

Review on manuscript amt-2024-43

Title: An easy-to-use water vapor sampling approach for stable isotope analysis using affordable membrane valve multi-foil bags

Author(s): Adrian Dahlmann et al.

General comments:

In the manuscript by Dahlmann et al. the authors present an alternative approach (in comparison to Herbstritt et al., 2023, Magh et al., 2022 and Havranek et al., 2021) of obtaining water vapor samples for analyzing the isotopic composition of soil water obtained with gas-permeable membranes (GPM) and storing them in multi-layer foil bags. They performed different experiments to test maximum storage time, potential memory effects and reusability as well as field applicability. The authors conclude that their approach is a simple, cost-effective, and versatile approach. The paper is nicely written and well structured.

However, I have two main concerns:

As approach and concept in this manuscript are very similar to the paper by Herbstritt et al. (2023) - only a different type of GPM and a different (commercially available) bag type were used - the results should be compared point by point and discussed accordingly. Here some revisions and additional considerations are needed.

Moreover, the cited study by Jiménez-Rodríguez is only available as preprint in HESSD. It was under review in 2019 but not accepted due to substantial issues. No revision was provided by the authors afterwards, thus no accepted peer-reviewed version exists. This pre-print can therefore not be cited in your manuscript.

Specific Comments:

L. 28: what you call 'precision' is the deviation from the true value, isn't it?

L. 30: (and throughout the manuscript) 'water stable isotopes' not 'stable water isotopes'

L. 34: 'suitable for many applications' was already mentioned in L. 31. Please rephrase

L. 61: 'which can cost anywhere from' sounds a bit sloppy

L. 67: '...provide new insights in research' please be a bit more specific or delete.

L. 98: wrong! ‰ is not "million"

L. 112: P/N of bags? Fitting of bags? Volume of bags?

L. 115: use the manufacturer as reference for material properties such as 'Water Vapor Transmission Rate'

L. 125: Fig. 1: Where is the bag? On the right side in Fig. 1b?

L. 130: how much standard water was added to the 100 mL bottle? And what was the size of the GPM inside the bottle? This is crucial for the isotopic equilibrium

L. 275: Jiménez-Rodríguez can't be cited (see general comments)

L. 289: Fig. 3: would be nice if you could add "L22" and "M22" directly to the figure, there is enough white space. The Legend is also a bit small.

L. 305: if you assume an error during the measurement, I'm wondering why do you present these data and didn't repeat the measurement?

L. 325 and 332: Jiménez-Rodríguez can't be cited (see general comments)

L. 324 to 342: please rephrase and take into account the findings of Herbstritt et al. (2023)

L. 354: Fig. 4: see comments to Fig. 3

L. 378: "...has not been described in the literature before" please rephrase or delete.
I would say it is comparable to Herbstritt et al. (2023), Fig. B1.

L. 378-400: Please discuss and compare the results of Herbstritt et al. (2023) on memory effects and conditioning here.

L. 504 ff: Please check the reference list thoroughly, e.g. Millar et al., (2018) or Orłowski et al., (2016b) are in the reference list but not cited in the text.

Technical correction:

L. 11: 'water stable' not 'water-stable'

L. 16: 'easy-to-perform' instead of 'easy to perform'

L. 30: I suggest "...using GPM combined with..." instead of "...using GPM and..."

L. 34: 'suitable' instead of 'suited'

L. 83: please use different bullet points for the field experiments e.g. i) ii) iii) or (a) (b) (c)

L. 98: wrong wording: detailed in

L. 108: Majoube is from 1971

L. 215: 'procedure similar to' instead of 'similar procedure to'

L. 247: please delete line break

L. 284: I suggest 'On average' instead of 'In average'

L. 396: 'especially in' instead of 'in especially'

L. 447: please add dates