

Wind Energ. Sci. Discuss., referee comment RC1  
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## **Comment on wes-2021-40**

Anonymous Referee #1

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Referee comment on "Statistical impact of wind-speed ramp events on turbines, via observations and coupled fluid-dynamic and aeroelastic simulations" by Mark Kelly et al., Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-40-RC1>, 2021

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The article is well written and the assumptions are clearly stated and results were explained in great details-

There are few remarks that the reviewer would like to make.

- In the manuscript the NM-80 wind turbine is used as an example. This type of event will be probably more relevant for large offshore wind farms and this turbine is probably not very representative of the offshore wind turbines. Can the authors comments on the impact of the wind speed ramps on large offshore wind turbines and wind farms, especially in relation to the offshore marine boundary layer where such ramp events can occur.
- Can it be said that the wind field modelled for such ramp events using constrained Mann turbulence box/LES capture the spatial characteristics of the ramp event in term of spatial turbulence, vertical and horizontal shear, veer, coherence etc. That is, can ramp events be modelled as normal wind fields?
- In term of loads. The increase of loads shown in this study requires that the wind turbine design loads need to be reassessed due to the occurrence of ramp events? To be more precise, in term of extreme loads, does the load increase due to ramps exceed the extreme loads envelope of the wind turbine ? In term of fatigue loads, does the occurrence probability of ramps require the fatigue loads to be assessed differently. How much would the current practice of using bins of mean wind speeds to assess the fatigue loads underestimate the fatigue loads cause by ramps.