

## ***Interactive comment on “Two-dimensional numerical simulations of vortex-induced vibrations for wind turbine towers” by Axelle Viré et al.***

**Anonymous Referee #2**

Received and published: 7 February 2020

The article investigates a relevant topic of VIV over tall towers of wind turbines during the installation process. However several points are not explained clearly. The article should also explain the following points before publication: 1) Introduction, Page 1: Provide some numbers as to what you consider as a large diameter or tall wind turbine for which VIV is relevant. 2) Section 2.1 - While you outline the k-w CFD model in detail, there is not much mentioned about the external wind conditions. What free wind condition range is applicable to your model in terms of free wind speed and turbulence? Can you also consider wind shear and ground effect? 3) Page 5: Why is there no aerodynamic damping term present in Eq. (18)? 4) Page 7: From figure 2, it appears that bending in only one direction is considered. For a wind turbine tower, both side-

C1

side and fore-aft modes are excited in VIV and so at least two springs in perpendicular directions should be considered. 5) Section 3:0 : Can you provide a figure of the CFD mesh you used? 6) Page 8: You state the structural damping is 0.007. How much artificial damping due to the CFD mesh do you generate in your model? Is this artificial damping significant with respect to your structural damping? 7) Same question for the turbulent flow: How much artificial/numerical damping is present in your CFD model and what affect does that have on the results? 8) Going by the results of Table 2 on the angle of flow separation over the cylinder, what would be the best direction to orient the spring for your structural oscillation, since you consider only single dimensional oscillations? 9) Page 12, line 240: The expression for aerodynamic damping used is not clear. There is no 'q' term in the equation as given in the explanation. 10) Figure 7, Figure 8 etc: Can you also plot this versus the Strouhal number? 11) Section 3.2.4: When you state realistic wind turbine tower, what is the wind turbine tower diameter, height and natural frequency that is considered? 12) Can you conclude on how the results of your work can be applied to an existing wind turbine tower? What wind conditions and tower natural frequencies should the turbine designer pay attention to for VIV?

---

Interactive comment on Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2019-83>, 2019.

C2