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Overview of the 2006 MILAGRO Campaign in Mexico City: Transport and Transformation of Emissions from a Megacity

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Megacities (metropolitan areas with population over 10 million) and large urban centers present a major challenge for the global environment. Population growth, increasing motorization and industrialization have resulted in a higher demand for energy, greater use of fossil fuels, and more emission of pollutants into the atmosphere. As a result, air pollution has become not only one of the central environmental problems of the century, but also presents serious consequences to human health and ecosystems and economic costs to society.

MILAGRO (Megacity Initiative: Local and Global Research Observations) is the first international effort to study the impact of air pollutants generated and exported by megacity. The Mexico City Metropolitan Area (MCMA) – one of the largest megacities in the world – was selected as the initial case study for MILAGRO. The measurement phase consisted of a month-long series of carefully coordinated observations of the chemistry and physics of the atmosphere in and near Mexico City during March 2006, using a wide range of instruments at ground sites, on aircraft and satellites, complemented by meteorological forecasting and numerical simulations. Together, these research observations have provided the most comprehensive characterization of Mexico City's urban and regional air pollution that will take years to analyze and evaluate fully. Initial analysis of the data is focused on understanding meteorology, emissions, urban and regional photochemistry, aerosol evolution and radiative effects – spanning the urban to regional scale transition. Many interesting aspects of atmospheric chemistry in and near the MCMA are emerging and have already added significantly to our understanding of the chemical and physical properties of the city's reactive atmosphere and the regional impacts. The information can be useful for decision-makers in Mexico in developing air quality management strategies as well as provide insights to air pollution problems in other megacities and large urban centers around the world.