

Review of the paper “A digital twin solution for floating offshore wind turbines validated using a full-scale prototype”.

The paper deals with the implementation of a physics-based digital twin of an offshore turbine and its validation using data coming from a full-scale prototype.

The Author did a great job building up the physics-based twin emphasizing the fact that this task is extremely difficult and requires a proper implementation of different estimators (wind speed estimator, thrust estimator, loads estimator, ...). In this work, which is still preliminary, the Authors relied mostly on Kalman filtering. Given the sophistication of the twin and the inherent complexity of the system, the agreement in the tower damage equivalent load estimation of lower than 15% is an excellent result.

I had also the opportunity to check the reviews of the previous round and the replies. It seems that the Authors provided fully adequate responses and corrections to the manuscript.

For this reason, I recommend publishing the paper.

I have only three minor requests that I hope the Authors may consider.

1. Abstract, line 12: it would be fair to add that the estimated errors of 10% refer to the tower fore-aft damage equivalent loads.
2. Model, section 2.3.3: why did the Authors consider only the fore-aft tower bending mode, when the side-side is also important as it is low-damped?
3. Linearization of the system: I would suggest that the linearization of the entire system could be done in multiblade coordinates to also capture the effect of the periodicity of the system. For example, whirling modes, that affect tower loads and fatigue, are only captured after applying MB transformation.