

Interactive comment on “Analysis of the runoff response of an Alpine catchment at different scales” by B. Zillgens et al.

B. Zillgens et al.

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Thank you very much for the response to our manuscript ‘Analysis of the runoff response of an alpine catchment at different scales’. We have revised the manuscript based on the review of Referee #2 (HESSD, 2, S1343-S1344, 2005), including the additional remark of the Editor (HESSD, 2, S1345-S1345, 2005). To us, it seems impossible to revise the paper according to the comments of Referee #1, since those comments are very general.

Our comments on the remarks of Referee #2:

Referee’s remarks: The role of initial moisture available for the bimodal events could be extended. It would be interesting to see the effect of rainfall events leading to bimodal

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events for cases where the initial baseflow was low. Is there a kind of critical storage volume or rainfall volume in these catchments?

Response: Fig. 5 and 12 clearly show that the unimodal and bimodal events are separated by the value of initial baseflow and of cumulative precipitation. This is valid for all 3 basins. From this observation we conclude that there must be a critical amount of water in the basin in order to generate a bimodal event, i.e. a second runoff peak. We added a few sentences in the conclusions section to highlight this point.

Referee's remarks: Events 11 and 12 of Table 3 support the dependence on baseflow while 2, 3 and 4 show the opposite. How can a lower precipitation and a lower baseflow lead to a higher second peak?

Response: The relationship between the runoff volume of the second peak and the variables (1) initial baseflow and (2) cumulative precipitation has not been explored in detail. For that to be successful we would need a larger sample (more than 12 bimodal events). Furthermore, the volume estimates of rainfall and runoff are delicate. For 4 out of 12 bimodal events the rainfall volume is underestimated, and the derivation of the runoff volume of the second peak is subjective due to the subjective separation between the first and the second peak. We added a short discussion on this issue in section 4.1.

The proposals of the Editor have been implemented:

Fig 13: I suggest to use underestimated instead underpredicted / Has been changed to underestimated.

The scale of Fig 2 is missing - please indicate at least in the caption the units / Units have been added.

Fig 12 unimodal and bimodal are exchanged in the caption / Has been corrected.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 2, 1923, 2005.