

# ***Interactive comment on “Accounting for dependencies in regionalized signatures for predictions in ungauged catchments” by S. Almeida et al.***

**Anonymous Referee #1**

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This paper deals with the two-step regionalization of a rainfall-runoff model:

- . The first step lies in regionalizing various flow “signatures” (i.e. statistics which reflect part of the behavior of the catchment);
- . The second step lies in using the regionalized signatures in order to constrain the search for an adequate parameter set.

In this paper, the search is made based on a Bayesian framework, and the reader gets lost in the details of the Bayesian methodology, and loses sight of the regionalization methodology. The methodology seems sound, the problem lies in the way the paper is

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written: the reader gets lost in the details of a statistical procedure, and we end up the paper with conclusions which only refer to details.

For example:

- . the authors use a first step of synthetic signatures, in order to put aside part of the uncertainty. But where is the detailed analysis of the difference between the synthetic case and the actual case?
- . the focus of the paper is put on the correlations between the different signatures, while there is no discussion of the actual value of the signature-based regionalization. Before worrying about the correlations, we should be at least sure that the two-step procedure is worth being followed (where is the demonstration that it is better than the one-step procedure?)

I believe there is a lot of interesting matter in the research that produced this paper. But the first author definitely needs help in order to organize her results in a way to make them understandable to a wider audience. I would personally prefer a less ambitious analysis based on catchment similarity : how do correlated signatures allow to find the most similar catchments. The application to PDM could come after.

Minor remark : please justify how you have selected the catchments that you use from the entire MOPEX dataset.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 5389, 2015.

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