**Hydrology and
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Discussions

Interactive comment on "Exploring water cycle dynamics through sampling multitude stable water isotope pools in a small developed landscape of Germany" *by* N. Orlowski et al.

Anonymous Referee #4

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The manuscript is presenting an impressive set of stable isotope and deuterium excess data collected over a two year period from a low slope and low elevation catchment in Germany. Focus of the work is on precipitation input, river water, soil water and groundwater interactions and processes. The manuscript is well written and structured. I recommend a publication of the manuscript in HESS after revisions. My comments below are in addition to all the points that were raised by the prior reviewers and I aim for additional improvements of the paper.

General comments

- Since snowmelt was found to play a fundamental role (Page 1810, Line 10), it would be helpful for the readers to get more details on sampling methods in the monitoring section (e.g., page 1817, line 12). Did you take several / replicate snow samples at the same site? Did you sample integral snow cores over the entire snow depth? Or were snow lysimeters installed? Any information on snow depths, snow density and water contents would be helpful.

- You do not give additional accuracies for soil water that was cryogenically extracted. I am impressed about your results concerning the soil studies and find it would be worth to better focus these. Your error bars in Figure 9 are sometimes larger than +/- 10 ‰ for d2H. Did you test your extraction method? Comments or a short reference would be helpful.

- For LGR measurements you give accuracies of 0.6 and 0.2 ‰ for d2H and d18O respectively, but you do not further comment on drift and memory corrections. Do you use such for your isotope measurements? Laser instruments are known to be sensitive to organic content in waters (especially soil water). Are you able to check / correct for this? Or was this not problematic in your case?

- Is the isotope data you present weighed by precipitation amounts or do you present individual values for collected events?

- Figure 4 and 5: You state outlier values in March 2012 and 2013 that are most likely due to snowmelt. How do you explain outlier values for Schwingbach site 64 in 9/2012 and for V-site 13 in 5/2012?

Specific comments

Study area:

- Page 1815, line 11: It would be helpful to include latitude, longitude of the study site

- Page 1817, line 28: (... all samples were filled and stored in 2 mL brown glass ... (Mook, 2001).). Mook (2006) recommends 50 mL glass bottles tightly closed to prevent

evaporation. Did you really store your "field samples" in 2 mL autosampler bottles closed with septa? Are replicate measurements possible - with such small amounts just out of one bottle?

Results and discussions

- Page 1824, line 23: "Furthermore, our and their isotope . . .". Please rephrase!

- Page 1825, line 8: I recommend d2H value with one digit after the comma (-57.6).

Figures and Tables:

- Table 1. I would recommend placing the mean values and SD of mean values first, and further to include a column for d-excess values.

- Figure 1: an overview map for the location in Germany / or Europe would eventually be helpful for non-European readers.

- Figure 3: (d = 10; dashed line) is not visible on my printout. Why do you give the 2003 to 2005 d-excess values from Koblenz and not the long-term mean d-excess values? Was the meteorology during 2003 to 2005 comparable to your study period?

Technical corrections

- Page 1813, line 2: ". . .. and re-evaporated thus isotopically fractionated."

- Page 1820, line 3-6: This sentence is hard to understand.

- I recommend to avoid short forms for date and time in the text: e.g., would recommend (July 2011 to July 2013) (Page 1820, line 14), or . . . (21st June to 21st/22sd September) (Page 1822, line 13 and 15) instead. - Page 1822, line 15: d-excess instead of D-excesses: "d-excess greater than +10 ‰ was . . .".

Figures and Tables:

- Table 2. Legend should first mention: mean and SD for isotope signatures and soil physical properties. The alignment of numbers in the table should be restructured.

- Figure 2: Give regression coefficient in the legend with one digit after commas, as d2H = 3.5T − 85.5

- Figure 8: In the upper insert figure "Rainfall" should be aligned. I would recommend to use 0.2 m and 0.5 m in the figures (instead of 20 cm and 50 cm) as given in the legend.