

Responses to Reviewers' Comments for Manuscript

**The LOLland offshore Lidar EXperiment
(LOLLEX): A novel observational
approach for the study of wind farm flow
and entrainment**

Addressed Comments for Publication to
Atmospheric measurement techniques

by

Malekmohammadi et al.

Authors' Response to Reviewer

Reviewer 1

General Comments. The authors have responded to the reviewers' concerns and the paper can be published once the following minor revisions are implemented.

Response:

We thank the reviewer for their feedback. The revisions are applied accordingly.

Comment 1

In line 285, after Eqs. 10 and 11, the authors refer to w_c , but Eqs. 10 and 11 do not include a variable w_c .

Response:

Following the second-round revision, we changed the corrected vertical wind speed, w_c , in Eqs. 10 and 11 to simply w , denoting the real vertical wind speed. However, the corresponding reference to w_c in the previous version was not updated. This inconsistency has now been corrected.

Comment 2

The authors should provide additional details about how the moving standard deviation σ_w is computed. What is the averaging time window, how many data points are averaged and how was the averaging time determined?

Response:

We have added this information to lines 341-346 as follows:

The standard deviation σ_w was estimated using a centred sliding window of 60 s, which, for a sampling frequency of 1 Hz, corresponds to 60 data points. The choice of the 60-s window represents a compromise between capturing minute-scale variations in turbulence and including a sufficient number of samples to

obtain a representative estimate of the vertical velocity standard deviation. This window length was, therefore, selected to retain relatively rapid changes in turbulence while avoiding an overly noisy estimate of σ_w .

Comment 3

Also, was any noise filtering applied when computing σ_w ?

Response:

No additional filtering was applied when computing σ_w . High-frequency variability is usually partly filtered by the along-beam spatial averaging of the lidar. In our previous study of Kelvin–Helmholtz billows ([Malekmohammadi et al., 2025](#)), we applied a correction for potential high-frequency noise to 10-min data. This correction requires a sufficiently robust estimate of the power spectral density, which cannot be reliably obtained from a 60-s window. The 60-s window also limits the contribution of variability at time scales longer than 60 s.

We have added this explanation to lines 346 to 350.

References

Malekmohammadi, S., Cheynet, E., & Reuder, J. (2025). Observation of Kelvin–Helmholtz billows in the marine atmospheric boundary layer by a ship-borne Doppler wind lidar. *Scientific Reports*, 15, 5245.