

Wind Energ. Sci. Discuss., referee comment RC2  
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## **Comment on wes-2021-148**

Anonymous Referee #2

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Referee comment on "Model tests of a 10 MW semi-submersible floating wind turbine under waves and wind using hybrid method to integrate the rotor thrust and moments" by Felipe Vittori et al., Wind Energ. Sci. Discuss.,  
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I have reviewed the paper entitled "Model tests of a 10 MW semi-submersible floating wind turbine under waves and wind using hybrid method to integrate the rotor thrust and moments" by Felipe Vittori et al. and submitted to Wind Engineering Science.

The authors describe an experimental campaign testing a floating offshore wind turbine by means of an hybrid method. They manage to generate wave and wind loadings. The novelty of the setup is that they includes not only the main aerodynamic thrust but also moments in the turbine plane, around the vertical and horizontal axis. As a main result, the authors shows that in order to predict the pitch natural period, the hydrodynamic database should be computed based on the geometry of the floater in its mean position (tilt) due to the average wind loading. This result is surely general to all the floater that have significant change of hydrostatic restoring moment with trim.

The floater they used in the campaign is developed by Saitec. This restricts the data that can be shared like the natural periods, the size of the platform, the description of the mooring lines.

One main comment is that the authors present many observations of the results shown in the Figures but they often stop there. They should always try to give possible explanations or ideas that would help understand the origin of such observations.

The development of the SiL system is described in previous papers. The main components of the setup are briefly described in the paper (actuators, software for aerodynamic computations, software for actuator command). The performance of the system for the frequency range at aim in this paper (from 0 to 0.16Hz FS, 0 to 1.2Hz MS) is missing (phase, gain and delays); such data should be used in the discussion of the comparisons between experiments and simulations. Is there a load cell at the top of the mast that

could provide the measured thrust and moments? That would be nice to compare the aerodynamic loads in the experiments (imposed by the SiL system) and the loads in the simulations, in the time domain and in the frequency.

Please see more details in the attached document.

Please also note the supplement to this comment:

<https://wes.copernicus.org/preprints/wes-2021-148/wes-2021-148-RC2-supplement.pdf>