Response to Referee #2 (anonymous)

Discussion Paper wes-2017-29

Decoupled simulations of offshore wind turbines with reduced rotor loads and aerodynamic damping

Sebastian Schafhirt and Michael Muskulus

Dear reviewer,

We thank you for your careful work and dedicated effort. Your comments are much appreciated. We will revise our manuscript based on your comments. Details on how we are going to address them can be found below.

With best regards,

Also on behalf of my co-author

Sebastian Schafhirt

(1) For offshore wind turbines on monopile support structures, the soil-structure interaction can significantly affect the performance of the system. Please clarify if the soil-structure interaction is considered in this study.

The reviewer's statement is correct. The model as it is defined in Phase I of the OC3 project is used. This model does not include a soil model. We will add this piece of information in beginning of Chapter 4. However, adding soil-structure interaction will not change the outcome of this study.

(2) The choice of two wind speeds (i.e. 8m/s and 20m/s) in the case studies should be justified.

In total 11 wind speeds between cut-in and cut-out wind speed are investigated. The rated wind speed for the turbine that is subject to this thesis is at 11.4 m/s. We decided to present results for one wind speed below rated wind speed and for one wind speed above rated wind speed. This decision is made due to differences in controller activities below and above rated wind speed. Aerodynamics differ in the different regimes. This is stated in the manuscript (page 10, last paragraph). We propose to rephrase the paragraph in order to clearly justify our choice.

(3) It would be appropriate to add a case study to validate the calculated damping ratio.

A validation is certainly a good point, but a little bit out of the scope for this work. The wind turbine subject to this study is a generic turbine and measurement data are not available. The study as presented in this manuscript can only conclude that the model is not linear. A valid question would be to evaluate how linear the aerodynamic damping is in reality. We can add a corresponding comment in the conclusion if requested.