**Hydrology and Earth System Sciences**

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# *Interactive comment on* "Hydrological model parameter dimensionality is a weak measure of prediction uncertainty" *by* S. Pande et al.

**Anonymous Referee #2**

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The authors investigate the relation between model parameter dimensionality, model complexity and prediction uncertainty. The concept of model complexity and prediction uncertainty derive from statistical learning theory, namely the Vapnik–Chervonenkis (VC) generalization theory, which was originaly developed in the context of support vector machines. The authors test in an experimental setting whether the number of model parameters is a good predictor for prediction uncertainty. They make use of the two interrelated models SAC-SMA and SIXPAR, working on five catchments from MOPEX. They find that the number of parameters is not a sufficient explanation for prediction uncertainty. The range of the parameters appears to have an important effect.

The manuscript is not finished with a lot of little errors and sometimes poor grammar.

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Interactive Discussion

Discussion Paper

It is not self contained - quite a number of concepts are not sufficiently explained.

It seems that "complex hydrological model" (as generally used in the hydrological community) and "model complexity" h (which originates from statistical learning) are two very different concepts that are hard to distinguish in the manuscript. This makes the manuscirpt very difficult to read.

The manuscirpt leaves it open why the model complexity h should be related to the number of paramters. Without giving strong support to this hypothesis, the remaining analysis is useless. I would expect this to happen in section 2.1

It is not easily understandable where the contribution relates to hydrology of real catchments

What happens to water stored in the catchment when data is permuted as described in algorithm 1? How does this relate to storage processes in the hydrological model? The authors should discuss how this relates to one of their conclusions that complexity depends on the range of the recession parameters.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 2555, 2014.