Reviewer 1

- Essentially, for a floating wind turbine, the wave-frequency induced motions impose additional effects on the wake generation. one may check the rotor plane fore-aft and side-to-side motion effect in separate analyses. that means it would be good to look at 0 and 90 wind-wave misalignment.

  That would be an interesting analysis that would be useful to further verify FAST.Farm for floating applications. In this case, however, we are running cases for comparison to Johlas et al and are limited to cases that they ran. With the 30-degree wind-wave misalignment included, here, we feel this is a reasonable compromise between the extremities you propose.

- There is a significant difference in the wind speed STDs from the two models. however, if it is only related to the low-frequency variation (low as compared to the rotor rotation frequency), from the wake and motion analysis of the floating wind turbine, one might just compare the rotor-averaged or the height-averaged STDs.

  Thank you for the suggestion of comparing the rotor-averaged std, we added that in the text. And indeed, the difference in std is a consequence of using TurbSim instead of the same inflow as Johlas et al., and the figure showing the vertical dependence of u (mean, std, and TI) is useful to evidence that. We realized after the fact that we could have generated TurbSim output with a std that more closely matched Johlas et al, but decided that what we had was close enough and it would not change the key conclusions, so, not worth changing.

- good to present the spectral comparison as well, if available.

  This would indeed be an interesting comparison, but unfortunately, we do not have the frequency (or time) response obtained by Johlas et al.

- it might be good to use some kind of period ratio to address this issue, for example the main wave oscillating period of the floater and the rotor rotation period. or one may check the velocity ratio in wind direction, for example between the wave induced rotor velocity and the wind speed.

  Interesting suggestion. In the present case, the problem was related to the displacement of the floater, and not much to the velocity. We had to use a value below the natural frequency of surge, which is a frequency induced by the mooring system. We could say, then, that $f_c/f_{n,surge}$ should be close to 1.

- could you please explain why the heave resonant motions could contribute to the fore-aft tower-base moment for the rated conditions?

  Sure. For the severe sea state, the wave energy spectrum encompasses the heave natural frequency, leading to relatively large heave motions. The vertical displacement changes the vertical rotor position within the wind shear profile, causing a variation in thrust. The vertical velocity changes the relative wind velocity at the blades (both magnitude and direction), thus also inducing a variation in thrust. And because the center of gravity of the tower and RNA are not aligned with the tower axis (due to the CG of the RNA and due to mean platform pitch), motions along the vertical direction introduce an inertial bending moment at the tower base. We added a sentence in the text to summarize these effects.

These effects are smaller than other effects such as turbulent wind fluctuation or pitch motion, but they are large enough to appear in the PSD plot for the case shown in yellow because of the large heave motion at the resonance frequency of heave.