

Key Results from ARI Mobile Laboratory Measurements During MCMA-2006

Scott Herndon¹, Ezra Wood¹, Timothy Onasch¹, Douglas Worsnop¹, Charles Kolb¹, Miguel Zavala², Luisa T. Molina², Berk Knighton³, Claudio Mazzoleni⁴, Mavendra Dubey⁴, Dwight Thornhill⁵, Lindsey Marr⁵, and Robert Seila⁶

¹Aerodyne Research, Inc., ²Massachusetts Institute of Technology /Molina Center for the Energy and the Environment, ³ Montana State University, ⁴Los Alamos National Laboratory, ⁵Virginia Polytechnic Institute and State University, ⁶U.S. Environmental Protection Agency

A wide range of real-time (~1s) trace gas and fine particle instrumentation were deployed onboard the ARI mobile laboratory (Kolb et al., 2004; Herndon et al., 2005) operating in the Mexico City metropolitan area (MCMA) during March 2006. Fixed deployments at urban sites (IMP (T0) and Pedregal) and downwind/boundary sites (Santa Ana, Pico Tres Padres and T1) yielded high time resolution ambient concentrations that allowed detailed data intercomparisons with co-located research grade and commercial monitoring instruments. By characterizing both urban core and downwind urban plume compositions key data on the evolution of photochemically active gases and secondary aerosol particle formation were obtained. The unique data sets obtained, as the boundary layer rose and the city's pollution plume enveloped the top of the ~900m high Pico Tres Padres site each mid-morning, clearly show how rapidly photochemical oxidation aged each mornings urban emissions and created copious amounts of secondary particulate matter in the process.

Moving between sites the mobile laboratory characterized on-road fleet average vehicle emissions of NO, NO₂, NH₃, CO, CO₂, HCN, a variety of VOCs and primary fine particles. These data allow comparisons of 2006 on-road emissions with those measured during previous MCMA campaigns in 2002 and 2003 (Zavala et al., 2006).

Key results from both fixed site and on-road mobile laboratory measurements will be presented and other talks and posters based on mobile laboratory data will be highlighted.

References

Herndon, S. C. et al., Characterization of urban pollutant emission fluxes and ambient concentration distributions using a mobile laboratory with rapid response instrumentation, *Faraday Discuss.*, 130, 327–339, 2005.

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Zavala, M. et al., Characterization of on-road vehicle emissions in the Mexico City Metropolitan Area using a mobile laboratory in chase and fleet average measurement modes during the MCMA-2003 Field Campaign, *Atmos. Chem. Phys.*, 6, 5129–5142, 2006.