

Interactive comment on “A past discharge assimilation system for ensemble streamflow forecasts over France – Part 2: Impact on the ensemble streamflow forecasts” by G. Thirel et al.

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Received and published: 22 July 2010

We thank the reviewer for carefully reading our manuscript and for his/her comments in the text. We have revised the manuscript following all received corrections/comments:

1. The two experiments suggested by the reviewer are relevant but could not be done because of CPU time. With a better precipitation analysis, the results of the first experiment would have been slightly improved for high discharges. This comment has been added in the paper.

Concerning the impacts of the improved physics, they are described into details in :
C1532

Improvement, calibration and validation of a distributed hydrological model over France. P. Quintana Seguí, E. Martin, F. Habets and J. Noilhan, Hydrol. Earth Syst. Sci., 13, 163-181, 2009.

The gain in performance can also be seen by comparing at day 10 the scores of IS1 (which is very close to the reference experiment) and IS2, because at day 10 the impact of the assimilation is very weak.

2. Yes, the 3 to 5-day horizons are more relevant for operational forecasts. But, as now better explained in the article, results are logically fitting the gap from day 1 to day 10. It means that there is no surprise on the performances of the system for the medium-term range. It has now been precised in the article.

3. We agree that for practical applications there is a need to validate the results for individual stations. This action is planned in cooperation with authorities in charge of the flood forecasting in France. In this paper we focused on methodology and results at the scale of France. Adding 1 or 2 hydrographs has no added values, as the choice can be highly subjective. The scattering of the results among the different basins can be seen in Figure 11 of the new version of the article. Further publications will focus on scores more linked to the practical use of these results.

4. The discharge Quantiles are taken per individual river.

5. A sentence has been added to precise that more research is needed to improve the performance for the high discharges.

6. The reference has been added: Cloke and Pappenberger, 2009: “Ensemble Flood Forecasting: A review”, Journal of Hydrology 375 (2009) 613–626

7. The conclusion section has now been reduced.

The technical corrections have all been added in the new version of the manuscript.