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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Search for evidence of trend slow-down in the long-term TOMS/SBUV total ozone data record: the importance of instrument drift uncertainty and fingerprint detection" *by* R. S. Stolarski and S. Frith

**Anonymous Referee #3**

Received and published: 14 June 2006

Review of "Search for evidence of trend slow-down in the long-term TOMS/SBUV total ozone data record: The importance of instrument drift uncertainty and fingerprint detection" by Stolarski and Frith

GENERAL COMMENTS

This is a well written paper that presents some timely and important analyses. In particular the paper cautions against the interpretation of recent ozone increases in mid-latitudes as being a clear sign of ozone recovery. When instrument uncertainties

are accounted for, the statistical uncertainty in the change of ozone trend increases. A change in ozone trend is a means of detecting the onset of ozone recovery. The hemispheric assymetry in the derived change in ozone trends suggests that recent increases in ozone are not purely a response to decreases in ODSs.

I would encourage the authors throughout the paper to reserve the word 'recovery' to describe ozone changes attributable to changes in ODSs e.g. detection of a statistical change in ozone trend is not enough to identify recovery. Attribution of the ozone trend change to changes in ODSs is also required. For example, I am uncomfortable with the statement on line 18 of page 7 "the recovery of ozone after Pinatubo". I would prefer to see "the increase in ozone after Pinatubo".

SPECIFIC COMMENTS

Page 2, line 5: Not just chlorine but chlorine and bromine.

Page 2, line 10: Instead of 'quasi-global' why not just say 'extra-polar'.

Page 3, line 2: Not only industrial activity e.g. use of methyl bromide in agriculture.

Page 3, line 10: You may want to qualify this statement by saying where in the atmosphere reductions of chlorine and bromine have been observed.

Page 3, line 11: It's not clear to me what you mean by 'chemical source of stratospheric depletion'. Do you mean concentrations of chlorine reserviour species?

Page 4, line 33: It would be great if you could be a little more quantitative than "xx%".

Page 6, line 25: Do you have any comment to make on the validity of the assumption that the Nimbus 7 TOMS drift uncertainty estimate applies to each of the other instruments?

Page 6, lst line: Why the "early" detection of column ozone recovery. Why not just "the detection of column ozone recovery"?



ACPD
6, S1202–S1204, 2006





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Page 7, line 27: Why not just use the volcanic aerosol time series as your basis function rather than a model derived ozone response to the aerosol time series? Are you worried about a non-linear response of the ozone to the volcanic aerosol?

It's not clear to my why your ensemble plots in figures 9 and 10 go to 2008 when you only have data to October 2005. I know the ensembles are independent of the data but you must have had to project the drift in some of the later instruments forward in time to make these plots. Is this really necessary?

Page 9, line 1: Now that the Yang et al. 2006 paper "Attribution of recovery in lower-stratospheric ozone", has been accepted for publication in JGR, do you want to say something about this here?

Page 10, line 6: Abstract says that the data go through to October 2005.

Figure 3 doesn't have a legend to say what the different colours refer to.

GRAMMAR AND TYPOGRAPHICAL ERRORS

It would be good if you could be consistent in the use of the MOD acronym. In the abstract it's "merged ozone data (MOD) data set", on page 3, line 28 it's "merged ozone (MOD) data set" and in the title for section 2 it's "Merged Ozone Data (MOD) Set".

Page 5, line 11: Insert "the" before "version 8 algorithm".

Page 6, line 6: Insert "of" before "time series".

Page 9, line 23: Delete "of"

Page 10, line 35: Replace "suggest" with "suggestive"

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 3883, 2006.



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6, S1202–S1204, 2006