



Contribution of Tula's industrial emissions to the Mexico City urban plume

G. Sosa, E. Vega, E. González, A. Zambrano, J.L. Arriaga, J. Gasca, M. Magdaleno
Matemáticas Aplicadas y Computación, México, Instituto Mexicano del Petróleo

gsosa@impmx / phone: +(52)-55-9175-7558

Tula is located 60 km Northeast of Mexico City Metropolitan Area (MCMA). According to the latest information, 355,000 T/Y of SO₂ are released by two major industries in this region; a power plant and an oil refinery. Other industries such as cement plants and open-sky mines are also responsible of important particle matter emissions and soil degradation. In order to characterize the local and regional air quality, a field campaign took place in this area from March 18 to April 22, 2006. The main goal for this campaign was to determine the influence of this industrial area on the MCMA urban plume, and to better understand the processes of transport and transformation of these pollutants into the atmosphere. Different measurements techniques and equipment were deployed at two sites (Jasso and PXT), where point continuous measurements were conducted for VOC, carbonyls, PM_{2.5} and PM₁₀, criteria pollutants and meteorological parameters at the surface level. Speciation of VOC and carbonyls were determined in the laboratory, as well as particle matter (black and organic carbon, Na⁺, NH₄⁺, K⁺, Mg²⁺, Ca²⁺, Cl⁻, NO₃⁻, SO₄⁻, and trace elements. Mobile measurements were also done using a MiniDOAS system to determine total SO₂ flux emissions from the major sources. This system also was used to track the SO₂ plume to identify the transport pathways under different meteorological conditions. Finally, long-term atmospheric deposition patterns of metals were determined by biomonitoring with *Tillandsia recurvat*. The sampling area covered 4000 km², and 21 trace metals (Al, Ba, Ca, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sn, Sr, Ti, V and Zn) were identified as main deposited species in this region. A discussion on spatial and time variations of these compounds is presented in this work, as well as its implication on the MCMA urban plume.