

## **PBL Aerosols SE of Mexico City in the dry Season: Biomass Burning and Windblown Dust and its Impact on Photolysis Frequencies.**

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**Abstract:** During the dry season in March 2006 airborne investigations on aerosol distributions, ultraviolet actinic radiation and ozone profiles were performed southeast of Mexico City using an ultralight aircraft as a mobile platform. The area investigated covered the rural area southeast of Mexico City, the Chalco Valley, Huexca and Atlixco south of the volcano Popocatepetl, east of Paso de Cortés to the airport of Puebla and the pass between Puebla and Mexico City north of the volcano Ixtachiatl.

The Chalco valley is the main venting valley of the Mexico City basin to the south. Intense biomass burning was observed on both slopes of the volcanoes leading to strong pyrocumulus cloud production in the northern part of the national reserve and above the motorway Puebla-Mexico. Fine particle ( $> 10$  nm) numbers reached up to  $80000/\text{cm}^3$  close to the burning plumes with significant reduction to  $\sim 30\text{-}40000/\text{cm}^3$  in the Chalco valley where coarse particles ( $> 300$  nm) dominated the total mass. Dust devils transporting coarse soil particles up to elevations of more than 4000 m a.s.l. were frequently observed. Particles and air masses of pollution sources in the area can be characterized by aerosol size distributions and/or spectral absorption from multi-wavelength aethalometer measurements as well as from ozone mixing ratios and meteorological data measured onboard. The aerosol impact on photolysis rates and air chemistry is derived from vertical profiles of actinic radiation in the JO1D and JNO2 spectral regimes at 300 nm and 380 nm, respectively. Profiles were flown on both sides of the volcano ridge, south of Popocatepetl and above Tenango del Aire where aircraft measurements were supported by Ceilometer aerosol vertical profiles.