

Review of Revised Version of “The dehydration carousel of stratospheric water vapor in the Asian Summer Monsoon Anticyclone”

This paper is significantly improved and important. There are still a few minor issues as indicated below.

Fig. 5 is more confusing than helpful. You make your main carousel point in Fig. 1, the 1D representation is not helping since the LDPs in 5b are widely separated in space. I suggest you drop Fig.5.

I am still a little puzzled why Type B water vapor (Fig. 4) is so much higher than A or M in the forward trajectory case. The explanation given in lines 125 to 141 suggests the following. Looking at Fig. 2b, the type B trajectory was dehydrated maybe 12 days earlier than sampled and since no further dehydration takes place after sampling the water vapor theoretically remains at LDP values – however the water vapor amount is larger than MLS. In the “full Lagrangian” you start 60 days earlier and run the trajectory 120 days forward. Then you get good agreement. This means that the measured water (the start of the B forward trajectory) is too high. There are two possibilities (1) the instrument is biased relative to MLS (2) some mixing took place with wetter air before it got to where it was sampled. In any event, perhaps the authors could expand on this dilemma somewhat. I found the discussion 133-142 inadequate.

Minor comments.

In 10 ... LDP mixing ratios

In 14 ... add Dessler et al. (2013) [Dessler, A.E., M. R. Schoeberl, T. Wang, S. Davis, K. H. Rosenlof, (2013) Stratospheric water vapor feedback, PNAS, www.pnas.org/cgi/doi/10.1073/pnas.1310344110]

Ln 17 In particular.. This sentence is awkwardly worded and somewhat confusing.

Ln 24 “for the large-scale SWV distribution” how about “in order to reconstruct the large-scale..”

Fig. 1 caption ... (see text and Table 1 for details)

Fig. 2 I presume that the square is the starting point of the back and forward trajectories. Please say that in the caption. Shouldn't there be two squares on Fig. 2a? Or are they on top of each other?

In 87 ‘which implies ice mixing ratios larger than ~ 0.1 ppm’

As I noted in the previous review, the CALIPSO doesn't detect ice mixing ratios. The mixing ratio is parameterization based on Heymsfield *in situ* data and is inferred.

Fig. 4 caption “As the ice clouds resolved by CLaMS-Ice are mainly ~~driven~~
~~by the experienced~~ produced by the lowest temperatures.

Ln 135 Fueglistaler et al. (2014) used ERAi data. Are the biases the same?

Ln 143 in situ