

July 2003

ARM Facilities Newsletter

ANL/ER/NL-03-07



Representative Lucas and Senator Myers Support SGP Site

U.S. Representative Frank Lucas and Oklahoma State Senator David Myers recently voiced support for the ARM Program SGP site in an effort to highlight the site and its needs. Though the SGP central facility and activity hub near Lamont, Oklahoma, has 31 employees and attracts hundreds of visiting scientists, its only access is via dirt roads. These roads can make travel to the site, especially in wet weather, difficult and treacherous for employees, visitors, and heavy vehicles delivering equipment.

Because the Department of Energy ARM site, the largest outdoor laboratory in the world, benefits the local communities economically, Senator Myers and Representative Lucas are seeking

federal funding to improve the access roads. Representative Lucas recently stated in the *Blackwell News*, "The ARM Program is a hidden treasure of sorts. Few Oklahomans know that on the back roads of rural Oklahoma is a world-class U.S. climatological research facility — one of only three in the world. I'll be working with state and local officials, including State Senator Myers, to ensure this facility has the resources available to continue its important scientific research." Senator Myers recently toured the central facility with Julie Arntz, a member of Congressman Lucas's staff, to observe the activities in progress and the instruments deployed at the SGP site. Senator Myers is also hopeful that funding will be made available to upgrade the access road to the facility.

ARM Facilities Newsletter is published by Argonne National Laboratory, a multiprogram laboratory operated by The University of Chicago under contract W-31-109-Eng-38 with the U.S. Department of Energy.

Technical Contact: James C. Liljegren
Phone: 630-252-9540
Email: jliljegren@anl.gov
Editor: Donna J. Holdridge

Broadband Outdoor Radiometer Calibration (BORCAL) Takes Place at SGP



Figure 1. The Radiation Calibration Facility as seen from the air at the SGP CART site (ARM photo).

To measure solar radiation reaching Earth's surface, the SGP site uses radiometers, instruments that measure incoming shortwave solar radiation. The several types of radiometers each have specialized measurement jobs. Because the measurement of solar radiation is essential to ARM's work, the accuracy of these measurements is critical.

The World Radiation Center in Switzerland maintains the World Radiometric Reference, an internationally recognized standard for shortwave solar

irradiance measurements. All of the ARM sites calibrate their solar radiation instruments against this standard. The SGP site is home to ARM's Radiometer Calibration Facility, a large outdoor platform on which radiometers can be mounted. A shelter below the platform houses the computer equipment used to perform the calibration procedures. The Radiometer Calibration Facility was designed to calibrate up to 100 radiometers simultaneously.

The ARM Program conducts two radiometer calibrations events each year — BORCAL-1 in June and BORCAL-2 in August. ARM has enough spare radiometers so that all of the radiometers can be calibrated each year without interrupting full operations in the field. The ability to place a newly calibrated instrument in the field every year increases confidence in the quality and accuracy of the data collected.

This year radiometers from the ARM Unmanned Aerospace Vehicle program and from the Naval Research Laboratory will be included in the BORCAL events. The participation of such organizations is the best kind of compliment to ARM's state-of-the-art Radiometer Calibration Facility.

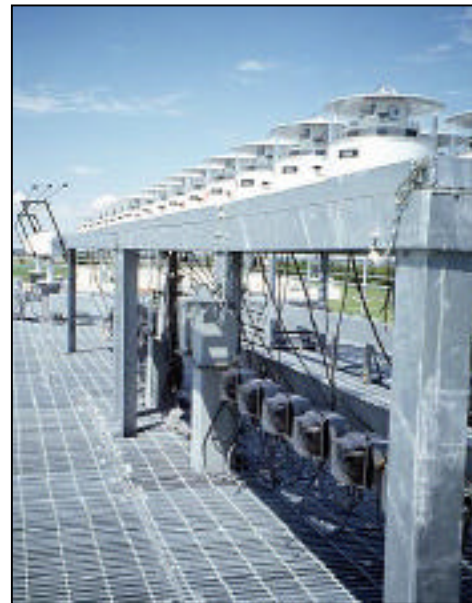


Figure 2. Radiometers are mounted atop the Radiation Calibration Facility at the SGP central facility to be tested during the BORCAL event (ARM photo).

ARM Program Research Featured in *Science* Magazine

Research results based on ARM data were published in the June 20, 2003, issue of *Science*, a highly prestigious publication of the American Association for the Advancement of Science. The author of the article indicated that portraying clouds correctly and realistically in climate models is even more important than had been believed. Previous calculations estimated that clouds absorb 40% more incoming solar radiation than earlier work had predicted. This finding greatly alters the way a computer climate model distributes energy throughout the climate system, changing surface heating and the hydrologic cycle — and thus changing the predicted climate trends. The researchers used cloud and radiation data collected at the ARM SGP site during two intensive observation periods — ARM Enhanced Shortwave Experiments (ARESE and ARESE II) in 1995 and 2000 — as a basis for verifying their calculations. ARM data were essential for improving the radiative transfer models incorporated into climate models, making the climate model results more realistic overall. The *Science* article (Adobe Acrobat Reader required) is online at this location:

<http://www.sciencemag.org/cgi/reprint/300/5627/1859a.pdf>