

Response to Referee – Impact of black carbon on daytime valley and slope winds in idealised simulations

Johannes Mikkola on behalf of the authors

June 2026

We thank the referee for their feedback on our revised manuscript. We have copied the comments of the referee here in black and include our response to each individual comment in [blue](#).

Report on the revised version of the paper
Impact of black carbon on daytime valley and slope winds in idealised simulations
by J. Mikkola et al.

The authors have addressed all my comments satisfactorily, with the thoroughness that characterizes their work. I therefore recommend that the article be accepted, provided that the minor comments below are addressed in the final version.

The page and line numbers below refer to the revised version.

p. 2, l. 19-20:

change

and weakly stable or unstable stratification

into

”and unstable or weakly stable stratification”

to make it clear that ”weakly” applies to the word ”stable” only.

[Thanks for pointing this out. This is now revised in the final text.](#)

l. 47: the heating due to absorption further stabilises the top of the BL following my comment, the sentence has been reformulated but is now too long.

My point was simply that heating in itself does not necessarily stabilise (heating from below destabilises). I suggest going back to the original sentence and simply adding ”from above”: ”the heating from above due to absorption further stabilises the top of the BL”. If the authors would like to keep the new sentence, it should be splitted into two sentences for clarity. For instance: ”If absorbing aerosols are located near the BL top or right above it, the absorption of

incoming solar radiation leads to warming and further increases the stability of the top of the BL. This reduces the shortwave radiation reaching the lower levels hence weakening the surface heating (Chen et al. (2022), Ma et al. (2020)).”

The new sentence from the revised manuscript is split in two as suggested.

l. 50: Both of these effects suppress buoyancy in the BL → I would write ”reduce” in place of ”suppress”.

Revised as suggested.

Figure 1a: I think what is missing is simply a color (grey here actually) scale.

We have added a colorbar in Figure 1, which is also shown below.

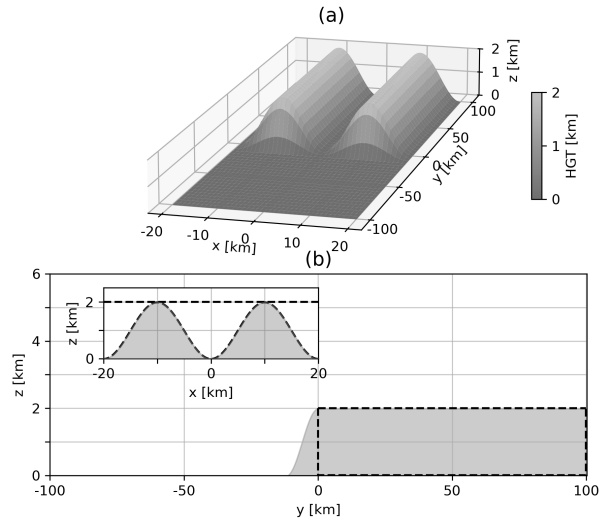


Figure 1: Revised Figure 1 in the final version of the manuscript.