Title: Parked and Operating Loads Analysis in the Aerodynamic Design of Multi-megawatt-scale Floating Vertical Axis Wind Turbines [https://doi.org/10.5194/wes-2021-60]
Author(s): Mohammad Sadman Sakib and D. Todd Griffith

Thank you for your valuable feedback which is extremely helpful. The author responses (**in blue**) to the reviewer comments (in black) are noted below.

Summary

As in the abstract stated, this paper describes load calculations with a vortex code for Vertical Axis wind turbines. The manuscript is clearly written and the results are as expected (a three-bladed version shows less variation than a 2-bladed one) To my opinion, the manuscript is a little bit too extended. Authors should consider if it can be shortened.

Response: Considering the various design variables we are studying (number of blades, tapering, aspect ratio) and their effect on turbine performance, including both operating and parked loads, the resulting manuscript is plot heavy. We have tried our best to ensure the manuscript reads well without extending the discussion too much.

General

The approach using a vortex type code to cover a broader parameter range seems meaningful as well as to focus on stand-still conditions. To get more insight on the overall accuracy of the "medium fidelity" approach authors should refer to recent CFD work, for example
Bangga et al. Energy 206 (2020) 118087

Response: The authors agree that the manuscript would benefit from referencing some high fidelity (CFD) work and vortex model compares against them. Thus, we have added a small extension on page 3, line 66-73.

Specific

Figure 11: the information might be easier to compare if cT (thrust coefficient) instead of absolute force would have been presented.

Response: As we don't have access to the original model that was used in Ottermo et al. (2012), the thrust coefficients of the turbine used could not be obtained. So, an online tool called webplot digitizer was used to extract the original data points from the plot in the manuscript and subsequently compared with the current model.

As the investigations presented seem to be part of a larger project "A Low-cost Floating …" it would be interesting to reads about how far this goal was achieves

Response: This is still an ongoing project and currently we do not have any published data on levelized cost of energy of the floating platform VAWT system. However, the impact of aerodynamic loads and on the floating platform design has been published in the journal 'Renewable Energy' which can be found at (https://doi.org/10.1016/j.renene.2021.09.076) [1]. Also effect of blade tapering on aeroelastic stability (flutter) for floating VAWTs has been recently accepted by the journal 'Renewable Energy' and can be found at [https://doi.org/10.1016/j.renene.2021.12.041] [2]. More details on ongoing and future work related to the project can be found at the project website: https://labs.utdallas.edu/griffith/.

Typos

Line 106: 2nd dot superfluous; exponent (-5) instead of 5

Response: Corrected and units added.

REFERENCES:

1. Gao, Ju, et al. "A semi-coupled aero-servo-hydro numerical model for floating vertical axis wind turbines operating on TLPs." *Renewable Energy* 181 (2022): 692-713.
2. Ahsan, Faraz et al. "Modal dynamics and flutter analysis of floating offshore vertical axis wind turbines " *Renewable Energy [Accepted]*, 2021, [https://doi.org/10.1016/j.renene.2021.12.041]