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

Anonymous Referee #3

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This paper looks to address the question regarding the residence time of water in the atmosphere recently raised by Laderach and Sodemann (2016). I feel this study does not provide enough evidence to significantly contribute to the discussion.

1) There are large limitations to using tracking models to track atmospheric moisture. The authors need to go into a lot more detail as to how the models were applied to this dataset. Specifically, how the water in the model is tagged, how this tagged water relates to the evaporation and precipitation in the subsequent time step, whether mixing of this water is taken into account. Without going into more detail as to how the tracking models specifically deal with water it is not possible to address question of the residence time of the water.

2) The authors highlight the difference in the assumptions made by Laderach and So-

dermann (2016), but more discussion as to why the authors disagree with these differences is needed. No evidence is provided to support the authors' choice in assumptions over the choice by Laderach and Sodermann.

3) The analysis of the results conclude that ERA-Interim shows close agreement to the previous studies of residence time, however does not provide a response to Laderach and Sodermann.

The paper needs to go into more detail of the tracking methods, a more detailed analysis of the results and a greater discussion regarding the assumptions made by Laderach and Sodermann, and to provide evidence as to why the authors disagree with these assumptions.

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