

Interactive comment on “An Overview on Isotopic Divergences – Causes for instability of Tree-Ring Isotopes and Climate Correlations” by Martine M. Savard and Valérie Daux

Anonymous Referee #2

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One comment I should mention is that the review is highly focused on climate reconstructions, while the ecophysiological responses to environmental cues are somewhat left a little bit on the side, as something that is dampening or disrupting the climate signal.

So, the more specific comments are more targeted to references in the literature (given this manuscript is a review) plus some other clarifications if the author agrees.

Line 125. The Model "MAIDEN" is not well explained, so I recommend explaining it a little bit, so the reader can understand what the model it's all about.

Line 131 The citation for the Vaganov model it should be correctly cited, or add the

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papers where Vaganov published originally, then, of course, you can use other citations as usage examples.

Line 89 and Line 359 The percentage of oxygen isotope exchange during cellulose synthesis, as you mention, can indeed be variable. Recently there is a published paper addressing this same possibility and highlights some of the possible hypotheses that can be involved in such phenomena. Probably this is a reference you might be interested in exploring. *New Phytologist* (2020) doi: 10.1111/nph.16484

Line 253 The PIN correction of the pCO₂ influence on the D13C discrimination should be double-checked. I think Gagen et al. 2007 made the first mention of the Pin correction that I know of. *The Holocene*, 17(4), 435–446. <https://doi.org/10.1177/0959683607077012>

Line 206 Another recent publication Citation that you might be interested in exploring about age effects in Tree ring isotopes is from Xu et al. 2020. I think this is relevant to your review as it addresses the age-related effect concerning Climate reconstructions. 2020 *Journal of Geophysical Research: Biogeosciences*, 0–2. <https://doi.org/10.1029/2019JG005513>

Lien 262. I agree that there is no overarching consensus over how to correct the pCO₂ effects on the discrimination of ¹³C. But I find a bit troubling this sentence "A wise approach is to test the various corrective methods and assess the performance of the resulting series with climatic reconstruction model." This statement is for me, suggesting that we should select the best fit to climate. I think this is a bit biased and undermined the fact that we still do not fully understand how the pCO₂ is affecting δ and Δ . so I think this part needs to be careful on not incentivize researchers to select the best fit, but instead, incentive to investigate what is the mechanisms and how the pCO₂ is or not affecting the Carbon chronologies. Then I suggest reviewing *Global Change Biology*, 22(2), 889–902. <https://doi.org/10.1111/gcb.13102>

Line 287 I think this part needs this reference. Dorado-Liñán, I et al. 2016. *Climate*

Dynamics, 47(3–4), 937–950. <https://doi.org/10.1007/s00382-015-2881-x>

Line 345 This reference also can be useful here Carbone, M. S. et al. 2013, The New Phytologist, 200(4), 1145–55. <https://doi.org/10.1111/nph.12448>

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-28>, 2020.

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