Flight Scientist Report
Tuesday 6/22/2021 ACTIVATE RF86

Flight Type: Statistical Survey Flight
Flight Route: KLFI ZIBUT 37N06915W ZIBUT ATLIC KLFI
Special Notes:

King Air

Pilot report (Wusk):
UC-12 single flight day; cooperative flight with the HU-25. Planned route: KLFI ZIBUT 37N06915W ZIBUT ATLIC KLFI with overflight of LFI. UC12 Takeoff from runway 26 ahead of HU-25. Uneventful departure and climb to FL280. Aircraft coincidence good throughout the flight. About 30 kt headwind headed west so HU25 pulled slightly ahead on return leg. Once on AR-9 had several step downs to stay clear of high clouds. Proceeded WB to ATLIC for the final sonde drop and the descent into Langley. 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; Zibut EB turn point, 1/2 to ZIBUT WB, ATLIC. Crew was Jamison, Wusk, Shingler.

Flight scientist report (Shingler):

Fairly clear between ATLIC and OUTES. Lots of low level aerosol from surface to 1 kft. A small amount of shallow cumulus formed between 1-2 kft after OUTES. Noticeably high scattering was seen in the MBL with low depolariziation (less than 1 %). Layers of aerosols above the clouds between 2-12 kft with a layer of enhanced depolarization between 10-12 kft. Very light cirrus was seen above the aircraft as of hallways between ZIBUT and the endpoint. The low level cumulus turned into a more stratified deck near the end point and still stayed between roughly 1-2 kft (thick enough that the lidar no longer penetrated through to the surface). Aerosol loadings above the clouds were quite high near the end point. On the return trip, we encountered quite a bit of cirrus at altitude requiring us to descend to attempt to stay under. RSP shutter was closed for a fair portion of this final leg. Four sondes were dropped in total this flight. The first at ZIBUT on the outbound leg, one at the turn point, one between the turn point and ZIBUT on the return leg, and one near the coast on the return leg. All instruments were operational.

Falcon

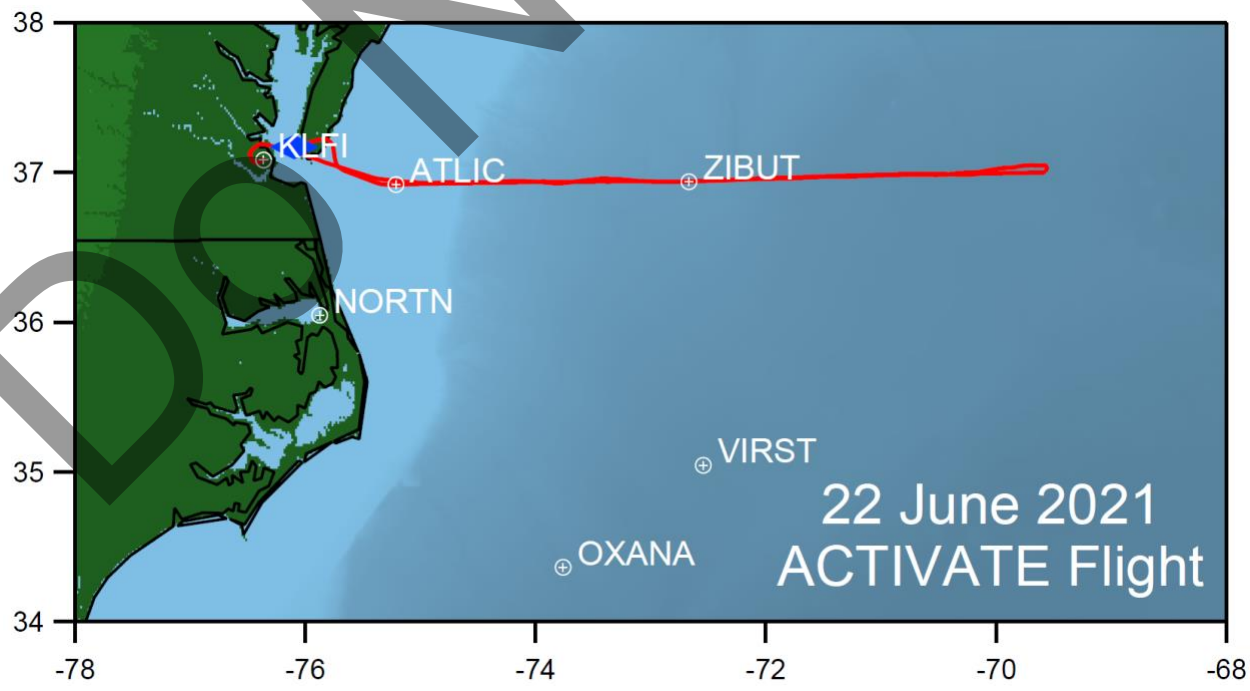
Pilot report (Baxley):
Takeoff (Z): 1216 / Land: 1532

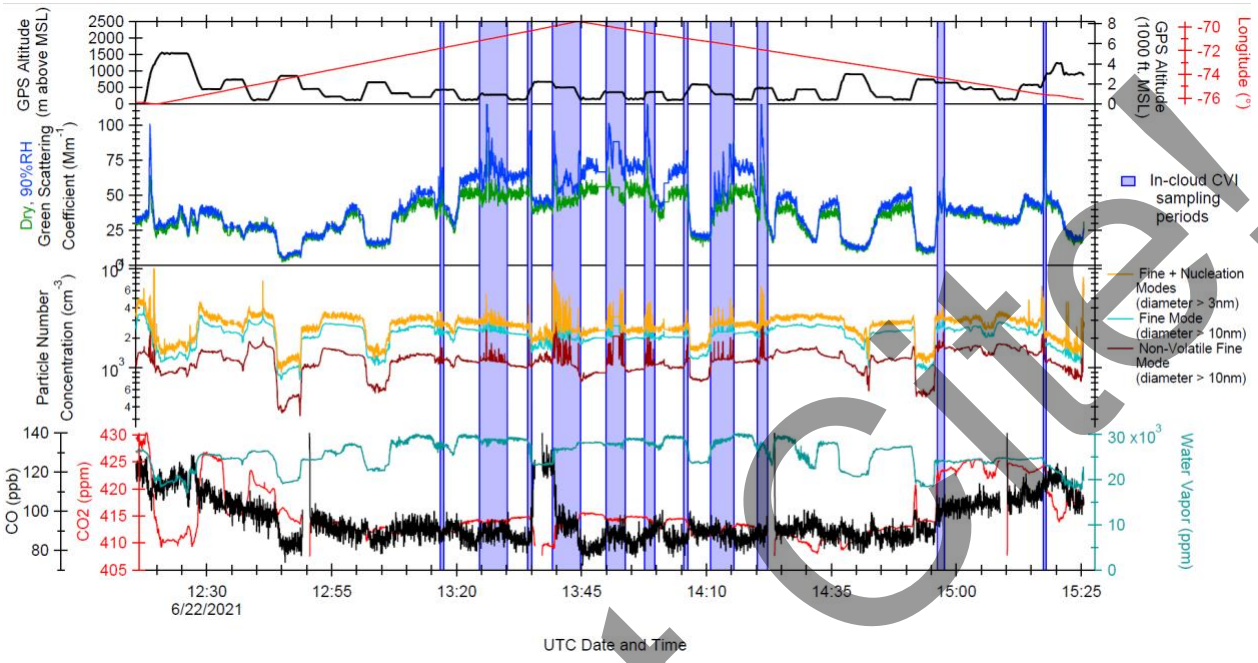
Science flight for the HU-25 in support of ACTIVATE Campaign #4, conducted cooperatively with the UC-12. Route of flight KFLI-ATLIC-ZIBUT-3700N/06915W-ZIBUT-ATLIC-KLFI. Departed Rwy26 right turn to ATLIC and climb to 5k ft MSL for initial transit, with descending to 500' MSL for clear air modules prior to ATLIC. No clouds present until east of ZIBUT, at which point the clouds were from 800' – 1300' MSL. On the return leg, clouds were 800' – 1300' from the eastern point until OUTES, and then 1000' – 2500' from OUTES-ATLIC. Coordination with the UC-12 was always within 10 miles, and the vast majority of the time within 5 miles. All objectives were achieved and with no discrepancies noted.

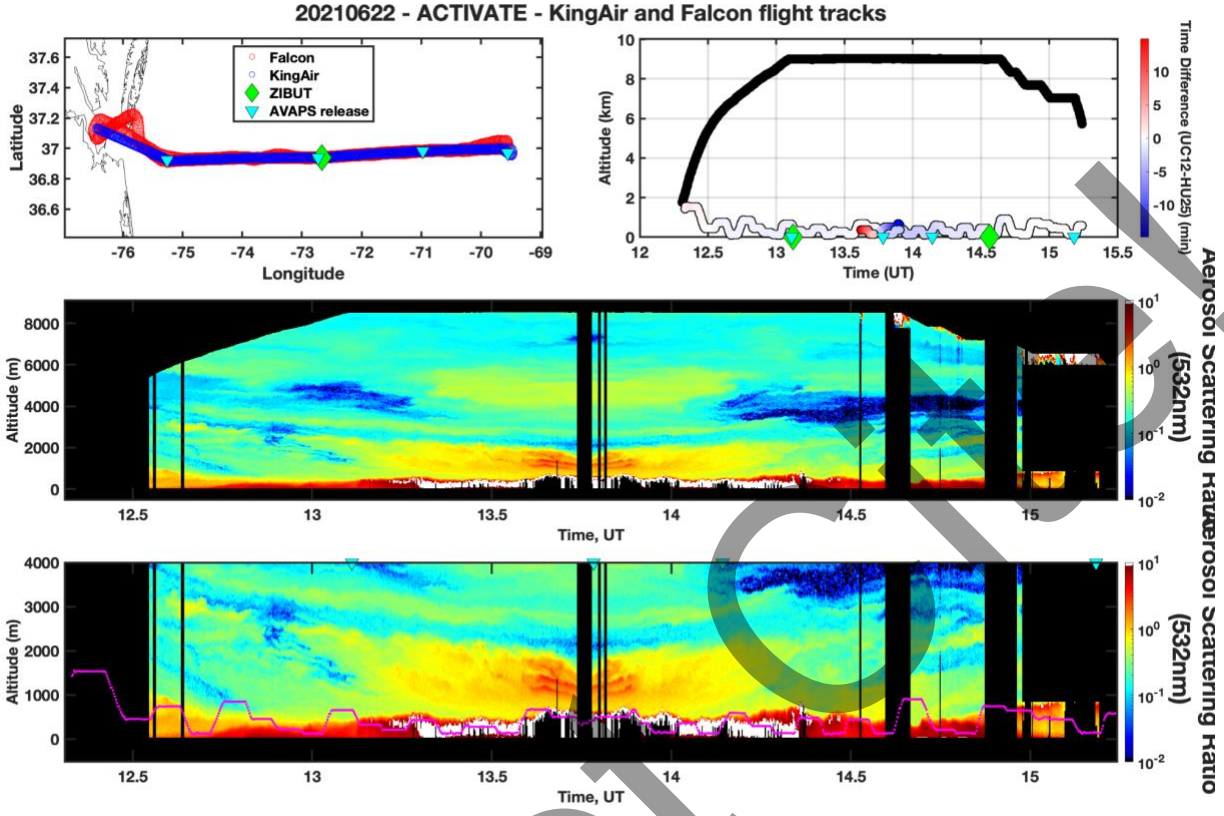
Pilots: Delaney/Baxley

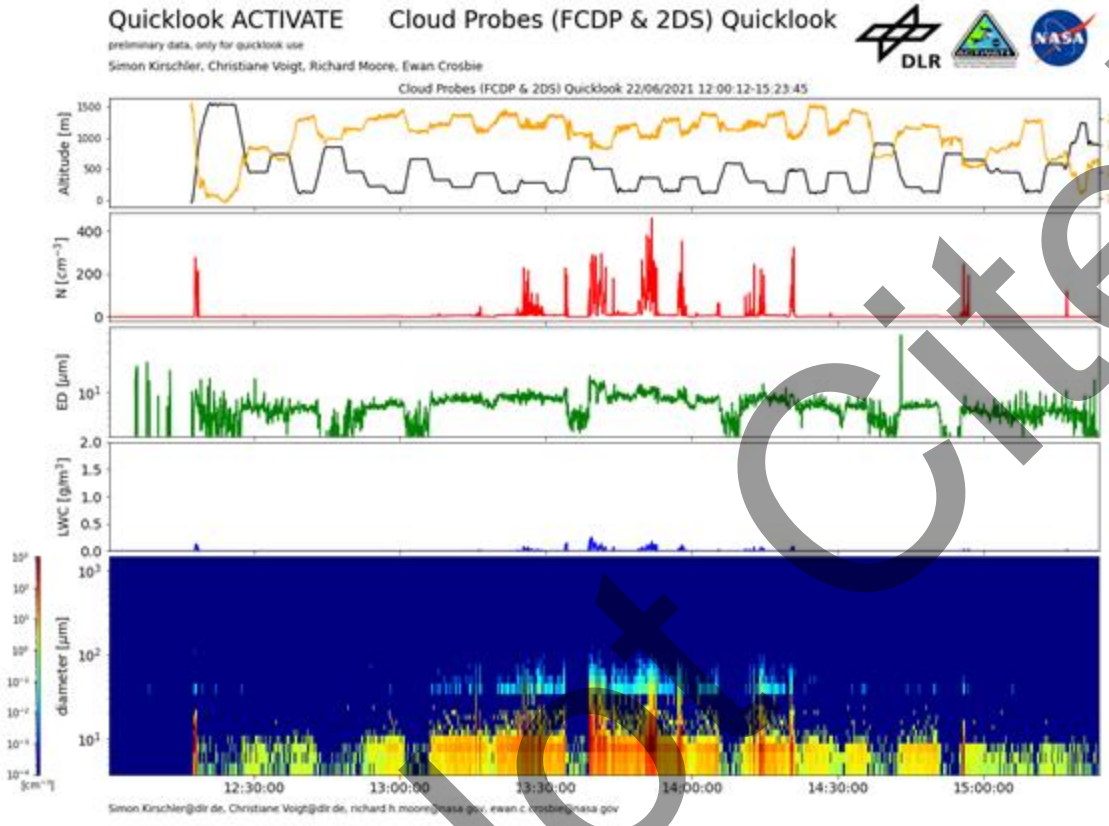
QNCs: Crosbie/Winstead

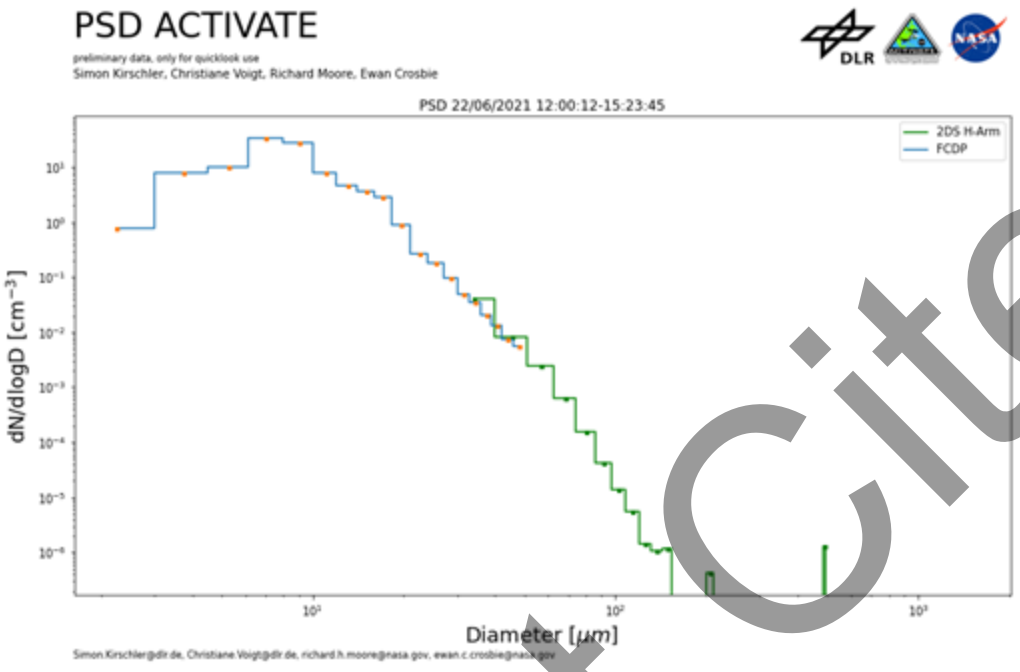
Flight scientist report (Crosbie):
The clouds were located on the eastern extent of the survey. The boundary layer was shallow throughout the flight and the cloudy region, the clouds were very small and tenuous. The clouds were embedded in a significant haze that was believed to be associated with significant sea salt in the MBL and the effects of a high humidity environment. In some places it was not easy to determine if the aircraft was actually below cloud base at 500ft because of the haze. Otherwise a relatively straightforward stat survey flight. (2 full cloudy, 1 part cloudy, 3 clear)

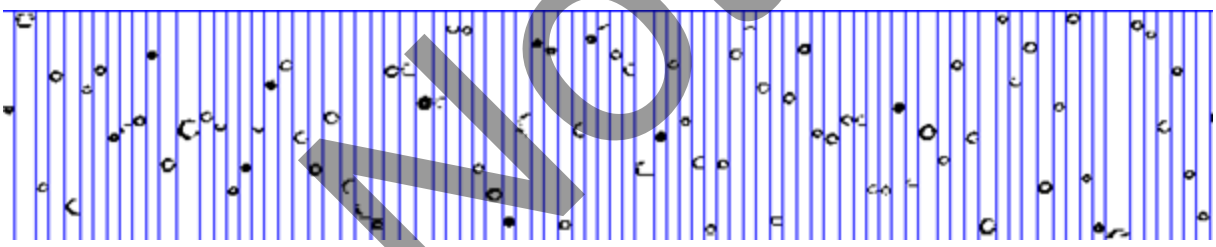



GPS Altitude (m above MSL)
GPS Altitude (1000 ft MSL)
Longitude (°)
Dry, 90%RH Green Scattering Coefficient (Mm-1)
In-cloud CVI sampling periods
Particle Number Concentration (cm-3)
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
CO (ppb)
CO2 (ppm)
Water Vapor (ppm)
12:30
6/22/2021
12:55
13:20
13:45
14:10
14:35
15:00
15:25
UTC Date and Time


20210622 - 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 22/06/2021 12:00:12-15:23:45
Altitude [m]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[km⁻³]
12:30:00
13:00:00
13:30:00
14:00:00
14:30:00
15:00:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

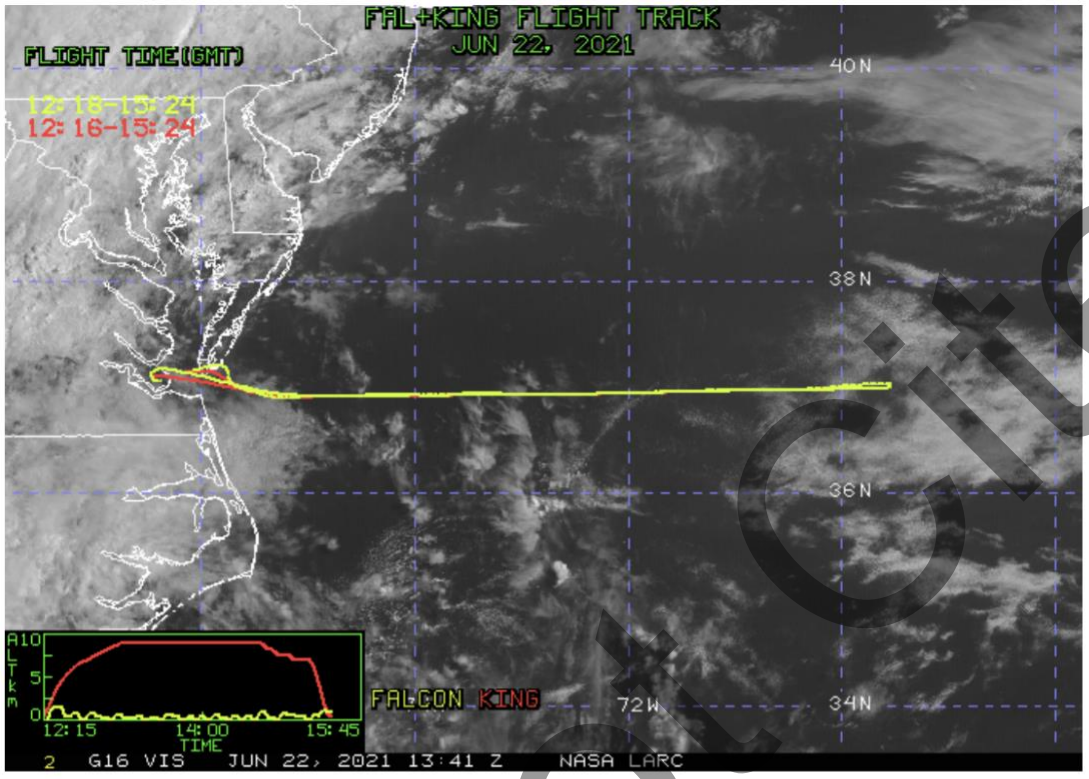




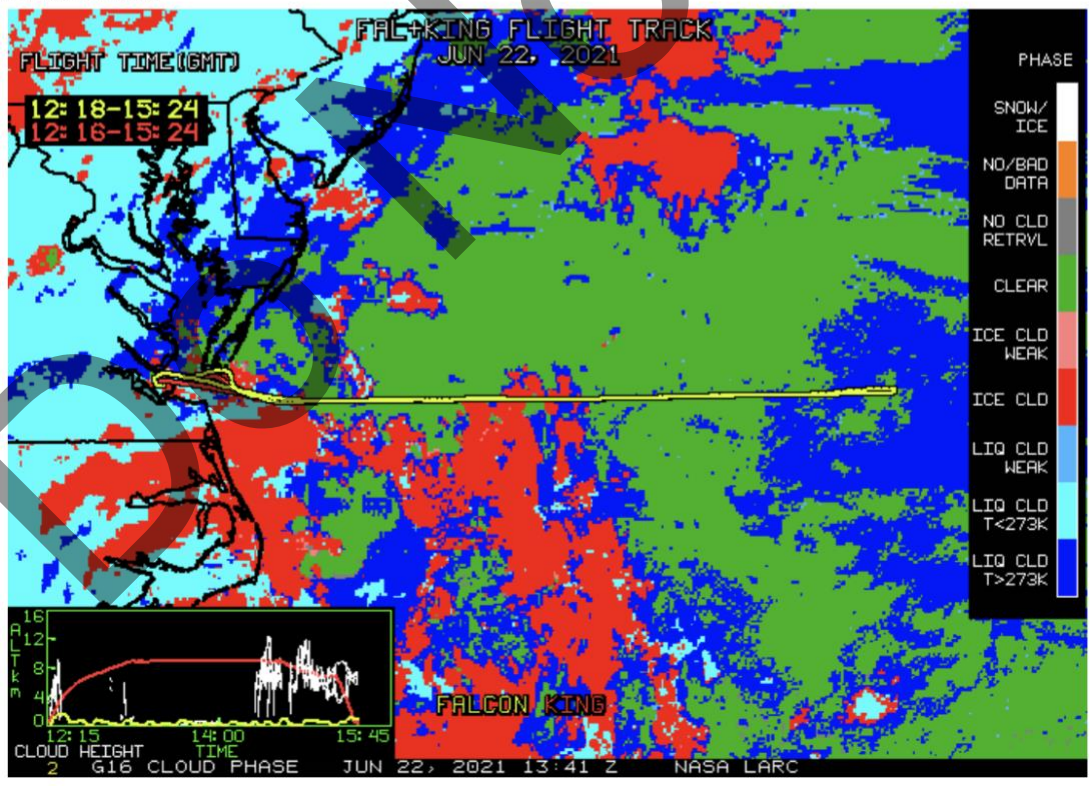
Only pure liquid clouds with drizzle.

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 86, 13:41 UTC Jun 22, 2021

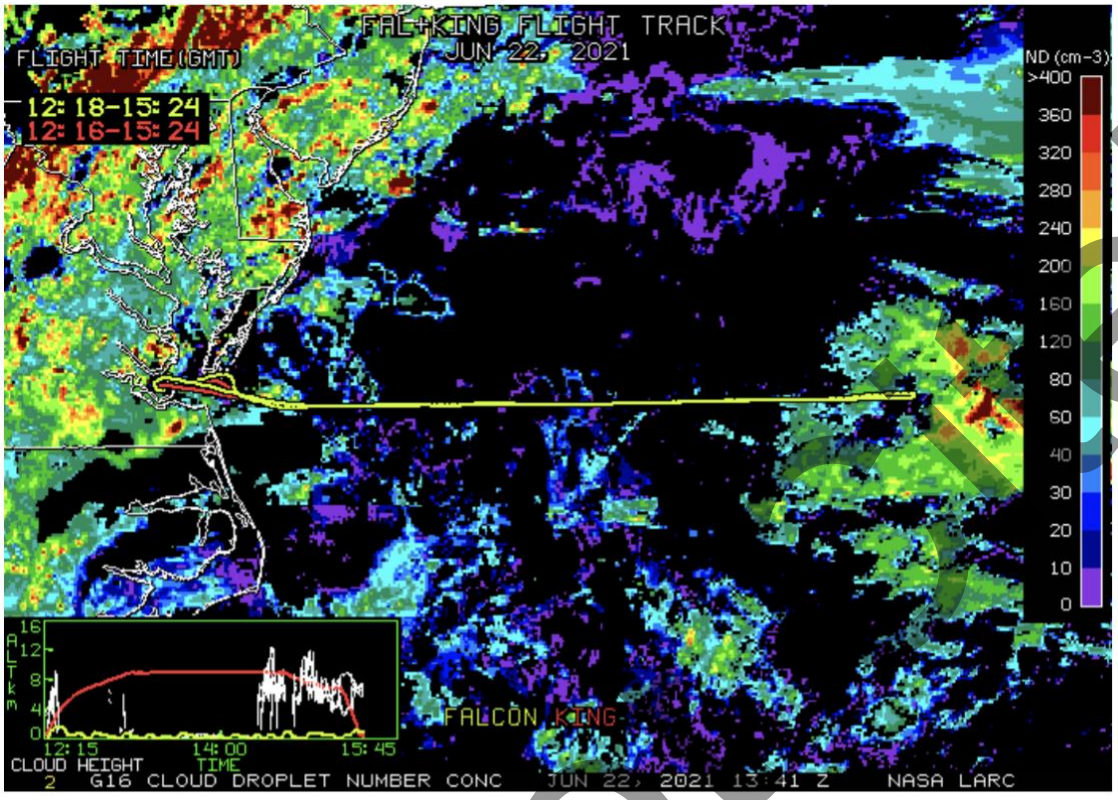
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)