

# ***Interactive comment on “Climate simulations and pollen data reveal the distribution and connectivity of temperate tree populations in eastern Asia during the Last Glacial Maximum” by Suzanne Alice Ghislaine Leroy et al.***

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Manuscript: Climate simulations and pollen data reveal the distribution and connectivity of temperate tree populations in eastern Asia during the Last Glacial Maximum

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This paper focuses on the past climate estimation for Eurasia for the Last Glacial Maximum (LGM) using climate modeling, and then simulates the potential distribution for

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the deciduous-broadleaved trees by combining these estimated climatic limits. Finally, the potential refugia of the deciduous-broadleaved trees are concluded and assessed by the pollen data. Generally, the manuscript is well organized, I would recommend this manuscript for publication in *Climate of The Past*. However, it needs to be improved before it can be accepted, and I do have comments and suggestions hereafter.

There are many literatures at least few of them published in English about the glacier refugia in East Asia, including that based on modeling, pollen mapping, and phylogenetic data, for instance, biome modeling by Anne Dallmeyer, Jian Ni. In this manuscript, authors cited too few literatures about the previous studies in East Asia. Authors should add and discuss them in this manuscript. In lines 76-79 we explain our aim, not to repeat using BIOMEs, as we want to use mainly variables which can be validated. The coupled models, at least those from the Max-Planck Institute for Meteorology are based for BIOMEs on the program JSBach, the code of which we investigated for finding ideas regarding limitations for tree growth had similarities with our choices but need quantities which can hardly be validated, e.g. soil parameters »»»»»»»»We cannot find a paper Dallmeyer and Ni perhaps the nearest article from these authors is Dallmeyer, A., Claussen, M., Ni, J., Cao, X., Wang, Y., Fischer, N., Pfeiffer, M., Jin, L., Khon, V., Wagner, S., Haberkorn, K., and Herzschuh, U.: Biome changes in Asia since the mid-Holocene – an analysis of different transient Earth system model simulations, *Clim. Past*, 13, 107–134, <https://doi.org/10.5194/cp-13107-2017>, 2017 However this does not cover the LGM We have already referred to Tian F., Cao X., Dallmeyer A., Ni J., Zhao Y., Wang Y. and Herzschuh U.: Quantitative woody cover reconstructions from eastern continental Asia of the last 22 kyr reveal strong regional peculiarities. *Quatern Sci Rev*, 137, 33-44, 2016 2) The weaker impact of LGM climate on vegetation in East Asia than European should be caused partly by the absence of continental ice sheet. Authors should add discussion about that. »»»»»»»»We have mentioned the larger Eurasian ice sheet (line 51). And in other places of the manuscript we mentioned the smaller ice cap in Asia, see line 540.

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3) Why the authors excluded *Betula*, *Alnus* and *Fagus*? They are quite important summer-green and broadleaf pollen taxa in pollen spectra from East Asia. Authors should explain that. In addition, in the list of pollen names, what is represented by "others"? »»»»»»We want to make the comparison to our previous work on Europe more straightforward. »»»»»»Others are for example *Carpinus* (see table 2, line 377). To make it clearer we add this information to line 152 too. 4) In this manuscript, there are a lot of results are marked as "(not show)", why not present them as an appendix? l»»»»»»t is not really worth it. The one on line 177 we preferred to show C&L and their difference with ERA because together one can recognize the argument and the difference map gives more information than an ERA panel. The same applies to the one in line 183 it is said that we do not expect any impact on our result The one on line 226 because those areas are too far outside our area of interest, we could remove the sentence For the one in line 483 we refer already to Fig.S1.1 as an alternative and we could have referred as well to Fig.S1.2, which contains also information for March We replaced this by referring to appendix A1 which is dealing with the progression of the monsoon

5) There are some sites from the South China behave pollen data during the LGM in the dataset of Cao et al. (2013), why authors presented only few of them? »»»»»»We kept the deciduous temperate trees which make the comparison to our previous work on Europe more straightforward

6) The conclusion is quite long, and some content should belong to the results or discussions parts. »»»»»»We have moved lines 509 to 520 to an earlier section.

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