

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 #2

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This manuscript presents a merged total ozone dataset and, most importantly, an uncertainty analysis of this dataset. The CUSUM method is then applied to this dataset to examine the slow-down in the trend. It is shown that when instrument uncertainty is considered the slowdown in the trend is marginally significant (or not significant in the SH mid-latitudes). Both the presentation of data and uncertainties and the CUSUM analysis are important contributions, and i think this manuscript is suitable for publication. I have only one major comment (and a few minor comments) that need to be addressed before publication.

MAJOR COMMENT

Do the results from a single model provide a robust "fingerprint" to test the data? Given the wide results in model simulations of ozone change how can we use a single model result as a fingerprint?

The abstract says model calculations suggest recovery of NH and SH together and that as data doesn't show this there is not a demonstration of response of ozone to chlorine. But is the recovery at the same time shown in figure 12 a robust result across models? Actually is it a robust result for this model: The NH CUSUM curve is clearly different that from the SH, and a slightly different uncertainty estimate would give different dates for significant (2-sigma) slowdown in each hemisphere.

I don't think you can say just because the data doesn't follow the results of a single model that there is not a statistically significant slow-down in the data (as implied/stated in final sentences of both sections 4 and 5). You can make such statements based on figures 10 and 11, but not the CTM results. I think the authors need to rethink the use of the CTM as a fingerprint, or provide more evidence for this (see further comments below).

MINOR COMMENTS

1. A few of the statements in the Abstract need to be a bit clearer. On lines 15 and 16 I think you should make it clear that by "significant" you mean significant at the 2-sigma level. Also, "model calculations" and "Our result" are vague terms. What type of model and what results are been referred to (results from the model or from analysis of the data)?

2. "Fingerprint" is used in the title, abstract, and conclusions but is not really discussed in any detail in the paper. This is word is jargon, and unless it is clearly defined its usage can be very confusing.

As stated above I don't think a single model result can be used as a fingerprint test,

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but maybe this is because my interpretation of a fingerprint test is different than yours. Defining what you mean might clarify this.

3. When referring to results from the CTM calculations I think the authors should use "CTM" rather than "model" as the term "model" is very vague. This applies not only to the abstract, but also figure captions and other places in the text. As a statistical regression model is also used in this study it may not be obvious what is meant by model or model calculations.

4. Many of the above comments come together in the caption of figure 12. "Model fingerprint of ..." is not a very informative caption. Replacing with "As in Fig. 11, except ozone from the CTM simulation." would be a lot clearer.

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

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