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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Air quality in North America's most populous city – overview of MCMA-2003 Campaign" *by* L. T. Molina et al.

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General Comments:

This is an excellent overview of the MCMA-2003 measurements and modeling. It provides a concise summary of the major results, and is a good road map to the several dozen related papers published in ACP and elsewhere. A few items, mostly clarifications, are suggested below for consideration by the authors.

Specific comments (page/line):

3116/23,24: Is there really evidence that the mountains trap pollutants in Mexico City? Modeling studies (e.g. de Foy et al., ACP, 6, 2321,2006) indicate nearly complete ventilation of the basin each day. The trapping is a long-standing popular notion which

may, or may not, be correct. Could it be worth commenting on it here?

3117/15: The statement that PM and O3 are "the two most important pollutants" is too absolute, since the relative ranking could depend on circumstances (e.g. CO or Pb could be as important in some localities). Perhaps "the two most important" could be replaced by "two very important".

3130/footnote 1: As stated, the footnote seems to indicate that ca. 90% of industry was NOT included in the emissions inventory. If so, this should be discussed in more detail.

3133/19-24: Fig. 3 shows total emissions (not emission indices) presumably integrated over the entire MCMA. Since the ARI van, DOAS, and other measurements are local, it would be useful to say a few words on how these data were up-scaled to the entire MCMA basin (even if this is described in greater detail in the specific papers).

3140/14: The relative contributions to OH reactivity from VOCs, NOx, CO, and HCHO, given on this line, are likely to change during the day. To which time period do the given values apply?

3140/16: The broad statement that measured VOCs are sufficient to produce observed SOA is in conflict with later statements in this paper and with the Volkamer et al. (2006) study. Models constrained by observed VOCs underpredict the observed SOA rather seriously.

3141/12: The nightime HO2 values (Fig. 5) seem to hover around 5-8 ppt, except after about 3:00am when they fall much lower. Are these non-zero values as real as the drop around sunrise? If so, what is their chemical origin?

3144/17-21: The discussion of the HO2/OH ratio as a function of NO is a bit cryptic. Of course the reader could go to Shirley et al., but with some clarification of the text, this interesting point could be brought forward in this overview paper.

Technical comments: 3125/3: Presumably 03:00am local time, not UT. Please spec-



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ify, since both times are being used. 3131/29: Change "agrees" to "agree" 3134/5: Grammar: run-on sentence. Break into 2 sentences or put appropriate conjunctions. 3139/15: Sentence seems incomplete. Perhaps clarify that these % values refer to formaldehyde (not glyoxal). 3142/13: Remove extra X from HOxx 3142/22 - 3143/3: These statements are repetitions of earlier statements, e.g. 3136/3 for HCHO, 3139/11 for glyoxal 3144/27-3145/7: It should be noted that other recent studies have also suggested that Mexico City O3 production is VOC-limited, e.g. Tie et al., Atmos. Env., 41, 1989-2008, 2007. Fig. 8 caption, 2nd line: delete "image plot of" (obvious).

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 3113, 2007.