

***Interactive comment on “Evolution of anthropogenic pollution at the top of the regional mixed layer in the central Mexico plateau” by D. Baumgardner et al.***

**Anonymous Referee #1**

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The study may have produced some data of value, but the paper is nowhere near publishable. First of all, the charges of the ionic species are always wrong or missing, which indicates a lack of attention to details, which is important!! Second, I am not sure if the authors know east from west. Mexico is in the northern hemisphere (NH) and the convention is to show the east on the right in the NH. Units for ratios are missing at key places in the text. This is another lack of attention to detail, which creates extra work for busy reviewers and would confuse any reader who might have been unfortunate enough to have read this as a final version. The biggest problem is that the authors compare their results to results from Mexico City (MC) and make conclusions about the MC plume. That does not make sense since they never measured air that originated

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in MC according to their Figure 3. Finally, the nearby Popocatepetl volcano and its possible effects are never mentioned even though some of the authors have published papers on this volcano! The authors need to take all the reviewers comments into account, assess their total data base, and decide if they want to write a new paper, perhaps with a different theme.

I'll make specific comments next though they may not be warranted as the paper needs to be totally rewritten.

P3266, L6: why were 3 days chosen and what were the other days like?

P3266, L12 - 14: 2 charges incorrect and one exponent incorrect!

P3266, L18: air flow up hill at night or whats going on?

P3266, last paragraph: no basis for conclusions about MC that I can see.

P3274, L21: 1013.25!

P3274, L25 and 28: +3!

P3275: what is relevance of large PM?

P3276, L10, 21, and 22: at least 4 mistakes in charges.

P3276 general: discuss Popo as sulfate source.

P3277: what is significance of organic speciation?

P3278: the discussion of meteorology using words only is hard to follow. I suggest the following if the authors proceed with a new paper. Eliminate Fig 4. the photo. Reverse the direction on Fig 5. Then add colored arrows to indicate day and night flow patterns.

P3278, L24: "of" before "RML"

P3279: I don't see the point of comparing an aircraft profile on 29 March (at an unspecified time and position with respect to the RML at that) with ridgetop data from March

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16-19?

P3280: I don't see the point of comparing aged air from Cuernavaca, Puebla, etc to fresh emissions in MC. If there is a point it needs to be developed and have all the many appropriate caveats!

P3280, L28 units!

P3281 Aged urban aerosol can have a OM/CO ratio similar to fresh biomass burning (BB) aerosol. Not sure how you can tell the two apart.

P3281-3282: the OM/CO or CO/OM from BB varies a lot so really all the ratios observed could be BB. That is not surprising since no MC air was sampled.

P3282, L9: define OM (earlier) and add plus or minus  $\sim 0.2$  to ratio.

P3282, L25: there are fires all over MC. I doubt the Yucatan caused impacts on the days mentioned that were larger than the impacts of local fires. Get the hotspot shapefiles from the CONABIO website and overlay them on Figure 3 for any days you want to analyze. Run some back trajectories free at HYSPLIT.

P3282, L26: "ammonium" should be "ammonia" two different things!

P3283, L18: diluted from what??

P3283, L27-28: wrong sign and justify comparison to MC (if you can).

P3284: comparison to MC does not seem to me to be what this data set should be used for.

Fig 1. not a bad idea for background, but soundings from Mar16-19, 2006 would be better to show.

Fig 3 add hotspots.

Fig 4. unneeded.

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Fig 5. reverse direction and add met patterns.

Fig 7-17: reevaluate if any or all needed in revised paper.

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**ACPD**

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