1.156 Air pollution in Mexico City from remote sensing measurements.

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Abstract:

The Mexico City Metropolitan Area (MCMA), with over 21 million inhabitants and around 7 million motor vehicles filling the streets, faces air pollution problems which are worth investigating not only at its surface. A broad remote sensing infrastructure has been set up to increase the vertical information of key pollutants such as CO, NO_2, O_3, CO_2, CH_4 and NH_3 from ground-based solar absorption measurements in the infrared as well as in the UV/visible regions. In this contribution we will discuss the advantage of using column measurements in synergy with satellite observations and surface concentrations to better understand the air quality in a complex setting such as the MCMA.
Particular emphasis will be placed in the results for carbon monoxide (CO). Its annual variability in central Mexico is related to biomass burning activities mostly in the dry season, but distinct weekly pattern and diurnal cycles in the urban environment are

dominated by the emissions from the transportation sector. A detailed study of the mean vertical and spatial distribution of CO enables the tracing of sources and helps to understand the transport mechanisms. Total vertical columns and profiles are measured outside the city at a high-altitude site (Altzomoni, 3985 masl) and within the city (UNAM campus: 2260 masl) only 60 km apart. The evolution of the mixing layer height, which is critical for understanding ground level concentrations, is investigated by means of a low-cost LIDAR and a reconstructed product from both surface and column integrated measurements. A satellite carbon monoxide product is used to obtain the spatial distribution of CO around the MCMA. The trends and variability of this pollutant will be shown and the potential of using a rich set of observations like these to reconstruct the emissions will be discussed.