Hydrology and Earth System Sciences Discussions

Interactive comment on "**A past discharges assimilation system for ensemble streamflow forecasts over France – Part 1: Description and validation of the assimilation system**" *by* **G. Thirel et al.**

Anonymous Referee #3

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GENERAL COMMENTS:

The overall quality of the paper is high. The paper is clearly structured. The methodology is well explained and followed with convincing studies carried out in the French catchments. The method BLUE is not new, but it has rarely been applied in such applications using distributed and coupled meteo-hydrological models in a quasi-operational mode.

SPECIFIC/SCIENTIFIC COMMENTS:

Figure 6: please consider improving the visibility of the legends and labels. They are hard to read at the moment.

Regarding observation errors: streamflow observation errors are usually dependent on the magnitude of the streamflow or discharge. Is this taken into account in estimating the observation error structures?

Improvement over the dry period from June to September for the Doubs is trivial and sometimes not the case at all. The authors have provided the reasons stating that 'the model and rainfall forcing characteristics being more important for this case'. Rainfall forcing is important but not as important as temperature and ET during the dry period, especially during a relatively long period of low rainfall. I will like to know how fast the model can catch up and produce a well improved simulated streamflow after a long dry period with this assimilation method.

The method shows considerable improvement for floods but not low flow due to the fact the method only aims to correct soil moisture by assimilating streamflow observation based on the discharge produced over saturation. I think the method could well suit a humid or semi-humid area but not an arid or semi-arid area because the flow generation mechanism is different for arid areas. I will also like to know what happens with snowfall dominated catchments. Can authors make comments on this?

TECHNICAL CORRECTIONS: Page 2418, L29: 'none have been performed...' –> none has been performed...

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 2413, 2010.