

Interactive comment on “Transport and modeling of stratospheric inorganic chlorine” by D. W. Waugh et al.

D. W. Waugh et al.

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Thank you for your detailed comments. As described below we have modified the manuscript following your suggestions.

Abstract:

- We have changed to "explaining many of the differences".
- We have included comments on implications for EESC calculations in the main text, but do not think it is worth including in the abstract.

Introduction:

- We have included "in the next two decades" in the first sentence, as during this period changes in Cly and Bry dominate.

- Requested changes made, i.e. changed to "explain many of the differences" and "also generally have later return of ozone".

- The statement regarding radiation schemes in CCMs has been removed.

2. Model Description:

- We have not included a table, but have included more information on the model runs.

- The year of the winds has been included.

- Brackets removed. The higher values in 1995 are related to the spin up issues, and a comment on this is now included.

- The paragraph describing the age spectra calculations has been modified to make description clearer.

3. Results

- Yes conclusions hold for other years. This can be seen, for Cly, in figures 3 and 4.

- Change made.

- Overestimate of Cly mentioned.

- No change made, as next section discusses the details.

4. Theory

- Unchanged. "Fraction of source gas dissociated in the stratosphere" and no need to add "relative to ...".

- Unchanged, as we think meaning is clear as it is.

- Unchanged. F is a function of mean age, regardless of how mean age varies.

- The sentence has been revised to make it clear we use equations 2 and 3 applied to model fields.

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- line 19 changed as suggested.
- A paragraph discussing implications for application of Newman et al method to calculating EESC has been included. Note, Cly^* does depend on pathways as F_i depend on pathways. Also, Newman et al (2007) discusses some of the uncertainties in the method, including those mentioned by the reviewer.
- line 21: changed.
- line 25: brackets removed.
- Figure 1: year is in caption.
- Figure 4: description of dashed curves added.

Minor Comments:

Suggested changes made except for

- "of air" not added as redundant. We don't say "Cly concentration of air" so why say "mean age of air"?
- Old age and young age are appropriate as age is a time scale.
- We continue to use F_i and Γ rather than fractional release rates and mean age of air, for the same reason we use Cly for inorganic chlorine.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 8597, 2007.

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