

Interactive comment on “Qualitative yaw stability analysis of free-yawing downwind turbines” by Gesine Wanke et al.

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The paper presents a reduced order model for the aeroelastic analysis of downwind wind turbine configurations. Parametric analysis of the stability of the system and the equilibrium yaw position is performed with parameters the tilt and cone angle and the shaft length. The results of the reduced order model are compared against simulation results from more advanced tools that simulate the full dynamics of the wind turbine system. It is a well written paper and a nice qualitative analysis of the downwind free yaw concept with in depth explanations of the underlying physical mechanisms. A few points that the authors should consider/comment are the following: 1) One critical choice of the work is that the WT system is simulated as a 2 dof system. The only dof, additional to the yaw dof, considered in the analysis is the lateral deflection of the

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tower. In my opinion the rationale of the above choice should be explained in section 2. It could be justified in relation to the full aeroelastic stability analysis performed with HAWCStab2. For example no other critical mode than the lateral bending mode appears in the HAWCStab2 analysis under any circumstances? 2) Several different models have been employed in the present work. Perhaps a table listing the main and most important features of the above models, per model, could be included. For example, which of the models include yaw skewness effect or unsteady aerodynamic and dynamic inflow effects etc? Sometimes it becomes a bit confusing for the reader who is not familiar with all the above modelling options to follow the comparisons.

Other specific comments and editorial can be found in the attached pdf.

Please also note the supplement to this comment:

<https://www.wind-energ-sci-discuss.net/wes-2018-69/wes-2018-69-RC2-supplement.pdf>

Interactive comment on Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2018-69>, 2018.

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