

General Comments

The study of “Impacts of rainfall features and antecedent soil moisture on occurrence of preferential flow: A study at hillslopes using high frequency monitoring” is of considerable significance to the scientific community interested in better understanding the onset of preferential flow. The vast amount of observational data collected by the authors is impressive. However, a significant revision needs to be done before the manuscript becomes suitable for publication.

One of the main issues with the manuscript is that it fails to engage the reader as to the importance of this study and how it differs from previous studies. The authors should highlight it in the Introduction section. Secondly, having a separate Discussion section is not the best approach here. Having a Results and Discussion section merged together will give the readers a better understanding of the similarities and disparities between the current study and the previous studies.

There are also a lot of grammatical mistakes in the manuscript, which makes the manuscript harder to understand and keep the focus on the actual research part. I suggest the authors have a native English speaking person review the manuscript to improve its overall quality.

Reply: Thanks a lot for your comments.

We will illustrate more to fill the gap between previous studies and our objectives. Basically, this study was initiated from two considerations. (1) It would be helpful in understanding the processes of subsurface hydrology, if we get the key factors that control the occurrence of preferential flow. Lots of studies have been carried out on this topic. However, contradictory results were obtained in different cases, e.g., the cases of Wu et al. (2014) and Hardie et al. (2013). And to our knowledge, no study on this topic has been carried out in northern China with sub-humid climate and poorly developed underlying soil. Hence, we think this study could be a complementary to the understanding of controlling factors of preferential flow; meanwhile, it would be helpful in understanding hydrological processes of the study area. (2) By far, there are many methods for the detection of preferential flow, but in-suit method is rather limited. The method using wetting front as an indicator, which was proposed by Lin and Zhou (2008) and later improved by Hardie et al. (2013), could be an alternative option. Since this method has been on applied in only two or three cases to our knowledge, it would be of interest to apply it in our study area, where climate and surface condition are different from previous cases. From this point of view, this study could be regard as a case study. And in the revised introduction, we will emphasis more about the difference between the study area and those of the previous studies, so as to illustrate the necessity to conduct studies at this area.

We've been hesitating whether to put Section 4 as discussion or as a part of results at the beginning. Thanks for your suggestion. We will combine Section 3 and Section 4 together as a section of “Results and Discussion”. We will make more comparisons between our results with those of the previous studies, so as to make our results sounder and more meaningful.

Concerning on the language issue, we will have a native English speaker for some help during revision. We will check the syntax errors through the manuscript, and improve the presentations.

Specific Comments

The title of paper can be shortened. Consider leaving out the second part of the title, as it does not provide much additional information.

Reply: Thanks a lot for your suggestion. Given that this study is kind of a case study, we think it would be necessary to present some key information of the study area in the title. We would change the tile into “*impact of rainfall features and antecedent soil moisture on occurrence of preferential flow in a sub-humid catchment*”.

Authors have used the word “rainfalls” at numerous instances throughout the manuscript. It should be “rainfall”.

Reply: We will check through the manuscript to make sure the word is properly used.

Missing citations in the Reference section. For example, Vogel et al. 2010; Niu, 2003. Please re-check and make sure all the references listed.

Reply: We will check through the manuscript to make sure the references are properly presented.

Page 1, Line 14: Remove “,” after intensity.

Reply: the comma will be dropped.

Page 1, Line 22: Replace “knowledge” with “finding”. Using the word “finding” instead of “knowledge” tells the reader the importance of the study.

Reply: Thanks for your reminding. We will change “knowledge” into “finding”.

Page 1, Line 26: Indent the paragraph.

Reply: We will re-format the manuscript according to the guidance of the journal.

Page 2, Line 4: Rewrite 1st sentence. “Among the many” what? Cite the studies after you have addressed what are “among the many”.

Reply: “Many” refers to the factors that influence the occurrence of preferential flow. We will rewrite sentence to make it clearer.

Page 2, Line 6: Do not begin the sentence with “And”. Reword the sentence.

Reply: Thanks for reminding. We will check through the manuscript.

Page, Line 20: A 2008 study, in my opinion is not “recent”. Rewrite the sentence and try not to refer a 2008 study as “recent” or cite another relevant “recent” study.

Reply: Thanks for reminding.

Page 2, Line 20-24: Try to break the sentence “On one hand” It is too long.

Reply: We are sorry that sentences in the paragraph are long hard to read. We will re-organize this section.

Page 2, Line 20: swap “became” with “becomes”.

Reply: We will change “became” into “becomes”.

Page 2, Line 24: rewrite the sentence “However, since larger”. It is poorly worded and is difficult to understand.

Reply: We will re-organize this paragraph.

Page 2, Line 28: “Among the numerous approaches” has only reference. Please cite additional studies if “numerous approaches” are mentioned.

Reply: We will specify the approaches in revision, by referring to the review work by Allaire et al. (2009) and other studies.

Page 2, Line 29: Use a semicolon instead of a comma after 1996 to cite two different papers.

Reply: We will re-format the manuscript according to the guidance of the journal.

Page 2, Line 3: In the last paragraph of the Introduction, the authors should not only mention what they are doing in the study but why and also highlight how their study is different from previous studies.

Reply: Thanks for your suggestion. We will illustrate more to fill the gap between previous studies and our objectives. Since this is a case study, we would emphasis more about the difference between this study area with those of previous studies.

Page 2, Line 8: Indent the first paragraph.

Reply: We will re-format the manuscript according to the guidance of the journal.

Page 2, Line 16: Indent the first paragraph. I have noticed this error through out the manuscript. Please fix this.

Reply: Thanks for reminding. We will re-format the manuscript according to the guidance of the journal.

Page 3, Line 20: The authors have not mentioned the reason as to why the probes were buried at different depths at different sites. Was it due to varying soil depths at these locations? What was the need to bury the probes further than 60cm if the authors only use 0-60cm for their analysis shown in the Figures?

Reply: The probes were buried at different depths for other purposes, and only the data of the 0-60cm is used in this study, in order to compare among the sites. We will clarify this issue in revision.

Page 4, Line 11: Which “data” are the authors referring to?

Reply: “Data” here refers to Table 2. We will re-organize the presentation to make it clearer.

Page 2, Line 27: Swap “was” with “is”.

Reply: We will change “was” into “is”.

Page 4, Line 25: “Producer” is not an appropriate word here. May be the authors can use “manufacturer”.

Reply: Thanks a lot for your suggestion. We will use the word “manufacture” instead.

Page 4, Line 27: “. . . a bunch of studies”. Use another way of describing like “ a lot of studies” or “other studies”.

Reply: Thanks for reminding. We’ll be careful in using the phrase “a bunch of”.

Page 5, Line 21: change “. . . as was shown” to “as is shown”.

Reply: We will change “was” into “is”.

Page 6, Line 4: Wrong usage of word “respectively”.

Reply: The word “respectively” will be dropped.

Page 8, Line 22: What does n=233 refer to?

Reply: “n” refers to the number of samples used for correlation analysis, specifically, it is the cumulative number of the rainfall events measured by the 9 rain gauges and used in analysis.