

Interactive comment on “Mexico City basin wind circulation during the MCMA-2003 field campaign” by B. de Foy et al.

Anonymous Referee #1

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1. General comments

This paper aims at providing the meteorological basis for the analysis of chemical measurements obtained in the MCMA during a field campaign. The major purpose seems to be classifying flow patterns in the MCMA into one of 3 classes that this paper has found to be typical for the MCMA.

The work reported here should provide a good basis for the analysis of the chemical measurements taken during the field campaign. The figures are generally very nicely drawn and mostly clear. However, I find the paper rather lengthy and I have difficulties

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seeing what is really new here and of interest for those researchers not involved in this particular field campaign (i.e., the majority of ACP readers).

Also, for such a type of paper I would have expected that the field phase is put into a climatological perspective by saying how typical (or atypical) the conditions during the field phase were. The classification suggested here would provide a good basis for that, if applied over a longer (i.e., multi-annual) time period.

After some shortening and after addressing the points below, the paper may be suitable for publication as part of a series of papers on the field campaign. However, I would not recommend publishing it in ACP as a standalone.

2. Specific comments

Section 1 is an exhaustive list of previous findings, but it lacks a clear structure. The results of previous studies must be put into context and presented in such a way that the reader can develop a picture of the processes relevant in the MCMA. As it stands now, it is merely a listing of different phenomena observed.

Page 2505, line 17: I wouldn't speak of micrometeorology here. The basin certainly spans meso-scale distances.

Page 2508, line 26: "national scale": use regional or a geographical rather than political expression.

Caption to figure 4: "wind transport directions": remove "transport" and specify for which altitude the wind directions are drawn.

Fig. 4-7, and generally on the issue of classification: It is not described how the different days were classified into one of the 3 clusters (O3-South, Cold Surge, O3-North). Was this done subjectively by hand, or was an automatic classification used? As this is so

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central to this paper, it must be explained carefully! Furthermore, it should be noted how clearly these cases could be separated, or whether there were any difficulties in attributing some of the days.

Page 2516, line 16: Why did you use the 2.5 K/km criterion for the mixing height? This doesn't seem to be a standard definition of the mixing height. I recommend to use something that's more established in the literature (see, e.g., the review paper: Seibert P, Beyrich F, Gryning SE, et al.: Review and intercomparison of operational methods for the determination of the mixing height *ATMOSPHERIC ENVIRONMENT* 34 (7): 1001-1027 2000.

Figure 12: What does the contouring show in this plot? You only explain the roses.

Figure 13-15: It would ease the comparison with the 500 hPa weather maps if there were a 2nd axis with height above sea level.

Discussion section: What I really miss here is a thorough comparison with the results of previous studies. The current results must be put into a perspective and it must be clearly emphasized what is new in this study and how it adds to the already available literature on the MCMA.

Again on the classification: The classes you have defined seem to be typical for the period of the field experiment. However, how does this relate to the "bigger picture". Would these classes still be sufficient and typical enough if you considered a multi-annual time period?

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 2503, 2005.

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