

Solid Earth Discuss., referee comment RC1
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Comment on se-2021-21

Anonymous Referee #1

Referee comment on "Seismic radiation from wind turbines: observations and analytical modeling of frequency-dependent amplitude decays" by Fabian Limberger et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-21-RC1>, 2021

The work is quite interesting, it is also well written (with some small exceptions, as page 10). The authors propose a way to model the seismic motion produced by the operation of wind turbines. They show the importance of phase shift due to the presence of more than one wind turbine, and propose a method to remove it.

However, the main problem in the manuscript is the lack of discussion of the effect that more wind farms would have in both: the observed and the modeled motion.

The spectral analysis and their observations are consistent with previous works. However, in their results they mention "The remaining (sharp) peaks show no systematic dependence which is an indication that their origin is not related to the WTs." To what could it be related? Could these peaks be related to the other two existent windfarms? Which are in some cases, closer than the Uettingen WF to the recording stations (i.e., stations 4 km away)

When the authors analyze the amplitude decay with the distance between 300 and 4000 m there are some stations with discrepancies with the fitting power law, which the authors explain as an effect of the near field for stations ~ 300 m away from the WF and as local anthropogenic noise for the stations at more than 3 km distance (which actually had been removed). So again the question would be: could these effects be due to the other two wind farms? For the farther stations, which would be the role of the eastern wind farm with six wind turbines?

On the discussion, the authors mention shortly the effect that short measurements (shorter as 6,5 weeks) can have on the estimation of b values, because of the presence of transients and earthquake events. On section 2.1 the authors mention they removed the local transients, but they don't explain how they managed with earthquake events. The authors should clarify if they removed these signals or how they managed with them.

The discussion of the authors is good and complete, and they focus on the problems they solve. The authors show the important role that three aleatory wind turbines would have in the motion, but the role of the nearby wind farms (with even six turbines) is just shortly mentioned. Please discuss in more detail.

Would it be possible to identify which signals are really coming from the Uettingen WF and which from the other wind farms, in order to identify the origin and obtain an even better model?

Figures 12 and 13 are discussed in the text before figures 10 and 11, it would be better to change the order. Figures 10 and 11 need a color scale for the modeled radiation patterns. The caption of figure 13 should be improved.