



Air quality impacts of industrialized cities in the Mexico megacity

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According to the Earth Sciences for Society Foundation, by the year 2007 more than half of the world's population (3.3 billion) will be living in cities, expecting to reach 60% by year 2030. Such rapidly increasing urbanization, particularly in developing countries, creates many opportunities and challenges (ESSF, 2005). Urban and industrial emissions, from developed and under development world, change the chemical content of the downwind troposphere in a number of ways; air pollutants emissions drive the formation of photochemical smog and its associated oxidants, degrading air quality and threatening both human and ecosystems health (Molina et al, 2004, 2007).

The Mexico City metropolitan area (MCMA), the Mexico Megacity, embrace 20 million inhabitants, 35,000 industries and 3.5 million vehicles in an area of nearly 1500 km². The complex topography, light winds, high elevation (2240m amsl) and intense sunlight contribute to form high pollution levels, generally worst in the winter, when rain is less common and thermal inversions more frequent.

In the neighborhood of the Mexico megacity, 60 km NW from Mexico City downtown, an important Mexican agricultural and industrial region (the Mezquital Valley) is located. In this region, the industrial complex of Tula is located, where the two major industries in this region, the Power Plant and Refinery, both emit 355,000 T/Y of SO₂. Among these, other important industries, such as Cement Plants and open-sky mines, are responsible of important particle matter emissions and soil degradation.

In this work, an extensive characterization of air pollutants in the Tula region is presented, as well as modeling results of the regional transport of the SO₂. The latest

results shows that the SO₂ plume from the Tula industrial complex can impact the Mexico megacity under stable conditions.

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