

Author Comments for WES-2025-244

We would like to thank both referees for reviewing the manuscript and providing valuable critiques and insight to the work.

The updated manuscript now includes their comments. And below we provide a description of the changes made.

The main changes:

- We appreciate referee 2 pointing out that our method for calculating torque balance in the extended BEM model was wrong. So, we have now included a loop in the code that only selects operating points where torque balance is present. Which is now also explained in the manuscript.
- During the sweep optimization we keep this loop such that also there only operating points are valid where torque balance is present.
- When improving the BEM model we noticed that in our measurements we mixed up the upstream and downstream RPM sensor, we adapted the results table and graphs accordingly.
- With respect to the electrical losses: we have included the generator efficiency we determined in earlier work specifically in the text, graphs, and model.
- We agree that the DC load may influence the efficiency of the system, we have mentioned the type and brand of the the load used in the CSTB wind tunnel. And also our process of manual power point tracking by changing the resistance at every wind speed to find the maximum power point (The turbine does not include an MPPT).
- We have updated the manuscript with the textual changes from the accompanying pdf file from referee 2 as well.
- Including an update to the third paragraph of the discussion where we now more clearly present a comparison between DRWT and single rotor operation.
- We furthermore updated the introduction and abstract according to the suggestions from referee 1. We now emphasize more on the experimental campaign instead of the extended BEM model.
- In the introduction we include a paragraph on already present BEM models and why we selected Amoretti's.
- In section 2 we tried to make more clear what our extension to their model is.
- We now state explicitly in the discussion that design methods exist for downstream rotor design and that our mirroring is not optimal.
- In the explanation of the mechanical turbine design we included more information from previous work to better detail hub design, blade root section, and pitch system.

- The graphs of the measurements do have error bars as can be seen in the CP plot of the CSTB measurements at low wind speed. We now explain in 3.2 the metric used for the error in the measurements.
- R_{prop} is changed to R_{rotor} (this came from the Amoretti paper).
- The distance between rotors is explicitly stated.
- The collective pitch is equal for three blades which is hopefully clear with the inclusion of the pitch system design explanation.

Also as suggested by referee 1 we update the title for put more focus on the experimental part of the study. We did struggle a bit as we also wanted to focus on the extension of Amoretti's BEM model to fit a double rotational armature design. So, we hope we have reached a better balance in the title now.

Finally after proofreading the updated manuscript we included some additional textual changes for clarity. We acknowledge that the present manuscript is a much improved version due to the comments of the referees and would like to thank them for their efforts.

On behalf of the authors,

Niels Adema