

Interactive comment on “Temporal variability of subsurface stormflow formation” by P. M. Kienzler and F. Naef

Anonymous Referee #1

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HESSD-2007-0079 Referee report Temporal variability of subsurface stormflow formation P.M.Kienzler and F.Naef

‡ This is an interesting paper on the generation of SSF, on its variation in time and how it is influenced by antecedent precipitation intensity in individual rainfall events. ‡ I recommend acceptance for HESS after the authors have addressed the comments made below, as well as the minor comments inserted in the attached .pdf version of the m/s. ‡ How does the present paper relate to the material presented in Kienzler and Naef (2007) and Retter et al. (2006) ‡ Throughout the m/s use of the term runoff should always be preceded by surface (OF) or subsurface (SSF) so that the reader is no doubt about which runoff we are dealing with. Is subsurface flow always fast? (see line 19, p. 2144) ‡ What is the precise distinction between matrix flow and macropore flow? (see

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also line 27 on p. 2150- line 1 on p.2151) ¶ Re. soil drainage, in most hydrological situations there is a certain amount of deep drainage (or percolation). This term is not mentioned here at all, although the authors refer to (semi)permeable layers and bed rock. ¶ Figure 3 (RHS) needs to be relabelled and the caption adjusted. Sure, the three curves are associated with drainage but they can not be identified as “drainage”. ¶ Re. soil pipes: they should be better defined/described if they play a major role. How important is their spatial distribution. How does one describe their presence (and location) in the different soils considered here? Do we have to be satisfied with qualitative descriptions like "They are present"? What are their dimensions? Where are they? Can their presence be quantified? Also please explain the difference between pipes and macropores. I assume that pipes are much larger and that they are predominantly horizontal, unlike macropores which are vertical? Do preferential flow paths involving macropores as well as pipes?? ¶ How is the distinction between shallow and deep subsurface introduced in this paper. How are the two terms defined and measured? ¶ Re. Figure 3. The impact of drainage after sprinkling. 100% represents values of soil suction, soil moisture content and piezometer head when sprinkling is completed. I don't understand "soil drainage" on the ordinate. The RHS of this figure should be fixed up as follows. Replace on the ordinates "soil drainage" by "relative value" The three curves relate to drainage but don't equate soil drainage. ¶ I find Figure 5 very difficult to interpret. What precisely is its meaning?

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