

The paper tackles an interesting topic studying the effect of the FOWT's motion on power production. The paper shows the difference in energy production between fixed bottom and different FOWTs designs.

General comments:

- In line 41: one of the paper goal is a sensitivity analysis. However, the results is randomly presented and the parameters of the sensitivity analysis are unclear. For example: the control strategy was only checked once at steady state but not in respect with the other parameters. Also the turbine rating and platform topology. There was no clear structure of the analysis and in some cases only the results of the 15MW with the VoltrunUS platform was shown.
- In Line 43, the third main contributions of this work is that it defines a methodology to study the response. However, this was not clear through the paper. There was no clear method with an objective, input and output.
- The result section needs to be restructured. A suggestion would be to have 4 sections representing each of the four defined multifidelity models. Then in each section perform the simulations of each of the four FOTWs and have a clear comparison at the end. Another option would be to define a set of analysis parameters at the beginning of the section. Then do the analysis for each of the FOWTs then have a final section to compare.
- The way that authors presented the results is not clear and very hard to follow with long paragraphs and complex Figures. Clear Figures and statements will help the readers to understand the results.

Specific comments:

- Line 9: performance is a general word, and structural loads are part of the performance. I believe you mean sacrificing the power?
- Line 21: energy point of view
- Line 39-45: Please have a look at the contributions and make sure they are clearly presented in the paper.
- In equation 3: There is a different variation for pitch angle that is introduced later on in the text. I suggest you introduce it here and add the "h" parameter. (line 303)
- In line 92: please state the DOFs considered. "different directions" is vague
- Line 104: To the best of my knowledge OpenFAST doesn't have a prescribed motion option. How was this included? If you have created a version is it open-access?
- Line 119: what does MPRO stand for?
- Line 132: what does WPRO stand for?
- Line 184: Why use the peak shaving and the nacelle velocity and not a baseline controller? Can you please clarify the motive behind this decision. It is clear from the steady state analysis that these options have a large effect especially around rated. But the effect they have in stochastic wind and wave is not clarified.
- Line 184: Which version of ROSCO was used? How was the model tuned?
- Line 288: How many seeds were used for the assessment of the affect of the turbulence intensity?

- Line 310: I agree that the other DOFs cannot lead to an increase in power production, but these motion occur and can lead to a decrease in power production. Were they locked during the simulations?
- Section 3.4: A list of the regular wave heights and periods used in this section should be added to the appendix. Or the method used to choose steady waves should be mentioned.
- Figure 11: The color bar for the 5MW spar is different than the rest of the Figure. Please unify the color bar for easier comparison.
- Line 347: An example of when the sensitivity analysis is inconsistent is the wind wave directionality study, where only one case was considered for platform topology and turbine size.
- Same comment for sections 3.5.1, and 3.5.2.
- Figure 13 caption says with steady wind and still water, which graph is steady water? I found it hard to follow the legend in this Figure.
- Line 376 and 377: Please rephrase and clarify the sentence. I did not understand what you mean in this paragraph.
- Figure 14: Please use different colors to show each result.
- Figure 15: which wind and wave directions were used in the Coupled-C model shown in this Figure? Please use different colors to show each result.
- Line 408: This statement looks contradictory to the findings introduced in line 306 with prescribed pitch motion. Is this true? Please clarify.
- Line 434: What do you mean by AEP algorithm? Can you please show the method used to calculate AEP?
- Line 454: Point 3 in the conclusion I believe was only shown for the 15MW on the semisub. This was not proven true for the rest of the FOWTs cases.
- Line 456 "the first finding, we have shown the wind turbine controller action makes power gains due to wave-driven motion possible only in below-rated winds speeds." I do not believe the controller actions and their effect on power gain were discussed in sections 3.1 or 3.3. Is this correct? Can you please clarify this sentence?