Wind Energ. Sci. Discuss., referee comment RC3
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Reply on AC1

Galih Bangga (Referee)

Referee comment on "A WaveNet-based fully stochastic dynamic stall model" by Jan-Philipp Küppers and Tamara Reinicke, Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2022-13-RC3, 2022

Dear Authors,

Many thanks for providing detailed responses in questions! Despite that, I still have few important doubts about the work based on your answers which I would hope could be included in the paper:

- Please describe the basis of the window sampling size in the revised paper as well. What happens if the sampling is less than one period of dynamic stall? It would be interesting to add the initial studies in the paper. Note that in real case dynamic stall is never ever periodic especially for turbulent case, thus the model should be relatively independent of the sampling width, knowing the limit will be of importance. From what we observed in our studies, there is a certain limit of the window width needed be followed, for timeseries prediction of the turbine wake we adopted autocorrelation for finding that, but here perhaps relate that with the dynamic stall parameters as you feel more convenient.
- I believe the silhouette plot adds a good value in the clustering analysis.
- Indeed we can feed the data for different airfoils and different Reynolds number. However, what about the weights obtained in the present studies? Should it be calibrated? What if we have no dynamic stall data for calibration for that airfoils? Note that in real wind turbine design load cases, manufacturers have to run more than 1000 load cases where most of the time they have no data to compare with and to re-train the models.
- No, unfortunately lift coefficient amplitude as high as 40 is totally incorrect. Just see on the raw data, the amplitude of the fluctuations is not even greater than 1. Have you checked in the FFT if you have divided the amplitude with the sampling number points in the FFT calculations?
- The problem with a fixed time step is the real usage in wind turbine design tools. Do we need to re-train the model every single time we modify the time step? I still see this as a drawback compared to well established model like Beddoes Leishman where we do not need to bother with time step and work without any training data. Please justify

this in the revised paper.

- As mentioned above, the problem with its generality is that the weights should be recalculated for different airfoils. For example, only for one blade we could have more than 7 different airfoils. What if we need to simulate several turbines at various inflow conditions? Coupling this with real wind turbine design tools will be a huge challenge and this should be properly mentioned in the paper.
- Moreover, when simulating the real turbine, we have "no initial value" to look back by 128 steps as done in the paper. I also believe this poses a challenge to use in wind turbine design tools and it is not as simple as just enabling TensorFlow as the tool. This has to be mentioned as well.

In conclusion, I consider this paper as a good progress in science, but above concerns should be considered properly before the paper can be published. Thank you.

Kind regards,

Galih Bangga