

DC-8 Flight 24, 13 July

This was the final flight of ARCTAS, the transit from Cold Lake to Palmdale (via LAX for Customs and Immigration). Primary targets were the fires in CA that are still burning since we sampled them during CARB and a final low-level run over the SJV coordinated with distributed sampling on the ground by the UCI group.

Chemical forecasts indicated that we might encounter diffuse remnants of the Siberian/Asian plume at relatively high altitudes over southern Canada and northern US during the first several hours of the flight. Profiling between 20 and 30 kft enroute mainly encountered relatively clean air, though there were small enhancements of CO and some fire tracers.

We descended through low cloud deck over Nevada and immediately observed aged BB smoke in and below the clouds (CA smoke plume on east side of the Sierras). For the remainder of the flight we remained below 9 kft until we had to climb to enter the landing pattern at LAX. DIAL and visual observations of the smoke and haze suggested that smoke was well mixed from the surface up to ~10 kft (higher at times). However, in situ measurements repeatedly found that the densest smoke (highest CO, scattering, absorption, HCN and acetonitrile) was 2-4 kft AGL. At 1000 AGL fire tracers were ~30% lower than maxima on each occasion when we descended. DIAL reported strongest scattering layer above us at ~8-10 kft through much of the low-level run, but in situ observations found this layer to be 50% less "smoke" than the peak near 2.5 kft.

Visibility improved in the SJV compared to the northern Sacramento Valley, and the fire tracers suggested more aged smoke, but it was extremely hazy all the way to the end of our Valley run. We diverted to circle east of Fresno prior to overflying the feedlot at Harris Ranch one final time (PTRMS reported a 2 second spike in MeOH and acetaldehyde over the feedlot).

On landing at LAX we were surprised by how clean the air was. Several investigators reported lowest values since we entered CA, CO was only slightly greater than 150 ppbv. Procedures to clear us back into the country were not at all smooth. After 2.5 hours we took off again and landed 18 minutes later at Palmdale. Monday the DC-8 crew worked miracles again and had all experimenter equipment, and nearly all the probes and windows off the plane by 15:00. Truck from Cold Lake also arrived Monday, so most teams are nearly packed and ready to depart on Tuesday.