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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Gaseous mercury distribution in the upper troposphere and lower stratosphere observed onboard the CARIBIC passenger aircraft" *by* F. Slemr et al.

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Comments on the paper “Gaseous mercury distribution in the upper troposphere and lower stratosphere observed onboard the CARABIC passenger aircraft.

There are very few reported observations of atmospheric mercury by aircraft. Probably less than about 10. This paper presents the first near global dataset of Hg in the atmosphere via commercial aircraft and. It must be remembered that mercury is present in the atmosphere in very low concentrations ng/m3 or about 100 parts per quadrillion, so it is a remarkable achievement that the researchers could automate the complex mercury measurement system for the CARABIC program. The data for the most appear to

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Interactive Discussion

Discussion Paper

be sound, the authors have used established methods, but modified for the challenging environment of commercial aircraft.

Most of the data are in the upper troposphere and lower stratosphere due to the nature of commercial flight. The authors use the data to interpret Asian and biomass emissions sources and the seasonal variations associated with loss of CO.

I do have several questions that I would like to hear the authors response.

First on the inlet. Your inlet likely does a good job of transmitting Hg2 compounds, so I tend to agree that your measurements most likely represent TGM. However, I am more skeptical of the tests with soda lime. This material is quite difficult to work with. We have seen examples of both losses and emissions of GEM. It is essential that the soda lime be tested carefully for interference and contamination. Were these tests done? Comments?

On the comparisons with the report by Talbot, it appears that both groups used similar inlet configurations. In fact Talbot’s inlet was designed for HNO3, a gas which is known to be difficult to transmit through the inlet. Yet you report your data as TGM, while Talbot et al report it as GEM. If this is true, then yes, it would explain why you never see stratospheric Hg to to zero, while Talbot et al report concentrations of zero. But how can we reconcile this with the similarity in the inlets used? It seems to me that if both groups used similar inlets, that do a good job of transmitting sticky compounds and have a similar detector they both measure TGM. Comments?

Finally, I would be appreciative of more information on the SF6 calculations and the inherent assumptions in this method.

Overall, a very nice dataset and analysis.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 18651, 2008.

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Interactive Comment