Gas and Particle Measurements during MILAGRO-2006 using the ARI Mobile Laboratory

Miguel Zavala1, Scott Herndon2, Ezra Wood2, Timothy Onasch2, Charles Kolb2, Berk Knighton3, Claudio Mazzoleni4, Mavendra Dubey4, Dwight Thornhill5, Linsey Marr5 and Luisa T. Molina1

1 Massachusetts Institute of Technology/ Molina Center for the Energy and the Environment
2 Aerodyne Research Inc.
3 Montana State University
4 Los Alamos National Laboratory
5 Virginia Tech.

Miguel Zavala, MIT, miguelz@mit.edu

As part of the MILAGRO/MAX-Mex/MCMA-2006 field campaign, the Aerodyne Research, Inc. (ARI) Mobile Laboratory was deployed at 6 representative urban and boundary sites across Mexico City metropolitan area (MCMA) to characterize trace gases and aerosols using a comprehensive set of research grade, real-time trace gas and fine particulate matter instruments. In addition to the fixed site measurements, the fast response instrumentation was also used during mobile lab transits between sites to obtain on-road vehicle emissions data in on-road fleet-average mode. Since the mobile lab has the capability of moving downwind of the city's emissions outflow, the monitoring sites were selected in advance on the basis of daily wind forecasts produced by the campaign's meteorological teams. In the first part of this work, we will describe the measurement sites, mobile laboratory instruments and measurement strategies used during the campaign. The second part of this work presents currently ongoing data analyses and exploitation activities that are in part based on the mobile lab measurements. It also identifies possible collaborations with other research groups. The large ARI mobile laboratory data set has been quality-assured and will be very valuable for understanding the evolution of primary pollutants into secondary oxidants, secondary aerosol precursors and secondary aerosols. These comprehensive datasets, in combination with other measurements made during the MILAGRO campaign, will serve as an important basis for the advancement of our understanding of the physical and chemical processes that characterize the air pollution phenomena in the MCMA and similar megacities.