



Interactive comment on “Studying the large-scale effect of leaf thermoregulation using an Earth system model” by Marvin Heidkamp et al.

Anonymous Referee #2

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Dear Authors

This paper is potentially interesting but in the current form I have large problems and therefor suggest major revisions

Major Point 1: The authors choose to show global model performances and then only focus on two sites, tropics and Tharandt. (minor comment Tropics should be Amazon, as we don't know how it performs in other sites around the tropics)

I would prefer to have a closer look to: a) More fluxnet sites and compare the performance. Don't understand now your global model runs. If you have those, why not comparing those with all fluxnet data? At least use some other sites to see why they

C1

deviate from each other, and why they deviate from Michaletz and other sources. Is it the LAI, type of forest, type of climate etc. I do miss a global perspective. b) To use the data available from literature, as shown in Fig.1 but also for instance by Linacre and compare those with your results. I would prefer to extend fig 1 will all your data from the introduction and make a new chapter in which you review more data available in literature. Also include in here the oxygen isotope linear regression line. It now is strange that you plot the data by Linacre but not From Helliker and others. I would prefer to have those data description in chapter 2 and then finally interesting to compare those with the model results

Major point 2: The single big leaf approach has clearly disadvantages. It is not clear to me how sunlet and shaded leaves are distinguished? Moreover, if we really want to understand the Tleaf, then we should better include the role of stomate in here (latent heat, now simply as rc ?). The stomata react on T, radiation, but also on a sharp co_2 gradient (higher below the canopy, specifically in the morning). I would like to see an analyses on different layers vs single layer approach and if the SBL approach still can be used to assess reliabbe Tleaf, that can be verified with measurements.

Small remark L158 LAL to LAI

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2020-75>, 2020.

C2