

C-130 IMPEX / INTEX-B Flight summary

date: 26 April 2006 (20060426)

flight number: 4

Take-off: 17:19:42 GMT

Landing: 00:57:54 GMT

Objectives:

- sample northern part of Asian pollution plume
- learn the models' predictive capabilities for Asian plumes

Instrument status:

All instruments, except SABL and HNO₃ in 4-channel CIMS were operating for the flight.

Flight summary.

A Military Operations Area near the Canadian border became active around the time of take-off, forcing the C130 to fly out through the southwestern corridor (Sedar). As a result, the C130's range to the northwest was rerouted to 51N and 138W. This point was just barely to the north of the weather front area. Even though the penetration of the frontal zone was not as deep as had been planned, a smorgasbord of air types were encountered during the flight.

Southeast of the front on the way north was a mixture of clean and polluted air parcels. CO varied from less than 100 ppbv to over 150 ppbv. Other pollutants also varied as well. Apparently new particles were observed in the cleaner air masses. One air mass was quite clean, with little NO_y species and particles.

On the other side of the front north of 50N, just beyond the low cloud deck on the northern side of the high frontal clouds, thin, dark layers of pollutants could be clearly seen. These layers were only at altitudes of about 2500 ft to 8000 ft; the air was cleaner with not evident pollutant layers from 8000 ft up to the C130 ceiling. In the pollution layers, CO was 150 – 200 ppbv, enhanced compared to 110-120 ppbv in the surrounding air. Enhanced NO_y species and particles were also observed in these layers.

On the return leg southeast of the frontal zone, almost over Seattle, very clean air, possibly of tropical origin, was observed. Particles, NO_y species, and other pollutants were very low, although O₃ was roughly 45 ppbv and CO was 130 ppbv.

On descent into Seattle, a layer with a few ppbv of NO_y and enhanced O₃ was seen at 4500 ft; the mixed layer, in which NO_y was constant at about 10 ppbv, began at ~2000 ft.

Overall summary. Despite ATF rerouting and a glitch in the data system for the northernmost portion of the flight, the flight may well have accomplished the objectives, and more.