

July 7, 2005 – Science Flight

Flight plan:

The objectives of this flight are to sample upper tropospheric and lower stratospheric airmasses with a variety of origins (Figure 1) as well as possibly sampling convective outflow. Head southeast during ascent and hold at 43 kft before ascending into the stratosphere (53 kft) and cruising at that level for 15 minutes. Next, fly a crenellation pattern along a northwest-southeast track including level legs at 41 and 49 kft across strong potential vorticity gradients. Sample outflow cirrus from the mesoscale convective system (MCS) present along the flight track at the Texas/Oklahoma border. At the end of the flight, dive to 33 Kft and climb to maximum altitude over the Gulf before heading back to base.

Planned takeoff time is 9:00 CDT (1400z); the estimated duration is 5:15.

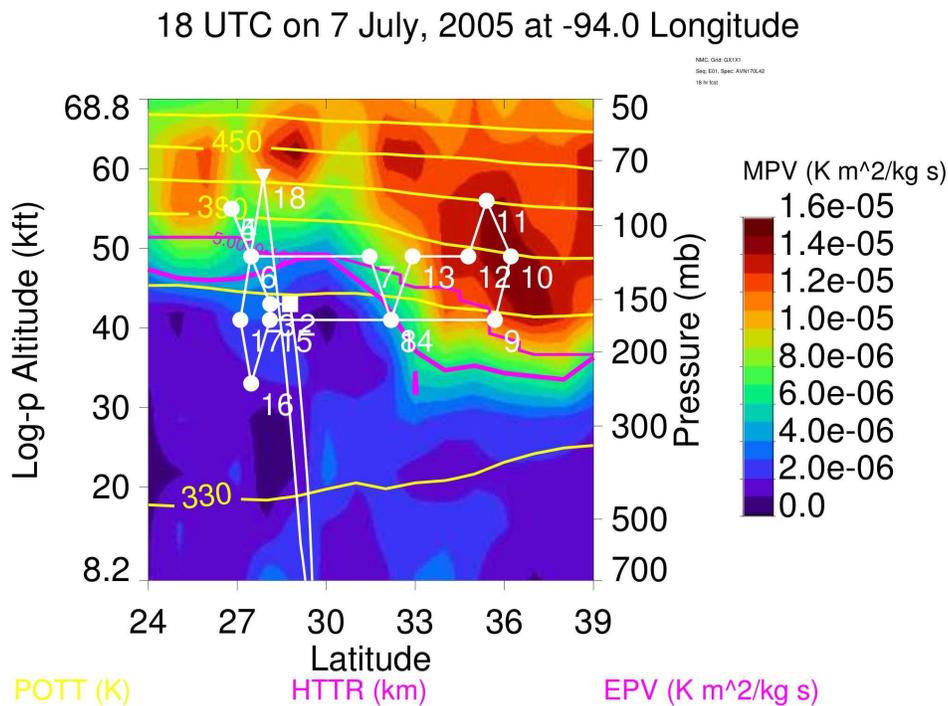


Figure 1: Latitude-height plot of flight plan.

Report:

The flight was flown as planned, with an ontime takeoff and a 5.5 hour duration. Several convective outflow cirrus layers were sampled on the flight at a variety of altitudes (Figure 2). On the northbound leg, the aircraft flew at 41 kft in the tops of the anvil generated by the midwestern MCS. Higher cirrus was sampled on the southern end of the flight track in the Gulf. Airmasses in the tropopause region transported from the tropical western Pacific, the eastern Pacific/South America, and high latitudes were potentially sampled.

Unfortunately, most of the isotope instruments still had some problems. However, some of the isotope instruments did appear to operate properly, and the other instruments on the aircraft worked well. The tracer, cloud, water, and isotope measurements in a variety of airmasses as well as convective outflow will be very useful.

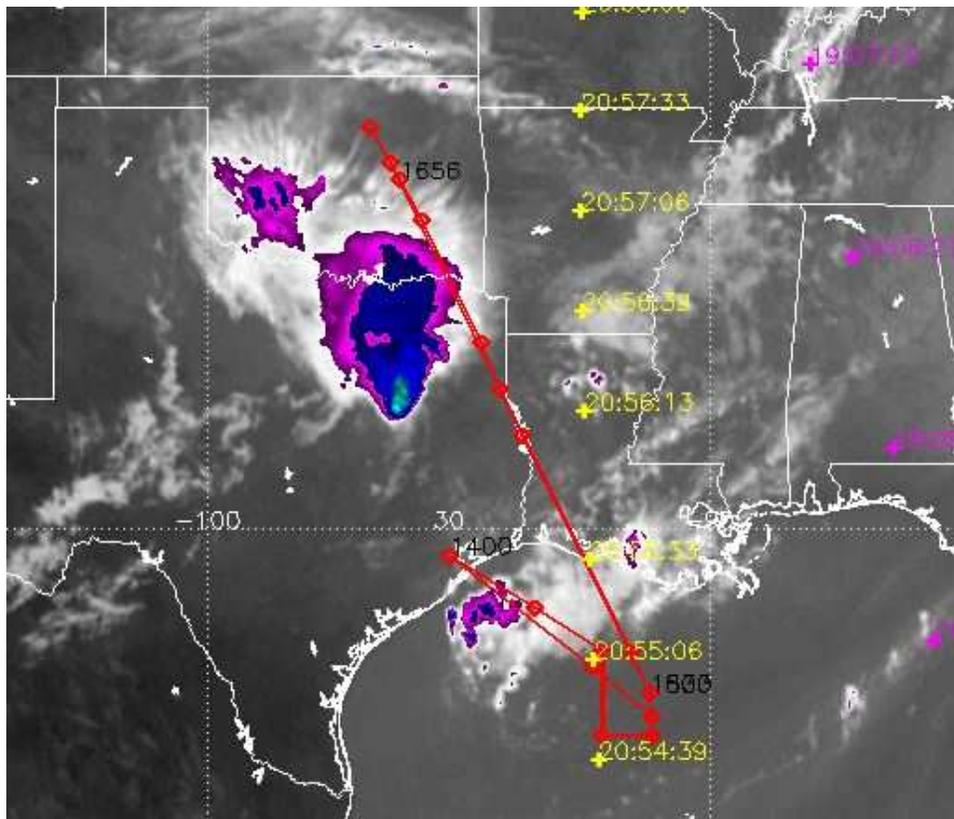


Figure 2: Flight track overlaid on the IR satellite image (Courtesy Lenny Pfister).