

Interactive comment on “Vectors of subsurface stormflow in a layered hillslope during runoff initiation” by M. Retter et al.

Anonymous Referee #3

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A. General Comments

This is an excellent paper with some useful conclusions about the vector methodology itself and its application to studying stormflow. The work presented is novel and very interesting. I do hope that the authors will continue to work in this area.

The authors acknowledge the limitations of the approach but I believe that they should also emphasise the potential more fully. For example, this methodology and the data that it produces are invaluable for numerical modelling of hydrological processes. This technique is a big step forward in giving us the ‘eyes in the hillslope’ that we so desperately need.

The paper is mainly fluent, however, the phraseology occasionally means that the meaning becomes unclear. I have highlighted these areas in the technical comments

sections along with my suggested alternatives.

B. Specific Comments

2524/7 Study site. I would suggest that a small annotated photo of your study hillslope and trench should be included if possible. This would help to make clear the characteristics of the site and how these would differ from (a) a more complex hillslope and (b) a lab setup.

2524/15 What is the conductivity of the siltstone? Is this contributing to flow or are there losses through bedrock cracks etc.?

2524/22 What do you mean by 'runs'? Please explain their approach in a little more detail.

2526/14 This doesn't sound like a very high time resolution. Why could you not record faster? Why did you select 90s? Was this recommended or was it trial and error?

2527/25 What were the characteristics of the storms? How were they used? This is unclear.

2528/3 What are Pyranin, Naphtionat and Uranin? Please give details especially regarding their properties as a tracer.

2533/17 I think this is worth expanding slightly. Do your observations therefore suggest that pressure responses do not occur in your hillslope? Perhaps they don't occur at all? What do you think? How could you test this further?

C. Technical comments.

2522/16 'stromflow' should be 'stormflow'

2523/4 'to closer look into', I suggest instead 'to look closer at'

2523/6 'inferior', do you mean 'less than'? meaning unclear.

2524/15 'underlaying', I would suggest that 'underlying' sounds better.

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2526/1 'decisive on', do you mean 'controls'? meaning unclear.

2527/15 'allowed to calculated the input precisely'. I would suggest instead 'allowed the input to be calculated precisely'.

2528/11 'allowed calculating tracer front velocity' I suggest instead 'allowed tracer front velocity to be calculated'.

2529/10 'under laying' I suggest instead 'underlying'

2529/11 please rephrase 'repressed water', meaning unclear

2529/20 'for same' I suggest instead 'for the same'

2529/24 'and neither one for' I suggest instead 'and neither was one found for'

2530/14 'because pattern' I suggest instead 'because the pattern'

2530/17 'excelled' do you mean 'exceeded'?

2530/17 'But still' do you mean ' Even so'?

2530/17 'fronts', please explain again the context as I'm losing the meaning within the paragraph. Exactly which fronts?

2530/21 'This is even confirmed' I suggest 'This is confirmed'

2530/23 'approachable' I don't understand your meaning, sorry.

2530/27 'To conclude' I don't understand this sentence.

2531/10 'emphasised on the' I suggest 'emphasised the'

2531/10 'refrained to apply a test' I suggest 'refrained from applying a test'

2531/28 'allowed to measure travel times by the first' I suggest 'allowed travel times to be measured from the first'

2532/6 'similar than' I suggest 'similar to'

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2532/8 'Line sourceĚtrench' I suggest 'line source salt tracer experiments at a distance of 8m from the trench'

2532/10 'resulted' I suggest 'was'

2532/11 'regarding' I suggest 'for'

2532/14 'amount' I suggest 'value of qtot'

2533/2 'among' I suggest 'in'

2533/4 'with the direction of that' I suggest 'with that'

2533/5 'scale' do you mean 'magnitude'?

2533/7 'were far off each other' I suggest 'were far apart from each other temporally'

2533/9 'we emphasis that' I suggest 'we emphasise the'

2535/11 'did not allow to' I suggest 'did not allow us to'

2535/20 'delayed to infiltration' not clear - I guess you mean that there is a time delay between infiltration and the lateral components. Rephrase.

2535/22 'movement' I suggest 'movements'

2535/24 'in the scale of' I suggest 'from'

Interactive comment on Hydrology and Earth System Sciences Discussions, 2, 2521, 2005.

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