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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Recent trends in atmospheric methyl bromide: analysis of post-Montreal Protocol variability" *by* S. A. Yvon-Lewis and E. S. Saltzman

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Comments:

We thank the reviewer for a thorough review and helpful comments. Please see specific responses below.

ITCZ Sensitivity Test: The reviewer requested that we conduct a sensitivity test, by shifting the location of the "missing source" between the two hemispheres depending on the seasonal location of the ITCZ. Several simulations were run to assess the sensitivity to placement of the model ITCZ. These simple experiments shifted the ITCZ for the full year, rather than seasonally but the results were enlightening. Moving the

model's ITCZ northward from the equator to 5N shifts the missing source almost entirely to the southern hemisphere. This results from the fact that moving the ITCZ northward causes a significant fraction (∼20%) of the OH sink in the NH to be shifted into the southern hemisphere. In the 5N ITCZ case, it is no longer possible to obtain a reasonable match to the amplitude of NH seasonal variations in CH3Br simply because there is no missing source left with which to "tune" the NH seasonality. From this result, we can infer that seasonal migration of the ITCZ would have the effect of strongly reducing the amplitude of NH seasonal variations. This was a useful exercise, and we have included some text in section 3.1 describing the results. This effect warrants further study with 3D transport models, capable of more realistic simulation of interhemispheric mixing.

Scenario 7: A statement indicating that the lifetime was kept at 0.81 yr has been added to the scenario 7 discussion.

Page 6526, line 18: The discussion has been changed to indicate an increase in emissions rather than stating that there was an increase in concentration. The model does predict a slight increase in concentration in 2005 in response the increased emissions, but the data show more of a leveling off followed by further decline. Mention of this has been added to discussion of scenarios 4 and 8.

Conclusions: This has been corrected. The 20% change in the missing source between Table 1 column 1 1996 budget and the Table 1 column 2 1996 budget is due to a change in assumed fumigation release from 50% to 60% which does indicate that part of the missing source can be explained as an underestimate of anthropogenic emissions.

Table1: A footnote has been added to explain the 60% Ag notation, and an additional line in the header indicates pre-phaseout and recent budgets.

Other technical corrections: Table 1: Caption will has been to '2007'. Table 1: The extra 'Best' has been removed. Page 6522, line 5 has been corrected Page 6522, line

14 has been corrected Page 6523, line 11 has been corrected Page 6525, line 9 has been corrected

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