

DOE Aerosol Intensive Operating Period (AIOP) May 2003

Carbonaceous species (BC and OC) are responsible for most of the absorption associated with aerosol particles. The amount of radiant energy an aerosol absorbs has profound effects on climate and air quality. It is ironic that aerosol absorption coefficient is one of the most difficult aerosol properties to measure. A new cavity ring-down (CRD) instrument, called Cadenza (NASA-ARC), measures the aerosol extinction coefficient for 675 nm and 1550 nm light, and simultaneously measures the scattering coefficient at 675 nm. Absorption coefficient is obtained from the difference of measured extinction and scattering within the instrument.

The DOE Aerosol Intensive Operating Period (IOP) was flown in May, 2003 over northern Oklahoma. One of the main purposes of the IOP was to assess our ability to measure extinction and absorption coefficient in situ. This paper compares measurements of these aerosol optical properties made by the CRD, PA, nephelometer, and Particle Soot Absorption Photometer (PSAP) aboard the CIRPAS Twin-Otter. During the IOP, several significant aerosol layers were sampled aloft. These layers are identified in the remote (AATS-14) as well as in situ measurements. Extinction profiles measured by Cadenza are compared to those derived from the Ames Airborne Tracking Sunphotometer (AATS-14, NASA-ARC).

Comparison of Cadenza Extinction and (Neph+PSAP) Extinct

