

Author Responses to Editor Comments

Second Round of Editorial Review

We extend our gratefulness for such a thorough review process and welcome each round of peer and editorial review and the associated changes as a significant improvement of this manuscript. Additionally, we thank the editor for the suggested minor revisions. Please see the acknowledgment and associated changes/comments in bold below.

Minor revision

Public justification (visible to the public if the article is accepted and published):

Before publication the following should be done: A few editorial corrections and reformulations regarding the results should be implemented.

1) There are some Track Change marks visible in the manuscript in lines 132-143. Please check (and correct).

- **Thank you for correcting this mistake, all track change errors have been removed.**

2) Regarding the possible impact of “saw-tooth” structures:

I suggest to write “only marginally” instead of “do not” in line 179.

- **The verbiage “do not” has been replaced with “only marginally” on line 179.**
 - **The sentence now reads from line 179-181, “However, these minor gradients only marginally affect the estimates of minimum gradient and associated heights from ERA5 and is most often overshadowed by the PBLH gradient.”**

3) Regarding the use of “daN-units”.

Please correct the following:

Fig.2a, Fig.2c legend: Change “daN-units” to “N”

Fig.2a, Fig.2c x-axis: Change “daN” to “N”

Fig.2 caption: Change “daN-units” to “N”

- **Changes have been made to the caption, legend and X-axis of Figure 2.**
- **Correction was also made on line 168 by changing “daN-units” to “N in daN-units”.**

4) Regarding the thickness of the ducting layers:

I suggest to add the following sentence in Section 3.2:

“It should be noted that the estimated thicknesses of the ducting layers, especially for ERA5, may be affected by the chosen interpolation method.”

- **We agree with the suggestion of the editor, and the line “It should be noted that the estimated thicknesses of the ducting layers, especially for ERA5, may be affected by the chosen interpolation method.” has been added to lines 295-296.**

5) Table 1 and Fig. 9 do not seem to be consistent.

Here is one example:

Table 1, RDS median, 122.5 degrees: -7.86

Fig.9a, at 122.5 degrees: the red value is : -8. ... (-8.something)

Several values are inconsistent.

Please check, and correct.

- **Table 1 is meant as a supplement for Figure 8. The reason is that Figure 8 is a cross-section with longitude represented on the X-axis. Additionally, a secondary axis representing a repeating scale of -5, 0, and 5 for each profile across the transect was incredibly complicated and cluttered the scale to a point of being illegible. As a result, Table 1 was added to the document directly after Figure 8 in order to illustrate the numerical values (median and M.A.D.) for the profiles in Figure 8. Table 1 is stated as a reference for Figure 8 in the caption (of Figure 8) as well as on line 355 in the main text.**
- **As an update to avoid and confusion to the reader, a reference to Figure 8 has also been added in the caption of Table 1 with the following text:**
 - **“Table 1: Peak values of median *N*-bias and corresponding MAD (%) values for MAGIC radiosondes (RDS) and ERA5 for each 5° bin seen in Figure 8.”**

Please ensure that the colour schemes used in your maps and charts allow readers with colour vision deficiencies to correctly interpret your findings. Please check your figures using the Coblis – Color Blindness Simulator (<https://www.color-blindness.com/coblis-color-blindness-simulator/>) and revise the colour schemes accordingly. => Figs. 2 and 6

- **Figure 2: The vertical profile lines are depicted in separate textures as noted in text, in caption, and the legend and they are consistent for all four panels within the figure. Additionally, the texture of the vertical gradient profiles in panels b and d correspond to the original variables in panels a and c, respectively. The ducting layers are described in a similar fashion with the top and bottom layer textured with dotted lines and the height of the minimum gradient identified with a dashed line. The green dashed line was changed to gold as it is more distinguishable when viewed with each filter from the Coblis tool.**
- **Figure 6: The figure was altered to use colors more agreeable to color vision deficiencies (red, gold, blue, purple). Additionally, instead of all open circles, each bin uses a different character (circle, square, diamond, asterisk, plus sign, triangle, and X). These combinations are identifiable using all filters provided in the Coblis tool. References in text and captions were altered to reflect the change of this figure as well.**