

PILS-IC Measurements Of Bulk Inorganic Fine Aerosol Particle Chemical Composition for INTEX-NA

Rodney Weber
Georgia Institute of Technology

This work involves measurements in support of the INTEX-NA objectives of characterizing the aerosol chemical properties of plumes over the Eastern United States. A Particle-Into-Liquid Sampler (PILS) coupled to a dual channel ion chromatograph will be deployed on the NASA DC-8 to make rapid measurements of fine particle (PM 1 μm) bulk ionic chemical composition. The scientific objective is to provide accurate and quantitative aerosol chemical data on time scales approaching airborne measurements of gases, meteorological parameters, and aerosol physical properties to better characterize tropospheric aerosol particles, investigate their sources, and study processes that influence their ambient concentration.

The instrument continually collects particles into purified water to measuring the following ionic compounds associated with ambient fine particles: chloride, nitrate, sulfate, sodium, ammonium, potassium, magnesium, and calcium, with a sensitivity of $\sim 30 \text{ ng m}^{-3}$ ($\sim 5 \text{ pptv}$) over a sample integration interval and duty cycle of roughly 2.5 minutes. The quantitative accuracy of the instrument has been verified by extensive intercomparisons with traditional filter sampling techniques.