

Interactive comment on “Trends in Peroxyacetyl Nitrate (PAN) in the upper troposphere and lower stratosphere over Southern Asia during the summer monsoon season: regional impacts” by S. Fadnavis et al.

Anonymous Referee #1

Received and published: 28 August 2014

Fadnavis et al. presents analysis results to examine the temporal trends of peroxyacetyl nitrate (PAN) during 2002-2011 over the Asian summer monsoon region using satellite PAN measurements from MIPAS and the ECHAM5-HAMMOZ model. Overall, this is a well-designed model experiment and the analysis results are presented well. I recommend the paper be published in ACP after the following minor comments are addressed, mostly editorial.

1. P19057, L17: To be more accurate, may be it is better to say “NO_x-limited regime

C6305

for ozone photochemical production”?

2. P19060, L11: delete “the south Asian countries”
3. P19061, L21: O_{1D} -> O(1D), 1 should be superscript, not subscript
4. Section 3.1: The model-aircraft comparisons are hard to see. May be add some quantitative comparison information, e.g. correlation, mean bias. . .
5. P19064, L8: variation -> distribution
6. P19065, L8: should be “distribution of PAN”
7. P19066, L16: monsoons -> monsoon
8. P19066, L19: “The boundary layer PAN transport” -> The boundary layer lofting of PAN
9. P19068, L13: “to the ASM anticyclone”?? What in the ASM anticyclone?
10. P19069, L13: increasing trend -> an increasing trend
11. Please use “the Himalayas” throughout the text. At many places, “the” is missing or Himalaya is used instead.
12. Section 5: I wonder if it is also good to add one more subsection/figure to discuss the impact on total NO_y (NO_x+PAN+HNO₃). This will offer information on the net impact after combining changes due to transport and wet scavenging, without worrying about NO_y speciation. Just a thought.
13. P19070, L27-28. This sentence is awkward. Consider rephrase.
14. P19071, L15: Nearer -> Closer
15. Please use “the Bay of Bengal” and “the western Pacific” throughout the text. “The” is missing at many places.
16. P19073, L11: The reference to the Brewer-Dobson circulation is very vague, or

C6306

perhaps inaccurate. To many atmospheric scientists, the Brewer-Dobson circulation refers to the mean atmospheric circulation, including its tropical ascending branch and the extra-tropical descending branch, etc. Please be more specific.

17. P19073, L22: "latitude-longitude cross-section of ozone" -> ozone distribution

18. Section 5.3: In addition to ozone percentage changes, you may consider add ppb changes as well to be more informative.

19. P19076, L13: "vice-a versa" -> vice versa

20. P19088, figure caption: describe which season.

21. P19090, Figure 4. I think Figure 4 is a very important figure for this study. Although the current form is ok, I think it can use some improvements for easy comparison for the readers. My suggestion is to use the same color (or same color groups) for each model-MIPAS set for ASM, CHINA, and IND, respectively. I would also suggest highlight ASM with thicker lines.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 19055, 2014.