

Interactive comment on “Evaluation of continuous water vapor δD and $\delta^{18}O$ measurements by off-axis integrated cavity output spectroscopy” by N. Kurita et al.

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Reviewer 1 comments:

P. 2824 L. 6: Aemisegger et al., 2012, AMTD, is a similar characterization study of commercial water vapor isotope analyzers and might also be included as a reference.

We have added “Aemisegger et al., 2012” in our reference list. Thank you for introducing me nice paper.

P. 2825 L. 2: “...have used the same...”

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We have fixed the wording.

P.2825 L. 1: “... 10 μs ...”

This was an error during the PDF conversion. We have modified this error.

P.2825 L. 3: “... than that of a multi-pass cell...”

We have modified this sentence following your suggestion.

P. 2826 L. 12: I suggest avoiding the extraneous numerical factor 1000 in the δ value equation. The isotope delta is a dimensionless quantity and the factor 1000 is not needed for a coherent definition of the isotope δ value (e.g. see Coplen, 2011, Rapid Commun. Mass Spectrom).

We have removed factor 1000 from the equations.

P. 2827 L. 22: Why do you need an external computer if both the WVIA and WVISS can be controlled by the instrument computer of the WVIA?

We have used external PC to monitor a display of the WVIA through internet. However, it is not mandatory item for this experiment. So, we have removed the description as for an external PC from the sentence.

P. 2828 L. 14: Did you trap the same amount of water for all samples (resulting in different trapping times) or trap for the same time period (resulting in different amounts of trapped water)?

We have tried to get same amount of samples in each experiment. Thus, sampling time was varied from 2 to 6 hour depending on water vapor concentration. We have collected water vapor samples with changing trapping time from 2 to 10 hour and then compared each obtained isotopic value. However, we cannot find any significant tendency/relationship related to the trapping time. I have added the sentence to show that the sampling time is different in each humidity level in the revised text.

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P. 2831 L. 2-3: I don't understand the sentence "The variation in `_DWVIA` is similar or less than the analytical uncertainty of cold trap samples." The variation in `_DWVIA` is clearly much less than the variation in `_DTRAP`. Or what do you mean with "analytical uncertainty of cold trap samples"?

Sorry, the `dD_WVIA` was mistyped. We have fixed the `dD_WVIA` to the `dD_TRAP`. As for analytical uncertainty, the isotope measurement of these trapped samples was carried out mainly using Picarro and the estimated external uncertainty for HDO measurement was about 2 permil. Thus, we defined that analytical error for HDO measurement is 2 permil. This value is almost similar to the variation of `dD_TRAP` in Figure 2.

P. 2832 L. 16: How do you know that the isotopic value of WVISS generated air is highly reproducible? If the sample air flow rate of the WVIA was changed or if the WVISS is operated at a place with different ambient temperature, this could probably change the concentration dependence of the WVISS.

This sentence seems to provide some misunderstanding to the reader. We have removed this sentence from the revised text and mentioned that identification of the source effects resulting in this isotopic offset is out of our scope.

P. 2834 L. 10-11: Was there any time-dependence of this calibration line and what would be the optimal calibration interval to determine the VSMOW/SLAP normalization?

Yes. We have observed a significant variation of the VSMOW/SLAP scaling factor from a daily measurement. The fact that calibrated values agreed well with the known values (see Table 1) represents that once in a day is an optimal frequency for calibration. We have added them in the revised text.

P. 2837 L. 2: Equation numbers are missing.

The equations described in Section 3.3.2 are given the numbers and we have referred them. To make sure this, we have added the section number (Section 3.3.2) where

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these equations were described.

We have referred the equation described in Section 3.3.2.

P. 2837 L. 7: What results in Sect. 3.3 are you referring to?

We have recalculated the isotopic values listed in Table 1 with applying long-term mean slope and intercept. So, it is suitable to mention as follows: "comparison with the results shown in Table 1".

P. 2838 L.15: The permil is missing: "(5 – 25 ‰"

We have added "permil" unit. Thanks.

P. 2851 L. 6: "...in a 30min interval."

This sentence means that every calibration was terminated within a 30 min. We have modified this sentence to show this clearly.

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