



Southern Great Plains Newsletter

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Summer Upgrades Will Improve Raman Lidar's Performance

The SGP Raman lidar (light detection and ranging) instrument at the central facility is getting a major tune-up to restore and improve its data-gathering capabilities. This ground-based remote sensing instrument uses laser technology to measure vertical profiles of atmospheric properties. The system will be out of service from late June until mid August.

New signal acquisition and processing electronics were installed in May. The telescope used to receive backscattered light is being removed in late June and returned to the manufacturer so that its mirrors can be stripped and recoated. The telescope will be reassembled and realigned after the mirrors have been refurbished. All of the critical interference filters will be replaced with new filters having higher transmissivity, to strengthen the signal reaching the detector. Other improvements include repairing the automated alignment subsystem and purchasing a spare external viewing window.



Figure 1. The Raman lidar at the SGP central facility. (ARM Photo)

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The atmospheric properties measured by the Raman lidar include water vapor mixing ratio, aerosol scattering ratio, and backscatter depolarization ratio. Cloud- and aerosol-related quantities are calculated from the measured backscatter signals. The SGP Raman lidar is a custom-designed instrument developed for the ARM Program by Sandia National Laboratories (<http://www.arm.gov/instruments/static/rl.stm>).

EarthStorm Workshop for Teachers Meets in July

One element of the ARM Program's mission is educational outreach to communities surrounding ARM facilities. The SGP Educational Outreach Program is hosting an EarthStorm Weather Institute for Teachers on July 12–15, 2004, at the University of Oklahoma's Sarkeys Energy Center in Norman. This free four-day workshop will give K–12 teachers an opportunity to investigate weather and improve their skills in preparing students to design and implement science fair projects.

In the EarthStorm Weather Institute, meteorologists from the Norman area and educators from Kansas and Oklahoma will share ideas and resources for teaching meteorological concepts and will establish long-term associations supporting science education. More information is online (<http://k12.ocs.ou.edu/teachers/workshops/default.html>).

The SGP Educational Outreach Program is administered by and in partnership with the Oklahoma Climate Survey, the University of Oklahoma, and the Oklahoma Mesonet.

Improvements to Aerosol Observing System Will Broaden Its View

The particle soot absorption photometer instruments in the SGP Aerosol Observing System (AOS) trailer and on the aerosol profiling aircraft are configured to collect measurements of absorption at a wavelength of 565 nanometers in the light spectrum. Scheduled upgrades to these instruments will expand their measurement capabilities to wavelengths of 450–700 nanometers. The new absorption measurements will complement scattering measurements made at the same wavelengths by nephelometers.

A Tandem Differential Mobility Analyzer (TDMA) to be built by Texas A&M University will be deployed at the AOS in 2005. Vacuum pumps used to draw air samples for the instruments will be relocated outside to make room for the TDMA installation and to reduce heat and noise inside the trailer. Aerosol characteristics measured by the TDMA include size distribution, refractive index, and ability to absorb moisture.



Figure 2. The Aerosol Observing System Trailer at the SGP central facility. (ARM photo)

To provide more research capability for the global scientific community, the scientific infrastructure and data archive established through the Department of Energy's Atmospheric Radiation Measurement (ARM) Program are now being made available for use by scientists worldwide through the ARM Climate Research Facility.