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Hydrology and Earth System Sciences
Discussions

Interactive comment on "The residence time of water in the atmosphere revisited" *by* Ruud J. van der Ent and Obbe A. Tuinenburg

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This is the response to the response of the referee Kevin Trenberth. The comment by the referee is in italic and the reply in normal text.

The fundamental issue is the whole methodology used by this and other studies, which the evidence suggests does not give the correct answers for reasons given. Namely the processes are not reversible, precipitation processes are not addressed (they are parameterized in models), and the lifetime of moisture in models is too short). Indeed precipitation processes are parameterized in the ECMWF model. The study does not deal with realistic precipitation processes. I am fine with the authors saying what their assumptions are and here are the results, but it is another matter to claim they represent the real world.

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Discussion paper

We thank the referee for pointing out that precipitation processes are parameterized in the ECMWF model and thus the ERA-Interim data. However, any model is an attempt to represent the real world, and any model fails in doing that exactly, because it is naturally different from the real world. In our opinion, we have clearly stated our assumptions and presented our results under these assumptions. We be no means intended to overstate our results, but we have built and expanded on previous research, and, therefore, think we have made a relevant contribution to the scientific literature. We also nowhere in the paper use terms like "truth" or "reality", but our results are of course an attempt to say something meaningful about the real world, given the state-of-the-art data and models at hand.

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