

April 21, 2011 – Science Flight

Takeoff: 1430 UT, Landing: 2002 UT

The plan for this flight was to sample cirrus over the SGP flight in coordination with the SPEC Learjet. However, air traffic controllers were extremely busy redirecting commercial aircraft around severe weather to the east of where we wanted to operate. The WB57 and Learjet approached the first coordinated waypoint, and the WB57 was put in a hold. The Learjet was unable to fly near the SGP site, and after discovering that a key probe (2DS) was not functioning properly, they returned to base. The WB57 was eventually cleared to fly southwest over the SGP site at 28 kft, but they were between cloud layers.

The aircraft was then sent southwest to sample anvil cirrus streaming into central Texas. There were two classic convective cloud systems with convection anchored in western Texas/northern Mexico and anvils extending $\simeq 100$ km east. During the run under the northern anvil, they could not get clearance to ascend above 28 kft, and they were below the anvil until near the southern edge of the anvil. The aircraft next climbed up through the anvil, exiting the cloud at $\simeq 43$ kft. The anvil profile indicated clear size sorting with ice concentrations increasing from 5 to 435 L^{-1} and effective radius decreasing from 45 to $14 \mu\text{m}$ as the aircraft ascended through the cloud.

The aircraft next ascended to 5 kft en route to the balloon intercept point at $\simeq 24.2$ UT, and spiraled down to about 40 kft.



Figure 1: Image taken from the WB57 cockpit showing the deep convection in western Texas.

Table 1: Instrument performance

SID3	Worked well
VIPS	Worked well
2DS	Worked, but noisy
CDP	Worked well
HVPS	Worked well
CPI	Potentially only small crystals
CIN	Failure
NMASS	Minor problem
FCAS	Worked well
PALMS	Minor problem
MMS	Worked well
ALIAS	Worked well
CLH	Worked well
JLH	Potential problem
ULH	Alignment problem
DLH	Potential offset
Harvard Water Vapor	Worked well
HHH	Potentially worked
Harvard Total Water	Not flown
Harvard Halogens	Minor problems
FISH	Worked well
CIMS	Worked well
O3	Worked well
O3Lite	Worked well
Frostpoint balloon	Mostly worked