

C-130 IMPEX / INTEX-B Flight summary

date: 09 May 2006 (20060509)

flight number: 10

Take-off: 17:29:45 GMT

Landing: 01:03:12 GMT

Objectives:

- intercompare with UW Duchess aircraft (and remotely with the EC Cessna)
- do a spiral over the NATIVE site in coincidence with a Terra overpass
- sample subsiding Asian pollution over high terrain
- sample offshore Asian inflow upstream of Mt. Bachelor

Instrument status:

All instruments, except SABL and RO₂ and HN₃ in 4-channel CIMS, were operating.

Flight summary.

The C130 flight was delayed 30 minutes because the Duchess had a problem. Even so, the Duchess left just after the C-130 from Paine Field, but arrived at the rendezvous point within 30 minutes of the C-130 spiral. The air was fairly uniform according to the profiles the C-130 did in region.

Finding evidence of entrainment of Asian air into the boundary layer proved to be difficult over the mountainous terrain. On the other hand, narrow layers of polluted air, perhaps of different origins, and more stratospheric-like air were encountered in random order. As the C-130 crossed mountain ridges in Oregon, it passed through more polluted boundary layer air over the ridge tops.

The spiral over the NAÏVE trailer was centered initially about 10 km from NATIVE. The ozonesonde balloon was seen from the C-130 and was blown within a km of the C-130 during the C-130's spiral. The C-130 was there too late for a Terra overpass.

Several layers were encountered along the whole flight path. Gaseous pollutants were not as strong as has been observed in layers on other flights; CO rarely exceeded 200 ppbv. However, a variety of aerosol particles were sampled in different layers. Layers that contained dust, sulfate, and few organics were sampled at different altitudes between 10 and 19 kft. A layer containing sulfate, sulfur compounds, and some reactive trace gases was encountered about 1 kft above the fair-weather cumulus layer over the ocean. The aerosol particles at 100 ft above the ocean contained sulfate and other components. Organic aerosols were encountered at the lower altitudes over land.

On the return toward Seattle, a zigzag curtain between 7 and 10.5 kft was flown in air that was projected to reach Mt. Bachelor. Because the bottom of the layer was much more polluted than the top, these data might provide useful information on air flow.

Overall summary. Most objectives were met. The Duchess and NATIVE comparisons were likely both successful, due in part to the relative uniformity of the air composition. It is not clear that the sampling of subsiding air over mountainous terrain was successful. Perhaps the plan for the next flight will work better.