"Coupled isotopes of plant wax and hemicellulose markers record information on relative humidity and isotopic composition of precipitation"

δ^2H and $\delta^{18}O$ isotopes are used together to reconstruct relative humidity and precipitation composition.
While δ^2H can be used to inform on leaf water ^2H enrichment, it can also help determine which climate variables are the major drivers in leaf water 2H enrichment.
When coupled with $\delta^{18}O$, it can be used to determine the deuterium excess, helpful for modeling relative humidity, with potential uses for paleoclimate reconstruction.
The paper is interesting, with sufficient data, even though the paleoclimate implications are a little bit under-developed.

My main concern with this manuscript is the small number of samples used to build the conceptual model. While I understand that the model can be drafted with such few samples, it should be made clear in the manuscript that the conceptual model is not a tool ready for a research use at this stage. The bias observed between the model outputs and the actual modern RH values/^2H leaf enrichment could be a concern since the model is not solidly built on a large number of observations.
Another concern is the assumption that the studied *n*-alkanes and hemicellulose markers are leaf-derived. I agree that these compounds tend to be tracers of terrestrial higher plants, and more precisely leaves, but there is very little description of the actual vegetation found in sample sites along the transect. There seems to be quite a variation in climate and vegetation across sites, and while I can agree that in the tropical humid areas, leaves will rapidly feed the topsoil layer sampled, without further description, the more arid areas, with hardly any leafy vegetation, could have a different profile. Please provide details on species/types of vegetation encountered at sampling sites. The source of fatty acids could be numerous (discussed on p. 2468, lines 18-23) – maybe some sampling locations deserve an estimation of leaf-derived vs. non-leaf derived material?

The Global Meteoric Water Line (concept and uses) should be defined in the manuscript.

"Based on the premise that *n*-alkanes and hemicellulose biomarkers are primarily leaf-derived, we reconstruct $\delta^2H_{leaf\ water}$ and $\delta^{18}O_{leaf\ water}$, respectively, which in turn allows assessment of the d excess of leaf water. The large calculated range in d excess along the transect (-67 to -178 ‰) can be used to calculate/model RH;"
The leaf water reconstructions, in turn, feed the RH reconstruction model. But RH is needed to estimate transpiration rates used in the leaf water reconstruction model? Isn't that an issue when coupling the models?

P. 2472, lines 13-28. This paragraph is confusing, Line 25 "However, give that this…": what does "this" refer to?

Overall there is sufficient data. As mentioned earlier, please clarify the model construction, and potential uses with such a small number of samples. Implications of the results could also be described further.

Figure 3: The caption/legend could be clearer.

Figure 5: May be too complicated. Evaporation Lines and GMWL needs to be clearly defined in the text. The legend is not clear as to what it is exactly that is reprensented. What is the main message that this figure should convey?

Figure 7: Is this figure necessary?

There are a number of issues with the reference list:

- Should the last Zech et al. reference in the list (2013) be 2013c? Please update in the manuscript as well.
- Huang, Y., Shuman, B., Wang, Y., and Webb, T.: Hydrogen isotope ratios of individual lipids in lake sediments as novel tracers of climatic and environmental change: a surface sediment test, J. Paleolimnol., 31, 363–375, 2004. : not cited in the text
- Cited in the text but missing from the reference list :
    - Gessler et al., 2009 (P. 2472, line 25)
    - Kahmen et al., 2009 (P ; 2466, line 20)
    - Song et al., 2013 (P. 2466, line 20)
- In the manuscript, please remove b from Kahmen et al., 2011b reference (P. 2466, line 13, and P. 2472, line 3)
- P. 2464, line 17 : Zech et al., 2013 → a, b, or c ?
- P. 2472, line 3 : Tipple et al. → 2012 in the manuscript, 2013 in the reference list. Please fix date in the manuscript.

Typos:

- Please make sure the n in *n*-alkanes is in italics throughout the text
- P. 2462, line 26: "enrichment of leaf water being recorded in both, n-alkanes and…": please remove comma
- P. 2463, line 19: "sampling localities": should this be sampling locations?
- P. 2464, line 25-26: "The chromatograms of the other sampled…": should this read "The chromatograms of the other sampleS…"?
- P. 2465, line 20: space missing between "The" and "^{2}H"
- P. 2469, line 28: please add comma after "enrichment of soil water", and replace "can possibly" by "could"
- P. 2472, line 1: "Third, given that leaf waxes considered to be…" : Should this read "Third, given that leaf waxes ARE considered to be…"?