

***WAVELENGTH-DEPENDENT OPTICAL PROPERTIES, MASS ABSORPTION  
COEFFICIENTS, AND CLOSURE STUDIES FOR CARBONACEOUS AEROSOLS AT  
THE 2010 CARES CAMPAIGN, SACRAMENTO, CALIFORNIA***

Bradley Flowers, Allison Aiken, and Manvendra Dubey, *Los Alamos National Laboratory*

Madhu Gyawali and Pat Arnott, *University of Nevada*

Kyle Gorkowski and Claudio Mazzoleni, *Michigan Technological University*

R. Subramanian, *Droplet Measurement Technologies*

Arthur Sedlacek, Gunnar Senum, and Stephen Springston, *Brookhaven National Laboratory*

Ari Setyan and Qi Zhang, *University of California, Davis*

Chen Song, John Shilling, Josef Beranek, Alla Zelenyuk, and Rahul Zaveri, *Pacific Northwest National Laboratory*

For presentation at  
The Second Science Team Meeting of the  
Atmospheric System Research (ASR) Program,  
San Antonio, TX  
March 28-April 1, 2011

**Environmental Sciences Department/Atmospheric Sciences Division  
Brookhaven National Laboratory**

**U.S. Department of Energy  
Office of Science**

**ABSTRACT**

Aerosol absorption and scattering coefficients measured at ground sites and by the DOE G-1 aircraft during the Carbonaceous Aerosols and Radiative Effects Campaign (CARES) of summer 2010 are analyzed. We report wavelength-dependent single-scatter albedo ( $\sigma_{sca}/\sigma_{ext}$ ) from simultaneous measurements of aerosol absorption and scattering at nine wavelengths between 1047–355 nm by eight separate integrated photoacoustic/ nephelometer (IPN) instruments. The  $9-\lambda$  absorption coefficients are combined with black carbon mass measurements from single-particle soot photometers (SP2) to derive wavelength-dependent mass absorption coefficients, including new results at UV wavelengths. The absorption and scattering data are combined with concurrent particle size distributions to estimate complex refractive indices ( $n-ik$ ). The imaginary part of the complex refractive index ( $ik$ ) is sensitive to enhanced absorption by organic coatings on soot cores and/or directly emitted primary and secondary organic particles. Closure studies will compare the estimated top-down refractive indices with bottom-up calculations using the observed chemical composition from aerosol mass spectrometers (e.g., Flowers, et al. ACP 2010). The wavelength dependence of optical properties and MACs for fresh and aged urban and rural emissions, including biomass burning, will be presented to help models accurately estimate net radiative effects for carbonaceous aerosol.

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**NOTICE:** This manuscript has been authored by employees of Brookhaven Science Associates, LLC under Contract No. DE-AC02-98CH10886 with the U.S. Department of Energy. The publisher by accepting the manuscript for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.