



Advances in studying the optical properties of complex aerosols with organic components

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Aerosols scatter and absorb incoming solar radiation and hence affect the radiative balance of the planet. The effects of aerosols are among the largest uncertainty in our understanding of the current and future climatic changes. We will present laboratory studies using cavity ring down (CRD) aerosol spectrometer to derive the extinction and complex refractive index of aerosols containing a significant organic component. By precisely measuring extinction as a function of particle size, the real and imaginary refractive indices are obtained and the single scattering albedo may be calculated. Specifically, we will present measurements of the complex refractive index of organic components intrinsic to soot particles at 532 and 355 nm, test various optical mixing rules and will present results on the extinction of core-shell particles. In addition, we will present a new combination of a continuous wave spectrometer (CW-CRD-AS) with a photoacoustic cell in order to measure independently the absorption and total extinction of aerosols. The instrument can be used for field work and will discuss its advantages compared to pulsed systems. Finally, retrieval of aerosol refractive index using a white light spectrometer will be presented.