Flight Scientist Report
Wednesday 6/16/2021 ACTIVATE RF84

Flight Type: Statistical Survey Flight
Flight Route: KLFI SIE LYNUS 37N07045W ZIBUT ATLIC KLFI
Special Notes: Today we are doing an overpass over Langley at the end of the flight to intercompare flight data with surface-based remote sensors.

King Air
Pilot report (Wusk):
Take-off 1426 Z

Landing 1810 Z

3.7 hours

UC-12 single flight day; cooperative flight with the HU-25. Planned route: KLFI SIE LYNUS 37N07045W ZIBUT ATLIC KLFI with overflight of LFI. UC12 Takeoff from runway 08 with HU-25 following 5 mins later. Uneventful departure with climb on course direct SIE. EB from SIE to LYNUS, ATC informed us that W-387 had ops that would require us to be at either FL300 or FL220 on the WB leg back to ATLIC, our initial response was that we could not make FL300 (based on recollections of RSD initial project and airworthiness limitations). Additionally ATC was going to require us to be at FL220 prior to entering non-radar airspace, which would have required us to spent several hundred miles at FL220. Eventually we negotiated having to be at FL220 by 30nm prior to ZIBUT. Meanwhile we discussed between crew and the HU25 crew (ASO and head of the ASRB) regarding the status of current paperwork limitations on the aircraft, ACTIVATE Ops and airworthiness considerations. After receiving confirmation from RSD (via chat) that subsequent updates had been made to paperwork allowing FL300 ops, we requested the FL300 option. The aircraft reached FL300 (but pretty much topped out) prior to ZIBUT. The tanker ops that blocked the airspace was still active but working their departure soon after we entered W387. Exiting W387 on the west side we descended back to FL280 for the final sonde drop. The aircraft then completed an overflight of Langley at FL280 wing level for <8nm, followed by ATC vectors for a visual approach to Runway 26.

General coincidence was maintained within 10 minutes. Normal landing at KLFI runway 26. 4x dropsondes deployed. Crew was Delaney, Wusk, Shingler.

Flight scientist report (Shingler): We ascended up through a layer of clouds on the way out up the coast that was at an altitude of about 6-8kft. Most of the route was fairly cloud free and only minimal aerosols were seen along the way. A total of five sondes were dropped (a repeat was dropped at the eastern extent drop location). It was a possibly a successful sonde, but it appeared that it may have had a connection issue of some kind. A KLFI overflight was

performed at the end of the route where Dr. Amin Nehrir was operating the HALO upward looking HSRL/water vapor lidar. All other instruments were operational.

Falcon

Pilot report (Baxley):
Takeoff (Z): 1430 / Land: 1800

Science flight for the HU-25 in support of ACTIVATE Campaign #4, conducted cooperatively with the UC-12. Route of flight KFLI-SIE-LYNUS-3700N/07045W-ZIBUT-ATLIC-KLFI. Departed Rwy08 direct to ATLIC climbing to 5k ft MSL for initial transit, then descending to 1000' MSL approximately 15 nautical miles north of KLFI. Winds were light (<15 kts) out of the west throughout the flight, with primarily no clouds the majority of the flight, and a line of clouds overhead KLFI at 1800Z that extended from 6500-9500' MSL. The overland profile from KLFI-SIE was flown between 1000-4500' MSL using clear air modules, the overwater profile from 500-6500' using clear air modules, and the final climb from TURET-KLFI was from 500'-14,500' MSL. Upon reaching 14,500' MSL overhead KLFI, a descending left spiral was commenced, with descent rates varying between 200-1200 feet/minute to remain in clear airspace. Coordination with the UC-12 was always within 10 minutes. All objectives were achieved and with no discrepancies noted.

Pilots: Baxley/Slover

QNCs: Crosbie/Winstead

Flight scientist report (Crosbie):
Not much to say about this flight, the conditions were really quite uniform. There was a little bit of cloud on the route up the eastern shore which actually proved to be more of an inconvenience because of the flight rules (VFR). We were not able to secure a block IFR reservation during that time so were confined to MIN and BCB. Once out over water, there were a few clouds that appeared to be well above the boundary layer and were short lived spatially. Further east towards the far turnpoint, there were a few very sparse Cu but not extensive or large enough such that we could sample them. The spiral over LaRC was executed successfully although we had to avoid clouds during that descent because of VFR rules. Aerosol conditions were moderate throughout the flight.

Eddie:
14:29:55 Takeoff

14:32:00 Sample filter A - ON; Sample filter B – ON

15:04 Out over water after flying up east coast

16:18 Clear air; no clouds

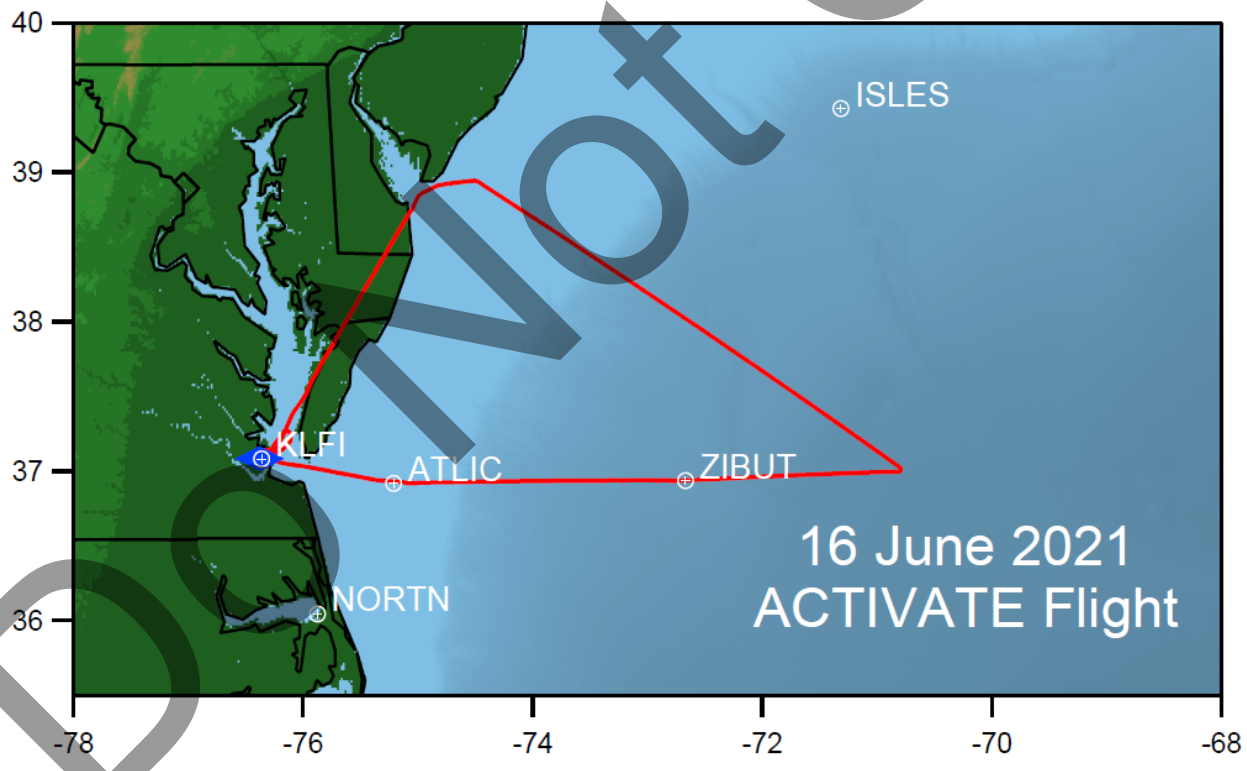
17:19:35 Start climb to 14500 ft to do spiral over Langley

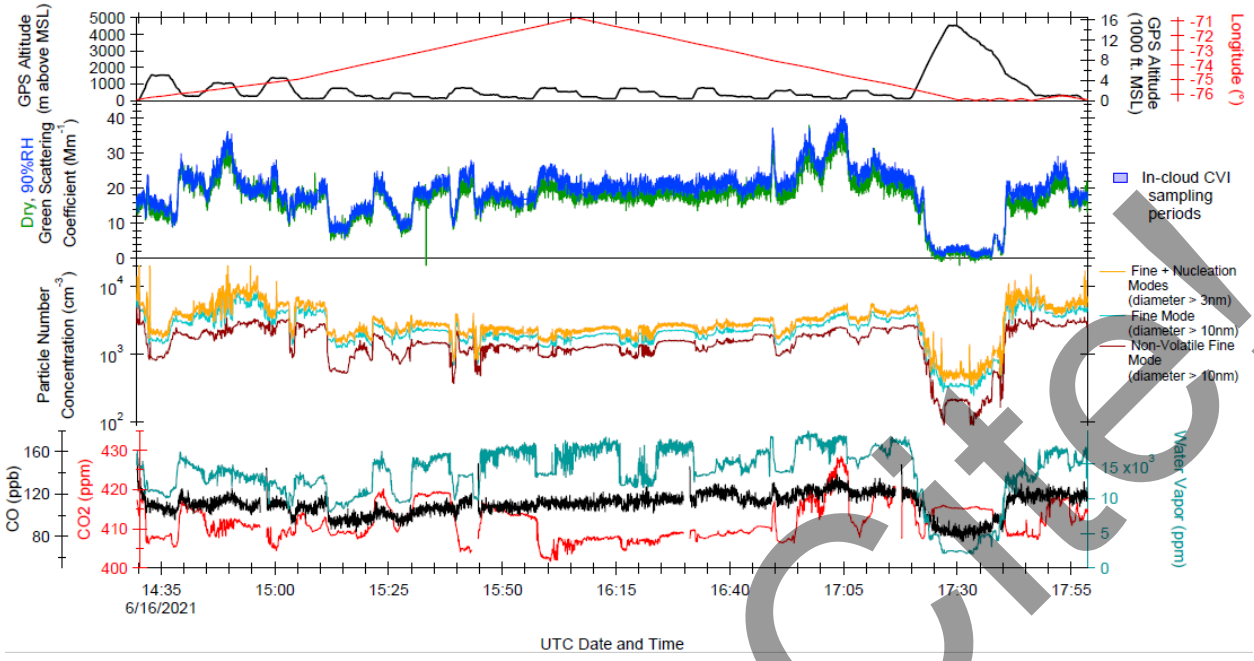
17:23:00 Sample filter A – OFF; Sample filter B – OFF

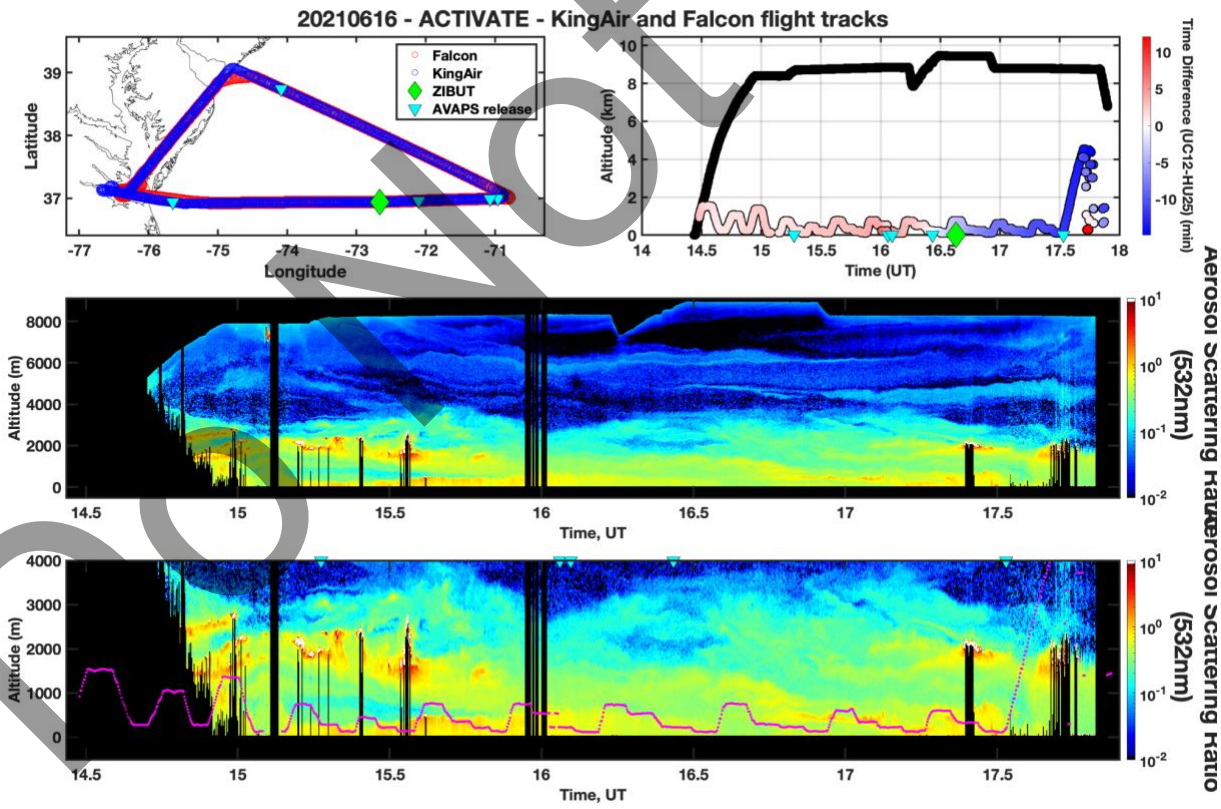
17:29:24 Start spiral down over Langley

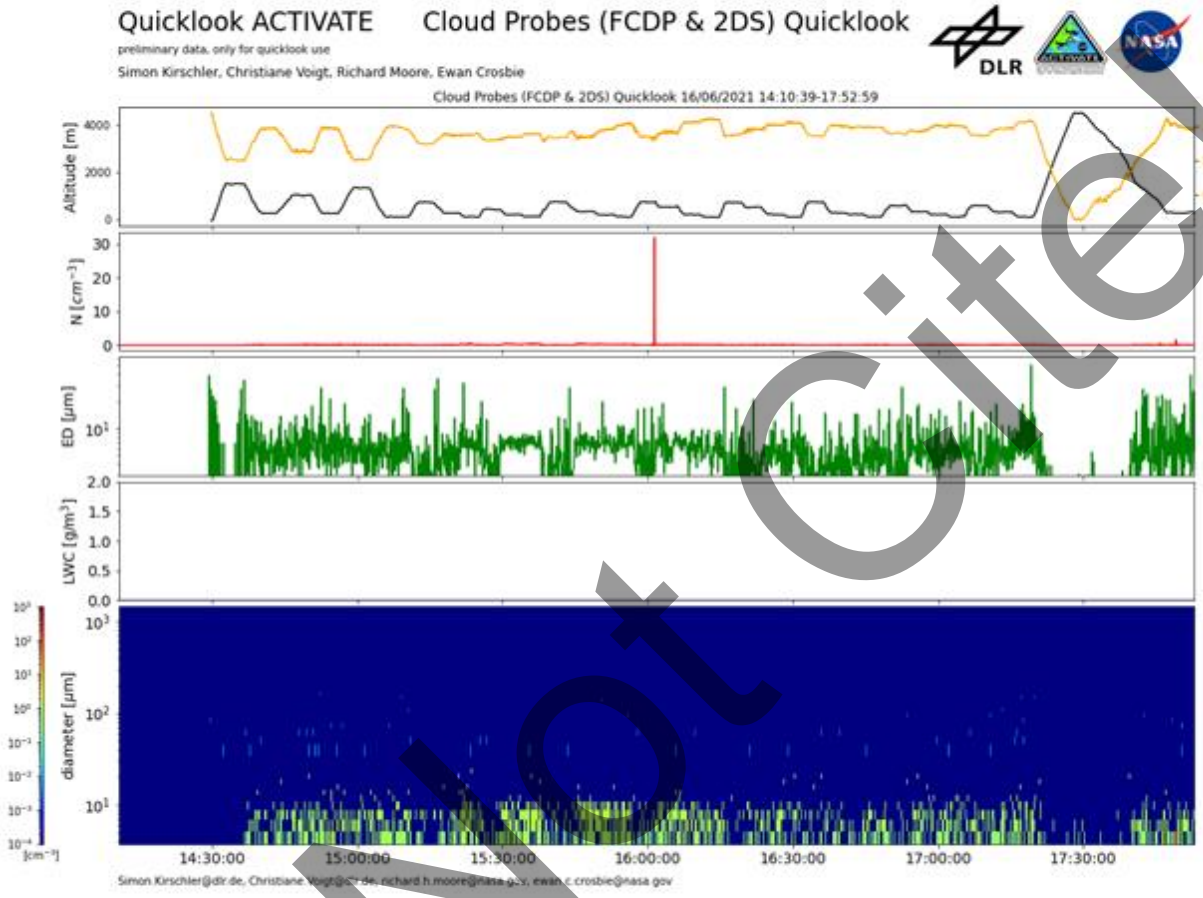
17:53:00 End of 3 minute level leg away from Langley; WCM & humidifier turned off in preparation for landing

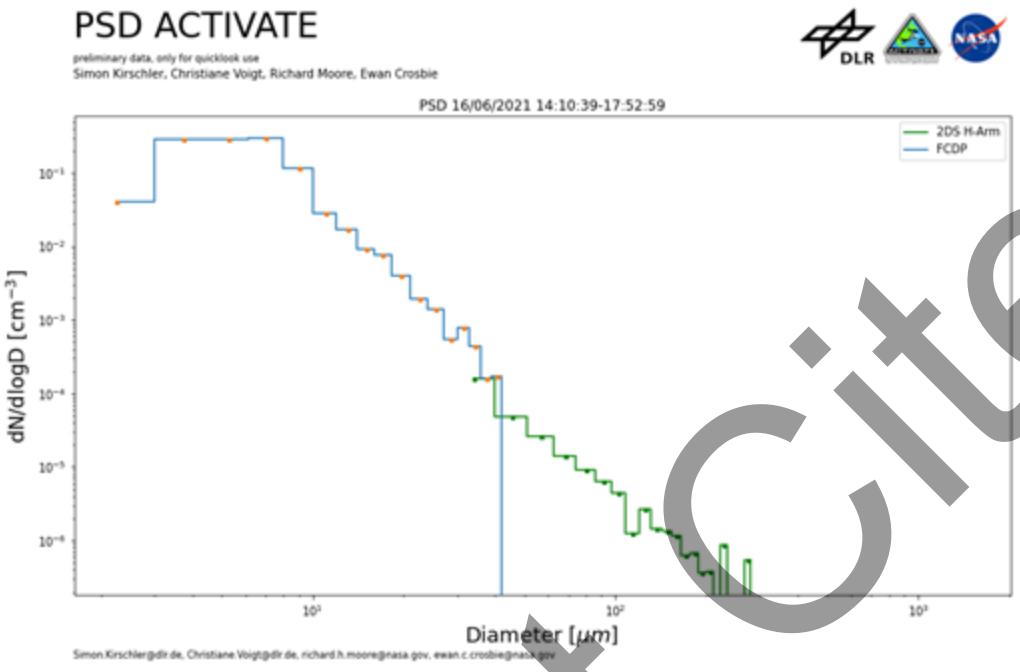
17:58:20 Landing

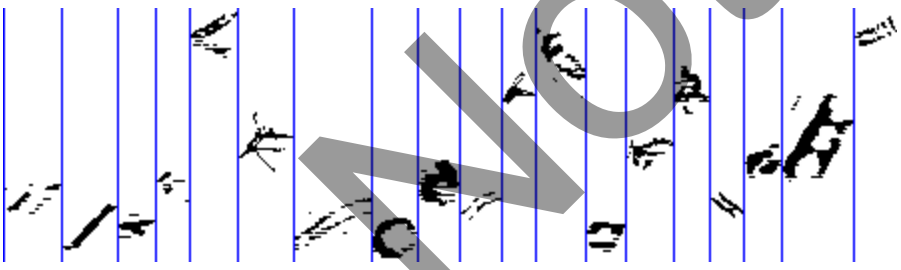



GPS Altitude (m above MSL)
GPS Altitude (1000 ft. MSL)
Longitude (°)
Dry, 90%RH Green Scattering Coefficient (Mm-1)
In-cloud CVI sampling periods
Particle Number Concentration (cm-3)
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
CO (ppb)
CO2 (ppm)
Water Vapor (ppm)
14:35
6/16/2021
15:00
15:25
15:50
16:15
16:40
17:05
17:30
17:55
UTC Date and Time


20210616 - ACTIVATE - KingAir and Falcon flight tracks
Falcon
KingAir
ZIBUT
AVAPS release
Latitude
Longitude
Altitude (km)
Time (UT)
Time Difference (UC12-HU25) (min)
Altitude (m)
Time, UT
Aerosol Scattering Ratio (532nm)


Quicklook ACTIVATE
Cloud Probes (FCDP & 2DS) Quicklook
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie
DLR
Cloud Probes (FCDP & 2DS) Quicklook 16/06/2021 14:10:39-17:52:59
Altitude [m]
Static Temperature [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
14:30:00
15:00:00
15:30:00
16:00:00
16:30:00
17:00:00
17:30:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

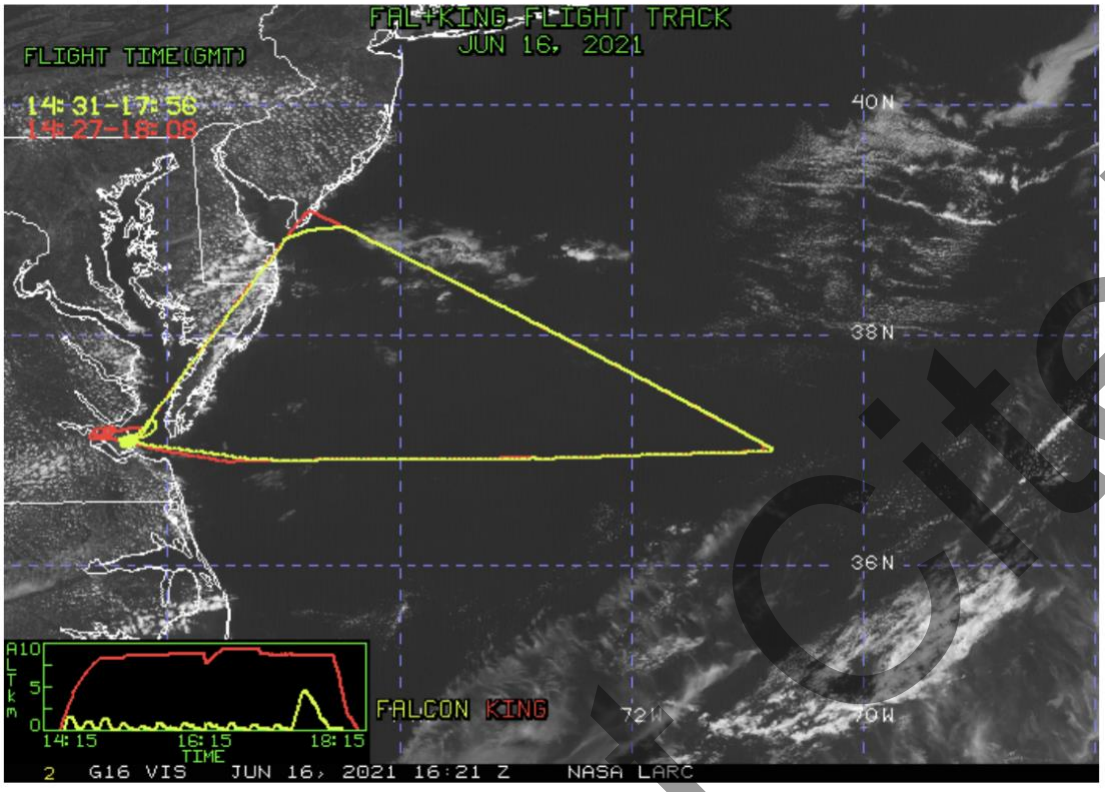




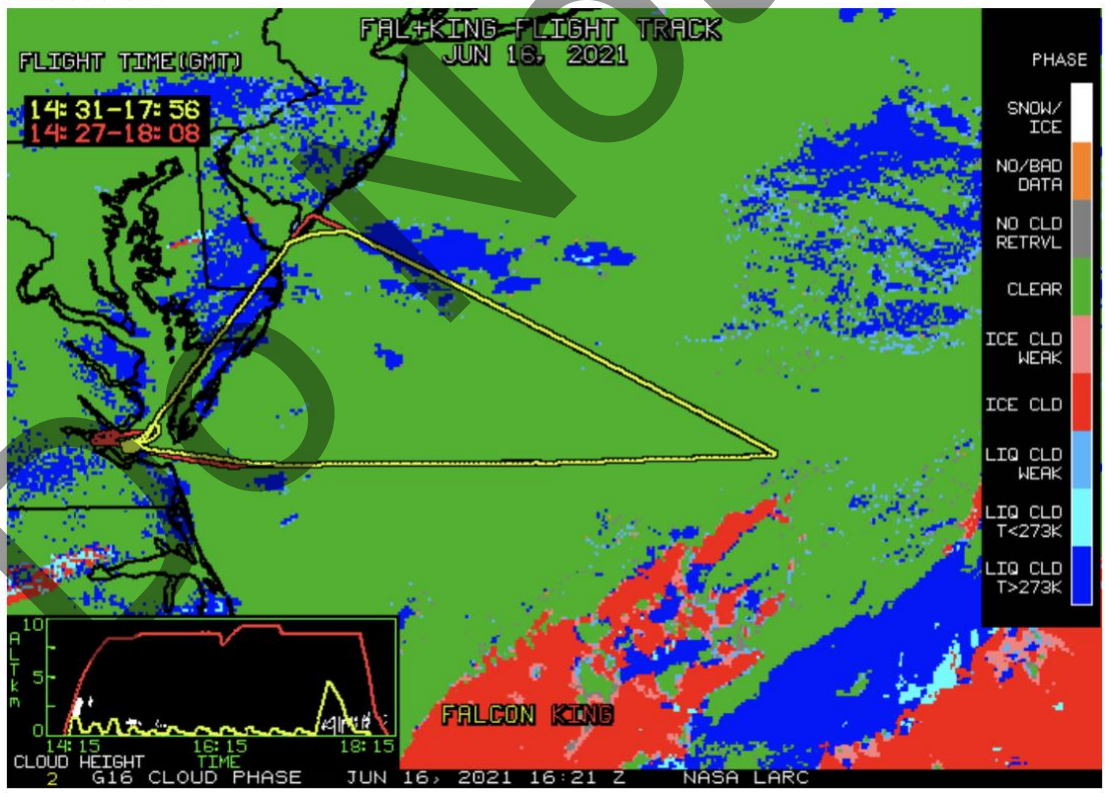
Looks like ice was seen around 14:45 UTC. No other particles seen by 2DS.

From Simon: Looks like we've seen ice particles, but only in very rare number (like 150 in total but during the whole flight by 2DS). No cloud was seen, but the particles may stem from a layer above? The temperature was above 0°C when particles were seen.

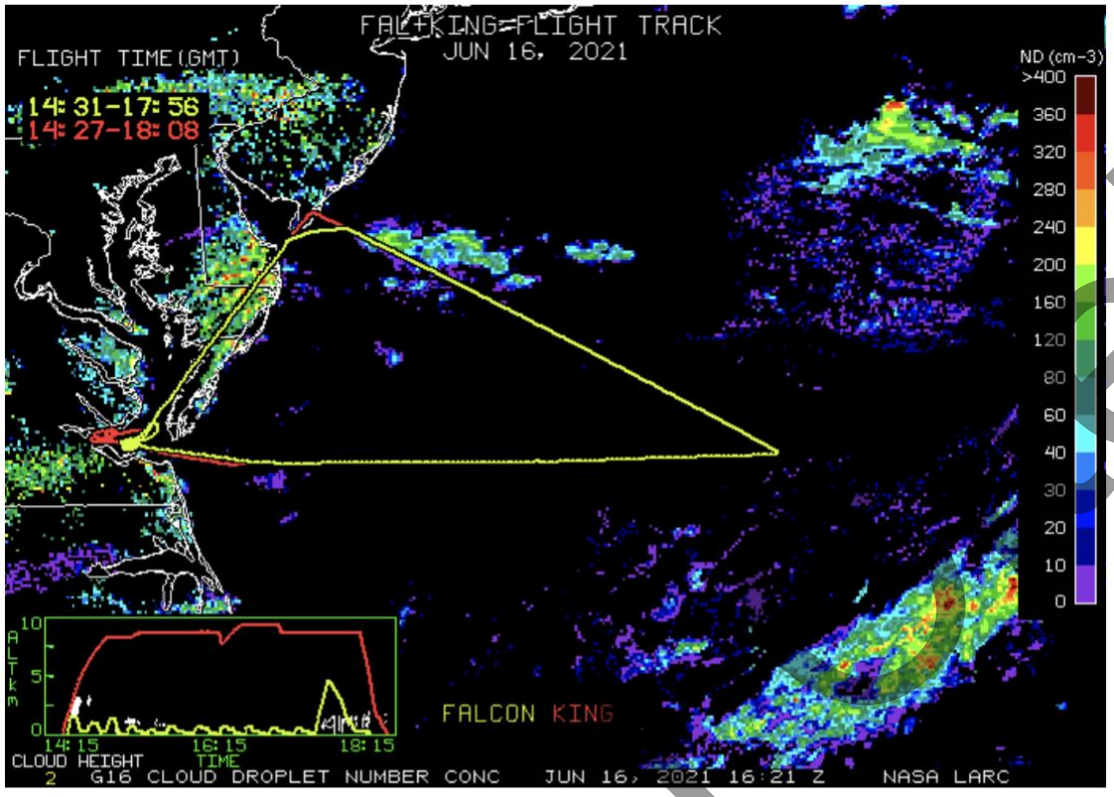
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)