Ammonia Measurements at the T1 Site during Milagro

Marc L. Fischer, Lawrence Berkeley National Laboratory
Timothy M. VanReken, National Center for Atmospheric Research

Marc L. Fischer, Lawrence Berkeley National Laboratory, mlfischer@lbl.gov

We measured gas phase ammonia concentrations at the T1 site from March 21-31, 2006 using a quantum-cascade laser spectrometer. A one-day intercomparison with a similar instrument located in the Aerodyne Research Mobile Facility showed good agreement in the 10-20 ppb NH_3 baseline and excellent temporal correlation of strong 50-100 ppb NH_3 peaks, likely associated with local sources. Similar baseline and peak concentrations were observed during the rest of the observation period, with higher concentrations generally associated with air carried from the south to southwest. Using measurements of air temperature and relative humidity, we also calculated the gas-aerosol equilibrium partitioning coefficient, Kp, representing the minimum NH_3 * HNO_3 concentration product necessary to form ammonium nitrate aerosol. The observed ratio of Kp/NH_3 suggests that ammonium nitrate aerosol should be present at the T1 site for HNO_3 concentrations above ~ 1.5 ppb for most of the observation period. We expect the NH_3 data to useful for further investigations of the gas and aerosol concentrations observed at T1.