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Discussions

Interactive comment on "Determining the stable isotope composition of pore water from saturated and unsaturated zone core: improvements to the direct vapor equilibration laser spectroscopy method" *by* M. J. Hendry et al.

C. Stumpp (Editor)

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Comments to Authors:

Two reviewers thoroughly evaluated the manuscript. Below, I briefly summarize the main comments:

1) give explanation for differences in isotope values in second sandy layer (Figure 1)

2) more specific details about used bags and procedure for carbon removal required

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Interactive Discussion

Discussion Paper

3) include main points of required minimum water content in summary

4) minor technical corrections required

In addition to the reviewer comments, I have some minor additional comments which should be addressed when revising the manuscript:

1) p6243, ln7-10: All the advantages of core samples are mentioned, but it is also worth mentioning that cores give time integrative information. This is probably sufficient in systems like aquitards and some specific research questions. However, when temporal information is required or dynamics are studied (e.g. unsaturated zone), either core samples have to be taken more often (and then heterogeneities might be crucial) or traditional water sampling methods are more beneficial.

2) p6244, ln19: Give ranges of analytical precision

3) p6244/45, ln29/1-3: some very recent studies have been published for <15 m (Sprenger et al. 2015) and <100 m (Filippini et al. 2015) Sprenger, M., Volkmann, T.H.M., Blume, T., Weiler, M., 2015. Estimating flow and transport parameters in the unsaturated zone with pore water stable isotopes. Hydrology and Earth System Sciences, 19(6): 2617-2635. DOI:10.5194/hess-19-2617-2015 Filippini, M., Stumpp, C., Niejenhuis, I., Richnow, H. H., and Gargini, A., accepted. Evaluation of aquifer recharge and vulnerability in an alluvial lowland using environmental tracers. Journal of Hydrology, doi: 10.1016/j.jhydrol.2015.07.055

4) p6248, ln6: how many liters of 99% deuterium oxide were used? Just to give the reader an idea on potential costs for such methods

5) p6251, ln12/13: But does the temperature increase also affect the isotopic composition (e.g. due to stronger evaporation during sample preparation)? Not generally, but most of the samples from dry sonic drilling are more enriched compared to wet sonic drilling. Can you get any information from d-Excess depth profiles?

6) p6252, ln23: has Barbour et al. (2015) been accepted? otherwise, remove sentence

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7) p6257, ln12/14: references required

8) p6258, ln16: I would not say that it is in widespread use considering that only a couple of labs worldwide have being doing the analysis to date; certainly, the potential is high to use the method even more frequently in future

9) p6258, ln25: is the temperature really no issue here?

10) p6259, ln21: this is a general statement and I suggest deleting "and being conducted by our group“

11) Figure 6: It would be good having information about temperatures on second y-axis

Currently, I ask the authors to only answer to the comments of the reviewers and editor. A revised version of the manuscript is not required at this stage of the process.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 6241, 2015.