Note: Reviewer comments are reproduced in italics, followed by our responses and the associated changes in the manuscript. All line numbers refer to the marked-up version of the revised manuscript.

RC1:

That said, some aspects of the experimental setup and analysis limit the broader impact and interpretability of the results. Some relatively straightforward reference measurements—such as a reference pressure measurement inside the tower—and fully consistent rotor position time stamping are stated to be missing. The absence of these quantities introduces additional uncertainty and necessitates assumptions or data anchoring during post-processing that could potentially have been avoided. This complicates the interpretation of the measured trends.

We agree with the reviewer that the absence of reference measurements and fully synchronized rotor position time stamping represents a limitation of the current data set. Measures are already being implemented to address these issues in future measurement campaigns. However, the quantified pressure amplitudes and the derived magnitude of rotor–tower interaction effects presented in this manuscript are not affected by this limitation.

The authors state that the measurement data sets cannot be made publicly available due to confidentiality and non-disclosure agreements between the project partners. While this constraint is understandable in the context of industrial collaborations, it limits the possibility for independent validation and reuse of the data by the wider research community.

We fully understand the reviewer's concern regarding data availability and agree that public access to full-scale measurement data would be highly beneficial for the research community. However, we are currently not permitted to share the raw data set. Within these constraints, we have aimed to provide as much quantitative information as possible.

In this context, complementary CFD analysis becomes critical, especially since the manuscript emphasizes that the blade–tower clearance in the present study is higher than typically reported in the literature, and this is used to explain discrepancies with previously published results. Without dedicated CFD simulations for the present configuration, this explanation remains largely qualitative. Moreover, in some cases, the observed measurement trends do not follow the same behavior reported in existing CFD studies from the literature.
Including CFD simulations tailored to the present geometry and operating conditions would substantially strengthen the manuscript. Such analysis could help support the interpretations attributed to increased clearance, bridge the gap with existing literature, and enhance the scientific value of the study, particularly given the limited availability of the raw experimental data.

We agree that complementary CFD analyses would provide valuable additional insight into the observed trends. However, dedicated CFD simulations were beyond the scope of the present experimental study. We consider this an important direction for future work, whereas in the aim of the paper at hand is the publication of the experimental results. We agree that such analyses would further strengthen the quantitative interpretation of the results. In response to this and as suggested in RC2, we have expanded the comparison with the existing literature and clarified more explicitly that the primary contribution of this work is methodological.

Changes in manuscript:
– Introduction, lines 65–96, 120–130

RC2:
For this reason, the reviewer considers the primary contribution of the manuscript to be methodological rather than the provision of a reference database for CFD validation, especially since the authors state that the measurement data sets cannot be made publicly available due to confidentiality and non-disclosure agreements between the project partners.

We thank the reviewer for this valuable perspective. We agree that the primary contribution of the manuscript is methodological, in that it demonstrates a full-scale measurement approach for quantifying rotor–tower interaction under real operating conditions. We have therefore clarified this focus more explicitly in the introduction, when defining the study's objectives, and reiterated it in the conclusions.

Changes in manuscript:
– Introduction, lines 120–130
– Conclusions, lines 450-453

In this context, the manuscript would benefit from a clearer and more explicit discussion of how the investigated turbine compares with configurations studied in previous CFD and small-scale experimental works available in the literature. Related to this, the motivation for focusing on an upwind turbine configuration—where rotor–tower interaction effects are expected to be less pronounced—is stated clearly, but its implications could be discussed in more depth. While the authors note that the interaction effects are measurable but minor for the investigated turbine, it would strengthen the manuscript to more clearly explain how the measured results, despite the reduced interaction strength compared to existing literature, can still inform the design of future upwind turbines, particularly with respect to blade–tower clearance re-evaluation studies.

We thank the reviewer for this helpful comment. This comment has helped us to further clarify the positioning of the manuscript within the existing literature and to sharpen the overall focus of the study. In an additional paragraph at the end of the “Results and Discussion” section, we compared the present findings with existing literature to provide context. In this discussion, we clarified how the measured results can inform the design of future upwind turbines, particularly with regard to re-evaluation of the blade–tower clearance.
Additionally, the introduction has been revised to provide a clearer and more comprehensive comparison of the turbine configurations examined in previous studies. Furthermore, we provided a more detailed comparison of the effects of rotor–tower interaction in upwind and downwind turbines. Finally, the conclusions have been adapted to this revision.

Changes in manuscript:
– Upwind vs. downwind: Introduction, lines 43–60; Results and discussion, lines 410–416
– Comparison to turbines studied in the literature: Introduction, lines 65–96; Results and discussion, lines 257–259, 281–283, 375–376, 379–381, 394–402

– Blade–tower clearance re-evaluation: Results and discussion, lines 402–409; Conclusions, lines 440–449

Clarifying the scope of the contribution, strengthening the comparison with existing literature, and better articulating the design implications of the results would further improve the clarity and impact of the paper.

We again thank the reviewer for the positive overall assessment of our work and for the constructive suggestions. In the revised manuscript, we have clarified the scope of the contribution, strengthened the comparison with the existing literature, and more explicitly articulated the design implications of the results, as outlined in our previous responses. We believe these revisions have improved the clarity and overall impact of the paper.