Mt Kenya GAW Station Setup and Initial Results

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The Mt. Kenya Baseline Station is among six stations started by the World Meteorological Organization (WMO) Global Atmospheric Watch (GAW) program in the 1990s. It is situated on the northern slope in the Mt. Kenya Wildlife Reserve at an elevation of 3897 m above sea level (0°3′S, 37°18′E) (Figure 1). This is the only such station on the equator. In 1993 infrastructure was put in place to make the site accessible, and in 1998 an instrumented container station was moved to the site. In March 2002 the staff assigned to operate the station was permanently deployed to the nearby town of Nanyuki.

The mission of the station is to perform long-term measurements of greenhouse gases and aerosols in equatorial Africa and to assess the contribution of agricultural burning and forest-clearing activities to the buildup of regional ozone. In addition, the station assesses the changes in stratospheric ozone in equatorial tropical Africa and checks if long-term trends in UV-B are evident. Among the current activities are measurements of meteorological parameters, trace gases (ozone and carbon monoxide) and aerosol (black carbon) in addition to radiation (global, diffuse and direct radiation). Other measurements include precipitation (analysis of mass, conductivity and sensitivity). Cooperative flask sampling has been started with CMDL for the analysis of CO, CO_2, N_2O, CH_4, H_2, SF_6, and the isotopes of hydrogen and oxygen. Sampling will be done at night using stainless-steel canisters provided by CMDL. Shipping arrangements are not yet completed. Another cooperative agreement will be put in place with Max Planck system has a data logger and other storage devices with a printer and a satellite data transfer system. Some computers are used in data analysis. A good uninterrupted power supply (UPS) has been installed at the station. A small electrical power generator is kept at the station for brief power production to enable data retrieval when there is a main power outage.

Most measurement programs started December 1999, the CO and precipitation chemistry began in September 2002, and aerosols started February 2003. Instrument calibration is done biennially by the Swiss Federal Laboratories for Material Testing and Research (EMPA) for the ozone and carbon monoxide instruments. Observational data go to different quality assurance and scientific activity centers for quality checks. Radiation data are sent to the U.S. National Renewable Energy Laboratory; ozone and carbon monoxide data are sent to the Swiss EMPA.

Figure 1. Mt. Kenya GAW station.