

Interactive comment on “Ozone predictabilities due to meteorological uncertainties in Mexico City basin using ensemble forecasts” by N. Bei et al.

Anonymous Referee #1

Received and published: 13 March 2010

Review of “Ozone predictabilities due to meteorological uncertainties in Mexico City basin using ensemble forecasts” by Bei et al.

The manuscript studies the calculated ozone concentrations sensitivity to different meteorological conditions (or meteorological uncertainties) during the MILAGRO field experiment. The content of the paper is interesting and has scientific merit for publishing this paper in ACP. The paper is well written and organized, showing a very careful work by the authors. However, this reviewer has some comments. The authors should address these comments prior the publication of the paper.

Specific comments;

(1) The authors should clearly indicate the meteorological conditions for the different

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ensemble model calculations. There should be a table to list the meaning of the ensemble calculation. For example, what are E-11 and E-14 to present? The authors also can add some statistics in the table (e.g., the O₃ differences with each ensemble run compared to ensemble mean). In this case, the reader can have insights that which meteorological variable has most important effects on ozone? (2) Similar to the comment 1, in the abstract and conclusion, the authors should give some result to indicate which meteorological variable has biggest impact on the calculated ozone concentrations (winds, temperature, pressure??). (3) There are some abbreviations need to be clarified or defined, such as 3DVAR, BES, GFS etc in page 3235. (4) In Figure 3 and page 3237, the authors indicate that there are anti-cyclones in Mar/09, Mar/15, and Mar/29. However, I read the map, and find they are cyclones instead of anti-cyclones. Please check these carefully. By the way, the map is too small to read. Maybe need to re-plot these maps. (5) In page 3239, the authors state that the large difference between the calculated and measured wind directions is mainly due to the uncertainties of the model. This reviewer think that the measured surface wind directions often be disturbed by city buildings, especially in large cities, which cannot represent the synoptic scale wind direction. The authors should make comments on this issue. (6) In Figure 5, the figure is not clear. I can hardly read the bold orange lines. (7) In Figure 6, I cannot read the measurement values, which are represented by colored squares. (8) In Figure 10, the figure is not clear. I can hardly read the orange lines. (9) In page 3233, Tie et al. (2009) studied the ozone formation in Mexico City and the surrounding areas, which should be cited in the paper.

Tie, X., S. Madronich, GH. Li, ZM. Ying, A. Weinheimer, E. Apel, and T. Campos, Simulation of Mexico City Plumes during the MIRAGE-Mex Field Campaign Using the WRF-Chem Model, Atmos. Chem. Phys. 9, 4621-4638, 2009

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 3229, 2010.

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