**Atmospheric
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Comment

Interactive comment on "Measurement of ambient aerosols in northern Mexico City by single particle mass spectrometry" *by* R. C. Moffet et al.

Anonymous Referee #1

Received and published: 27 June 2007

General comments:

This paper describes the composition and the origin of the particulate matter observed in the Mexico City Metropolitan Area during the MCMA field campaign in March 2006. A comprehensive characterization of the aerosol chemical composition, mixing state, size distribution and temporal variability is carried out based on the statistical analysis of the aerosol mass spectrometry measurements and back-trajectory simulations. Results are of great interest for understanding the aerosol formation and evolution patterns and for air quality model validation studies in this region. The paper is well written, the methods are well established and the results are within the scope of this journal. Therefore, I recommend that the manuscript be accepted for publication with minor corrections, listed below:

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Specific comments:

1) Experimental: The presented results rely on complex measurement and analysis techniques. The authors should provide a short description of the uncertainties involved with these measurements and quantify the associated errors. It is also unclear how the particulate water is treated in the measurements. Are the particles dried prior to their chemical analysis or is the water included?

2) Chemically resolved particle size distribution: Biomass particle seems to be one of the major aerosol components in Mexico City. According to the results displayed in Fig. 3 the mean diameter of the mass distribution ranges from 0.6-0.8 μm, which is rather characteristic of aged smoke particles (several days). Please comment on how the obtained results compare with the values commonly reported in the literature (Fiebig et al., 2003 and references therein).

This larger diameter can also be an indication that Biomass class may be dominated by the secondary organic aerosols. At this point, it will be interesting to discuss on how the size distribution of various species vary during the day. The comparison of the size distribution obtained in the morning and afternoon hours should provide a good indication of the production of SOA species.

3) Authors have shown that inorganic nitrogen species are mostly found associated with mineral dust particles. This heterogeneous formation of coarse-mode nitrate on dust particles has been observed in several field campaigns and modeling studies (e.g. Hodzic et al., 2006; Putaud et al., 2004). Can the contribution of this heterogeneous formation to total nitrate concentrations be quantified from the present dataset?

4) Average diurnal trends: Fig. 7: What is the diurnal trend of the Higt_Mass_OC component?

Fiebig M, Stohl A, Wendisch M, Eckhardt S., Petzold A., Dependence of solar radiative forcing of forest fire aerosol on ageing and state of mixture, Atmos. Chem. Phys. 3:

ACPD

7, S2691–S2693, 2007

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881-891, 2003.

Hodzic, A., Bessagnet, B., Vautard, R.., A model evaluation of coarse-mode nitrate heterogeneous formation on dust particles, Atmos. Environ, 40 (22), 4158-4171, 2006.

Putaud, J-P., Van Dingenen, R., Dell'Acqua, A., Raes, F., Matta, E., Decesari, S., Facchini, M.C., Fuzzi S., 2004, Size-segregated aerosol mass closure and chemical composition in Monte Cimone (I) during MINATROC, Atmospheric Chemistry and Physics, Vol. 4, 889-902.

Technical corrections:

The outline of the manuscript should be included at the end of the 'Introduction' section.

Fig. 7: BAM data are difficult to distinguish on this figure. Add in the caption the type of line used for BAM data: (BAM, dashed red line).

Section 3.3, line 11: Figures 3 and 4 should be changed to Figures 4 and 5.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 6413, 2007.

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