

Sept 21, 2010 DC-8 Platform Scientist Report

Takeoff 154748 UTC Landing 231156 UTC

Accomplished at least 3 major objectives:

- 1) Square spiral pattern in PGI-46, with 19/19 dropsondes good and all other instruments functioning well.
- 2) CloudSat/Calipso underflight for deep precipitating clouds at overpass time of 1731 UTC, then northward from that point over a heavy and widespread dust outbreak.
- 3) Still in conjunction with the underflight, but offset 15 nm westward to account for wind, runs through dust at 7500 and 5000-6000 ft., 1000 ft subcloud, and 2600ft just above cloud base to compare cloud droplet population with aerosol counts below cloud base.

Thanks to Simone Tanelli and the LASE+LARGE teams for timely alert to the unusual opportunity for this favorable orbit of CloudSat/Calipso just east of the Antilles that passed from heavy clouds south of 15N to widespread heavy dust and 20 knot surface winds that lofted sea salt particles in the subcloud layer. This permitted us to be directly under the satellite(s) within a minute or two of overpass time in deep clouds for APR-2 (that might change rapidly), and still not far off in time for the run over the dust layer.

First, shortly after takeoff we did an early dust run at 7500 ft with good data for LARGE. (Dust was evident near the surface at STX all morning.)

After a "scouting" run south along the satellite track to select the right location to return northbound at overpass time, the actual underflight was over mostly anvil, with stratiform precip + bright band, with only a few convective clouds below. See APR-2 image attached.

Immediately after the cloud part of the underflight, we descended from FL350 to 250 to assure LASE data under cirrus, made a dropsonde at 16.0 and 17.5 N along that track before descending enroute northbound until the drop splashed. Then we accomplished a series of runs in the dust, above, within, below clouds, and importantly, just above cloud base, which was quite uniform near 2400 ft. LASE, LARGE, DAWN, and Microphysics all reported excellent data in this set of legs that was well coordinated with Calipso. Kudos to the flight crew and navigator for getting the timing and altitude changes as requested.

The attached figures show the weather system that was investigated with the square spiral pattern, but with one major exception. We started by proceeding west along 16N after the dust work. Shortly after starting the southbound leg we entered the Venezuela FIR, hoping that we would be permitted to carry out the pattern efficiently, as sketched. The bad news is that their ATC asked us to turn around, and return to our entry point near 16/67, but the good news is that we had already proceeded quite far south, so we did get 3 dropsondes on the west side of the vorticity maximum (~ 63-64W). So with advice from both the GRIP and PREDICT teams, we used the remaining time to get a double line of dropsondes, the first just east of the Venez. FIR, the second about 60-75 nm east of that. We eliminated the points farthest to the SE.