

**TC<sup>4</sup> DC-8 Science Flight – Stratus Flight**  
**29 July 2007**  
**Prepared by Mark Schoeberl**  
**All times local – Add 6 hrs to get GMT**

**Objectives:**

1. Examine chemical and particle distributions of stratus layers off Ecuador
2. Sample the Tungurahua volcanic plume
3. Underfly the CALIPSO and Cloudsat tracks
4. Avoid turbulence and lightning

Takeoff 6:42 am

BBIR is not working due to computer problems.

Power on (engine start) was unacceptably delayed after power off (~40 min). We need power on the aircraft 1.5 hours before doors close. Ozone 3 ppb on runway. On the way to the stratus waypoint off of Ecuador, we overflowed boundary layer stratus that extended upward to 6 kft – some of this precipitating according to APR-2.

Boundary layer stratus leg was moved further south to begin at the endpoint of the plan (below), moving along the same line. This was fortunate, because we did not get permission from ATC to descend to the track until late, and we were far south along the flight lane. This region had both open and closed cellular structure. Descended to cloud top at 2.5 kft, then descended to base at 1.5 kft. The base descended as we flew south, and we moved downward to about 1 kft. Turned and ascended to 4 kft, then descended back into layer. Continued probing the stratus layer above and below the clouds on intervals designed to allow SAGA and WAS to take samples. Went to 500 ft for biogenic gases since it was clear under the cloud deck. This is an upwelling region, so should have a lot of biological activity. Continued at 3 kft then 5 kft until turn toward Ecuador – could see aerosol layers out the window. DIAL located a layer near 11 kft and another layer higher up (see plot below). Flew in layer at 11 kft in plume (based on *in situ* measurements), then off the coast of Ecuador ascended to 19 kft and found plume again. Flew north. At some point we realized that we were missing a Nav that was the start of the Cloudsat-CALIPSO track; so we had to run a little east to catch the satellite track start. Went to satellite overpass point and did an improvised racetrack for APR-2. After the overpass, we went north sampling cirrus shields. LASE/DIAL saw dust in the Caribbean sector. Did a pitch maneuver for MMS.

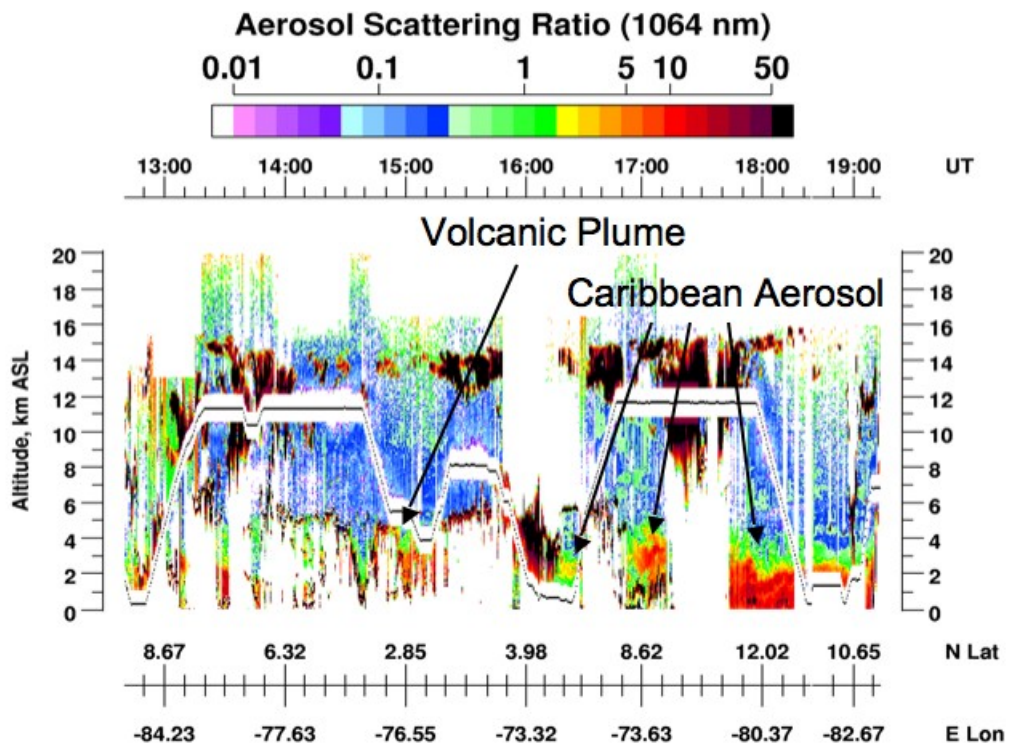
Landed ~2:09 PM local.

- Mark Schoeberl

TC4

Flight 6

21 Jul 07



DIAL image

Photos from the flight:

Ramp to Shopping Center

Melia Cariari Hotel



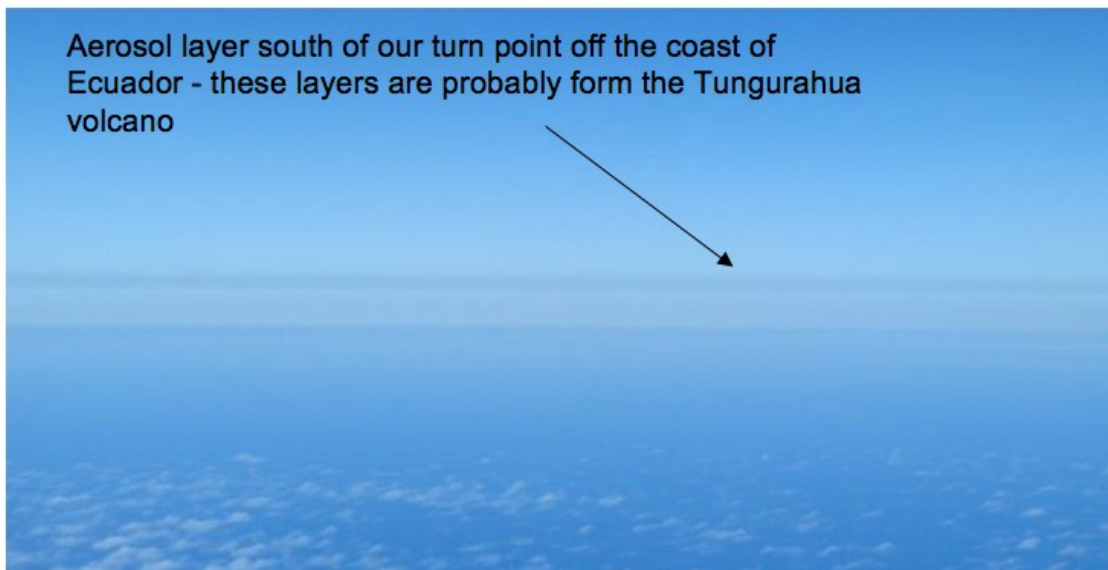
We had a good view of the Meliá Cariari Hotel on takeoff



Convective system developing on the Pacific side (photo 7:28 am)



**Stratus deck off the coast of Ecuador/Peru (photo 9:20 am)**



**Volcanic residue off the coast of Ecuador (photo 10:37 am)**



**Edge of a convective cirrus shield over the Caribbean side (photo 1:13 pm)**