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Interactive comment on “Global precipitation response to changing external forcings since 1870” by A. Bichet et al.

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Received and published: 26 April 2011

This manuscript presents the effects of sea surface temperatures (SSTs) and aerosols on precipitation. I think that especially Fig. 9, which shows the spatial distribution of SSTs and aerosols affecting precipitation, is very insightful. I have, however, some minor comments:

Section 4.1 Origin of water in global land precipitation. The authors found that at least 35% of the global land precipitation comes from oceanic evaporation (1 - 500/760). They furthermore note that the trend in land evaporation is apparently the best explanation for a trend in land precipitation, which also indicates an important role for continental moisture recycling. There is no flaw in this calculation, but I think reference

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should be given to van der Ent et al. (2010). Especially take a look at their Fig. 6. In this study it is shown that moisture recycling plays a significant role for continental precipitation, but in fact not all evaporation returns to the land surface. Although in some regions it can be almost 100%, such as the Northern Amazon, Congo and Tibetan Plateau (summer), on average it was found that 57% of the land evaporation returns to the land surface. This means that about 60% of the global precipitation comes from oceanic evaporation and about 40% from continental evaporation.

I found Figs. 6 to 8 insightful in their relative simplicity, but in Figs. 7 and 8 the legend in the upper left corner reads: as in Fig. 6. I recommend the authors to change that to the actual legend of Fig. 6., because this is hardly extra text, but much easier to interpret when these figures are perhaps several pages apart in the final manuscript.

References

van der Ent, R. J., Savenije, H. H. G., Schaeefli, B., and Steele-Dunne, S. C.: Origin and fate of atmospheric moisture over continents, *Water Resour. Res.*, 46, W09525, 10.1029/2010WR009127, 2010.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 11, 9375, 2011.

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