

Interactive comment on “High resolution climate and vegetation simulations of the Mid-Pliocene, a model-data comparison over western Europe and the Mediterranean region” by A. Jost et al.

Anonymous Referee #2

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In this very interesting article Jost et al. carried out a high-resolution (60 km grid) climate and vegetation simulation of the Mid-Pliocene in Western Europe. They also compared the model simulation with mid-Pliocene climate estimates from abundant pollen data from that area.

Similarities and disparities between the model and estimates from pollen data are discussed and model and data show similar higher mean annual temperature estimates. However, they also seem to show some differences with respect to precipitation and the north-south latitudinal gradient observed by the pollen data are not reproduced by the model. The effect of the vegetation change introduced by the simulation is weak

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and does not really affect the model temperature and precipitation.

This paper is very well written and organized and results are clearly shown and discussed. Therefore I only have a few comments and suggestions:

I am not an specialist on modeling but I had problems understanding why in the experimental design section the authors set atmospheric CO₂ and CH₄ concentrations to 315 ppmv and 790 ppbv respectively even though several mid-Pliocene proxies suggest higher CO₂ values of about 425 ppmv. The authors later discuss that this could be the reason why they get underestimated temperature values. Then why did the authors set the CO₂ to 315 and not to 425 ppmv? This should be further discussed.

Minor changes:

Pag. 1368, line 4: Change There for “Here we perform. . .” Pag. 1370, line 21: “all of which are suitable. . .” Pag. 1371, line 4: “Even though its influence on global climate appears to be rather minor, the authors show. . .” Pag. 1371, line 12: case study Pag. 1371, line 19 and 24: use comma before which. Pag. 1372, line 19: please define AMIP. Pag. 1373, line 13: what do you mean with “recent past”? Present? Pag. 1376, line 17: bisaccate pollen grains Pag. 1377, line 15: mid- to high-altitude conifer forests Pag. 1377, line 18: what do you mean by certainly? Most of them? Pag. 1379, line 14: change increase for higher. Pag. 1379, line 18: Please delete “A clear region of” this is redundant as later on you specify Mediterranean Sea. Pag. 1381, line 25: “in pollen data and only subtropical. . .” Pag. 1383, line 10: “decrease in large-scale. . .” Pag. 1383, line 11: change “all over” for throughout. Pag. 1383, line 18: change “of” for in. Pag. 1390, line 1: “This is of. . .” Pag. 1394, line 19: Please add a reference at the end of that sentence. Pag. 1395, line 7: “can also be invoked”

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