

Interactive comment on “Studying catchment storm response using event and pre-event water volumes as fractions of precipitation rather than discharge” by Jana von Freyberg et al.

Anonymous Referee #3

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General comments: The authors propose a new approach to characterize the catchment response of a pre-alpine mountainous catchment Erlenbach, in Switzerland. They measured high-resolution precipitation and stream flow isotopic data to calculate pre-event and event water fractions based on precipitation instead of discharge, as commonly used. A large number of storm events (24 events, in total) are analysed combined with, for example, antecedent moisture conditions in the catchments. The results shown in this study underline their potential to a new “fingerprint” of catchment responses. With respect to the transferability of these results, it is clear that a cross comparison study is needed, as it is already mentioned in this study. However, I recommend to extend the remarks on whether this fingerprinting approach might hold also

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in other catchments and to hypothesize which requirements would need to be fulfilled (catchment characteristics or climate such as mountainous, specific land cover proportion, temperature climate and so on). Besides, the manuscript is written in a concise way and in good English quality. Some figures deserve further attention regarding additional information in the caption or their readability. To conclude, only minor revision is needed for this study to be accepted in Hydrology and Earth System Sciences.

Specific comment: Page 1, Line 14: At this point, it is not clear for the reader if event-averaged fractions or instantaneous fractions are used. Please clarify. Page 8, Line 5: Is it correct that the average isotopic composition is taken from the period of time of 2,5h prior to the storm event? This information could be added here in parenthesis, for example. Page 10, Line 3: If your data analysis starts 6 May 2017, the effect of snowmelt on the isotopic composition of the stream water is still present and should be considered when discussing May and June storm events (for example, 13 and 19 May 2017 events). Both events occur after intense snowmelt infiltration into the stream (see Figure 2). Page 10, Line 10: Which technical problems occurred with the automatic sampler? However, it is not necessary to report these details in the manuscript. Page 14, Line 2-3: Please remove the first “not”. Page 18, Line 4: Qini in Figure 7 is not displayed in log-scale Page 18, Line 16-18: Please discuss further whether these ‘fingerprint’ may results from the specific catchment characteristics of Erlenbach catchment and how strongly they are connected to the catchment land cover.

Table 1: the last date entry of column 1 is ‘29Ot2017’. Figure 1: Please enlarge map symbols and make labels more visible (using a different colour and fontsize, for example). Please correct ‘The Erlenbach...’ in the caption. Figure 2: Although these events are not considered for your analysis, please mention the remaining events, during which isotopic stream composition remarkably drops (snowmelt events?) Figure 3: On which criteria is the selection of events displayed here based? Please report. Figure 5: Could you add errorbars in this graph? Figure 7: Axis labels and tick labels are very small and difficult to read. Please enlarge here to improve readability.

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