

Interactive comment on “An efficient frequency-domain model for quick load analysis of floating offshore wind turbines” by Antonio Pegalajar-Jurado et al.

Anonymous Referee #1

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This paper presents a simplified modeling approach, called QuLAF, to calculate tower-base loads in a floating wind turbine. The approach is an interesting one and is well thought out and presented.

Some items that I think would make the paper better include a larger discussion on what makes this modeling approach unique from others that have done simplified modeling in the past. Other work is presented, but the differences are not well described.

A second point would be to better describe how the authors see this approach benefiting the design process for a floating wind turbine. There appears to be several steps in developing the simplified model which could make it time consuming, such as the

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extraction of damping coefficients. How much of this work can be automated, versus how much needs to be done manually? What would the total time to develop this approximated model from the original? With super computers now, 50,000 simulation could be run in a couple of days. In addition, the authors are still using WAMIT in the pre-computation stage, which will be time consuming. The time savings seems to come from being able to do multiple simulations for the same design. However, it does not seem like this approach would allow designers to quickly examine different design approaches due to the time components for creating the model.

Why not consider using a Morison model for the hydrodynamic loading? While it may not be completely accurate for larger structures, it seems the represent the system fairly well, especially considering the level of accuracy in this simplified approach. Was a comparison to this approach done?

While I can see such a model could predict steady-state loading, and thus be able to estimate the fatigue loading of the system, it would not capture the discrete events that tend to cause extreme loading in the system, which can be a design driver. I therefore think a more thorough discussion of where this tool fits within the design process would be beneficial.

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