration..."
- Conclusions: Potential implications of OS1 vs. OS2 to the wake of the turbine can be

briefly discussed to open up the discussion for flow control studies.

Thanks for your efforts, looking forward to read the revised version!