

Review of the paper “ANALYZING THE PERFORMANCE OF VERTICAL WIND PROFILERS IN RAIN EVENTS ANALYZING THE PERFORMANCE OF VERTICAL WIND PROFILERS IN RAIN EVENTS” by Carvalho et. Al.

General comment

The present paper deals with an evaluation of the availability of SODAR and LIDAR measurements in case of rain. Since LIDAR and SODAR devices are nowadays essential for many activities related to the wind energy discipline (e.g. site assessment, field testing, etc.), the topic of this work deserves investigation.

The adopted methodology is sound, and the analyzed dataset is fit for purpose.

The paper is well written, even if I found many points that should be clarified before the acceptance of the paper. All these points are listed in the “Comments” section, here below.

Comments

1. Table 1: please, consider the possibility of appending a geographic representation of the measurement points to the table itself.
2. Section 2.3: Instead of using subsections, it could be useful to describe all criteria using a bulleted list.
3. Figure 1: when commenting on Figure 1, is it possible to spend a few words to explain the fact that R_{max} may be greater or lower than R_A ? This was just mentioned in section 2.3, but here a clarification could help readers understand the employed criteria.
4. Figure 2 (and many others): In the caption, it is written “Source: Author”. What does it mean?
5. Figure 3: This figure is hard to interpret:
 - a. The legend can be improved. I guess the different lines refer to different levels of C_{10} .
 - b. Y-label can be ameliorated.
6. General comments on section 3.1:
 - a. The values of Standard deviations in Tables 2 and 3 deserve explanations. They are mildly commented on but may bear important information.
 - b. There is some kind of mixed relationship between CON_{10} and C_{10} ... What happens for high C_{10} but low CON_{10} and vice versa? Maybe a double-entry table or a 3D plot may help readers understand the characteristics of R_A combining these two criteria.
7. Figure 4 and related comments: It is hard to extract some pieces of information from this analysis because the wind at different altitudes is typically different due to the atmospheric shear layer. Additionally, different shear layers can be experienced in the same location according to the stability of the atmosphere. I strongly suggest either

eliminating the plots (and the few lines of comments) from the text, or extending thoroughly the analysis as, in the current state, the plots does not offer a valuable output given the scope of the paper.

8. Figure 7: same observation as the previous point.
9. Figure 8: missing x-label. Y-label can be improved.
10. Pag.17, lines 254-255: As it was previously written, Here the overspeed is due to the shear layer. Since we might experience shear layers of different magnitudes, the difference between measurements taken at 10m and 40m cannot be compared directly. Hence, fig 10 and the related comments hardly provide useful information. Please, clarify.
11. Line 258: “suggesting that inland winds have a significant impact on the equipment’s range”, this needs a justification, otherwise it could be viewed as a spurious correlation. Could it be dependent on wind events, that may occur more often in the case of inland winds?