



Aerosol optical properties near Guangzhou, China during the PRIDE-PRD2006 campaign

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The extinction of solar radiation by aerosol particles is of great importance for the Earth's radiative balance and climate. The optical properties of atmospheric aerosols are, however, highly variable and not well characterized. In this study, aerosol optical properties were measured approximately 60 km northwest of the megacity Guangzhou in south China. These measurements were part of the "Program of Regional Integrated Experiments of Air Quality over the Pear River Delta" intensive campaign in July 2006 (PRIDE-PRD2006).

Prior to the aerosol optical measurements, the sampled air was dried to below 40% RH (generally 20-40 % RH). Three instruments were used to measure light absorption and scattering by aerosol particles. Aerosol scattering coefficients at 450 nm, 550 nm, and 700 nm were determined with a TSI three-wavelength nephelometer. Aerosol absorption coefficients were measured with a DRI Photoacoustic Spectrometer in situ at 532 nm and with a Carusso/MAAP instrument on a glass fiber filter tape at 670 nm.

During the 30-day measurement campaign, a variety of different types of air masses and meteorological conditions were encountered, including high pollution events from local biomass burning. The maximum aerosol scattering and absorption coefficients during these polluted periods were 1900 Mm^{-1} (at 550 nm) and 838 Mm^{-1} (at 532 nm), respectively. The average single scattering albedo for the campaign was 0.83 (at

532 nm); however, there were many instances where significantly lower single scattering albedo values were measured (as low as ~ 0.6). In addition, diurnal cycles of single scattering albedo and Angstrom exponents were observed; both parameters showed a minimum value in the early morning ($\sim 4:00$). These measurement results suggest that the local aerosol emissions may have a large impact on the radiative balance of the Pearl River Delta region. Characteristic results will be presented and atmospheric implications will be discussed.