

## ***Interactive comment on “Estimation of antecedent wetness conditions for flood modelling in Northern Morocco” by Y. Tramblay et al.***

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This paper deals with flood modelling in Morocco. The hourly event-based model correctly reproduces 16 available floods occurring from 1984 to 2008. Three methods are tested for estimating humidity initial conditions: the discharges of the previous day, an antecedent precipitation index and a continuous daily soil moisture accounting model (SMA). Best results are obtained with the last method. Finally, indexes produced by the SMA model are compared with daily soil moisture indexes estimated by two different remote sensing data products (ASCAT and AMSR-E). A good adequacy is observed in both cases. Authors conclude that in the future, the model could benefit from satellite data for an operational application.

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The paper is clear and well organised. I suggest a minor revision. Below are some remarks/suggestions.

Line 4 p9365:  $65\text{km}^2$  is indicated by mistake

Line 9 p9374: Does Figure 3 show the S values calibrated using a unique parameter set for St and Tc? If yes (that is that I understood from the text), then present S values in another figure, after Fig. 3. Because, if you look only at the figure 3, you understand that S, St and Tc are optimized all together, for each flood (and that is not the case if I correctly understood). You could also compare S values obtained when estimated St and Tc for each flood, and the final S values estimated with the median St and Tc values to see if values are robust or if there is some compensation.

Line 26 p9374: In my opinion, the model is here not really tested “as if it was in an operational context”. Indeed, Rc, Td, St and Tc parameters are estimated using the 16 available flood. Only the relationship for estimating initial condition S is recalculated when removing the i-th flood for validation (but I maybe misunderstood this point). One more robust method would be to split in two subsamples the 16 flood and calibrated model parameters on one period and validate to the other. Another possibility would be to recalculate all your parameters at each i-th removed flood (it is may be what you did, but it not appear clearly in the text). I suggest to use this method

Line 5 p9375: Results could be more discussed. By example, is there events particularly different from the others, why? What about the rainfall spatial variability which seems to be missed due to the few number of available raingauges?

Paragraph 4.2 p9375: The value of this paragraph is difficult to evaluate, since, the gain in term of discharge is not shown. Some results should be presented, with discharges calculated using the satellite-based initialisation.

Line 25 p 9375: Table 4 is missing

Line 5-7, p 9376: I don't completely agree with the last sentence of the paragraph. If

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the purpose is to calibrate the model with satellite time series, long-term data is also difficult to obtain. Furthermore, as shown by Oudin 2005, evapotranspiration can also be derived from mean inter-annual air temperature which are data relatively easy to obtain.

OUDIN, L., HERVIEU, F., MICHEL, C., PERRIN, C., ANDRÉASSIAN, V., ANCTIL, F. & LOUMAGNE, C. (2005) Which potential evapotranspiration input for a lumped rainfall-runoff model? Part 2 - Towards a simple and efficient potential evapotranspiration model for rainfall-runoff modelling. *Journal of Hydrology*, 303, 290-306.

Line 21, p 9379: Jackson et al is not cited in the text

Line 13, p 9390: Njoku et al is not cited in the text

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