Comments on wes-2025-91

General comments

The paper presents a climatology analysis focused on LLJ in the North Sea based on bias-corrected ERA5 and NORA3 data. The topic is important for meteorology and wind energy, and the methods appear sound. However, minor revisions are advised to improve the reliability and repeatability of the results.

The quantile mapping and bias correction are applied regardless of season, wind direction, and other parameters that may influence the model performance, This should be discussed thoroughly in Section 2, since correcting for overall bias may mask cancellation of errors of opposite sign happening in different data clusters.

The use of a logarithmic profile in the stable conditions where the jet develops needs more justification. It should be clarified whether the addition of the jet profile reduces the need for a stability correction, for instance.

A map of the FINO site with the nearby coastline and wind farms should be added at the beginning of Section 2.

The flow can be improved. For instance, do results in Section 3.1 refer to model data before or after the bias correction? Describing all the methods in section2 and the results in section 3, although customary, in this case may lead to confusion. A schematic of the workflow may help as well.

There should be a detailed description of how the bias correction is practically implemented. Are the 5 parameters of the log-jet function adjusted so that the fitted profiles follow the observations more closely? Is there an intervention on the full model output U, V, W, T, etc? Is the model rerun with different settings? Please clarify.

Specific comments

- L 65: Please provide more details on the experimental dataset, specifically the temporal averaging, the type of scan used for profiling, the lidar model, and the data availability during the campaign.
- Fig. 1: Please clarify whether the time is UTC or local.
- Fig. 3: What is upper-case U* on the x axis?
- L 155: Please describe the score used in the K-means (silhouette?) and provide a reference for the elbow method.

- L 166: Why would the agreement between ERA5 and NORA3 be surprising if the latter uses the former as a boundary condition? Please expand.
- L 243: missing capitalization.