

Evidence of long-range transport of Mexico City outflow based on CMET balloon trajectories during the MILAGRO 2006 campaign

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During the MILAGRO 2006 campaign, free-floating Controlled Meteorological (CMET) balloons made observations relevant to long-range transport, mixing, and dispersion during intensive study periods. The balloons, which were launched from within the Mexico City Metropolitan Area (MCMA), made repeated profile measurements of temperature, relative humidity, and winds as they drifted with the mean flow over distances of up to 1100 kilometers. On March 11-12, a pair of CMET balloons launched into the polluted residual layer in the northeast quadrant of the MCMA followed highly divergent paths with one balloon exiting the basin to the east and later returning and the other exiting through the south gap. On March 18-19, another pair of balloons was launched from the northwest quadrant of the MCMA just after the DOE G-1 aircraft had finished sampling in the area. The balloons were intercepted again after 28 hours by the NCAR C-130 near the US border. A preliminary analysis of the balloon profiles and the aircraft intercept data are presented. The data are the first to combine in-situ meteorological measurements with initial and final aircraft intercepts in a long-range transport event. We expect these data to be of significant value in constraining and evaluating meteorological and gas-aerosol chemistry models.