

***Interactive comment on* “Effect of spatial distribution of daily rainfall on interior catchment response of a distributed hydrological model” by J. M. Schuurmans and M. F. P. Bierkens**

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The authors of the paper use 8 different rainfall scenarios with different spatial resolutions as input to a distributed hydrological model, and they perform a sensitivity analysis with respect to simulated discharge, groundwater levels and soil moisture content.

Sensitivity to discharge is expressed by showing the modeled discharge from two pumping stations for the different rainfall scenarios. Sensitivity to groundwater levels and soil moisture is expressed showing the development in time of the groundwater level and soil moisture at a randomly selected node.

The paper faces an important and interesting topic, which is the effect of rainfall spatial

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variability on internal catchment response. As I did not see a reference to observed discharge, to observed soil moisture and to observed groundwater level, and since a calibration of the model with the different rainfall scenarios has not been performed, the outcomes of this study implicitly rely entirely on the model used. If this is the case, this paper belongs to that category of papers where the authors use the model as a “virtual laboratory” to perform their analyses. While this way of operating gives the advantage that everything of the field of operation is known, since the field of operation is a model, the main disadvantage is that it only stresses model sensitivity, and not basin sensitivity.

To improve the paper, I suggest that the authors make a difference between using synthetic or real data in this kind of studies, explaining the advantages of each. I also suggest that the correspondence of the model with the real catchment conditions is better proved. Without this aspect it is difficult to support strongly any conclusion.

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