

**TC4 ER-2 Science Flight: July 24, 2007**  
*Tentative Flight Plan*

**Flight Scientists:** P. Newman, S. Platnick

**Sortie:** 07-9021

**Pilot:** Denis Steele

**Takeoff (MROC):** 1200 UTC (6:00 AM local)

**Landing (MROC):** 1850 UTC (12:50 PM local)

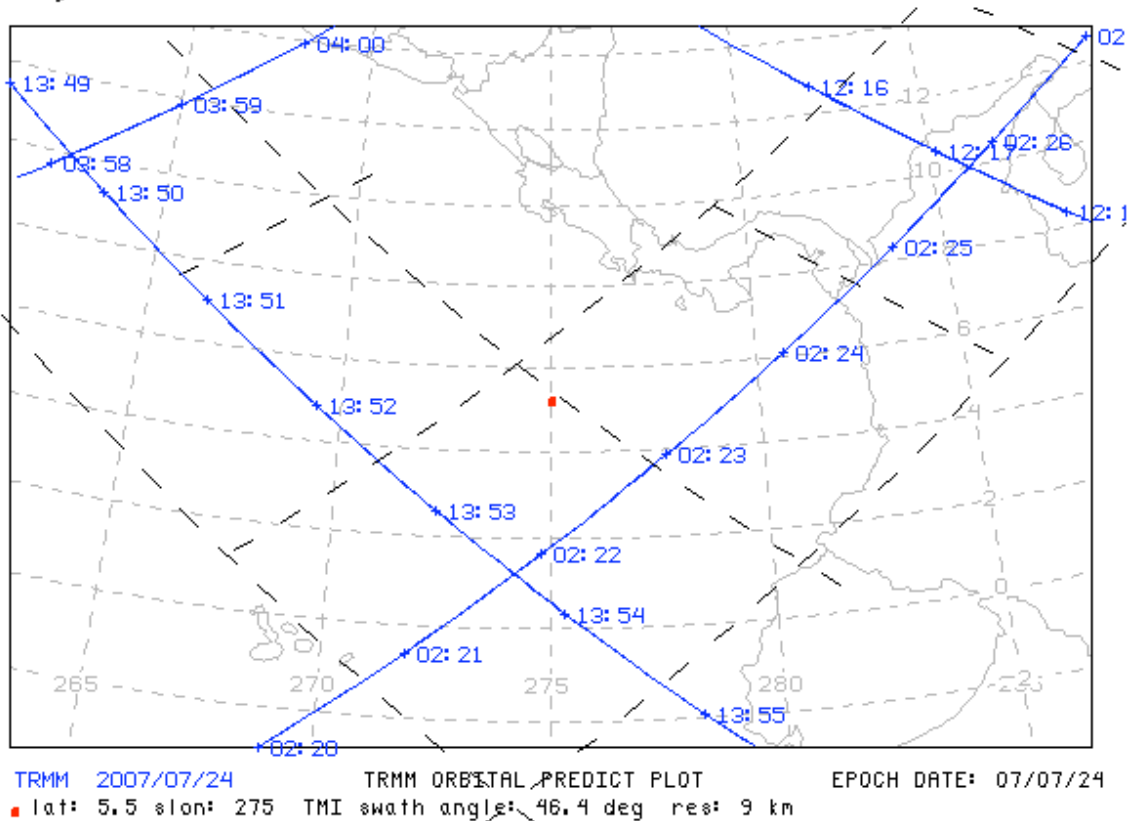
**Duration:** 6:50

**Objectives:**

- To perform coordinated cloud sampling of maritime cirrus shield with DC-8 and ER-2.
- To sample boundary layer/free troposphere air feeding convection
- To sample cloud outflow
- To profile dust optical depths between the Caribbean and the Pacific

## Satellite Coordination:

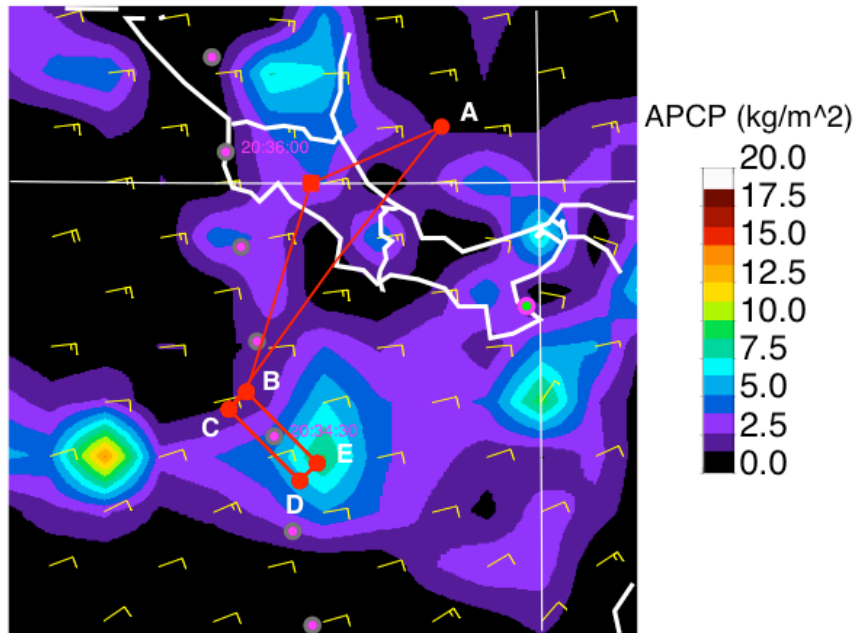
Terra overpass at 15:36 UT well to the east of the ER-2 racetrack (192° heading) over Columbia. The image below shows the TRMM overpass with the TMI swath superimposed as the dashed lines (image from the NASA Langley TC4 satellite web page: <http://angler.larc.nasa.gov/tc4/>).



## Flight Plan Summary (see map):

Takeoff at 1200 UT (6 AM local time). The ER-2 initially flies ENE over the Caribbean into relatively clear air while gaining altitude (waypoint A on the map). The ER-2 will then fly SW along a line (A→B) with relatively clear air below the aircraft in order to view aerosol concentrations. After reaching B, the ER-2 will fly a racetrack pattern (B→C→D→E repeat) in coordination with DC-8. Approximately 7 patterns will be flown. The racetrack is positioned downstream of expected ITCZ convective systems. At about 1800 UT, the ER-2 will turn homeward for MROC and will land at approximately 1850 UT (plot courtesy of Leslie Lait).

18 UTC on 24 July, 2007 at 250.0 mb



red line = ER-2 flight track

color image: accumulated precipitation from (1200-1800 UT)

yellow wind barbs (m/s)

### Expected Cloud Conditions during flight:

The racetrack pattern (B→C→D→E repeat) is set in the ITCZ. The forecast map (see above) shows precipitation accumulation. The track is set near a forecast maximum of precipitation. The A→B track is set for relatively cloud free conditions in order to see the African dust plume. Panama bight convection is predicted to be relatively weak for July 24. The 250 hPa (~32,000 feet) wind pattern shows that the cirrus detrainment for the ITCZ clouds will be from the East to the West at about 10 m/s.

### Proposed Plan:

### Proposed Waypoints:

MROC 10° 00'N 84° 13'W 12:00

### ER-2 Science Instrument Payload and Status:

<b>Instrument</b>	<b>Status</b>	<b>Notes</b>
<b>CPL</b> Cloud Physics Lidar		
<b>CRS</b> Cloud Radar System		
<b>EDOP</b> ER-2 Doppler Radar		
<b>AMPR</b> Advanced Microwave Precipitation Radiometer		
<b>CoSSIR</b> Compact Scanning Sub-mm wave Imaging Radiometer	<b>NA</b>	<b>Ballasted out</b>
<b>MAS</b> MODIS Airborne Simulator	<b>NA</b>	<b>Hard failed, flying as ballast</b>
<b>S-HIS</b> Scanning High Resolution Interferometer		
<b>IR Radiometer</b> Broadband flux radiometer (nadir & zenith)		
<b>SSFR</b> Solar Spectral Flux Radiometer (nadir & zenith)		
<b>MVIS</b> video camera		
<b>MTP</b> Microwave Temperature Profiler		

**G = good; P = partial data collected; F = failure, no data**