

Wind Energ. Sci. Discuss., author comment AC1
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Reply on RC1

Kevin Ray Moore and Brandon Lee Ennis

Author comment on "Aeroelastic Validation of the Offshore Wind Energy Simulator for Vertical-Axis Wind Turbines" by Kevin Ray Moore and Brandon Lee Ennis, Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2022-91-AC1>, 2022

General comments

- The structural solver is verified by comparison against GXBeam. A brief description of the GXBeam code is recommended before presenting the verification. -> Agreed, a description has been added
- Aeroelastic simulations include coupling between the structural solver and the aerodynamic solver. The present study verified the structural solver comprehensively but did not pay attention to the aerodynamic simulation methods and associated correction. The coupling between the structural solver and aerodynamic method should be briefly presented, though they have been studied in other papers. -> Agreed, more details on the coupling method have been added.

Detailed comments:

- Line 54: the authors mentioned a new unsteady method (RPI). Please briefly clarify this method. -> The RPI method has been clarified
- Page 4: it is recommended to present a figure to show the structural model. Table 2 and Table 3 can be replaced by two equations. Parameters denoted by formulas are also recommended to be presented by equations. -> Tables have been replaced with equations, the formulas changed to numbers where appropriate, and a clearer reference to the structural model figure is added.
- Section 3.1: beams with and without a bend are used for different cases. Please clarify the beam shape (e.g. by figures) to avoid possible confusion. -> Clearer references and more detail is added to highlight the relative figures and distinguish the different analyses.
- The discrepancies shown in Figs. 4-6 are significant. The authors attribute the discrepancies to methods of applying structural damping. Please clearly state the damping coefficient applied in the two codes. Is there any other reason that can cause the discrepancies? For instance, the time marching scheme? -> More detail and clarity added as recommended.
- Section 3.4: control modeling is important for the dynamic behavior of VAWT, it is recommended to give a more detailed description of the modeling of the controller for the normal operating, startup, normal stop and emergency stop conditions. -> Agreed, more detail and clarity was added.