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Hydrology and Earth System Sciences Discussions

Interactive comment on "Experimental analysis of drainage and water storage of litter layers" *by* A. Guevara-Escobar et al.

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The authors present the results of experimental laboratory work where they analyze the storage - discharge properties of different litter layers. The experimental design consists of a rainfall simulator that can produce rainfall at different intensities. Water is sprayed by a set of nozzles, and each of them is underlain by a circular sample container with surface area of 0.26 m2 and height of 0.72 m. In total, they have 80 - 100 nozzles, and as many containers.

In my opinion, this laboratory work offers the potential to better understand the behaviour of litter layers, and therefore this article is of potential interest for HESS. However, I recommend major reviews.

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EGU

First, I find the main message of this paper difficult to understand. The abstract and introduction seem to focus on the problem of slope stability, however, the experimental configuration and the analysis carried on does not deal with this subject. Also, there is a reference to interception, which does not seem to be discussed in the rest of the paper. Paragraph 3.5 named “further research” starts with the sentence “This study shows that the amount of water stored by litter layers was important”. The conclusion section starts with the sentence “this study confirms previous reports of increased maximum storage proportional to increased rainfall intensity”.

My suggestion is to express more clearly the focus of this paper, and be consistent with it from the abstract until the conclusion. I also suggest leaving out the problem of slope stability, (unless the analysis proves to be useful to this problem) and focus more on the storage properties in relation to interception.

Second, the paper is very fragmented, and it is difficult to follow the author’s reasoning. In order to improve the clarity of the explanation, I suggest dedicating each paragraph to answering a specific question. Many sentences sound cryptic, and on the other hand there are details that could be left out. The authors should indicate what is the potential use of their work, and show how their analysis contributes to a better understanding of the behaviour of litter layers. They should aim at communicating the results of their study to the whole community of hydrology, rather than to a restricted group that works in their specific field of research.

Third, I find test 1, test 2, and test 3 sections in 3.1, 3.2, and 3.3 a mere description of results, which lacks interpretation. For example, in test 1, which refers to fig 1, why does the maximum storage capacity does not increase with the amount of litter in the samples? The woodchips behaviour in figure 2 shows that this material has a different storage capacity with different thickness layer, a result that seems to contradict that of figure 1. Why does the storage capacity increase (or not) with rainfall intensity? In figure 4, the difference between Cmax and Cmin seems to be constant, independent of the litter mass. Should this be discussed? Since the authors measured rainfall and

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discharge, they should be able to plot the storage - discharge relation of the various materials and the hysteresis associated with the wetting-up and drying cycle.

Fourth, the authors compare their experimental results with the Rutter model. They should say why they do this and what they can learn from this comparison? Finally, the authors should be able to interpret the results of each test and provide a conceptual description of how the system works. Moreover, they should discuss the relation between their laboratory experiment and the real world.

Minor:

I think there is a mistake in figure 2 and 3. The four rainfall intensities do not correspond to ABCD but to DCBA. Please provide a legend to all figures. A picture of the laboratory set up would be useful

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 1767, 2007.