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## Vertical distribution of aerosols in the vicinity of Mexico City during MILAGRO-2006 Campaign

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**Abstract.** On 7 March 2006, a mobile, ground-based, vertical pointing, elastic lidar system made a North-South transect through the Mexico City basin. Column averaged, aerosol size distribution (ASD) measurements were made on the ground concurrently with the lidar measurements. The ASD ground measurements allowed calculation of the column averaged mass extinction efficiency (MEE) for the lidar system (1064 nm). The value of column averaged MEE was combined with spatially resolved lidar extinction coefficients to produce total aerosol mass concentration estimates with the resolution of the lidar (1.5 m vertical spatial and 1 s temporal). Airborne ASD measurements from DOE G-1 aircraft made later in the day on 7 March 2006, allowed the evaluation of the assumptions of constant ASD with height and time used for estimating the column averaged MEE.

The results showed that the aerosol loading within the basin is about twice what is observed outside of the basin. The total aerosol base concentrations observed in the basin are of the order of 200  $\mu\text{g}/\text{m}^3$  and the base levels outside are of the order of 100  $\mu\text{g}/\text{m}^3$ . The local heavy traffic events can introduce aerosol levels near the ground as high as 900  $\mu\text{g}/\text{m}^3$ .

The article presents the methodology for estimating aerosol mass concentration from mobile, ground-based lidar measurements in combination with aerosol size distribution measurements. An uncertainty analysis of the methodology is also presented.

- ▣ [Final Revised Paper](#) (PDF, 5061 KB)
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