

Interactive comment on “Hydrologic responses of the Zwalm catchment using the REW model: incorporating uncertainty of soil properties” by A. El Ouazzani Taibi et al.

A. El Ouazzani Taibi et al.

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First we think Prof. Savenjie for reviewing our paper. His comments are useful to our paper. We were happy to read his words in the first paragraph on general comments.

However, we do not agree completely with the referee regarding the use of the phrase “sensitivity analysis” and not “uncertainty analysis” because in the sensitivity analysis one has to consider the variation of the input parameter or parameters in a systematic way and look at the output responses accordingly. Our case is different; we considered our input parameter (which in our case is the saturated hydraulic conductivity) as random variable described by a probability density function (Uniform pdf in our case) characterized by the minimum and maximum values of the range observed in the watershed (see Table 2). The assumption we made is the use of a lumped (spatial average K_s) over the watershed because the REW version, we already have used, can

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only handle lumped parameter with K_s . The uncertainty that was considered is on the spatial average K_s that was computed based on the lower and upper limits of K_s (see Table 2).

Maybe the procedure (section 2) was not clear. We will give some more explanation here. The procedure is as follows: first we calibrated the REW model, second we computed minimum and maximum values of weighted average K_s , third, we generated from a uniform pdf a value of spatial average K_s . Then the REW model response is computed. The procedure is repeated many times for each realization of K_s .

The Monte-Carlo approach, presented in this paper, is commonly used in groundwater studies to model uncertainty in K_s (see e.g. Kinzelbach ???ĚĚĚ)

Specific Comments:

The referee said “The authors do not really present any info on soil variability” However, this is not true we provided data on soil map and values of K_s in Table 2.

We would like also to emphasize an issue related to variability and uncertainty which we think the referee means by his sentence (we guess). We did not consider variability of soil parameters in the model because the REW model version, used in the study, does not take this into account, while we considered uncertainty in the spatial average K_s which in our opinion is a good start to show the methodology and in the future the methodology could be extended to address uncertainty due to variability.

1. I think if we remove the sub-title “incorporating uncertainty in soil properties” we will lose the essence of the paper. There should be something on the title saying something about that (section 2). 2. We did shorten chapter 6. However, we kept the title because we believe it is not sensitivity as we mentioned above. 3. We removed figure 11, 14 and 15, however, we believe figure 10 and 12 and 13 are essential to show the results of the methodology explained in section 2 and we revised the text accordingly. We also should mention that Figure 10 was based on FigureĚĚĚ(book). 4. We removed the

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lines 16-20 on page 83.

Technical Comments

These comments has been incorporated.

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