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Comment

Interactive comment on “Impact of Mexico City emissions on regional air quality from MOZART-4 simulations” by L. K. Emmons et al.

Anonymous Referee #2

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This paper analyzes the CO transport from Mexico City, the regional and global sources of CO in the area, the aging of the urban plume and ozone production from urban emissions. It is scientifically relevant, methodologically sound, and clearly presented and so to be recommended for final publication in Atmospheric Chemistry and Physics subject to the comments below.

General Points:

The model is used at both a large scale (evaluation of CO contribution from China) and regional scale. Given the range of scales, please add some discussion of how it relates to other work at both the global scale and at the local scale. For example, the results should be compared to the results from Adhikary et al., 2010 at the global scale. At the local scale, the results seem to be consistent with earlier findings about venting of

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the Mexico City plume (see eg., de Foy et al., 2006). Note in particular Fig. 7, which seems to be in contrast with page 3459, line 17 of the abstract. This should be clarified in the abstract.

The choice of emission inventory can have important consequences for interpreting the results of the analysis. I would suggest adding a table with some of the different values of emissions from the MCMA to show how the current analysis compares with previous work, see Table 3 in Fast et al., 2009.

Finally, given the global scale of some of the analysis, it would be nice to see some discussion of the potential relevance of these results to other megacities around the world.

Specific Points:

Please add a brief description of the chemical mechanism to section 2, and a slightly more detailed description of the BIGALK and TOLUENE classes.

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de Foy, B., Varela, J. R., Molina, L. T., and Molina, M. J.: Rapid ventilation of the Mexico City basin and regional fate of the urban plume, *Atmos. Chem. Phys.*, 6, 2321-2335, 2006.

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