Clim. Past Discuss., 7, C2384–C2386, 2012
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Climate of the Past Discussions

Interactive comment on "Tree-ring proxy based temperature reconstructions and climate model simulations: cross-comparison at the Pyrenees" *by* I. Dorado Liñán et al.

I. Dorado Liñán et al.

isabel@gfz-potsdam.de

Received and published: 17 January 2012

We thank the reviewer for the constructive comments on this manuscript, with which we essentially agree.

Of course, we would like to be able to draw an additional conclusion or comments on whether our findings are valid for other locations or regions but we believe that this would be rather speculative. The findings related to the methodology test performed with the tree-ring data may apply for tree-ring datasets from other areas/regions. However, the conclusions drawn based on the comparison between tree-ring based reconstructions and the model simulations depend on factors that may vary, such as the

capacity of the trees to record a more regional climate signal.

The concern of the reviewer related to the overall value of the reconstruction will be taken into account in the revised version. The current version of the manuscript discusses the skill of every combination of standardization and reconstruction methods to reproduce the instrumental trend , as well as the skills of the different calibrations performed based on the statistics of the split period procedure. However, in the light of the reviewer's comments, we possibly did not sufficiently underline this point in the original submission. It will be more deeply discussed in the revised version.

Regarding the suggestion of the reviewer of focusing more on the different methods for reconstructions and less in the model comparison, we partly disagree. The fact that both models and proxy based reconstructions record the solar minimum or the period of prolonged temperature anomaly such as the LIA is not new. However, the comparison of temperatures inferred from model simulations and proxy based reconstructions raise two main interesting points: (1) is the differences in the 20th century trend. Whereas they mostly agree in the rest of the low frequency variations, they strongly disagree in the reproducing the instrumental trend of the temperatures. Models tend to overestimate the temperature trend and reconstructions tend to underestimate them. (2) The amplitude of the past temperature variations is one open question in paleoclimatology, since this will determine whether the current warming trend is unprecedented or not. Model simulations and tree-ring based reconstructions display different amplitudes, partly due to the difference in the 20th century trend. We consider that the detailed analysis of these two points and the discussion of the possible cause of their disagreement are of relevance, since it actually leads to significant new knowledge, at least for the area under study.

We are thankful for the detailed reading of the manuscript and will try to condense the manuscript as much as possible, shorten long sentences and reduce the number of brackets and abbreviations. Further minor comments, in which we generally agree, will be taken into account when redrafting the revised version of the manuscript.

CPD
7, C2384–C2386, 2012

Interactive comment on Clim. Past Discuss., 7, 3919, 2011.