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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Separation of emitted and photochemical formaldehyde in Mexico City using a statistical analysis and a new pair of gas-phase tracers" *by* A. R. García et al.

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We would like to thank the referee for his/her comments, and for noting that the major aim of this paper is to show that using glyoxal works better than all previous approaches to improve analysis of HCHO sources in urban air. We agree with this observation and believe that the current manuscript makes that point.

The potential extensions of mentioned by the reviewer are interesting and were all considered by us as we prepared the manuscript. Unfortunately, all require substantial additional work much of which is in progress or presented in companion manuscripts. For example, to address the question of HCHO emissions, and comparison with the

emission inventory, other experimental approaches, including direct on-road measurements of vehicle emissions, were pursued as part of MCMA-2003. These measurements yielded more suitable data to address this issue (direct measurement of real world emission factors) and these results are presented in a separate manuscript, just submitted to APCD, cataloging on-road gaseous emissions and comparing them with recent MCMA emissions inventories. The manuscript at issue here demonstrates that their is still significant HCHO that is not accounted even when using the glyoxal-CO tracer pair; thus, the approach is thus not comprehensive enough to derive HCHO emission factors without additional data.

On the other hand comparison of this manuscripts analysis of the ratio of daily directly emitted HCHO with fresh photchemical production with predictions of air quality models, both in terms of daily concentration variations and feedbacks requires a significant amount of work and a sophisticated air quality model that includes updated emissions information from the MCMA 2003 campaign. Nonlinearities on the photochemical feedbacks, as well as the identification of specific subsets of the vehicle fleet as important HCHO sources require a thorough model sensitivity analysis, as well as a specific analysis of the MCMA-2003 dataset. All the data is available to do this model analysis and this will present an interesting study on its own. We are currently establishing the models and modeling capabilities to accomplish this task, but the required studies will take a lot of time and effort. In the meantime, we believe that the current manuscript contains sufficient novel data and analyses to stand on its own.

A quick judgment of the issues raised by the reviewer, based on the analysis presented as part of this paper would be premature and carry the risk of inconsistency. Given that the impact of direct motor vehicle HCHO emissions is policy sensitive, we are reluctant to expand the current manuscript along the directions requested and stand by the paper in the way it is presented.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 11583, 2005.