

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.

Anonymous Referee #1

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Verstraeten et al. present a validation study of satellite measurements of tropospheric ozone from the TES instrument. The TES measurements of tropospheric ozone have been validated in a few papers (eg. Worden et al., 2007; Nassar et al., 2008; Boxe et al., 2010). This study focuses on the six-year record of available TES data, and examines the stability of TES biases spatially and temporally. This is important for future applications of TES ozone measurements for model evaluation and trend analyses. Thus the paper well fits the scope of AMT. The study is well conducted and well presented. I recommend publish on AMT after the following comments addressed.

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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.

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?

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?

Technical corrections:

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

Page 1248, Line 21: Suggest change ‘TES O3 measurements profiles’ to ‘TES ozone profiles’.

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.

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