Atmos. Chem. Phys. Discuss., 8, S10497–S10499, 2009
www.atmos-chem-phys-discuss.net/8/S10497/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Assessing the regional impacts of Mexico City emissions on air quality and chemistry" *by* M. Mena-Carrasco et al.

Anonymous Referee #1

Received and published: 17 January 2009

General comments:

This paper discusses the regional impacts of MCMA emissions on the air quality and photochemistry using the combined model products and flight measurements data. The predicted results agreed reasonably well with the observations and captured the observed variability. The results that the MCMA emissions have discernible impact on regional air quality and the lower ozone production rate near the city than further from the city provide valuable information about the properties of MCMA aerosols.

I have only two major criticisms that should be addressed before publication, both of which overlap: i) “discernible impact” would be a much more citable result if it were quantified, in the text, conclusions, and abstract. Is “dis-

cernible” 10%? More/less? ii) The paper has a good clear discussion of the method and uncertainties, but little effort is made to quantify either the uncertainty or the variability of the conclusion. Is the “discernible” impact always, frequently, or occasionally present? How much does it exceed the error?

1) Does the paper address relevant scientific questions within the scope of ACP? Yes.

2) Does the paper present novel concepts, ideas, tools, or data? Yes. This paper presents novel model products.

3) Are substantial conclusions reached? Yes.

4) Are the scientific methods and assumptions valid and clearly outlined? Yes.

5) Are the results sufficient to support the interpretations and conclusions? Yes.

6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes.

7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes.

8) Does the title clearly reflect the contents of the paper? Yes.

9) Does the abstract provide a concise and complete summary? Yes.

10) Is the overall presentation well structured and clear? Yes.

11) Is the language fluent and precise? Yes.

12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes.

13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? No.

14) Are the number and quality of references appropriate? Yes.

ACPD

8, S10497–S10499, 2009

Interactive Comment

Specific comments:

1. Section 3.1, Page 9, it is said “The MCMA contribution is highest for the short lived species (e.g., NO2), but it is also more geographically confined…” But fig. 1 shows the opposite: the MCMA contribution is highest and more geographically confined for long lived species CO for both surface level and at 3 km.

2. Section 3.1, in the discussion of MCMA contributions to pollutants, the results are derived from the mean MCMA contributions of the campaign, do these results and patterns hold for individual cases or what are the variabilities?

3. Page 9, Line 9, specify where “Tampico” is.

4. Page 9, define NOx, NOy, and NOz (later in the manuscript).

5. The analysis of the long range transport and the impact on ozone production is based on one case study of March 18-19, and the effects of aerosols on photolysis rate are based on the case of March 10. Are these results also true for other cases?

Technical corrections:

1. Page 3, Line 2, insert “Metropolitan Area” after “Mexico City”. 2. Page 3, Line 8, define MTBE here. 3. Page 6, Line 1, insert “)” after “Particles in Equilibrium”. 4. Page 11, Line 7, “KM” should be lower case letters. 5. Page 11, Line 27, delete one of the “as”. 6. Page 11, Line 28, “NOy” should be “NOy”. 7. Table 1: Specify “Mod”, “Obs”, “n” and the units in the table description. 8. Fig. 3, it would be better that the dates can be shown clearly on the figure. 9. Fig. 7 is not cited in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 20283, 2008.