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Hydrology and Earth System Sciences Discussions

Interactive comment on "Formation of runoff at the hillslope scale during intense precipitation" *by* S. Scherrer et al.

S. Scherrer et al.

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We would like to thank the anonymous referee #3 for his suggestions. The suggestions improve the readability of the paper and will clarify complex or not well formulated statements. A more detailed description of the model would make the paper too long. However, we will refer to the more detailed description of QSOIL and the combined approach of field experiments and model application (Faeh, A. O., Scherrer, S. and Naef, F.: A combined field and numerical approach to investigate flow processes in natural macroporous soils under extreme precipitation, Hydrology and Earth System Science, 4, 787-800, 1997). For us it is important to show that the interpretation and process identification cannot always be based on the monitoring data alone. The presented experiments were made some years ago. One result of the workshop "SLICE" in 2005

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was the call for the intercomparison of hill-slope experiments. Therefore we decided to present our big set of experiments to a wider audience, because no other data set with such a detailed evaluation is known to us. 11. p 2544, top: What might be the implications for flood formation at catchment scale? The implications of our result will be explained with different examples, e.g. soil's capacity to infiltrate and store water is often underestimated. As a consequence, runoff coefficients are overestimated, etc. 12. p. 2558: Sorry, but I do not agree with your interpretations, as I clearly see an effect of the antecedent moisture. We do not argue that antecedent moisture does not influence runoff formation. It seems that our argument is not clear enough. Figure 9 and 10 show that the influence of antecedent moisture differs from site to site. Sites 2 and 17 in figure 9 show large differences in runoff volume under dry and wet conditions. After 120 min. nearly 10 time as much rainfall has been transformed to runoff at site 2 when it was wet. On the other hand, the runoff responses under dry and wet conditions (figure 10) varied only some percents at site 18. This phenomenon reflects differences in the efficiency of the drainage of hill-slope and of the infiltration capacity.

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