

***Interactive comment on “Spatial and temporal patterns of land surface fluxes from remotely sensed surface temperatures within an uncertainty modelling framework” by M. F. McCabe et al.***

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Both referees suggest that the paper is interesting and suitable for publication on HESS. I agree with them in considering this manuscript a potentially valuable contribution.

However, I believe that a major revision is requested in order to better explain the analysis. In the paper there are no equations. I believe that some technical specifications should be provided. In my opinion, the most important details of the analysis should be given in the paper and not by referring to previous contributions. My remarks follow here below.

1) I agree with Referee 1. A few details about the TOPUP model should be provided. The manuscript should be self-contained. I am not saying to provide a full explanation of the model (the paper does not need to become unnecessarily long), but just to add the most important specifications in order to understand how the model works.

2) Application of GLUE. The authors rightly state that GLUE allows to make explicit its underlying assumptions. For this reason, I think we need to know with more details how GLUE was applied. The authors should make clearer in the paper that the confidence bands provided by GLUE are subjective. They are significantly affected by the assumptions made. Therefore it is important to state clearly (besides the details already provided in the paper): a) the likelihood measure used; if least squares (or Nash-Sutcliffe efficiency) is used, it should be stated that this is not a formal statistical likelihood measure. Moreover, it is based on the assumption of independence of the model residuals and therefore a discussion should be provided about the soundness of this hypothesis, which in this case may be not verified. I am not saying that this is a problem, but a discussion should be provided. b) The criteria that was used in order to reject non behavioural models. c) Whether some TOPUP parameters were kept fixed and why.

The confidence bands provided in Figure 6 (please provide a title for the ordinates) are narrow compared to the actual uncertainty that affects the estimates. Therefore I would suggest the authors to remark that they do not provide an assessment of the total uncertainty in a statistical sense. They are the result of the application of GLUE and are therefore conditioned on the assumptions made.

I would like to congratulate with the authors. I believe this paper provides a significant contribution to HESS.

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