Reply to the comments provided by the Anonymous Referee #2 on the manuscript amt-2020-228 entitled "LiSBOA: LiDAR Statistical Barnes Objective Analysis for optimal design of LiDAR scans and retrieval of wind statistics. Part II: Applications to LiDAR measurements of wind turbine wakes", by S. Letizia, L. Zhan and G.V. Iungo

The authors thank the referee for the further comments. Our replies are reported in the following. References to pages and lines are based on the revised marked-up manuscript.

Comments

I would like to thank the authors for their reply. I have only one minor comment. At several places in the manuscript it is stated that LiSBOA has been used to select or optimize the scanning strategy, while it seems to be used only to adjust the azimuth angle resolution and most of the scan settings have been decided without using LiSBOA. Please state clearly which part of the scan strategy was designed with LiSBOA. Some statements to consider:
L1-2 "The LiDAR Statistical Barnes Objective Analysis (LiSBOA), presented in Letizia et al. (2020), is a procedure for the optimal design of LiDAR scans …"
L57-58 "… the data collection strategy is optimally designed through the LiSBOA."
L100-103 "The scope of this study is dual: first, assessing the capabilities provided by the LiSBOA for the optimal design of the LiDAR scanning strategy by maximizing the statistical accuracy of the measurements and coverage of the sampling domain with the prescribed spatial resolution;"
L156-157 "The present section aims to explore the potential of the LiSBOA for the optimal design of a LiDAR experiment, data postprocessing, and reconstruction of 3D flow statistics."
L357 "The optimal LiDAR scanning strategy has been selected through the LiSBOA, …"
L366-368 "Two noticeable advantages of the LiSBOA arise from the present work: first, once the wavelengths of interest and the LiDAR basic setup are selected, the LiSBOA allows a systematic and effective design of LiDAR scans, which includes all the essential information of the flow under investigation and the LiDARs used."

R: We now clarify that in this paper the LiSBOA is used only for the optimization of azimuth resolution, being the other parameters fixed by the atmospheric conditions and the geometry of the scan. For instance:
At L 4 it is now reported: "For both case studies, the LiSBOA is leveraged for the optimization of the azimuthal step of the LiDAR and the retrieval of mean equivalent velocity and turbulence intensity fields".

At L 57 it is now reported: "The LiSBOA also performs adequate filtering of small-scale variability in the mean velocity field and mitigation of the dispersive stresses on the higher-order statistics provided that the algorithm is tuned based on the characteristics of the flow under investigation and the free parameters of the LiDAR scan are optimally designed through the LiSBOA".

At L 102 it is now reported: "The scope of this study is dual: first, assessing the capabilities provided by the LiSBOA for the optimal selection of the angular step of the LiDAR scans by maximizing the statistical accuracy of the measurements and coverage of the sampling domain with the prescribed spatial resolution…".

At L 158 it is now reported: "The present section aims to explore the potential of the LiSBOA for the selection of the optimal azimuthal resolution of a LiDAR scan, data post-processing, and reconstruction of 3D flow statistics."

At L 355 it is now reported: "The LiDAR Statistical Barnes Objective Analysis (LiSBOA) has been applied to two different cases of wind turbine wakes to estimate the optimal azimuthal step of the LiDAR and retrieve mean velocity and turbulence intensity fields".

At L 360 it is now reported: "The optimal azimuthal resolution of the LiDAR scan has been selected through the LiSBOA, while the mean velocity and turbulence intensity fields retrieved through the LiSBOA have offered a detailed insight of the wake morphology".

At L 370 it is now reported: "Two noticeable advantages of the LiSBOA arise from the present work: first, once the wavelengths of interest and the LiDAR basic scanning parameter dictated by the atmospheric conditions and target position are selected, the LiSBOA allows a systematic and effective optimization of the azimuth resolution, which includes all the essential information of the flow under investigation and the LiDARs used".