

Interactive comment on “Validation of six years of TES tropospheric ozone retrievals with ozonesonde measurements: implications for spatial patterns and temporal stability in the TES bias” by W. W. Verstraeten et al.

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Specific comments: 1) Sect.2: I suggest the authors add a paragraph or a few sentences in this section describing improvements of the TES retrieval algorithm for this version (V004) relative to previous versions of ozone retrievals. This will be useful for readers to understand why the TES biases in the ozone measurements have remained nearly the same.

Reply: Thank you for this comment. In the revised manuscript we have added a small

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paragraph indicating the improvements of the V04 data compared with version 2.: “Improvements to the temperature and water retrievals resulted in slightly improved agreement between calculated and actual uncertainties of the vertical ozone profile (Boxe et al., 2010). However its not clear that this changed any bias characteristics of the TES data.”

2) Page 1251, Line 11-13: TES biases are higher at northern mid-latitudes than those in the Tropics. It is explained as weaker vertical sensitivity or higher stratospheric influences. Can you find some evidence to support the statement? For example, a positive correlation between TES biases and averaging kernel values in the stratosphere?

Reply: Lower sensitivity will affect the bias because the effect of the bias on the estimate will depend on the sensitivity (see Worden et al., 2011). However, biases from not completely resolving variability in temperature and H₂O vertical profiles will affect the TES ozone because these effects cannot be completely reduced through averaging. Worden, J., Noone, D., Galewsky, J., Bailey, A., Bowman K., Brown, D., Hurley, J., Kulawik, S., Lee, J. and Strong, M. Estimate of bias in Aura TES HDO/H₂O profiles from comparison of TES and in situ HDO/H₂O measurements at the Mauna Loa observatory. Atmos. Chem. Phys., 11, 4491-4503, 2011.

3) Page 1253, Line 21-24: ‘The p-values show that none of the slopes are significant . . .’. But in Table 1 the p-value for the Northern mid-latitudes is small (0.00). Is it a typo? Or reflecting a robust trend for the seasonal averages?

Reply: The p-values larger than 0.05 are not considered significant. We have added this in the revised manuscript. The p-values in Table 1 refers to the statistical test on the intercepts. This was not mentioned in the caption of Table 1 of the earlier version of the manuscript. In order to avoid any confusion we have added this to the caption in the revised manuscript.

Technical corrections: Page 1247, Line 23: ‘Boxe and Worden (2010)’ should be ‘Boxe et al. (2010)’

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Reply: Thank you for noticing it. It is corrected in the revised manuscript. —————

Page 1248, Line 21: Suggest change 'TES O3 measurements profiles' to 'TES ozone profiles'. Reply: We have changed this in the revised manuscript as suggested.

Page 1264, Fig. 3: In the caption, please describe the latitude bin for the right panel. Please also state the values of the dashed latitudinal lines.

Reply: We have added this in the captions of Fig. 3 in the revised manuscript.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 1239, 2013.