WIND ENERGY SCIENCE DISCUSSIONS

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Interactive comment on "A fully integrated optimization framework for designing a complex geometry offshore wind turbine spar-type floating support structure" *by* Mareike Leimeister et al.

Anonymous Referee #2

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This paper presents a geometry re-design of the OC3 spar using a genetic algorithm. To make the problem more manageable, the authors make a number of simplifying assumptions in their analysis:

- No structural analysis

- Frozen mooring design and performance (despite large changes in the geometry)

- Frozen hydrodynamic coefficients (despite large changes in the geometry)

- Relatively few design variables and constraints

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Discussion paper

There are some weaknesses in the methods and results that could be improved to make a stronger paper. For instance, due to these simplifying assumptions, the optimized design geometries are quite surprising and raise as many questions as answers. The authors acknowledge that these are more qualitative and instructive design geometries than immediately applicable, but in that case more sensitivity studies and trade-off studies should be executed. Also, the presentation of the methods and results is fairly long winded and somewhat repetitive. Efforts could be made to tighten up the language and organization. However, instead of discussing these weaknesses in more detail, I am more concerned with the uniqueness and level of contribution of this paper.

If I do a literature search on the keywords "floating spar optimization", I get many hits and papers going back at least 15 years, only some of which are mentioned by the authors. Some of these papers also build on the OC3 spar that the authors have chosen for their baseline and/or use genetic algorithms to explore the design space as is done here. Furthermore, many of these papers do not make the same simplifying assumptions as this work does, leaving me to think that I should trust those other papers more. This also leads me to wonder what the novel contribution to the literature here is. I do not see that clearly stated in the paper.

An even more significant concern for me is the similarity between this paper and a previous one already published by the authors that also does a similar optimization of the OC3 spar with a GA: https://doi.org/10.1016/j.oceaneng.2020.107186. Much of the material here on the methods and discretization is nearly identical to their previous paper and leaves me to wonder why these two efforts were not combined. To me, this submission has not done enough to separate itself from the authors' prior work and perhaps also not enough to separate itself from the prior work of others. What is different just doesn't meet the bar of its own journal paper, so perhaps a conference setting would be more appropriate. I am willing to hear the authors retort to my concerns, but I am inclined to decline this submission.

Interactive comment on Wind Energy. Sci. Discuss., https://doi.org/10.5194/wes-2020-93, 2020.