

## ***Interactive comment on “From runoff to rainfall: inverse rainfall–runoff modelling in a high temporal resolution” by M. Herrnegger et al.***

**M. Herrnegger et al.**

mathew.herrnegger@boku.ac.at

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David,

as long as the forward model is able to represent the catchment responses to rainfall, an inversion will be possible. Yes, if the catchment is large, you don't necessarily see the effect of the rainfall in the discharge at the outlet in the same time step. In this case you will generally have problems modelling that system with a lumped model setup (regardless of spatial heterogeneity). This effect will e.g. occur, if it only rains in the headwaters of a larger catchment. The lumped input into the forward model for this time step or rainfall event will be much lower, since it will be spatially aggregated. This input is simply not applicable to the whole catchment and the simulations will show

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deficits, simply because the aggregated rainfall is "wrong". In this case, an inversion does also not make sense.

Concerning decreasing discharge during rainfall events: Yes, the inverse model can also calculate rainfall in these situations.

Regards, Mathew

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 13259, 2014.

**HESSD**

11, C5728–C5729, 2014

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