

Dear, reviewers

First, thanks for all your comments. Your comments and suggestions are valuable in improving the quality of this work. Based on your comments and suggestions, we have made some changes to the manuscript.

Editorial comments: Please format the reference list strictly per IOP recommended style.

Comments from Reviewer #1

The references cited [1, 2, 3, 4, 5, 6] should be clarified. What type of studies in these references? In the methodology, please add discussions how to select the initial training cases.

Reply: Yes, the details of the references are given in the revised paper. As for the selection of the initial training cases, normally the initial cases can be selected by grid sampling based on each parameter design space.

Correct typos, for example in Sec. 4 'win-wave cases'

Reply: Sorry for such small errors. We have checked all the texts and corrected such typos.

The results are too limited (only Table 3). More results shall be included, including validations of the method.

Reply: We added other results of the AK-DA approaches. Regarding to the validations of the method, here we directly compared the results of the AK-DA approach with the classical simulation approaches.

Comments from Reviewer #2

1. In the very beginning of the abstract, it is suggested to clarify the significance of the research. Why is fatigue estimation of bottom-fixed wind turbine important for the offshore energy industry? And why is the efficiency important for the estimation of fatigue damage?

Reply: Thanks for such advice. We have made some changes in the abstract.

2. In the methodology, it is suggested to provide more detail on the AK-DA approach in terms of how the model is trained using active learning and clarify the meaning of all the symbols and identifiers. Considering its substantial contribution to the study, the methodology of AK-DA should be allocated a larger portion of the article's length.

Reply: The details of the AK-DA approach can be found in the original work. As this approach was not developed by the authors and there is a page limitation of the paper, we have summarised the AK-DA approach in Fig.2, which can help readers to understand well this approach.

3. In the conclusion, it is suggested to make some expansion on the significance of the work and findings. How might this efficient estimation method impact the offshore wind energy industry in terms of cost savings, safety, or design improvements?

Reply: Yes, we have added some discussion about this part.

4. In the end of conclusion, you could discuss the limitations of the study, if any. Also, you could accordingly discuss the potential areas for future research.

Reply: Thanks for your suggestions. We have added this part in the end.