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Interactive comment on "On biases in atmospheric CO inversions assimilating MOPITT satellite retrievals" *by* Yi Yin et al.

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The author's reply to our comment did not address the serious deficiency that their study does not provide evidence to support their conclusions about assimilating profile vs. column CO MOPITT retrievals, since they did not assimilate profile data, even without bias correction. It would be necessary (but still not sufficient) to show that the assimilation of profile data, without bias corrections, performs significantly worse than column assimilation as compared to independent CO observations. I disagree with their assessment that MOPITT retrieval biases cannot be corrected due to their spatial and temporal variability. Although this correction could be tedious, and it will likely be less accurate where there is a lack of validation data, bias information is provided in Deeter et al., (2014) and Buchholz et al., (2017) for MOPITT V6 and Deeter et al., (2017) for MOPITT V7. After demonstrating the performance of the profile assimila-

tion, if their conclusion about assimilating column CO vs. profiles is particular to the vertical biases in their model, they should make this more explicit in the abstract and conclusions rather than the blanket recommendation for assimilation only of column CO.

References: Deeter, M. N., Edwards, D. P., Francis, G. L., Gille, J. C., Martinez-Alonso, S., Worden, H. M., and Sweeney, C.: A Climate-scale Satellite Record for Carbon Monoxide: The MOPITT Version 7 Product, Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-71, in review, 2017.

Buchholz, R. R., Deeter, M. N., Worden, H. M., Gille, J., Edwards, D. P., Hannigan, J. W., Jones, N. B., Paton-Walsh, C., Griffith, D. W. T., Smale, D., Robinson, J., Strong, K., Conway, S., Sussmann, R., Hase, F., Blumenstock, T., Mahieu, E., and Langerock, B.: Validation of MOPITT carbon monoxide using ground-based Fourier transform infrared spectrometer data from NDACC, Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-241, accepted, 2017.