

Interactive comment on “Equatorial total column of nitrous oxide as measured by IASI on MetOp-A: implications for transport processes” by P. Ricaud et al.

Anonymous Referee #1

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This is a nice paper that shows how IASI trace gas data for the long-lived N_2O molecule can be used to study atmospheric dynamics. In particular, operational total column data for N_2O are sufficiently precise and accurate (after seasonal averaging on a 5° grid) to show equatorial maxima over Africa and Indonesia, and a minimum over South America. The MOCAGE model helps to explain the observations by showing a convergence of airmasses over Africa. I have just a few questions and corrections:

1. I found repeated use of the term ‘factor 1.25%’ when discussing the correction to N_2O to be a minor irritation because the authors do not mean multiply by 0.0125, but multiply by 1.0125. I suggest simply replacing 1.25% by 1.0125 everywhere including

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in two figures.

2. I very much liked Figures 1 and 2, but a few more comments on pg. 3249 would be helpful. I was puzzled by the residuals for what I assume to be CO on the left of Figure 1 and CO₂ on the right. The CO₂ residuals are attributed to NLTE effects and assuming that the lines are from hot bands (Is this true?) seems to be a plausible explanation. However, I am surprised that NLTE effects are significant in these mainly tropospheric spectra. No comment is made about the CO residuals. Are they hot band lines or is there some other problem? I found Figure 2 to be quite striking with the horizontal peaks at 700 and 250 hPa. My main complaint is that I find it hard to think in terms of hPa and perhaps an approximate scale in km on the right would be helpful (and giving a few more approximate heights in km in parentheses in the text would be nice). What is the tropopause height for this example (hPa and km please!).

3. In view of the fairly good agreement between the observations and MOCAGE over Africa and South America, I wonder why the agreement is so poor over Indonesia (and outside the equatorial regions) as shown in Figure 4. No comments are given although the discrepancies are noted in the text. Any suggestions would be welcome.

4. An extra A appears after MetOp-A on pg. 3257, line 22.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 3243, 2009.

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