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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Diagnostic calibration of a hydrological model in an alpine area by hydrograph partitioning" *by* Z. H. He et al.

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Remarks:

This manuscript is a re-submission of I manuscript I already evaluated in March 2014. The original manuscript was already rather interesting concerning topic and concepts, but rather unripe in its realization, analysis and presentation. In this new version the problematic issues have been addressed.

In its current form the paper is very well embedded in scientific literature on the topic. Also the description of the test area is well documented and referenced. As in

the original manuscript I appreciate the use of field data for estimating the lapse rates (Sections 2.2.1 and 2.2.2). This is a nice example of confining uncertainty by adding additional information from observations.

Concerning the improvements we have now in Table 5 a good overview including calibration and evaluation periods.

In the original submission I was complaining because I found your model was not able to capture peaks due to storm rainfall and rapid reaction by the basin. In this version I found this issue is almost solved. Did you some adjustments in the process description? Or is this an improvement stemming from the changes in the snowmelt and icemelt components (Page 13402)?

Points to be addressed:

1) I already mentioned in the original submission, that you should be careful in defining your partition a "dominant runoff mechanism". In this manuscript you confuse and mix this again. I remember we suggested to use "dominant source of water".

2) On page 13400 you present your rules to separate the hydrograph. In Figure 6 we see the temporal distribution of the 4 options presented in Eq. 6. I understand you want to keep the rules easy, but if I correctly interpret Figure 6 you have surely small rain events in April. The red and green categories are very marginal in your test area, as they should focus on temperature driven snow and icemelt short before and short after the rain season. How do these rain events with obvious generation of Qr affect your calibrated data sets?

3) 13403: As table 4 demonstrate their sensitivity to your approach, can you

give some more information on the meaning of KKA and KKD. You call both of them “coefficient used to calculate calibrated subsurface flow”, which is for me no useful information. Are the two factors linkable to some physical property (infiltration, storage coefficient or so?)

Minor issues:

13390-15: Typo: “slope”

13400: The notation chosen in Equation 6 is rather odd (minus signs in the indices to describe the mathematical equivalence). It is surely how you implemented it in your algorithm, but it is not very elegant in a manuscript. Wouldn’t be better to have maybe a table instead?

Table 3: on which basis you decide to have identical hydraulic conductivity in the u-zone and s-zone?

Final considerations:

I thank the authors for having made the effort to invest some more time to improve this manuscript. I listen now only few point they should now address . If this is achieved than I can recommend the paper for acceptance.

Best regards

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 13385, 2014.