

Report #1

Submitted on 11 Aug 2025

Anonymous referee #3

General comments:

I want to thank the authors for carefully addressing all points that were raised by the reviewers and the editor.

However, when looking at the data a second time, I really have strong concerns that eventually the data (or the labeling?) from 'Ref. Open' and 'Tube-Dip-in' in Figure 7 might have been swapped. Is it plausible to have such huge weight differences as presented in Figure 3 but no equivalence in D-Ex?

If all bottles with the different evaporation barriers during experiment 2 were exposed to the same controlled laboratory conditions, the "induced interactions between evaporation and condensation processes" you mention in L 250 should have affected the whole experiment in the same way. Instead, all waters plot on the evaporation line (Fig. 10), without the 'Ref. Open'.

Please double-check in the original data.

Thank you once again for reviewing this manuscript and providing additional suggestions. We fully understand the general comment given by referee #3. We were also surprised by these results and have checked the data several times for possible errors. Indeed, it is surprising that the open bottles do not plot along an evaporation line like the Tube-Dip-In water. However, they vary widely along the GMWL, which is indeed unexpected. That is why we added the following lines in the last review (L248–256):

"The reason why the sample water in an open reference bottle plots along the GMWL remains unclear. A possible explanation could be fluctuations in relative humidity and temperature during the experiment, which may have induced interactions between evaporation and condensation processes."

We also checked photos and the positions of the bottles, including the open bottles and the lid. The lid was partially lying on the bottle, which might have influenced the relative humidity inside. Nevertheless, we highlight this unexplained observation in the manuscript, which is not yet fully understood by adding following text section to the revised manuscript:

"The reason why the water samples taken from the open reference bottle plot along a line with a slope close to 8 remains unclear. One possible explanation is a higher relative humidity in the open headspace above the water surface and/or fluctuations in relative humidity and temperature during the experiment. These factors may have induced interactions between evaporation and condensation processes. We only observe this effect in open-bottle experiments because the interface between water and the open laboratory atmosphere is significantly larger than in all other setups of our experimental series."

Technical corrections:

L 141 Please change to 'water isotope analyzer' – it can be used for both, vapor and liquid samples.

corrected

L 144 Please change to 'VSMOW-SLAP scale'

corrected

L 184 I would delete 'vertical' in this introductory sentence to keep it more general. Other processes than evaporation, e.g. hydrogeochemical processes have quite different effects on the D-Ex.

Thank you for this suggestion. We deleted 'vertical' to keep it more general.

L 187 It is 'isotopic fractionation', not 'water fractionation'.

Of course. We corrected.

L 188 'have' instead of 'has'.

corrected

Report #3

Submitted on 26 Aug 2025

Anonymous referee #2

Many thanks also to this anonymous reviewer, who made many technical comments for further improvement of the manuscript.

L38 & elsewhere: citation style: (Michelsen et al., 2018) --> Michelsen et al. (2018). Please check throughout MS

True. Since this reference is mentioned directly in the text, the author's name does not appear in parentheses, only the year. We have revised this in the entire manuscript.

L39: insert “focused on“ or equivalent before “modifying“ or change “modifying“ to “modified“

Corrected.

L45: To me, in this context, “isotope fractionation“ is a quantitative, temperature-dependent phenomenon (described by the dimensionless quantity ‘alpha’) that will happen anytime a liquid water pool and a vapor phase can exchange, which is the case in any partly filled bottle – open or closed. What you are probably referring to is the effect that fractionation has when a significant amount of vapor can leave the system (=evaporation). To be more precise, I would therefore suggest replacing “isotope fractionation“ by “significant enrichment of heavy isotope“ or equivalent.

To be more precise, we changed “isotope fractionation” into “significant enrichment of heavy isotope in the water phase”.

L50: sampler -> samplers

Done.

L51: its -> their

Done.

L66: compare -> compared

Corrected.

L77: insert “in” after “result”

Corrected.

L80 (in alignment with L45): please replace “isotopic fractionation” by “enrichment of heavy isotopes”

We replaced with ‘the enrichment of heavy isotopes in the water phase’.

L87: delete “long-term”, insert “deployed” after “systems”

Corrected.

L92: consider replacing “inlet-methods” with “inlet designs”

Corrected.

L100: site or side?

Corrected.

L103: I do not understand “During filling, test bottles with syphon became water-filled.” beyond the obvious. Please clarify.

We rewrote this sentence to be more precise: ‘The bottles with siphons were filled through the siphon, ensuring that a water column remained inside as a barrier.’

L118-120: I would expect a statement like “The tube-dip-in... ..evaporation experiments.” in the discussion rather than the method section.

We moved this information to the conclusion section and checked for consistency.

L122: would -> could

Corrected.

L131f: Delete “Shows the” (2x)

Corrected.

L137(?): is consisting - > consists

Corrected.

L141: water liquid -> liquid water

Already corrected, referee#3.

L158: please add units (%?) to the numeric values of mean and SD

Corrected

L169: consider replacing “and” by “vs.”, shows -> showed

Corrected

L170: has -> had

Corrected

L171: is -> was

Corrected

L176: Figure 3: there is no zero (0) on the vertical log scale axis. Instead, it has to be -10^{-1} .

Thank you for this comment. We have revised the vertical logarithmic axis with (0, -1, -10, -100). This scaling will be easy for readers to understand.

L179: varied between -> were, and -> or

We improved this sentence taking the referees comment into account: 'The initial water volumes in the 250 mL SCHOTT glass bottles were 50, 100, 150, 200, or 250 mL.'

L187: insert "isotope" after "water"

Already commented by referee#3 in a different way.

L188: has -> have (because "data" are plural of "datum")

Corrected

L193: what does "1s-7" mean?

This expresses an internal sampling number. We explained this value more briefly in the manuscript and harmonized that with the used ID in table S1)

L195: please replace "point" by "symbol"

Corrected

L209: insert "tested" before "evaporation"

Inserted

L215: consider replacing "sampling systems" by "studies"

Corrected

L229ff: is -> was, averages -> averaged, is -> was, occurs -> occurred

We corrected the tense.

L234(?): Figure 6: No "0" on log scale axis, must be -10^{-1}

We revised the scale (see comment to L176).

L237: varied between -> was, and -> or

See L179. We corrected this sentence.

L248f: consider inserting "significant" after "showing", replace "an open reference bottle" by "one of the open reference bottles"

We inserted 'significant'. The aspect about the open reference bottles is correctly written. It's more than one sample that plots along the GMWL.

L251: variation -> variations, was -> were (because oxygen and hydrogen isotopes)

Corrected

L258: replace "fractionations" by, e.g., "evaporation effects"

We replaced.

L273f: “dual water” -> “water dual” or delete “water” as obviously in the entire study you persistently analyzed water (also in L300, L308)

Okay, we deleted ‘water’ in the subtitle and corrected within the entire manuscript.

L282: label -> symbol

Thank you, we corrected that.

L283: please replace “fractionation in the water phase” by, e.g. “evaporation”

We replaced this term for smoother reading.

L290: “label” -> “symbol”

We corrected that.

L309f: varied between -> was

We harmonized within the manuscript, checked tense and wording.

L313: fractionation -> enrichment (also in L316)

We corrected.

L326f: This is speculative. In your study, you did not test whether temperature and humidity fluctuations would “significantly influence” the samples’ isotopic compositions. Please rephrase.

Okay, we removed a sentence (L326-327) to make it clearer.

L329: Doesn’t this (“...to better understand...”) contradict your previous statement where you seemed to already know “their role”?

This is consistent with the previous comment. It is clearer if the previous sentence is deleted (L326-327). However, we removed ‘role’ and added ‘extent of’.

L333: fractionation -> evaporation

Corrected

L339: “unstable” in terms of what?

We clarified and replaced ‘unstable condition’ with ‘weather-related pressure fluctuations’.