

Authors' response to Reviewer 4

We thank the reviewer for his/her evaluation of our revised manuscript and accepting it following minor revisions. We are also pleased by his/her appreciation of the efforts put into revising the original manuscript. Below we address the reviewer's comments (full text) indented by arrows and coloured in blue. We appreciate the efforts made by the reviewer, which significantly helped improving our manuscript.

General comments

- I observed mistakes with geographical names in the manuscript: i) as far as I know, the official name of the Atlantic sector between France and England is "English Channel" while "British Channel" is written in the MS (e.g., lines 356, 368, 381 and many others) ii) "Marocco" should be changed to "Morocco" in line 363.

→ *Thank you, we will change that.*

- There are frequently occurring technical mistakes in the reference list with two journal titles: i) the bracketed term (1979) should be removed after Science (lines 552, 566, etc.) and similarly ii) the bracketed term (Amst.) should be removed after J Hydrol (lines 569, 580, etc.)

→ *Thank you for noticing, we will change that as well.*

Specific comments

line 26: "... to exclude the effect of local meteorologic effects" It sounds strange. Could you rephrase to eliminate the repetitive structure, please?

→ *It is unnecessary repetitive, indeed, we will simply change it to "to exclude local meteorologic effects"*

line 199: A space is missing here.

→ *Thank you, we will change that.*

line 303: As I see Fig 5, this statement is not true for the local moisture source group, but rather for the "Other" moisture source group. Please check it.

→ *Upon second inspection, we agree with your analysis – this statement is only true for remote sources, we will change that.*

line 372: I think "side" should be changed to "site"

→ *Correct.*

line 417: Various $\delta^{18}O$ ranges were calculated and reported in lines 221-230 but none of them was 4.8‰. Please check and clarify it.

→ *This value (4.8‰) was derived from the mean of all moisture origin-specific seasonal ranges in Fig. 5. But you are right to mention that this is difficult to understand without context, and since this value is not mentioned anywhere else in the manuscript, it is probably best to remove it. We chose to take the IQR of $\delta^{18}O$ (5.0‰) instead of the mean of seasonal ranges for that same statement, which also allows us to make the same point with a more reliable number.*

line 479: I think that the word “by” should be omitted from the sentence.

→ *Right.*

lines 479, 510: Maybe "inaccurate" instead of "unprecise".

→ *That is a better way to put it, we will change that, thank you.*

line 498: Maybe "sub-cloud" instead of "in-cloud".

→ *Yes, we agree. Sub-cloud effects were also meant here.*

line 499: In lines 425-426 it was written that LMWL of Belvaux (Luxembourg) ranks amongst the flattest reported for Germany. If you want to place it into a European context I suggest considering this study: DOI:10.1144/sp507-2020-68

→ *Thank you for bringing this study to our attention, we will add it to the discussion and change the sentence in the conclusion accordingly.*

Figures and Tables

Figure 1: There are gaps in the red lines of 30-day running means. What does it mean? Were there >30day long periods without rain?

→ *Periods without precipitation over 30 days in Luxembourg are very rare, meaning that this could unlikely be the cause. However, the tipping-bucket rain gauge we used has a funnel with a very narrow opening at the bottom, which can easily be clogged by dust, pollen, or even insects. Despite our best efforts at keeping the station regularly maintained, some incidents occurred, leading to the apparent gaps in the timeseries.*

Of course, the second phase of the sampling campaign, with the manual protocol from April 2020 onwards, was less prone to having issues with clogging. Missing samples because of a clogged inlet were problematic in the first phase with the ISCO automatic sampler directly connected to tipping-bucket rain gauge. Still, we still relied on that same station for the precipitation amount data. Here, it is important to mention that the red lines are precipitation amount weighted 30-day running means, so they will also have gaps if samples were available, but not the precipitation amount data.

Authors' response to Reviewer 2

We thank the reviewer for his/her evaluation of our revised manuscript and accepting it following minor revisions. Below we address the reviewer's comments (full text) indented by arrows and coloured in blue. We appreciate the efforts made by the reviewer, which significantly helped improving our manuscript.

Specific comments

Line 96: Be more specific here, e.g. "short-term influence of changes in moisture origin or moisture source conditions"

→ *Thank you for the specification, we accept your suggestion and will add it to the manuscript.*

Line 105: Typo. Change to "interpreted".

→ *Thank you for noticing, we will change that.*

Line 149: Adjust the sentence structure to be clearer, e.g. "We extracted hourly temperature and relative humidity measured at 2 m above ground level from a nearby meteorological station [...]"

→ *That is clearer, thank you.*

Line 204: To me, it is not completely clear how the residuals are calculated. Can you add one sentence for explanation here or elsewhere?

→ *The residuals are in fact obtained automatically as a side-product when building a multiple linear regressions model in R using the lm function. We will add a few lines on what variables were used and in which environment we built the model, and how the model with the best performance was retained. We hope this will clarify this point.*

Line 232: The intercept in summer is even lower. Change to "ranging from 1.01 ‰ (JJA) to [...]"

→ *Good remark, we will change that. Thank you for bringing it to our attention.*

Line 235: Add this link as a reference to the reference list following the HESS standards (<https://www.hydrology-and-earth-system-sciences.net/submission.html#references>)

→ *We will add this.*

Table 1: Why the standard deviation is equal for all sources per month? Shouldn't this be variable depending on the number of events and their isotopic variability?

→ *It is the standard deviation of sub-daily isotope values within every season, regardless of the moisture origins, to give a reference for the isotopic variability in the dataset. In the paragraph where*

we discuss the results of Fig.5 and Table 1 (lines 305-330 of the new revised manuscript), we compare moisture origin-dependent differences of isotopic compositions to this inherent seasonal variability – it is probably clearer in that context.

Figure 6 and 7: Can you add the names of the zones of moisture origin (NW, SE, ...) as in Fig. 3? This would help for fast visual identification.

→ Thank you for the suggestion, we will add that.

Line 347-384: Make clear that you refer in these paragraphs to the residuals from the normalized values. Otherwise, it may be confusion when you mention highly positive $\delta^{18}\text{O}$ values, even if all precipitation $\delta^{18}\text{O}$ are negative. You may introduce a new symbol for the residuals, e.g. $\Delta\delta^{18}\text{O}$ or $\delta^{18}\text{O}_{\text{res}}$, to better distinguish it from the measured value.

→ Again, thank you for the pertinent suggestion, we will also add a symbol for better clarity.