

***CIMEL SUN PHOTOMETERS: UPDATES ON NEW DEPLOYMENTS AND CLOUD
MODE ZENITH RADIANCE DATA***

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ABSTRACT

Since March 1998, ARM has deployed Cimel Sun PHOTometers (CSPHOT) at several but not all ARM sites. This past year, as part of the deployment of the Boundary Layer Cloud System, 6 new units were acquired. The ARM CSPHOT deployments were expanded to include the second ARM Mobile Facility (AMF2), Manus, and Darwin. The older units at the Southern Great Plains (SGP) and first ARM Mobile Facility (AMF1) were replaced. And an additional spare was added to the rotation to make sure units get calibrated at NASA's Aerosol Robotic Network (AERONET) between deployments with a minimum of interruption to the observations. This last unit will be part of the Aerosol Life-cycle campaign at Brookhaven National Laboratory in the summer of 2011 to make a connection to column aerosol properties for the very detailed in-situ aerosol observations of the Mobile Aerosol Observing System (MAOS). In the past, the CSPHOTs were only used under predominantly clear sky conditions to derive aerosol properties and the instrument remained in sleep mode during cloudy periods. Marshak et al. (2004) suggested that over vegetated surfaces cloud optical depth could be derived from ground-based zenith radiance measurements. Christine Chiu worked with AERONET using the CSPHOT at SGP to alter the observing strategy to include a number of zenith radiance observations during previously idle periods (Chiu et al., 2010). This "Cloud Mode" has now been enabled operationally on all ARM CSPHOTs. However, since the wet sensor does not always detect snow, and since the cloud optical depth retrieval algorithm requires vegetated surfaces, the cloud mode is turned off during snow seasons. The provisional cloud mode data are now available in the AERONET archive (http://aeronet.gsfc.nasa.gov/new_web/cloud_mode.html) and will soon be available through the ARM archive.

References:

Chiu, J. C., C.-H. Huang, A. Marshak, I. Slutsker, D. M. Giles, B. N. Holben, Y. Knyazikhin, and W. J. Wiscombe, 2010: Cloud optical depth retrievals from the Aerosol Robotic Network (AERONET). *J. Geophys. Res.*, 115, D14202, doi:10.1029/2009JD013121.

Marshak, A., Y. Knyazikhin, K. Evans, and W. Wiscombe, 2004: The "RED versus NIR" plane to retrieve broken-cloud optical depth from ground-based measurements. *J. Atmos. Sci.*, 61, 1911-1925.

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