Hydrol. Earth Syst. Sci. Discuss., 5, S1301–S1303, 2008
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Hydrology and Earth System Sciences Discussions

Interactive comment on "Constraining model parameters on remotely sensed evaporation: justification for distribution in ungauged basins?" *by* H. C. Winsemius et al.

Anonymous Referee #2

Received and published: 30 September 2008

The paper presents a method to transfer the prior distribution of the parameters of a conceptual hydrological model into a justifiable posterior distribution, by constraining the priors on satellite-based evaporation estimates. The approach, that is contextualized in a classical Bayesian framework, is conceived to make a contribution for the study of ungauged watersheds. The addressed question is indeed relevant in the scope of HESS and the exposition appears well organised.

I suggest the paper to be published essentially in its current form, with consideration of a few comments and suggested revisions (below).

1. The paper is concise and efficient, while I found the abstract rather heavy to read and scarcely attractive. I would suggest to the authors to reformulate it by concentrating on what is really new in the paper, leaving to the next sections the technical details of the method and application.

2. In the introduction two references are made to the SEBAL model (P 2297 lines 2 and 28) that are difficult to understand for the reader who doesn’t know the model already. Consider the possibility to move these comments after section 3.1.

3. When the semi-distributed conceptual model is introduced, the authors state that the unsaturated soil zone is completely equal to the HBV soil zone and then mention the names of the analogous parameters in the two schemes. I would leave aside these details and concentrate more on the meaning of these parameters.

4. In the discussion section a posterior likelihood function is defined. It is unclear to me how this particular form is obtained.

5. Results for the four model units are shown in Figure 4, where possible fuzzy regions that could be applied as parameter constraints are also suggested: - I believe there is a mistake in the label name of the x-axis of the right column: L instead of Ip. - In the text no mention is made to the method used to determine these regions. Provide a short description of the procedure.

6. In the same section (P 2340 lines 11-12) the authors refer to Figure 5, where an example of a well-performing model is given for each land cover. Which parameter sets lead to these results? Are they plausible for the unit they refer to? The dash-dotted line in Figure 5 is not very readable, can you change the style of this line?

7. In the final discussion the authors comment on the results referring to the results in the panels of Figure 4. Each situation is critically described, exception made for the top right panel. I would suggest to add some comment on this, since it seems rather evident the presence of two different populations. Do you have an explanation for this

HESSD

5, S1301–S1303, 2008

Interactive Comment

behaviour? To improve the readability of the paragraph I would also suggest to mark each panel with a letter and to make reference to this letter in the text.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2293, 2008.