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Earth System Dynamics
Discussions

Interactive comment on "Life time of soil moisture perturbations in a coupled land-atmosphere simulation" *by* T. Stacke and S. Hagemann

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Following the revised submission, one of the reviewers Dr. Paul Dirmeryer has provided additional comments. The authors may address the comments and revise the manuscript in the light of the additional comments which are given below:

———Additional Comments by Dr. Paul Dirmeyer ————-

Main comment:

The authors have addressed my comments satisfactorily, and I appreciate the thoroughness of their responses. As I read the responses, I thought again about alternative sources of memory and realized there is another possible memory mechanism in this model: SST/ocean heat content anomalies. It is possible that these are not

cause-effect relationships in the land surface, but effect-effect where the atmosphere is delivering the signal (via circulation-induced precipitation anomalies) of the actual cause, which is a multi-year ocean anomaly. This could happen in both coupled and AMIP-style simulations. This possibility needs to be checked, to be sure the ocean is not a culprit here.

Additional minor/specific comments (based on original manuscript):

1. Fig 9: The scale on the right panel is quadratic, not exponential.

2. Table 1: What is before/after the semicolon? Also, please don't use what look like computer code variable names - write out the full names of the variables.

3. Section 5 is very interesting and the discussion is thought-provoking. The notion of short-lived shallow anomalies filtering into longer-term deep anomalies is reminiscent of the theory behind the old force-restore soil schemes (cf. Dickinson 1988; J Clim. 1086-); also see Fig 2 in Entekhabi et al. (1992; J. Climate 798-), so there is precedent for this notion.

Interactive comment on Earth Syst. Dynam. Discuss., 6, 1743, 2015.