Climate
of the Past
Discussions

Interactive comment on "Temperature variability of the Iberian Range since 1602 inferred from tree-ring records" *by* E. Tejedor et al.

Anonymous Referee #1

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The effort of the authors commenting and answering my questions and assuming mistakes in the calculation of some statistics is laudable. However, relevant issues described in detail in my initial review have not been answered and the reliability of the calibration is still questionable. The key component of this manuscript is the development of a climate reconstruction based on tree rings. If the calibration raises serious doubts, then the whole manuscript is dubious. I am aware of the effort that is needed to develop a proxy-based climate reconstructions, however, I still believe that the reconstruction presented in this manuscript is not fully reliable mainly due to three main issues:

1. How good or bad is the agreement between the tree-ring record and the climate record on the high-frequency domain remains unanswered. A poor visual agreement on the high frequency is obvious having a look to Figure 8, and the author's reply

("the reconstruction is better at mid and low frequencies than at high frequencies") is insufficient and does not provide any additional or new information to clarify this point. The way to solve the doubt is, as suggested in point 4 of my initial review and also suggested by S.Klesse, to do a comparison (correlation) of both series at different time scales and make sure that the correlation observed in the calibration are due also to synchrony in the high frequency and not only to a similar long-term trend. If the series correlate on the low frequency but do not show a reasonable agreement on the high frequency, then the correlation shown for the calibration period would be spurious and the reconstruction simply incorrect. The running correlation analysis will only answer this question if the series would have been high-pass filtered, which is not the case. In addition, the residual analysis now included on the paper would also require to include some test on the trend and autocorrelation of the residuals (i.e., Durbin-Watson test). If the calibration fulfils all above (agreement on the high-frequency domain and test of residuals), then we could talk about a statistical reliable calibration.

2. Whether chronologies encoding different climate signals have been merged into a final composite remains also unanswered. The new column added to Figure 3 containing the values of the correlations between the single and regional chronologies does not answer my initial question. Checking whether all chronologies encode the same climate signal means to correlate each individual chronology with climate. This is the way to know if tree growth is limited by the same climatic factor at all sites or different climate signals are being mixed in the regional chronology. Considering that the chronologies used are from different tree species, derived from different elevations and some chronologies do show poor correlation with the others, testing potential different climate signals is advisable, particularly because solving such a question is extremely easy.

3. The physiological explanation is still too general (in fact, has not substantially changed) and not very convincing. It is hard for me to picture how tree growth can be negatively influenced by the cumulative mean of temperature from the current and

previous year of growth: how trees manage to grow then? How did they survive for centuries and did not die by carbon starvation if cumulative temperature of the previous 21 months have no positive effect on growth? Physiologically seems quite unlikely to me but still, I was hoping for a good explanation or answer that could challenge my thoughts on this regard.

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