Review on Aalto et al. *Strong influence of trees outside forest in regulating microclimate of intensively modified Afromontane landscapes*

This research topic is interesting and important, and data analysis is described clearly. However, the results interpretations and conclusion parts need to be improved. The main finding of the research is that canopy cover reduces the microclimate temperature, and this cool-down regulation decreases with elevation. For me, the former finding (i.e. canopy cover down-regulates microclimate) is not very novel, which has been reported in many earlier studies (e.g. Zellweger et al., 2020; Fig. S2 and S5). In contrast, the latter finding (i.e. the influence of canopy cover on microclimate is regulated by the elevation or ambient temperature) is novel and very interesting, but the authors did not say much about this result. I think this part should be emphasized and enhanced descriptions are needed (e.g. discuss that what are the potential mechanisms? refer to Zeng et al., 2019). Meanwhile, some other things also should be clarified, such as macroclimatic temperature also largely affects the microclimate, how did you address or consider this issue in your work? The effect of canopy cover on microclimate and satellite LST is very different in mechanistic (please see the general comments and specific comments).

General comments

1) Macroclimatic temperature also largely affects the microclimate (e.g. Fig. 1c in Zellweger et al., 2020), how did you address or consider this issue in your work? Or you think the topography has included the macroclimatic influence? Please clarify
2) The effects of canopy cover on microclimate and LST are different from the mechanistic perspective. The effect on microclimate is mixing and shading. The effect on LST is the temperature difference between vegetation canopy and background surface temperature (e.g. soil). Microclimate and LST just have a similar negative correlation with canopy cover. Thus, should take cautions when expanding the LST pattern or findings to microclimate, and *vice versa.* Please clarify
3) The effect of canopy cover on microclimate is regulated by ambient temperature (and the effect on LST is regulated by elevation) are very interesting findings. Maybe better to provide more evidence and descriptions. Such as the across diurnal timescales, ambient temperature change a lot (from low temperature to high temperature), how CC on microclimate change, give the relationship panels (e.g. x-axis mean temperature, y-axis: CC effect on microclimate, I guess there is a positive correlation between them, i.e. higher temperature, higher CC effect).
4) The analysis of LST should be more rigorous. For Landsat 8 satellite, although you have taken some corrections, only one thermal band could be used, and the uncertainty remained large. Maybe you should add the comparison between MODIS LST (three thermal bands are available, 1km resolution, which has also been widely used) and Landsat 8 LST to validate the accuracy of Landsat 8. Meanwhile, you only analyze the LST at 10:30, the analysis of 13:30 LST is also necessary, since it corresponds to the near-maximum temperature within a day, and the effect of CC on LST may be larger at 13:30 than that at 10:30.
5) The results or visualization about the effect of canopy cover on microclimate variability should be improved (Line:191-195).

Specific comments:

Line 22-23: "……vary strongly with elevation and ambient temperatures". It's unclear to me, what're the ambient temperatures refer to? (if it is macroclimatic air temperature? I guess you did not measure this indicator)

Line 24: what do the macroclimatic conditions mean?

Line 78: how to quantify the stability of microclimates?

Line 86-87: please provide the LAT, LON location information, although this could be interpreted from the Fig. 1

Line 103-107: this information would be better to be assimilated into the introduction part

Line 122-124: Please provide more information about microclimate sensors installed environments, they will affect collected microclimate data. For example, at low CC sites, the sensor was installed shadow area or sunlit area, and there are large temperature differences between sun and shade, meanwhile sunlit or shadow saturation also changes with sun angles, how did you consider these issues?

Line 129-131: macroclimate also largely affects microclimate (e.g. Fig. 1c in Zellweger et al., 2020), how do you consider this issue or how do you eliminate the influence of CC on microclimate? Meanwhile, whether the elevation and CC independent (independent assumption of the linear model)?

Line 134: please add the values.

Line 137-141: please clarify whether the mismatch of the collection date between ALS data and microclimate data could influence your research results, or evaluate its uncertainty?

Line 159: how do you calculate the land surface emissivity?

Line 170-174: I am worried about this correction: this method could be regarded as three independent steps: the first step is removing elevation influence by minus dTh; the second step is removing slope influence by minus dTh; the third step is removing aspect influence by minus dTa. It makes sense if these three factors are independent, if they are highly correlated, this method will over-correct the LST?

Line 191: 'affected also' → 'also affected'; please give the full definition of SD when it first appears

Line 191-195: where are these results from? I guess maybe from the Figure, this information may not be obtained by readers directly. please clarify.

Line 258-261: what's the underlying season the cooling impact of CC decease with elevation? Table 4 may be moved into supplementary

Line 286-287: Not clear to me, the sensible flux of canopy means the sensible heat exchange between canopy surface temperature and surrounding air temperature. Only when canopy temperature equals surrounding air temperature, we can say no sensible effect.

Reference:

Zellweger, F., De Frenne, P., Lenoir, J., Vangansbeke, P., Verheyen, K., Bernhardt-Römermann, M., ... & Coomes, D. (2020). Forest microclimate dynamics drive plant responses to warming. Science, 368(6492), 772-775.

Zeng, Z., Wang, D., Yang, L., Wu, J., Ziegler, A. D., Liu, M., ... & Wood, E. F. (2021). Deforestation-induced warming over tropical mountain regions regulated by elevation. Nature Geoscience, 14(1), 23-29.