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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Temporal evolution of stable water isotopologues in cloud droplets during HCCT-2010" *by* J. K. Spiegel et al.

Anonymous Referee #2

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The authors present and interpret cloud isotope data collected during a mountain campaign in Germany. The paper is well structured and tries to squezze out as much as possible information the data potentially contain. Sometimes I assume an over-interpretation, basically ever, if general conclusions are drawn, simply because of the low number of cloud events and the short duration of the campaign. Moreover, the data may be better embedded in other isotope data sets, e.g. the one from Heidelberg.

Although the train of thoughts is usually well traceable, due to the complexity of the topic, it is often not simple for the reader to fully understand each step in the interpretation. The situation becomes more complicated by the fact that the nomenclature is often not self-explanatory. For instance, in equation (2) the subscript c is used to "distinguish the collected cloud samples from the calculated vapor samples" (what c

is meant?) ... better write "... from the modelled vapour samples" and use c and m as subscripts. In equation (6) the subscript c is again introduced differently, with Rc marking the isotope ratio of the condensate. Thus, define well-understandable abbreviations/subscripts. Also, the denotation "model run A" and "model run B" is not suitable, as they simply describes two consecutive steps in the model, but not two different model versions (as one expects if indexing with A and B).

Besides this, I have only some minor concerns.

Equation (1). Multiply it by 1000 per mil.

P. 15145, l. 28. What a delta unit? If per mil, then write it.

Equation (3). Is the uncertainty in the collected volume zero?

P. 15147, l. 7. horizontal instead of spatial

P. 15147, l. 23. How you maintain such an "upwind sounding"? The sounding site is likely stationary and only during specific synoptic conditions "upwind", right?

Section 2.4. Introduce two subsections (with numbering 2.4.1 and 2.4.2 or not) for model run A and B so that the reader can better follow the sense of the two runs.

P. 15151, l.18. add "simply, as other factors, e.g. ..., which cannot accurately be described by the model, will not have played a significant role" or something like that.

P. 15152. Indeed, six weeks are not appropriate to retrieve any "seasonal variation". If you come with this argument, you have to embed your data in other studies / observations and have to give typical seasonal trends in "per mil in 6 weeks" or so. Then you can write: "our numbers of ... agrees with ...". This badly constrained "seasonal argument" pops up too often in the manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 15139, 2012.