

New ARM measurements for detailed atmospheric observationsJames Mather[†];[†] Pacific Northwest National Laboratory, USALeading author: Jim.Mather@pnl.gov

The DOE Atmospheric Radiation Measurement (ARM; <http://www.arm.gov>) program has recently enhanced its observational capabilities at its fixed and mobile sites as well as its aerial facility. New capabilities include scanning radars, several types of lidars, and an array of aerosol instruments. All ARM sites have been equipped with dual frequency scanning cloud radars that will provide three-dimensional observations of cloud fields for analysis of cloud field evolution. Sites in Oklahoma, Alaska, and Papua New Guinea have also received scanning centimeter wavelength radars for observing precipitation fields. This combination of radars will provide the means to study the interaction of clouds and precipitation. A Raman lidar has been stationed at the ARM site in Oklahoma for many years providing profiles of aerosol properties and water vapor. A second Raman lidar has been added, this time in Darwin, Australia. This radar is providing detailed profiles of water vapor through the tropical middle troposphere. ARM has also expanded its capabilities in the realm of aerosol observations. Previously, ARM has operated three Aerosol Observing Systems at Oklahoma, Alaska, and as part of the first mobile facility. These aerosol systems principally provided measurements of aerosol optical properties. Observing systems matching these existing aerosol suites have been added to several new sites. Additionally, a new Mobile Aerosol Observing System has been developed that includes a variety of instruments to provide information about aerosol chemistry and size distributions. Many of these aerosol instruments are also available for the ARM Aerial Facility. The Aerial Facility also includes a variety of cloud probes for measuring size distribution and water content. The new array of ARM instruments is intended to build upon the existing ARM capabilities to better study the interactions among aerosol, clouds, and precipitation. Data from these instruments are now available and development of advanced data products is underway. We will provide an update on the new instruments, data product development work, and anticipated applications.