

Wind Energ. Sci. Discuss., referee comment RC1
<https://doi.org/10.5194/wes-2022-55-RC1>, 2022
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Comment on wes-2022-55

Anonymous Referee #1

Referee comment on "Introducing a data-driven approach to predict site-specific leading-edge erosion from mesoscale weather simulations" by Jens Visbech et al., Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2022-55-RC1>, 2022

- 1) Define NEA and DKA domains more appropriately in the text.

- 2) It is unclear the reason for the $\alpha=0.16$ adopted by the power law extrapolation. This extrapolation procedure should be further explained and, furthermore, the sensitivity of the measured quantities with respect to α should be investigated.

- 3) The main input to the data-driven model is the accumulated rain impingement. Despite it does combine the effect of amount of rain and wind speed, it does not consider a third important parameter which is the rotational speed of the wind turbine. In the paragraph related to line 260, please expand the discussion while taking this argument into account. What would be the implication of including the rotation speed into the prediction models?

- 4) The authors discuss that the feedforward neural network with a 2-layer architecture with 5 neurons per layer + RELUs; was enough and outperformed other methods such as PCE, support vector machine, . The ability to learn non-linear relationships is not exclusive from FFNN, and the RELU effect to allow a linear piecewise description of the neuron weights can be emulated by another model based on moving averages or any piecewise form of approximation, for instance. The authors are encouraged to improve all the discussion surrounding the choice for the FFNN, exposing also its main limitations and the results of the PCE that was largely investigated.

- 5) Have the authors considered the use of classical surrogate models such as the Kriging method?

- 6) The authors should present one application case that applies the developed framework to predict damage in a new site within the covered region, focusing mainly on the

workflow that would need to be followed.