

Wind Energ. Sci. Discuss., author comment AC2  
<https://doi.org/10.5194/wes-2021-41-AC2>, 2021  
© Author(s) 2021. This work is distributed under  
the Creative Commons Attribution 4.0 License.



## Reply on RC2

Aemilius A. W. van Vondelen et al.

---

Author comment on "Damping Identification of Offshore Wind Turbines using Operational Modal Analysis: A Review" by Aemilius A. W. van Vondelen et al., Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-41-AC2>, 2021

---

Thank you for your positive and constructive feedback, which we find very useful in improving the quality of the paper.

Please find below responses to the critical points raised in the review:

>>The reviewer thinks that the effort the authors spent in their introduction to justify the need for more accurate damping estimation would >>better be directed to the damping estimation during the real lifetime of the structure. Continuous estimation of damping along with other >>structural properties would enable continuous updating of the lifetime predictions. If the initial conservative damping assumptions were >>replaced continuously by more realistic damping estimates longer lifetimes associated with economic benefits can be expected. However, it >>must be kept in mind that the accuracy of lifetime predictions depends on the length of prediction times and does not only depend on the >>estimated structural properties but, for example, also on the implemented inspection philosophy.

The authors agree that the main benefit from operational damping estimation can be gained with improving estimations for lifetime predictions rather than optimizing structural design during the design phase. The authors also believe that the successful estimation of structural damping in operational projects will help in a better understanding of the phenomenon, in turn leading to more accurate damping assumptions in the design phase. It is expected that such an increase in the accuracy of damping models will be accompanied by a reduction in the level of conservatism currently demanded in wind turbine design. A modification to the overall motivation has been made throughout the entire paper.

>>Is the suitability criterion fulfilment in table 2 reported from literature or is it derived from the authors' own judgement?

Although the authors evaluated several of the considered algorithms in a practical case, the conclusions in table 2 are drawn from current literature only. A clarifying sentence has been added in the introduction to emphasize this, Page 5, Line 140.

>>Did the present authors evaluate one or more algorithms by their own software implementations?

The authors evaluated the SSI, KF-SSI, PolyMAX, Enhanced PSDT, LSCE, Cepstrum editing and Modified LSCE algorithms on experimental and simulation data from an operational offshore wind turbine. The results from this study will be presented in a future publication.

>>Looking on the notation used for the equations the authors should improve the definition for the indices. For example, in Eq.(1) the sample  $k$  and indices  $t_1$  are not explained. Index  $t_1$  is not unique on the left hand and the right hand side of the equation. Other equations >>should be reviewed accordingly.

Thank you for pointing out this mistake, the missing definitions of indices have been added.

Please also note the supplement to this comment:

<https://wes.copernicus.org/preprints/wes-2021-41/wes-2021-41-AC2-supplement.pdf>