- **This paper discusses the generation of homogeneous, isotropic wind fields. The aim is to improve the quality of reconstructed fields by using knowledge of the correlation tensor. The paper is technically interesting and well written. It provides a useful overview of previous work, but the novelty of this work could be highlighted more effectively.**

  Thanks for pointing it out.

  Action: The novelty of the method has been explained in more details in sections 5 and 7.

- **My main criticism, which is left, concerns the discussion of the possible application of this work to wind energy systems, i.e. generating real wind fields. How can the IEC-wind field generators be improved? A comment on how to extend the proposed method to simulate full three-component wind fields would be helpful.**

  Thanks for the comment. At the moment it is possible to use the CBM considering only an homogeneous and isotropic wind field, described by the correlation function defined in [Batchelor, 1953]. In a subsequent publication, it is intended to extend the CBM modeling capabilities adding the Kaimal [Kaimal et al., 1972] and the Mann [Mann, 1994] PSDs. To do so the respective correlation functions shall be computed (i.e., computing the inverse Fourier transform of the PSDs), and then used as the wind field required correlation, substituting the homogeneous wind correlation function (i.e., Eq.(16) in the proposed paper). Even if in the example in the proposed paper covers a 2-D wind field, it is already possible to synthesize 3-D wind fields considering the correlation function for a 3-D domain:

$$B(\vec{r}) = \sigma^2 \left[\frac{r_x^2}{\vec{r}^2} f(\vec{r}) + \frac{r_y^2 + r_z^2}{\vec{r}^2} g(\vec{r}) \right] . \tag{1}$$

  Action: The intention to add the Kaimal and Mann PSDs in a future work has been added in the conclusions.

- **Coming to real wind fields. Some remarks o the following questions would be of value: How can non-homogeneous situations be handled? A big problem will be non-stationarity. Which quantities should be measured in the field? I also question whether the increased accuracy shown is really valuable for real wind fields. I would imagine that the intrinsic errors of the corrections of wind field measurements are so high than the proposed increase in accuracy. To discuss this frankly does not lower the quality of the work but is of interest for application.**

  Thank you for pointing it out. In fact, this was not mentioned at all in the proposed paper. The idea behind the CBM is to have a method that

does not introduce computational errors and then refine the wind field synthesis using field data (e.g., measured using anemometers, five-hole probes). From these data a more realistic wind correlation function can be inferred, to then be used in the synthesis of wind fields. Regarding modeling non-stationary wind, the method proposed in [Wilson, 1997] is being investigated.

Action: The comment on the CBM error in section 7 has been extended adding this answer.

- **Another question is whether the authors have any ideas about how to include higher-order correlations/statistics. For example, does the reconstructed wind field reproduce the well-known skewness scaling of ideal turbulence?**

  Thank you very much for this comment. In the paper the authors focused only on a second-order statistics, assuming a Gaussian distribution of the wind field. However, it would be possible to add non-Gaussian features to the synthesized wind field following [Friedrich et al., 2022]. This is being considered for future work.

  Action: The possibility to add non-Gaussian features in a future work has been added in the conclusions.

The authors would like to thank the reviewer for her/his time and effort. All the raised points were very helpful in pointing out the parts not clear and to clarify how the method will evolve in future works.

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