

Interactive comment on “Statistical diagnostic and correction of a chemistry-transport model for the prediction of total column ozone” by S. Guillas et al.

Anonymous Referee #2

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General Comments

This manuscript describes a new method to improve the predictions from chemical transport models, by modifying the model output on the basis of linear regressions with observations. I am not sure exactly what is gained from the method, and whether it is worth the analysis. However, I see nothing technically wrong with the method and others may think this is a useful method. Thus I think it should be published, once the comments below are taken into consideration.

Specific Comments

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1. As mentioned above I am not convinced that a lot is gained from this method. For example, part of the modification ("improvement") involves taking into account processes not captured by the model (e.g. QBO, AAO, AO etc.). However, explanatory variables could equally be applied to the data to remove these effects when comparing data and model (this is in fact often done). What is gained by the new method? Also, the method might improve the statistical properties of the prediction but it removes the possibility of associating the prediction with different processes (chemical reactions, transport etc.), and examining what aspects cause a particular change. This is a major disadvantage.

Can the authors please include some more justification of why one should apply this method (i.e. what is really gained)?

2. The paper includes too many tables with many entries. This makes the paper difficult to read, and at times I was not sure which entries I should focus on. For example in section 5 the reader is asked to compare table 6 with table 4. Which entries should be compared? You need to help the reader out.

Minor Comments.

Pg 2, 2nd col, line -13: Please include some quantification of the improvement in the model transport. How much larger is the mean age from previous model, and how does it compare with observations.

Pg 5, table 2: Could you highlight in the table the coefficients that are significant (bold or underline).

Pg 5, 1st col: "limited understanding of the dynamics in the SH". Is it limited understanding of the dynamics or limited ability to correctly model this dynamics?

Pg 5, 2nd col, line 4: "diagnostic".

Pg 6, 1st col: "limited understanding of polar vortex". As above, understanding or ability to model, especially in a 2D model.

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Section 6: "method to estimate and modify" estimate?

Why do variations linked to AAO/AO not impact trends over 50 yrs? You mention later the possibility of change in AO due to GHG forcing. Doesn't this raise the possibility of a trend in AO, which could be linked to a trend in ozone.

"temperatures"

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 10421, 2005.

ACPD

5, S4233–S4235, 2005

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