

## ***Interactive comment on “Inter-comparison of two land-surface schemes applied on different scales and their feedbacks while coupled with a regional climate model” by F. Zabel et al.***

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This paper is – apart from textual corrections which need to be passing a copy-editing service – accepted for publication, realizing that the study could still be carried to a deeper level of analysis and understanding. The basic rationale and presentation are ok: a land surface model embedded in an RCM does affect the overlying atmosphere; replacing that land surface model by another one with quite different properties and responses to ambient conditions does affect this overlying atmosphere. A two-way coupling between the atmosphere and land surface is visible by a feedback exerted

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on the surface evaporation, which has a spatial signature. But yet, some other points would warrant some further analysis:

- a pronounced effect of replacing NOAH by PROMET is the increase in net radiation. This is apparently due to a lower albedo in PROMET, but this sensitivity (and its spatial structure) are not at all evaluated
- the presumed effect of a high degree of permeability in PROMET does indeed seem to relate to increased Bowen ratios in a large fraction of the domain, but an equally large fraction of grid points does display strong differences in the surface energy balance while the fraction of impermeable surface is negligible (fig 8). So one wonders whether the impermeability aspect is indeed the major cause for the evaporation differences
- figure 13 shows that the difference between the annual cycle in evaporation of Milan and Rhine-Neckar reduces when switching from the offline to the coupled mode (grey dashed & solid lines are closer to each other than black dashed & solid lines in JJA), but yet a positive surface evaporation feedback is claimed in both the dry Milan and wetter Rhine-Neckar area. Also the results in fig 13 seem to suggest that the evaporation time series in the Rhine-Neckar area are very similar for the two configurations. This is counter-intuitive and would deserve some more analysis.

However, the paper has seen too many revisions already, and it does provide a scientific contribution in its present shape.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 7091, 2011.

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