

Third round review of “A North Sea in situ evaluation of the Fitch Wind Farm Parametrization within the Mellor–Yamada–Nakanishi–Niino and 3D Planetary Boundary Layer schemes” by Agarwal et al.

The manuscript has undergone significant change during all revisions. After revising some minor comments listed below, the manuscript will be ready for publication.

Specific comments

- L 374-376. Here it is stated that since 3DPBL has a higher wind speed in the wake than MYNN, it also has more turbine-induced TKE. However, the turbine-induced TKE is only related to the TKE source from Fitch, which actually should be lower in 3DPBL than in MYNN because of the lower wind speed. Rather, 3DPBL generates more mechanical (shear-driven) turbulence. This should be noted and the physical mechanism (ideally refer to 3DPBL equations) should be explained.
- Appendix A4: Thanks for adding the 28 day analysis. Your current final sentence “Increasing the length of the evaluation window helps reveal systematic differences between the model” is a rather weak and informative statement. Please add more details on what we can learn from this analysis. With the mention of 3 statistically significant results, you should add that bias is significantly lower for MYNN, while cRMSE and R2 are significantly better for 3DPBL. Most importantly, explicitly mention whether extended analysis confirms the take-aways from the 12h analysis or not. Lastly, please use the same labels on the x-axis as in Fig 14 and in the main text directly refer to this appendix to make the reader aware.

Technical corrections

- L8 “3DPBL TKE bias underperforms MYNN TKE bias”: not very clear what underperforming here means. Please rephrase
- Section 2.1.3: for me not necessary, but ok to keep it in.
- Section 3.1.1 header: not sure whether “atmospheric stability” fully captures the content of this section. Proposal: “Profiles of atmospheric variables” or similar
- L360: 3PBL → 3DPBL
- L365: In this sentence you talk about both TKE (Fig b) and WS (Fig a), yet only refer to Fig b. Either add reference to Fig a or remove this reference to Fig b.
- Fig 11: quality of figures needs to be improved
- Conclusions: rename to ‘Conclusions and future work’. I’d make this explicit as this comprises a significant part of this section. Please also add that power generation estimates need to be evaluated in future work.
- L495 “The optimal PBL scheme depends on the site”: add that it also depends on the variable and error metric