

Interactive comment on “High-resolution global atmospheric moisture connections from evaporation to precipitation” by Obbe A. Tuinenburg et al.

Anonymous Referee #2

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Estimating the origin and the destination of the atmospheric moisture and its associated properties, such as travelling distance, is an interesting scientific question that also has a wide range of applications in water management, mitigations of climate change and weather forecasts. Via this study, authors offer a global monthly dataset on high resolution generated from a state-of-art tracking model and reanalysis dataset, ERA5. Analyses and data quality reported herein are convincing. I suggest an conception of this manuscript after the following comments being answered satisfactorily.

1. Line 88: Are these 25 model levels or pressure levels? 2. Lines 91-94: If authors run UTrack using global evaporation, then the distribution of atmospheric moisture in

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each column should be similar to the Q (specific humidity) that obtained from ERA5 archive (if not on hourly scale, then it should be on daily and longer time scale). Is it the case? 3. Line 156: Conventionally, the precipitation recycling ratio is defined as $\rho = P_{\text{et}}/P_{\text{tot}}$. Therefore, what defined as the evaporation recycling ratio herein, is called the precipitation recycling ratio elsewhere, vice versa. I will suggest that either add a caveat to remind readers about this difference, or re-brand the term to follow the convention. 4. Lines 224-227: Can authors explains a bit more why the delta latitude is smaller in backward analysis? Why this is not shown in longitudinal transport? It is convincing as authors explain the difference in the local differences. How about this on global scale? 5. Both the precipitation and evaporation recycling ratios are high over the ragged topographies. Does this indicate that the mountains can intercept moisture flux transported from upstream and can trap evaporation originated locally? If this is the case, should we see a long/normal travelling distance in backward analysis from the upstream, and a short travelling distance in forward analysis to the downstream? I suggest a discussion on this point.

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