Interactive comment on "A geostatistical data-assimilation technique for enhancing macro-scale rainfall-runoff simulations" *by* Alessio Pugliese et al.

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Referee comment:

(1) The symbol should confirm, such as equation (6).

Authors reply:

Thanks.

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[Discussion paper]

ACTION: the missing cap over $Q^*(x_0)$ will be added in the revised version.

Referee comment:

(2) This author exploring a technique for the daily streamflow simulation post processing, whether the name "data-assimilation technique" is ok or another name is better

Authors reply:

There are some similarities between our technique and applications in climate modelling (see e.g. Komma et al., 2007). We would like to keep the title as it is now.

Referee comment:

This method used the information from local information (such as rainfall, landuse and topography) and neighbour watershed data (observation runoff data for FDC), Can we get the effect of local/neighbour information on different part of runoff simulation (such as peak flow and baseflow) combined this technique.

Authors reply:

The power of the proposed technique relies on the fact that no further observations than mere discharges are needed for enhancing streamflow simulations. Surely, it would be interesting to investigate how other hydrological features, such as baseflow index or peakflow data, might be assimilated in the method.

ACTION: We will underline in the discussion section that future research studies will deal this problem.

Referee comment:

Whether the method can be applied in real time forecasting, and hope the author give us some perspective.

Authors reply:

In principle it could be used by blending this assimilation technique to e.g. long term forecast, even though the proposed method cannot be applied without any locally observed streamflow series.

ACTION: We will add in the discussion section that future analyses will assess the reliability of the method with the final aim to provide better simulations for practitioners at operational level, e.g. applications in civil protection management strategies, climate change trends, safety of river structures, etc.

Referee comment:

I tried to do the example, but I cannot download the Observed daily streamflow series. http://www.water-switchon.eu/sip-webclient/sip-beta/#/resource/12072.

Authors reply:

(5) Thanks. We will fix the broken link.

References

Komma, J., Reszler, C., Blöschl, G., Haiden, T., 2007. Ensemble prediction of floods – catchment non-linearity and forecast probabilities. Nat Hazards Earth Syst Sci 7, 431–444. https://doi.org/10.5194/nhess-7-431-2007