Review of "Correlation among cirrus ice content, water vapor and temperature in the TTL as observed by CALIPSO and Aura/MLS" by T. Flury et al.

This manuscript presents correlations between NCEP 100 hPa temperature, MLS H_2O at different pressure levels, and vertically averaged CALIPSO cloud frequencies and ice water content. The manuscript is reasonably clear. My primary suggestion is that the authors consider and discuss the possibility that the vertically averaged CALIPSO cloud products would include strong influence from convectively-generated anvils cirrus, in which case correlations between the different variables would not necessarily be expected. Specific comments below.

1. Page 25040, lines 24-25: The vertical averaging methodology is an important aspect of the analysis; more detail should be provided.

2. Discussion of data product precisions and accuracies should be provided.

3. Page 25041: The cold point temperature should correlate with stratospheric H_2O even better than the 100 hPa temperature. The cold point can be well above 100 hPa, particularly during Boreal winter.

4. Figure 2: With 3-4 km vertical averaging, you are probably getting mostly convective (anvil) cirrus in your sample, which is apparent from the spatial patterns in the Figure. The manuscript suggests the TWP is where dehydration is dominant. This issue is confused by the approximate co-location of low tropopause temperatures and deep convection. Further discussion should be provided.

5. Page 25043, lines 20-23: The tropopause is also elevated well above 100 hPa during Boreal winter over much of the tropics [Seidel et al., 2001].

6. Page 25044, line 4: This sentence does not make sense.

7. Figure 4: It would be interesting to see how thin cirrus at different vertical levels correlate with stratospheric H_2O rather than just looking at the 3-4 km average cloud product.

8. Page 25044, lines 22-24: I do not really understand this statement. Why does an elevated tropopause cause a positive correlation between H_2O and IWC?

9. Page 25043, lines 16-19: It is not entirely clear how much of the high-humidity air enters the overworld in the deep tropics. (Reference Randel et al., 2010).

10. Figure 5: It would be clearer to show both H_2O and IWC in the same units.

11. Figure 5: If much of the IWC is coming from convective cirrus (as suggested above), then you would not necessarily expect a strong correlation between IWC and H_2O.

12. Page 25046, lines 4-5: This may be true for the seasonal variation of 100 hPa T, but geographic and intraseasonal variations are affected by convection, Kelvin waves, and other phenomena.

13. Page 25046, lines 11-12: The results are overstated here. H_2O and IWC are only highly anticorrelated within the regions indicated by the dashed boxes in Figure 4. Elsewhere the anticorrelation is weak (or negative).

14. Figures 6 and 7, and discussion: Following the comments above, it seems likely that in convective regions, the 3–4 km CALIPSO cloud frequency average is strongly influenced by convectively-generated anvil cirrus, in which case one would not expect an anticorrelation with temperature in

these regions. This seems like a clearer, more plausible explanation than the one given in the manuscript.