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Atmospheric Chemistry and Physics Discussions

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

Anonymous Referee #2

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This paper addresses an interesting topic. The method seems sound. There are some issues of clarity that should be addressed before publication.

What is the definition of "ensemble spread?" Is it a standard deviation, a peak difference, a peak-to-peak difference? The reported ozone spreads, for example, seem small compared to the spread evident on the plots.

All the plots need to be increased in size to be readable.

In section 4.1, line 20: It is better not to use altitude words to describe chemical concentrations. Although "elevate", "rise", and such are commonly used, they can lead to confusion. "Increase" would be clearer when one is talking about an increase in concentration rather than the movement of an air mass.

Section 5 is potentially very interesting, but the authors do not say enough about it. They wish to conclude that the relatively small initial condition perturbations shown in the previous section are more important than the choice of PBL scheme. Some more detail would help to convince the reader. For example, what are the primary differences in concept between the PBL schemes? Is any observed difference in performance due to the PBL scheme, to its coupled surface layer scheme, or to differences in the surface fluxes induced by those schemes? Are the BL heights calculated by the different schemes truly directly comparable?

Section 6 could also be expanded. I am not sure I agree that the time evolution "basically agrees well with the observations." The three days are quite different. Why is the predictability different on the different days? The provided explanation is not very convincing, but the authors probably have enough information to provide a better one.

The Conclusions should be checked for consistency. Are the uncertainties in ozone primarily due to initial conditions, as stated on the paragraph beginning on line 8? Or are model and emissions uncertainties more important, as implied by the second paragraph? Perhaps a clearer distinction between random and systematic errors would help to clarify. The last paragraph makes an important point, that improved initial conditions may not be possible, and therefore a prediction system must be robust against expected uncertainties. This is certainly true for small random errors in the analysis, as shown here, but may not be true for systematic errors, which might be more subject to improvement.

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