

Interactive comment on “Mitigating Impact of Spatial Variance of Turbulence in Wind Energy Applications” by Jonas Kazda and Jakob Mann

Anonymous Referee #2

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This is certainly an interesting paper, with a good introduction, and interesting outcomes. It makes a number of assumptions about the turbulent flow approaching the front row of turbines, and takes data from Lillgrund to verify the results of the analysis. It is obvious that for a short averaging period (T) the turbulence approaching one turbine will not have the same statistics as that approaching another, even for turbulence that is laterally homogeneous when averaged over a long time. But it is worth making the point too. It would be nice to know how the predictions vary with T . It's also obvious, is it not?, that the nacelle instrumentation (assuming it is working) should give a better indication than remote mast instrumentation – a point of conclusion on page 11, line 18.

Through to equation 4 is straightforward, but I cannot comment adequately on the

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remainder, bar a few points. On page 4, line 2, the mean velocity is put to zero. This seems rather odd (i.e. wrong), and so needs some justification. Line 10, the vector r is not defined.

Page 5 sentence on line 16 is essentially a repeat of that on line 14. The Mann model is for neutral flow, so something should be said when applying the results to supposedly (weakly) non-neutral flow. Suggest a bit more is said about the bands in Fig 3. Cite ref.

Page 7, line 15. Presume this should say eqn 9.

Fig 3. In comparing this with Fig 2 it would be easier if the left-right order was reversed - to be the same as Fig 2.

Page 9, line 4. "A similar, spatial .." . This seems to be repeating what's covered in the previous chapter?

Page 11, line 2. The frequency range in the near wake is bound to be to much higher frequencies than in the upstream flow because the blade-wake scale, as they form into the near wake, are much smaller, and also energetic.

The assumption of frozen flow (Taylor's hypothesis) – it's validity, or lack of - will have offsetting influences: if the wind is stable the ABL will be less deep (wrt neutral), and so a fixed distance –eg 200m – will be a greater relative distance – making the assumption less valid. On the other hand, the lower turbulence intensity will have the opposite effect. The opposite occurs for unstable flow: deeper, so relatively closer vs more intense.

Page 13, line 14. "The second approach ..." First approach is fine, it's clear, but the second is not clear/obvious. I think it needs some elaboration.

Overall, I think the latter half of the paper is not as well written as it could be.

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