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Atmospheric Measurement Techniques Discussions

Interactive comment on "Evaluation of continuous water vapor δD and δ^{18}O measurements by off-axis integrated cavity output spectroscopy" *by* N. Kurita et al.

Anonymous Referee #1

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The manuscript presents an extensive characterization of a commercial water vapor isotope analyzer. This is in line with various similar studies that have been carried out recently using commercial isotope ratio laser spectrometers. What distinguishes this study from many others is that it is very comprehensive as it includes all relevant aspects and thereby convincingly shows what effort is needed for reliable and accurate measurements. In particular the concentration dependence of the commercial calibration device used here is a new aspect that has not been considered previously. The manuscript is well written and structured. Specific comments and suggestions are listed below:

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.

P. 2825 L. 2: "...have used the same..."

P.2825 L. 1: "... 10 μs..."

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

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).

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?

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)?

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

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.

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?

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

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

P. 2838 L.15: The permil is missing: “(5 – 25 ‰)”

P. 2851 L. 6: “...in a 30min interval.”

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 2821, 2012.