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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Steady-state aerosol distributions in the extra-tropical, lower stratosphere and the processes that maintain them" *by* J. C. Wilson et al.

J. C. Wilson et al.

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Response to Reviewers: We appreciate the reviewers' careful reading of the manuscript and their comments. We respond to each comment in order.

Responses to Dr. Mills' Specific Comments:

To clarify the concept of ppbv of aerosol sulfur we will add the following parenthetic expression before equation 1. "(One ppbv of aerosol sulfur is one atom of sulfur in the aerosol per 10^9 molecules of air. When the sulfur in one ppbv of OCS is converted from gas to aerosol, it creates 1 ppbv of aerosol sulfur.)";

To address the question of how we determined that the annual turn over in sulfur

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roughly equals the abundance, we will add the following sentence in place of the clause following the “and” in the quoted sentence on p. 3675 line 7. “To estimate the amount aerosol sulfur processed in a year, we multiplied the OCS time derivative and the sedimentation term in Equation 1 by the number of seconds in a year and found that for X_{N2O}<200 ppbv, the amount of sulfur condensed or sedimented out per year roughly equals the steady state abundance.”;

Technical corrections. The SPARC report has, alas, mislabeled G. Toon’s data (see figure 3. But 65N is where the OCS was calculated and we will change the text to agree with that.

We intend the comparisons at 65N so that the altered transport time applies to both the OCS and extinction comparison. This remains unchanged in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 3665, 2008.

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Interactive Comment