

The authors have developed a reference-type coherent Doppler wind LiDAR (RCDWL) for calibration of meteorological LiDAR, which has strong practical value in application. The manuscript mentions a dual-channel composite detection mechanism based on a combination of continuous and pulsed modes. CDWL has achieved key technical indicators such as a low blind zone of 10 meters, high resolution of 10 meters, and a maximum detection height of 3000 meters. This job is quite interesting. And using radiosondes, meteorological gradient towers, and 9 types of LiDAR for comparative observation and analysis, the work is relatively solid. However, there is room for improvement in the writing of the manuscript and the standardization of the illustrations. Otherwise, it will lose the interest of many readers and cause confusion. I think it is necessary to make major revisions to the manuscript before publication. The specific revision suggestions are as follows:

1. In the abstract section: It is necessary to streamline the content and highlight the innovative work, rather than a large amount.
2. In the introduction section: A brief introduction was given to the development history of LiDAR and various calibration methods for LiDAR. From my perspective, I believe that the authors avoided the important and focused on the trivial, and did not provide any reference on the development process of LiDAR core technology. The implication is that in terms of the development of reference radar, what technology or methods did the author use to innovate and what problems were solved. The outline of the problem is not clear enough. Or what new methods are used in the calibration process? These did not provide clear statements. This is regrettable.
3. Authors need to reintroduce the development history of the core innovation section in the manuscript and add corresponding references.
4. From the current manuscript, it appears that there is insufficient expression of innovation and there is no clear discussion. If it is only focused on comparative verification, then I think this paper still needs further discussion.
5. Isn't it bad to give a conclusion directly at the end of the background introduction? This kind of writing is puzzling. Authors need to improve their writing skills.
6. In section 2 of the manuscript: Figure 1 (a) is not clear, the font is small, and the quality is poor. The schematic diagram in Figure 2 and the flowchart in Figure 3 look terrible, but from a normative perspective, there is a lot of room for improvement.
7. What is the purpose of placing the workflow diagram in Figure 3 here? Does it reflect your core skills and methods?
8. In the description of section 2, the process of data processing is provided, it was not seen what methods or techniques can be used to adjust or reduce errors when the speed accuracy and error are large. This further raises the question of whether this mechanism of LiDAR can achieve high accuracy?
9. The simulations in Figures 4 and 5 do not have specific descriptions, making it feel like they suddenly ended, which is terrible.
10. If possible, try to make the tables in the manuscript into three line tables to increase readability.
11. In section 3.2, the comparison results are very beautiful. If there are any errors or inaccuracies during the observation process, I would like to know how to adjust them? Why

not display some observation results compared to altitude? Or statistical analysis of errors with altitude? At which altitudes is it possible to have significant errors and what are the reasons?

12. The authors' rough handling of wind directions exceeding 360° in Figure 6 (b) is shocking, please correct it.
13. Figures 8, 9, and 10 have poor quality. Please make changes to improve readability.
14. In section 3.3, the author only provided data for two points (10 meters and 200 meters) when analyzing the comparison between LiDAR and meteorological tower sensors. What about the rest? I think when analyzing (Figures 9 and 10), more data analysis can be provided to increase the reliability of the evidence.
15. What is 66 operational LiDARs (compared to the other 66 LiDARs?) in Figure 11 and the corresponding narrative section of the manuscript? What is its function? What do you want to express here?
16. In the fourth section, Figure 12 presents a comparative presentation on December 18, 2023, which was not mentioned in the manuscript narrative section and is quite confusing. I think the authors did not take the manuscript writing seriously and it was very rough.
17. The authors did not provide latitude and longitude coordinates for the comparison locations of the experiments, which is confusing.
18. The authors' rough handling of data beyond 360° in Figures 13 (b) and 13 (d) is shocking. Please correct it.
19. The conclusion needs to be rephrased based on the revised content.
20. The writing and narration of the entire manuscript are poor and require overall improvement.