DC-8 Flight 6, Fairbanks to Thule (final destination Iqaluit) 8 April, 2008

The second DC-8 trip to Thule targeted multiple objectives, including: boundary layer run over Prudhoe Bay, hour long formation leg with NASA P3 at 3 altitudes, coordinated spiral with P3 over Eureka at time of CALIPSO overpass, and an exploratory boundary layer rund north of Alert searching for ozone depletion and BrO. All of these were performed as planned, with all instruments except HO_x CIMS operational. Unfortunately, strong cross winds prevented landing at Thule and we had to divert to Iqaluit. Most of the unplanned 2-hour long southward leg was flown in the stratosphere, but we did fly the length of Frobisher Bay in the boundary layer just prior to landing, in a BrO "hotspot" observed by GOME 2.

The pass over Prudhoe Bay occurred before sunrise, but large enhancements of numerous hydrocarbons were observed. Intercomparison with NASA P3 included 15 minute level legs at 18, 7 and 1 thousand feet pressure altitude. After the 15 minute leg at 1000 feet the 2 aircraft separated and descended to 300 (DC-8) and 200 (P3) feet AGL for additional boundary layer sampling. O_3 was slightly depressed, as was GEM, and there was detectible soluble Br^- in the BL. Skies above Eureka were cloud free, and the timing with satellite overpass was excellent. Enroute to our northernmost point DIAL reported indications of depleted O_3 in the boundary layer. In-situ sampling at 300 feet AGL 15 minutes later as we flew from 86 N toward Alert found O_3 mixing ratios < 0.5 ppb, with significant levels of soluble Br^- and Br_2, but very low levels of BrO. GEM was not detectible through the low altitude leg in this region. In Frobisher Bay it was not clear whether O_3 was significantly depleted and no BrO was detected, but small amounts of soluble Br- were observed.