CPEX Research Flight # 11 --- June 17, 2017

PRELIMINARY DRAFT Summary by Airborne Mission Scientist Ed Zipser
Ground Mission Scientist Dave Raymond

Takeoff 170130 UTC Touchdown 000336 UTC/18 June (7 h 2 minutes)

Mission Objective: Convective region in NW Caribbean, not far from targets during previous 2 flights on June 15 and June 16. Low-mid-level vorticity forecast to continue increasing, mainly as result of the persistent up/down convective systems in that region.

After takeoff, the originally-anticipated initial working location was too cloudy for a clear region objective, and had too much convective debris from prior convection, so decided to head for 18.5 N 81.0 W. Intention was to fly a small "clear air" box in that convection-free region. The intent was to obtain good DAWN and environment data which was adjacent to a region of growing convection, between ~ 17-18 N and ~ 79-81 W. (to be refined when satellite data added to this report).

~ 1900: Completed ~ 40 nm box centered near 18.5 / 81.0, with slight eastward adjustment to stay away from precip as much as possible. Extended slightly to east, needee considerable maneuvering to stay within the shrinking fair weather region, but probably mostly successful. Then requested and obtained permission to climb to FL 350 for convective box, centered near 17.5 N 80.5 W. Initial intention was a box with 80 nm N-S legs and 50 nm E-W legs. As usual, that was modified according to changing conditions.

~1915 – 2030: Moved the west leg of the box by 50 nm, making it more like a large square, to try to keep convection inside the box before altering flight to penetrate some cells. Executed about 5 sides of this box before turning westbound short of the original southern leg to penetrate convection. Impression of convection: Fairly tall, obviously extending above our altitude, with mostly light turbulence from time to time. Will amplify after viewing APR-2 quick looks. Unfortunately dropsondes only partially successful – still evaluating but at this point estimating (from Dave Emmitt) that any dropped with precip below failed at and below melting level. Kept modifying location of legs during second half of this period to encounter some of the stronger cells.

~ 2030 -2100: Simone in control from cockpit, executing his propeller pattern on 2 of the strongest cells growing in or near the originally-sampled clear region. Can check the chat for comments on times of turbulence but best done from APR-2.

2100: Made decision to end work in this area, mainly due to inability to obtain either DAWN or Dropsonde data in this convective region, and use the available hour of flight time to execute pattern recommended by Shuyi and Dave E for DAWN and dropsondes between the loop current and Florida.

2210 – 2335: While passing through Yucatan Channel (having descended from FL 400 to FL 200), obtained DAWN and dropsondes northbound along 86 W from 21.5 – 24.3 N. This was the humidity gradient region, with cloud cover rapidly decreasing in coverage and depth. Good DAWN and dropsonde data for the remainder of the planned pattern to Florida. Only issue was between 21.5 – 22.5 or 23 N when DAWN window fogged up after descent and needed to be dried out. Some minor deviations in track due to ATC clearance issues, but believe that good data was obtained as requested for this entire leg from near loop current center to Florida.

End draft mission summary.

Just got Simone's great email with attachment – will really help in getting better assessment of what was achieved on this mission.

Photos attached below at low resolution – can send originals later.

223823Z 17 Jun

224657Z

225139Z

225145Z (~ 45° left of heading, from cockpit)

232111Z

232123Z