The Expanded Scope of CMDL Surface- and Aircraft-Based Aerosol Measurements in 2005

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It is well known that unlike the major long-lived gases, aerosols are not distributed uniformly in the troposphere. In order to estimate global aerosol radiative forcing and the effects of aerosols on the global climate, measurements of the aerosols are being made by CMDL at many locations. Many major surface regions remain undersampled, however, and very few long-term measurement efforts have been made at altitude. In a major expansion of activities, the CMDL Aerosol group has undertaken several new long-term measurement campaigns to begin in 2005. In collaboration with the Department of Energy (DOE), a mobile surface aerosol measurement system was developed to be deployed at various locations around the world. This system is currently deployed at Point Reyes, California, and will be sent to Niger, Africa, later this year to measure Saharan dust aerosols. Two additional surface aerosol measurement systems are being developed for the World Meteorological Organization (WMO) Global Atmosphere Watch (GAW) program. These systems will operate at the existing GAW stations at Cape Point, South Africa, and Mt. Waliguan, China, and will provide critical aerosol data from undersampled regions. The current light aircraft sampling program conducting regular vertical profiles over the DOE Cloud and Radiation Testbed (CART) site in Oklahoma is being expanded to include several new measurements. The aircraft platform will be changed from a Cessna C172 to a larger C206 model. Finally, NOAA has funded a new program conceived by the CMDL Aerosol group to conduct regular long-term aircraft measurements over the central United States. Aerosol optical, microphysical, and chemical properties will be measured on this C206 aircraft, as well as carbon cycle gases and ozone. Figure 1 shows the current design. All of these new and expanded measurement programs will use standard CMDL sampling protocols and the normal suite of instruments, making measurements from all platforms directly comparable.

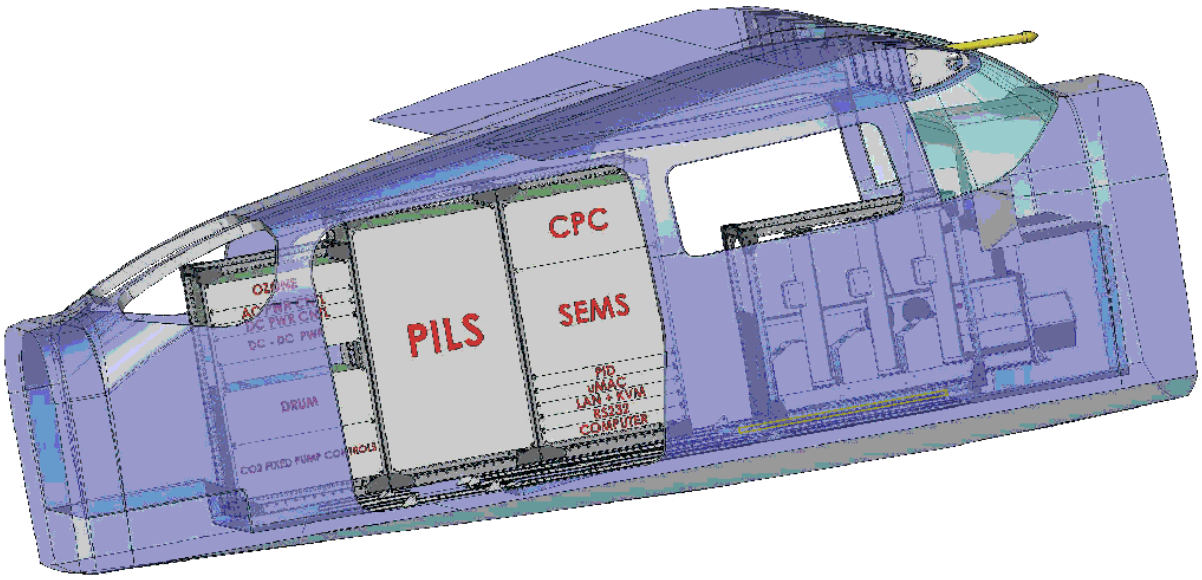

Figure 1. Three-dimensional schematic of the new NOAA Airborne Aerosol Observatory showing orientation of inlet and major measurement systems.