

Author Response:

- 1) "The authors have carefully addressed all my comments, as well as corrected some of their results. I only have one minor concern about the change in L319. It now says that LWP could be overestimated by a lower PBL height, but this is not what one would expect. Maybe you can elaborate on this idea better."

We believe this may have been a typo and meant to say "higher PBL height". This sentence was added in response to a previous reviewer comment, the previous discussion is repeated below. The boundary layer varies day by day, sometimes it is simulated above observations and sometimes below. Other boundary layer characteristics, such as strength of the inversion, would be a factor here as well. Upon further review, we believe decoupling to be the most likely explanation for the LWP overestimation. We think any comment here relating the boundary layer to LWP may mislead the reader. We propose removing this sentence for the final submission. We also propose adding "as the observed MBL" to the prior sentence for added clarification. This segment now reads;

Line 316: "A potential source of the overestimation is the model MBL is not as decoupled in nature as the observed MBL, allowing more moisture to accumulate in the model MBL. Evidence of this can be seen in Fig. 2, however, is more apparent in the individual radiosonde launches shown in Fig. S1 of the supplement. Despite the overestimation, our results show a notable improvement in the model's skill at reproducing LWP in this region relative to the +66 % NMB of Gordon et al. (2018), who used UM version 11.2 with ERA-Interim nudging."

Previous Discussion:

L299 Could the difference stem from both decoupling and inversion height mismatch? Could a sensitivity test with finer height resolution help elucidate the difference? (that could be proposed for future research)

Yes, inversion mismatch is another valid potential source. Thank you for the suggestion.

Line 329: Added "Another potential cause of the overestimated LWP is that the simulated inversion heights are slightly lower than observations (Fig. 2)"