

The NOAA ESRL Airborne Aerosol Observatory: The First Two Years of Operation

P.J. Sheridan¹, E. Andrews², and J.A. Ogren¹

¹NOAA Earth System Research Laboratory, 325 Broadway, Boulder, CO 80305; 303-497-6672,
Fax: 303-497-5590, E-mail: patrick.sheridan@noaa.gov

²Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO 80309

In June of 2006, ESRL began conducting regular (2-3 times per week) light aircraft measurements over central Illinois. The program is the Airborne Aerosol Observatory (AAO), and the platform is a Cessna T206H aircraft. The primary objective of this program is to obtain a climatology of aerosol properties aloft for evaluating aerosol radiative forcing and testing chemical transport models. During the first 18 months (through end of 2007) over 200 flights were conducted, with many of these near the Bondville, Illinois surface station. Statistical distributions and climatologies of aerosol properties have been compiled for the set of AAO research flights. Low altitude fly-bys of the Bondville station show that surface measurements of aerosol extinction are representative of aerosols in the lowest km of the column. Although individual profiles can be quite variable, the climatological profile of single-scattering albedo shows very little variation in the vertical. Comparisons of AAO aerosol data have been made with measurements collected on another Cessna 206 aircraft flying a similar aerosol package in profiles over Oklahoma. Examples of typical profiles and comparisons of profile climatologies at each site will be presented. Comparisons of AAO *in situ* measurements with Aeronet sunphotometer data will also be discussed.

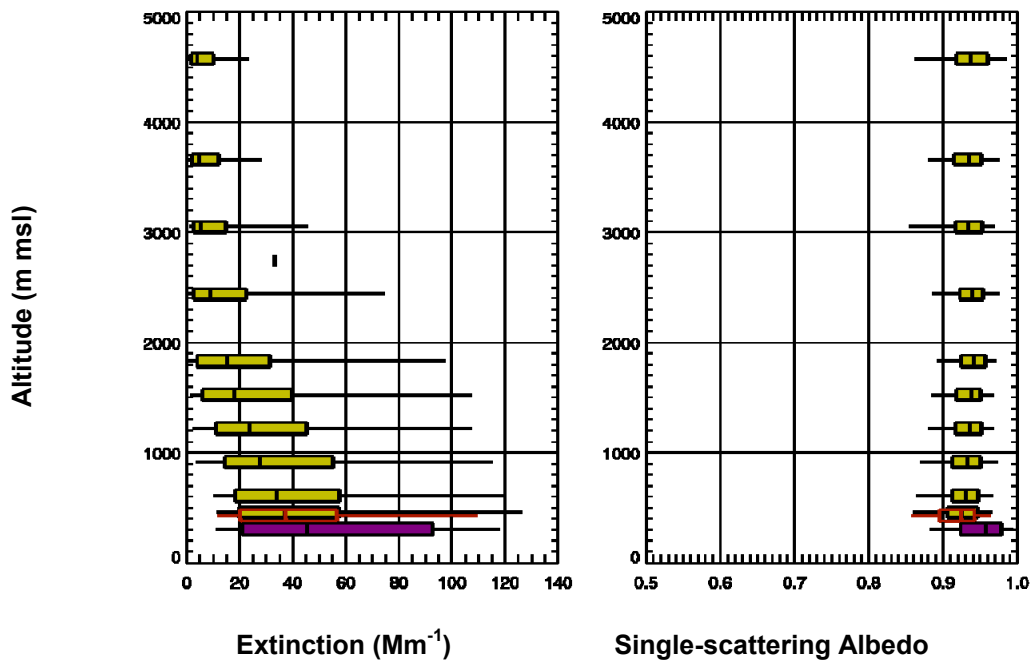


Figure 1. Statistical distributions of extinction (550 nm) and single-scattering albedo taken from AAO vertical profiles over Lodge, IL. Yellow boxes represent the distribution of data on the profile levels, purple boxes show the distribution of concurrent Bondville surface data, and the red outline boxes represent low-altitude Bondville station fly-by data. The surface extinction measurements agree well with aircraft data in the lowest km of the column after accounting for particle size sampling differences. Single-scattering albedo shows little variation in the vertical, but SSA at altitude is generally slightly lower than at the surface.