

Reviewer comments in **black**, responses in **blue**

Reviewer 2:

We thank Referee #2 for the comments which will help to prepare an improved version for publication. We answer below to each comment in a point-to-point reply.

Specific comments:

- L46-54: this paragraph seems convoluted and I am not sure it add much to the introduction, since the need the high-frequency measurements has already been stated. I would suggest to remove this paragraph, or condense it in one sentence.

Thank you for this comment. We agree that the information is redundant and we did delete the paragraph.

- L86: "The aim of our study is to..."?

We changed „was“ to „is”

- L453-454: The sentence, describing deuterium depletion, seems to run counter to proposed argument so as to why there could be deuterium enrichment in the xylem. Further, I cold not find Zhao et al. (2017) but if the correct reference is Zhao et al. (2017) (<https://doi.org/10.1111/pce.12753>), then this paper does not discuss an ubiquitous response of xylem deuterium signature (as compared to the phloem, depending on the xylem's location, or compared to soil signature). As a result, I would suggest to simply remove this sentence which does not really support the discussion one way or another.

We agree that the study by Zhao et al. is a bit misleading in the discussion. We replaced the sentences by a more general sentence to provide a more general discussion on possible fractioning / enrichment effects on stable water isotopes: “Another source of isotope enrichment in xylem water could be fractioning processes during or after plant water uptake. Thus, data from before the labelling experiment show for all trees isotopic enrichment in the xylem water compared to the soil water isotopic composition (Fig. 7 (c) and (d)).”

According to the Reference Zhao et al., 2017: It should be Zhao et al., 2016.

- L498-501: At first glance, it seems to me that the findings in Kübert al. (2020) are opposite to the one reported here, since here the authors first report more obvious d18O differences between in situ and destructive sampling, and d18O is precisely the isotope under "natural abundance". One can however tease out the "considerable differences" between methods found for soil d2H after labell1, but it seems that direct equilibrium values are more enriched, running counter to the hypothesis of having more depleted pre-event water sampled as compared to in situ method ?

Please rephrase these sentences to better capture the point of convergence/divergence between that study and yours.

We do not fully understand the reviewer's comment. We have changed the sentence to: "Kübert et al. (2020) found small differences between in situ measurements and cryogenically extracted isotope values under natural abundance conditions."

Technical comments:

- L34: "is" instead of "are"

we changed are to "is"

- L61-62: the sentence reads a bit strange, and is somewhat redundant with previous statement. I would suggest to remove it and modify the subsequent one as follows: "Such limitations can be overcome with high-frequency in situ measuring methods [...] community."

We followed your suggestion. Thank you.

- L294: Replace "Tab." by "Table". Same thing on L298

We replaced "Tab." with Table

- L297: "[...] 3 h and 15 h (Quercus), respectively."

we added "respectively"

- L444: "[...] which is especially visible [...]"

We changed the order of the words. Thank you!

- L493-494: Maybe rephrase "[...] differences among the destructive methods we used." ?

Thank you for your suggestion. We rephrased the sentence accordingly: "... we did not find differences among the destructive methods we used."

- L495: since "no trend of differences" is mentioned just before (among destructive sampling), I would suggest to start here with "As compared to in situ measurements, $\delta^{18}\text{O}$ values provided by destructive sampling suggest that the latter contains more [...]"

We followed your suggestion: "As compared to in situ measurements, $\delta^{18}\text{O}$ values provided by destructive sampling suggest that the latter contains more tightly bound water that was similar to pre experiment precipitation (Table 2, Fig. 6)."

- L498: Kübert al. (2020) is missing from the bibliography

The reference can be found in the bibliography in L764 (old manuscript)

- L528: Marshall al. (2020) is missing from the bibliography

The reference can be found in the bibliography in L777 (old manuscript)

References

- Kübert, A., Paulus, S., Dahlmann, A., Werner, C., Rothfuss, Y., Orlowski, N., & Dubbert, M. (2020). Water stable isotopes in ecohydrological field research: comparison between In situ and destructive monitoring methods to determine soil water isotopic signatures. *Frontiers in plant science*, 11, 387.
- Marshall, J. D., Cuntz, M., Beyer, M., Dubbert, M., & Kuehnhammer, K. (2020). Borehole equilibration: testing a new method to monitor the isotopic composition of tree xylem water in situ. *Frontiers in plant science*, 11, 358.