Geophysical Research Abstracts
Vol. 12, EGU2010-8288-3, 2010
EGU General Assembly 2010


# Biomass burning and soil dust aerosol layers over West Africa during the African monsoon dry season

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We present observations of tropospheric aerosol transport over West Africa and the associated meteorological conditions during the African Monsoon Multidisciplinary Analysis (AMMA) SOP-0 dry season experiment, which was conducted in West Africa in January–February 2006. This study (Kim et al., ACP, 2009) combines data from ultra-light aircraft (ULA)-based lidar, airborne in situ aerosol and gas measurements, standard meteorological measurements, satellite-based aerosol measurements, air mass trajectories, and radiosonde measurements. At Niamey (13.5°N, 2.2°E) the prevailing surface wind (i.e. Harmattan) was from the northeast bringing dry dusty air from the Sahara desert. High concentrations of mineral dust aerosol were typically observed from the surface to 1.5 or 2 km associated with the Saharan airmasses. At higher altitudes the prevailing wind veered to the south or southeast bringing relatively warm and humid air masses from the biomass burning regions to the Sahel (<10°N). These elevated layers had high concentrations of biomass burning aerosol and were typically observed between altitudes of 2–5 km. Meteorological analyses show these air masses were advected upwards over the biomass burning regions through ascent in Inter-Tropical Discontinuity (ITD) zone. Aerosol vertical profiles obtained from the space-based lidar CALIOP onboard CALIPSO operated the following year also showed the presence of dust particles at low levels and biomass burning smoke aerosol between 2 and 5 km. CALIOP data indicate that these distinct continental dust and biomass burning aerosol layers likely mix when advected further south over the tropical Atlantic Ocean.