

Interactive comment on “Opportunities and challenges for the use of scintillometer-based catchment-averaged evapotranspiration estimates as model forcing” by B. Samain and V. R. N. Pauwels

Anonymous Referee #1

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1. General comments

The manuscript presents a study on the use of actual evapotranspiration (AE) estimates as inputs of a rainfall-runoff (RR) model, instead of the more conventional potential evapotranspiration (PE) inputs. Since AE measurements are becoming widely available, this issue is particularly relevant while relatively novel. Despite the clear theoretical advantage of AE measurements to constrain conceptual RR models, the results appear quite disappointing. While these disappointing results should not prevent publi-

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cation, I am not sure the followed methodology is really appropriate. It is clear that the authors have the material to reach quite interesting conclusions, but more should be done on the RR model structure and parameterization/optimization.

2. Specific comments

My main concern is on the use of AE within a pre-calibrated RR model. As pointed out by the authors RR model parameter values are largely influenced by the inputs used during calibration, and consequently, the modification in the inputs without recalibrating model parameters is very often followed by a decrease in model performance. However, the authors did not consider a re-calibration of RR model parameters while they change PE inputs. This is all the more the case when they modify the structure of the RR model AND the inputs. Given the accuracy of AE estimates and the fact that no recalibration of the model is allowed in the paper, the disappointing results appeared logic to me. To my opinion, a wiser approach at this stage could consist in calibrating the RR model with the same structure (i.e. by using PE inputs) so that AE estimates by the model fit AE measurements (and also flow within a multi-objective framework).

I did not understand the focus on flood events, while RR models sensitivity to PE likely emphasized on low flows and water balance. It appears quite obvious that a modification on PE will not affect largely flood peaks, unless the model is calibrated on this modified PE inputs, which is not done in the paper.

The first part of the paper on the sensitivity of RR models to PE is interesting but not really novel. An interesting and novel add-in could be to analyse simulated AE and measured AE in terms of annual volume (bias) and dynamics (correlation, variance ratio) for all possible PE inputs. This is done at the end of the paper but for only one PE configuration.

In the introduction, there is no reference on previous studies using actual AE measurements for RR model simulations. Is this was done before? What about the spatial significance of AE measured by scintillometer at the catchment scale?

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