

The manuscript has improved considerably in the revised version. The methodology is now clearer and more reproducible, and the added discussion helps to put the results into better context. The main comments from the previous review have been addressed, and the major concerns are resolved. Only a few minor comments remain, mainly related to clarification and presentation. Overall, the manuscript is in good shape and suitable for publication after these points are addressed.

Dear reviewer, thank you very much for your thorough review and constructive comments and edits, which improved the paper readability and validity. Response and changes in the revised manuscript are shown in blue.

- Line 74: “several radars deployed” instead of “several radar deployed ...”

Revised according.

- lines 90-97: This paragraph interrupts the storyline at the beginning of the introduction. Consider moving it towards the end of the introduction, where the instruments used in the study are introduced.

Now it is relocated to the end of the introduction.

- lines 115-118: Consider rewriting this part to make the content clearer for the reader. Instead of using one long sentence, it may be easier to follow if the information is divided into several shorter sentences.

Now it is revised as: When the beam deviates from zenith, however, horizontal wind is projected onto the radar beam. Even a small pointing offset can therefore introduce a systematic bias in Doppler velocity, which may propagate into estimates of vertical air motion and turbulence.

- line 132: “quantitatively retrieving both pointing angles” Please clarify which two angles “both” refers to, as they have not been introduced earlier in the text.

Now “both” is removed.

- line 164: “the cloud radar signal processor” instead of “the cloud radar signal processo”

It is revised accordingly.

- line 225: “off vertical tilt angle is defined as” instead of “off vertical tilt angle. Is defined as”

Now it is revised accordingly.

- Fig. 3: “and radar zenith pointing angles ( $\theta_0$ )” Typo: “zenith” should be elevation. Please check the manuscript for similar inconsistencies and correct them where necessary.

Revised in Figure 3. Now the zenith angles are corrected with elevation angle.

- lines 311-312: Please clarify that the 150-minute time window is taken both before and after the radiosonde launch, as shown in Figure 1. In the current description, it could be interpreted as a 150-minute window centered on the radiosonde launch (i.e., 75 minutes before and 75 minutes after). It may also be helpful to state explicitly that this results in a total averaging period of 300 minutes.

Now it is revised as “...are averaged within a time window of  $\pm 150$  minutes centered on the radiosonde launch time.”

- lines 316-317: Please clarify the approximate vertical spacing of the radiosonde data grid. This would help the reader understand how many radar gates are contained within one radiosonde grid cell.

We thank the reviewer for this helpful comment. The vertical spacing of the radiosondes data varies depending on the wind and ascent rates. The radiosonde altitude spacing is approximately 10 m, with a mean of 10.59 m and a median of 10.30 m. The 5th–95th percentile range is 8.80–13.30 m. In comparison, the radar range-gate spacing is 30 m. Thus, one radiosonde grid interval corresponds to approximately 0.34 radar gates, or approximately three radiosonde levels fall within one radar range gate. We have clarified this information in the revised manuscript.

- lines 346-347: The revised text provided in the response to the reviewer does not appear to have been incorporated into the manuscript. Please update this section accordingly.

Now it is revised as” The CAPE-k campaign was deployed from April 15, 2024, to October 15, 2025. The radiosonde measurements in Fig. 6a show that the dominant in-cloud winds were directed toward azimuths of approximately 50–150°, measured clockwise from north, corresponding to flow toward the northeastern through eastern to south-southeastern sector.”

- lines 358 and 374: “an elevation pointing angle  $\theta_0$  of approximately 87.5°” instead of “a zenith pointing angle  $\theta_0$  of approximately 87.5°”

Now it is revised as: “The amplitude of the fitted cosine function corresponds to a elevation pointing angle  $\theta_0$  of approximately 87.5°”

- line 456: The sensitivity to the reflectivity threshold is evaluated later in the manuscript, but the threshold itself is not introduced beforehand. Please state in the Methods section which reflectivity threshold is used for the main analysis.

Thank you for the comments: Now we revised as in section 3.2 : In actual observations, particle sedimentation produces a negative bias and scatter in the fitted relationship, as demonstrated in the following section. Because particle fall velocity is related to radar reflectivity, we will evaluate the sensitivity of the retrieved beam-pointing parameters to the reflectivity threshold used for sample selection.