

Analyses of Mexico City Surfaces Properties Using MODIS and Sun-photometer Data During MCMA-2006/MILAGRO Campaign

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Monitoring the air quality in megacities around the world and understanding the impact of the emitted pollutants on the local and global climate is a challenge for the scientific community. The air quality monitoring system in megacities has been based almost exclusively on ground-based station networks. Satellites can be used as a complementary tool to the ground-based stations by providing in a systematic way aerosol property with a higher spatial resolution than the continuous ground-based stations. With the growing concern over aerosol particle pollution in megacities, interest in the higher resolution data from satellite retrievals is increasing. However, to achieve a higher spatial resolution from the MODIS instrument, it is essential to have more accurate information on the surface reflectance and aerosol optical properties. The heterogeneity of the surface cover in an urban environment only increases the uncertainties in the estimation of the surface reflectance and therefore aerosol optical depth (τ_a). In this work we perform an analysis of the surface reflectance specifically for the Mexico City urban area. We also present the improvement that the new estimation can provide for retrievals over the region. We performed this analyses based on an unprecedented measurement of τ_a from a network of sun photometers deployed in Mexico City during the MILAGRO Campaign experiment in 2006. The Milagro (Megacity Initiative: Local and Global Research Observations) campaign of air pollutant measurements was carried out during the month of March 2006 in Mexico City. It has four main components, this work is part of the MCMA-2006 (Mexico City Metropolitan Area - 2006) led by the Molina Center on Energy and the Environment.