

Nov 5–6, 2011 – ATTREX Science Flight

Takeoff: 1631 UT, Landing: 0901 UT, Duration: 16:31

There were a number of setbacks during this flight, ultimately resulting in a much shorter flight than planned. However, we did obtain useful science and engineering data, including multiple profiles in the deep tropics, sampling of very cold air, sampling of thin cirrus near the cold point tropopause, and an extended cold soak to evaluate the fuel temperature evolution. Instruments on the aircraft (including AWAS and CPL) generally performed well.

Landing was originally scheduled for 1700 UT Nov 5, which would have given us a 25-hour flight. At the T0 Saturday morning, the TAF indicated overcast and icing conditions starting at about 1300 UT, so the landing was rescheduled for 1200 UT. After takeoff and climbout to lost link, the aircraft headed south. There were numerous Iridium and Ku problems. An \approx 1-hour run at 45 kft was executed along the southbound leg from about 2010 to 2104 UT.

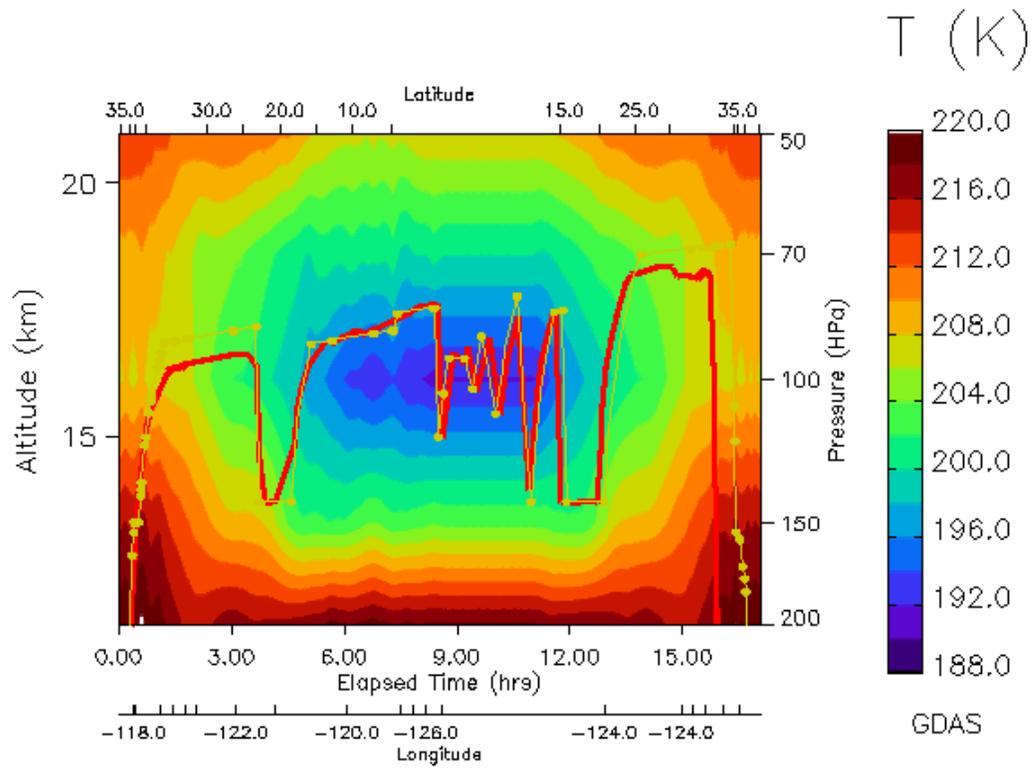
As we headed south into the tropics, the pilots obtained a TAF indicating broken clouds and potential icing conditions over the range earlier than expected. As a result the pilots decided to head back toward base at about 23.5 UT. Lenny Pfister discussed the forecast with the pilots, and Phil Hall spoke to the Air Force forecasters who issued the TAF. It was then decided that we could fly for another two hours in the tropics before returning to base.

At this point, we decided to head west toward a region of cold forecast tropopause temperatures. Toward the end of the westbound leg, the aircraft went through a VPM down to 50 kft. At the westernmost point, the aircraft turned south and had still not climbed back to cruise from the VPM. The pilots noted rapidly decreasing Total Air Temperature (TAT) as we headed south, and shortly thereafter they decided to head back east toward warmer air. A descent was initiated in an attempt to get to warmer air, but the descent was aborted when it appeared that the temperature was dropping. TAT briefly dropped to (or a bit below) the actuator limit (-94 F). The minimum static air temperature indicated by MMS was about 188.5 K. The TT4 fuel temperature bottomed out at about -42 F (several degrees F above the red fault). The pilots then directed the aircraft north and east, and the temperatures warmed up.

Once in somewhat warmer air, the aircraft essentially loitered near 11.5 N for a couple of hours, during which time a few more VPMs through the TTL were executed (see Figure 1). The deepest VPM went to 45 kft. The CPL, SSFR, and FCDP data all indicated thin cirrus near the cold point at times during the TTL sampling.

Instruments generally worked well on this flight with the exception of ULH. Apparently, a bad connector resulted in loss of ULH data for much of the flight.

2011-11-06T02:00 UTC



GLOBALHAWK A/B: atrex_2011-11-05 v. 0

Figure 1: Time-height curtain of forecast temperature along the flight track. The red curve indicates the actual path of the aircraft through the forecast temperature field.