

## ***Interactive comment on “On the sources of global land surface hydrologic predictability” by S. Shukla et al.***

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This paper is direct and to the point, quantifying the relative impact of initial states to meteorological forecast quality in contributing to skill/errors in simulations with the VIC model, examined globally. I suggest only minor revisions.

General comments:

1. The Reverse-ESP method, when used in conjunction with ESP, is very instructive for helping to separate out the IHC versus FS impacts. Presumably, the Reverse-ESP will converge to the "control" run, given enough time. It would be helpful to say something about the typical timescale for convergence (space and seasonal structure) for the different hydrologic variables validated here. Presumably that has a lot (maybe

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everything) to do with the patterns found. Furthermore, is there a means to infer the corresponding time scales in nature, at least for some locations?

2. This is a "perfect model experiment" by design - "validation" of the test cases is against output of the same model with a different combination of past/future forcings from the test cases. Thus, the term "skill" should be carefully and specifically defined early in the paper for this context (not the conventional definition of model forecast skill, which is validation against actual measurements), or the term should be replaced with something more appropriate, like "predictability".

Specific comments:

1. Abstract: It seems the "control run" is never named as such again in the paper - either change the term here or in the first paragraph of Sec 2.
2. P1991, L10-23: This really well justifies the ESP approach for this study.
3. Sec 2.2.2: Please give some more description of VIC: does it have transpiration, vegetation effects, etc.?
4. Sec 3.1: Please define to what (effective) soil depth  $\kappa$  is applied. This can have a big impact on the values calculated.
5. Fig 1 vs other Figs: It would be instructive to give the values of the global pattern correlations between corresponding panels, as the authors infer a connection between the two. This should be made quantitative.

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