Flight Scientist Report
Tuesday 05/10/2022 ACTIVATE RF152

Flight Type: Statistical Survey Flight
Flight Route: KLFI ATLIC ZIBUT KENDA ZIBUT ATLIC KLFI
Special Notes: Complex day with multiple cloud layers and hard to get below the base of lowest clouds.

King Air
Pilot report (Sandeen):
Activate single sortie flown. Flight was flown as briefed (KLFI ATLIC ZIBUT KENDA ZIBUT ATLIC KLFI at FL280). Layers of clouds on takeoff and landing at approximately 3000 - 4000 and 5000-6000. Winds at altitude were generally from the NNE, 30-60 knots. There were no significant issues with instrumentation and 4 dropsondes were dropped. All sondes were nominal. Timing was well within 10 minutes. Light cloud layer encountered for 1 minute on ZIBUT to KENDA leg in each direction. Crew was Sandeen, Baycura, Shinger, Collister.

Flight scientist report (Shingler):

KLFI ATLIC ZIBUT KENDA ZIBUT ATLIC KLFI

Today was fraught with stratified cloud layers at many varying altitudes and a little bit of elevated cirrus. The lower decks were all fairly opaque and limited visibility to the layers below.

4 sondes were dropped
ZIBUT
KENDA
MID KENDA/ZIBUT
ATLIC

Falcon
Pilot report (Slover):
ACTIVATE statistical survey research flight. Planned and flown as KLFI ATLIC ZIBUT KENDA ZIBUT ATLIC KLFI. Low clouds prevailed over the Atlantic Ocean and only a few 500' AGL min altitude segments were able to be flown. Most MINALT attempts had to be level at 1000' AGL as adequate visual of the sea and forward visibility were not present. Multiple cloud layers made selecting an altitude referenced to a top or bottom layer were challenging. At KENDA, cloud tops were above 10,000' MSL but IFR clearance was for a max of 10K (8K clouds predicted in WX brief), so a full profile above that cloud layer was incomplete. Aircraft landed in good condition for next flight.

Flight scientist report (Crosbie):
Extensive cloud coverage associated with a cut-off low positioned off the mid-Atlantic coast. Strong northeasterly winds were associated with this system and warm advection over the coastal cold water was creating the stratiform cloud near the surface. There was an observed humidity inversion associated with the tops of the cloud deck which was suggestive of the transported/imported moisture. It appeared that the cloud tops were located within the inversion most of the time, and cloud tops were variable. The structure of the turbulence encountered in flight and the vertical profile of LWC was not suggestive of mixed conditions throughout the cloud, rather the lower part of the cloud often was turbulent with higher LWC and the upper region was more tenuous. In places the clouds thickened substantially, and there were several layers of decoupled stratiform cloud in the lower (free) troposphere, while in other regions the cloud scene was simpler with just a marine layer. Near the northeast turn, there were more vertically developed cloud fragments with precip spanning between the layers and raining into the surface marine layer further complicating the interpretation of the cloud and the environment. It was not possible to sample below the clouds in the region north of ZIBUT because of low ceilings. In places where sub-cloud sampling was possible there was often drizzle. An exception was close to the coast where BCB sampling was possible at MINALT, and it was hazy with scattering near 100Mm-1 in places. The AMS did not show commensurate enhancements but PILS real-time indicators suggested a high conductivity suggestive of sea salt.

Eddie:
12:34:05 Takeoff

15:52:00 Landing

Notes:

WCM status indicators all green.

12:53:30 At 500 ft, green scattering approx. 55; rough seas; Large sizes in LAS

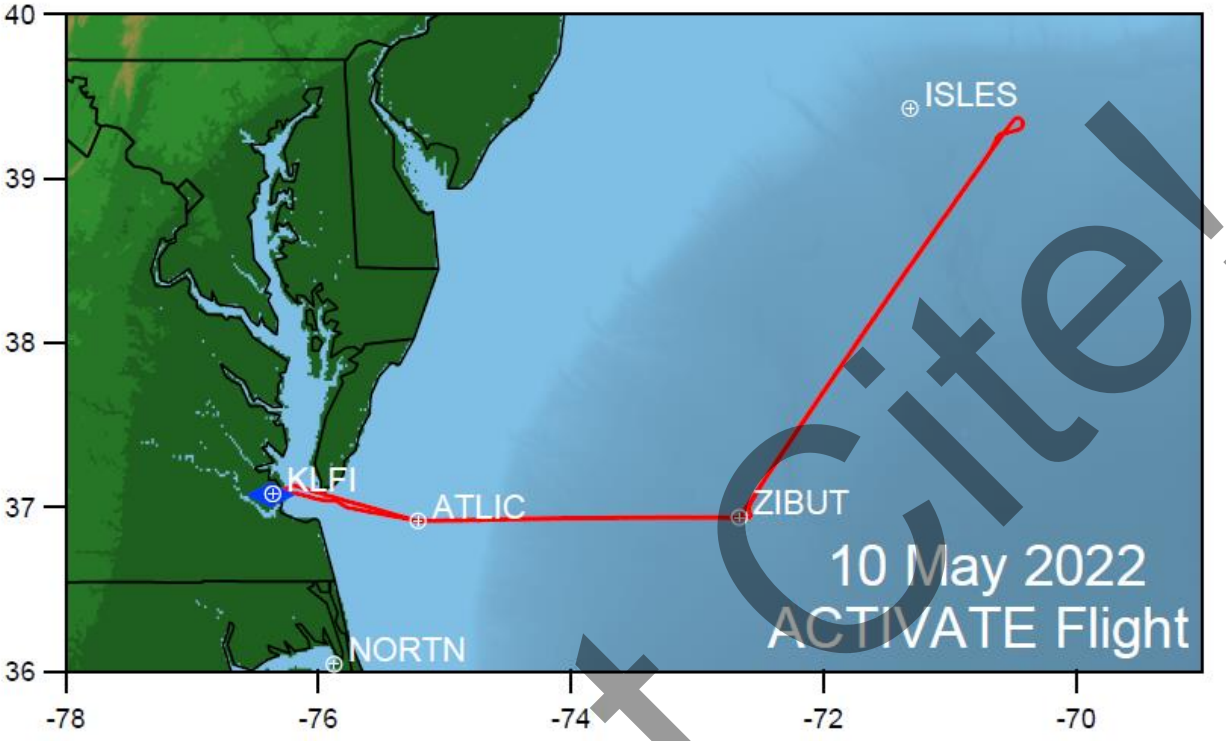
13:05 Haze all the way to ocean surface

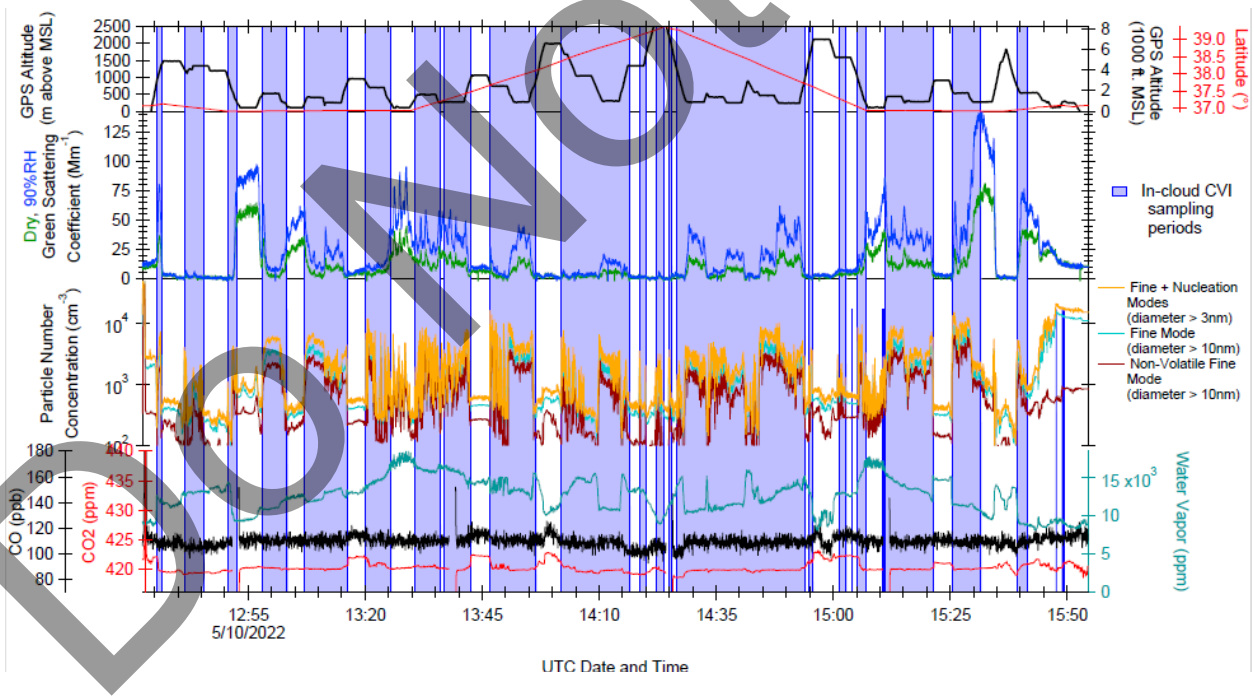
13:10 SMPS neutralizer was off; Now on.

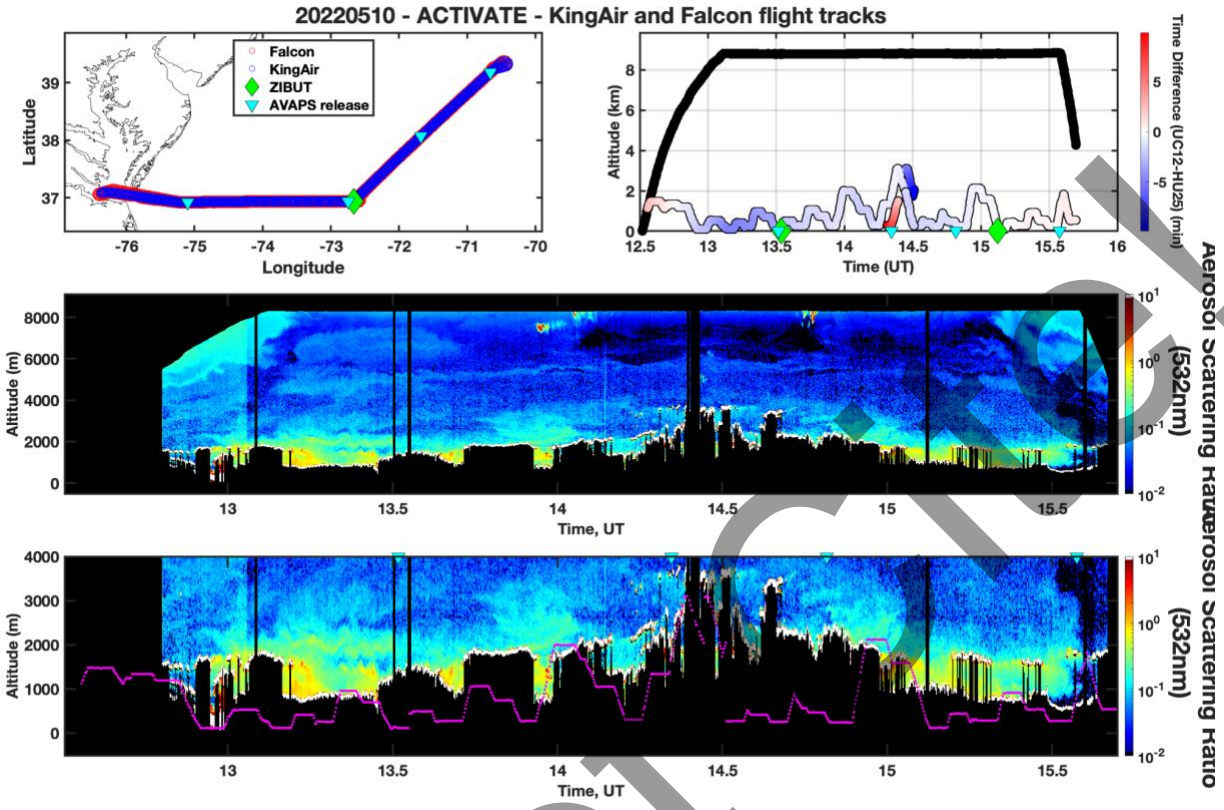
14:20 Cloud scene messy

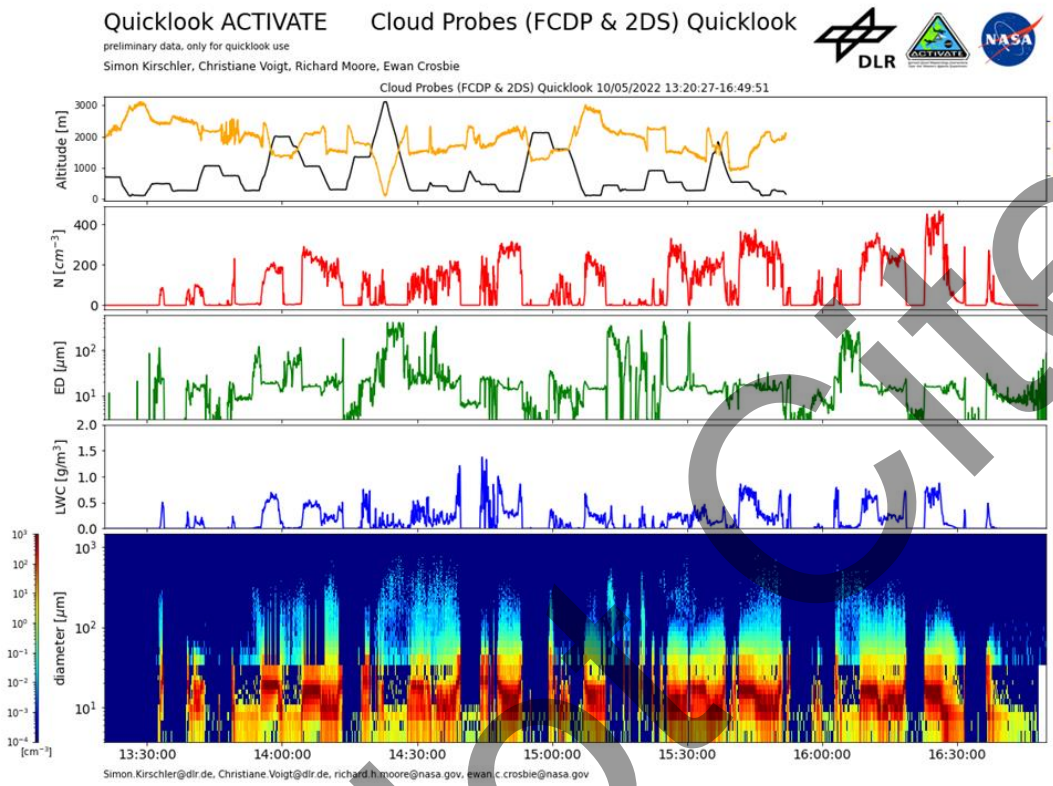
15:07:30 1st time able to get below clouds at 500 ft since beginning of flight due to clouds.

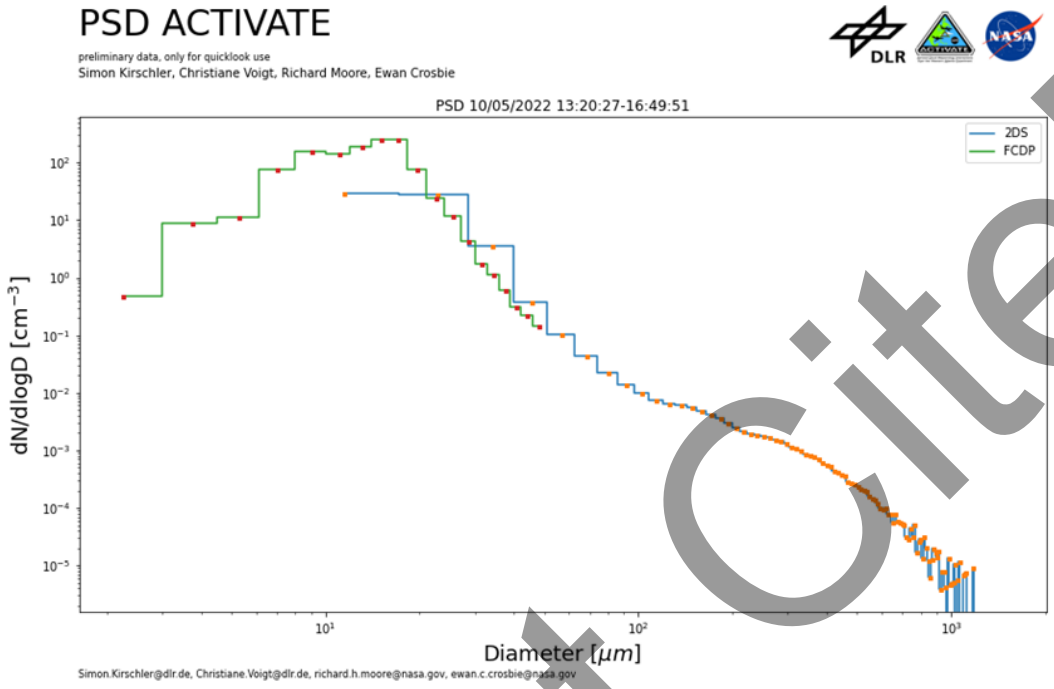
15:46 WCM and humidifier off in preparation for landing

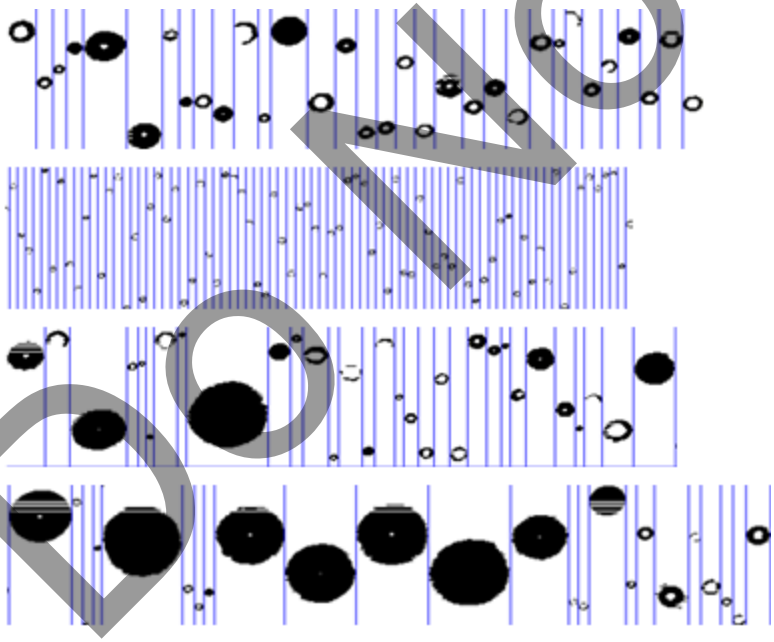

ISLES
KLFI
ATLIC
ZIBUT
NORTN
10 May 2022
ACTIVATE Flight
40
39
38
37
36
-78
-76
-74
-72
-70


GPS Altitude (m above MSL)
Dry, 90%RH Green Scattering Coefficient (Mm^{-1})
Particle Number Concentration (cm^{-3})
CO (ppb)
CO2 (ppm)
GPS Altitude (1000 ft. MSL)
Latitude (°)
Water Vapor (ppm)
In-cloud CVI sampling periods
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
12:55
5/10/2022
13:20
13:45
14:10
14:35
15:00
15:25
15:50
UTC Date and Time


20220510 - 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)

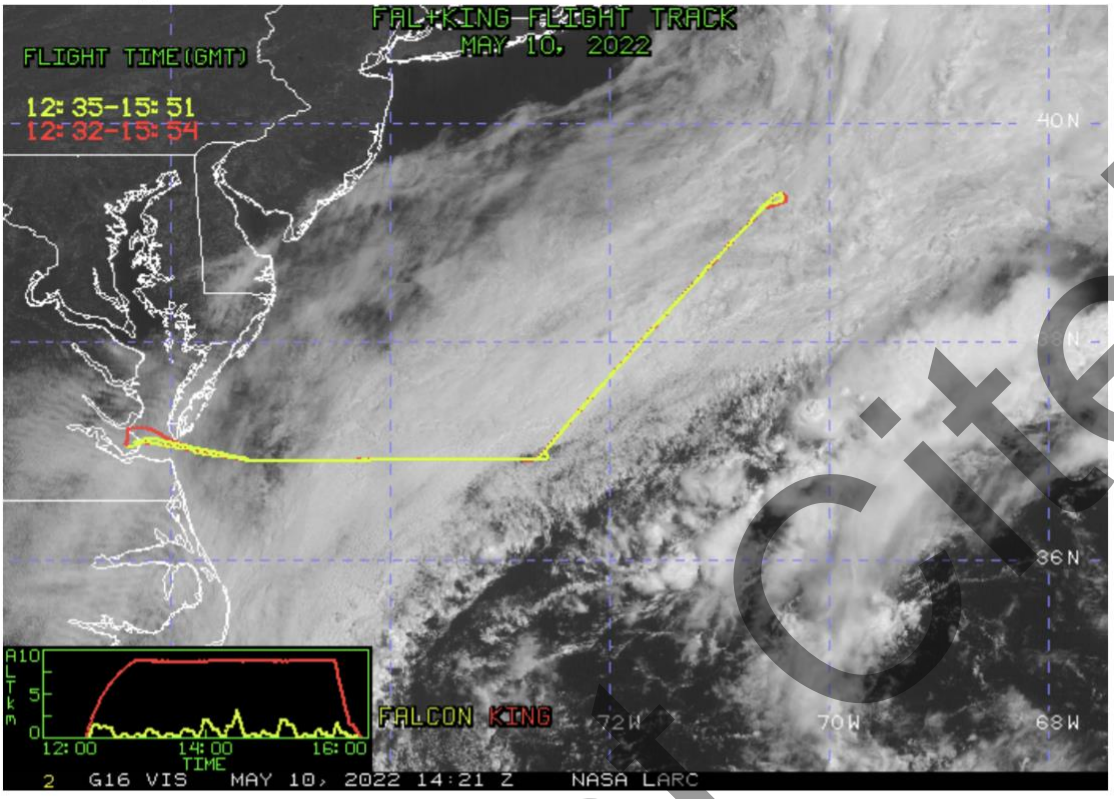

Quicklook ACTIVATE
Cloud Probes (FCDP & 2DS) Quicklook
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie
DLR
Cloud Probes (FCDP & 2DS) Quicklook 10/05/2022 13:20:27-16:49:51
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
13:30:00
14:00:00
14:30:00
15:00:00
15:30:00
16:00:00
16:30:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov



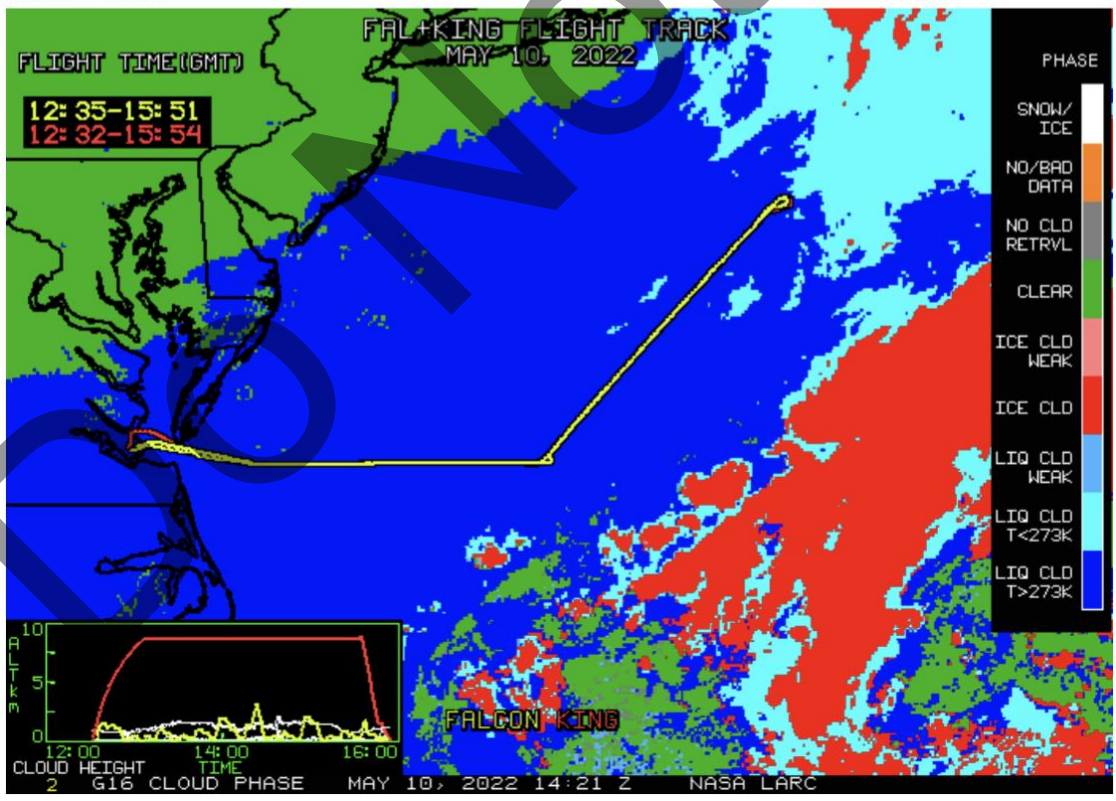


Only pure liquid clouds with precip.

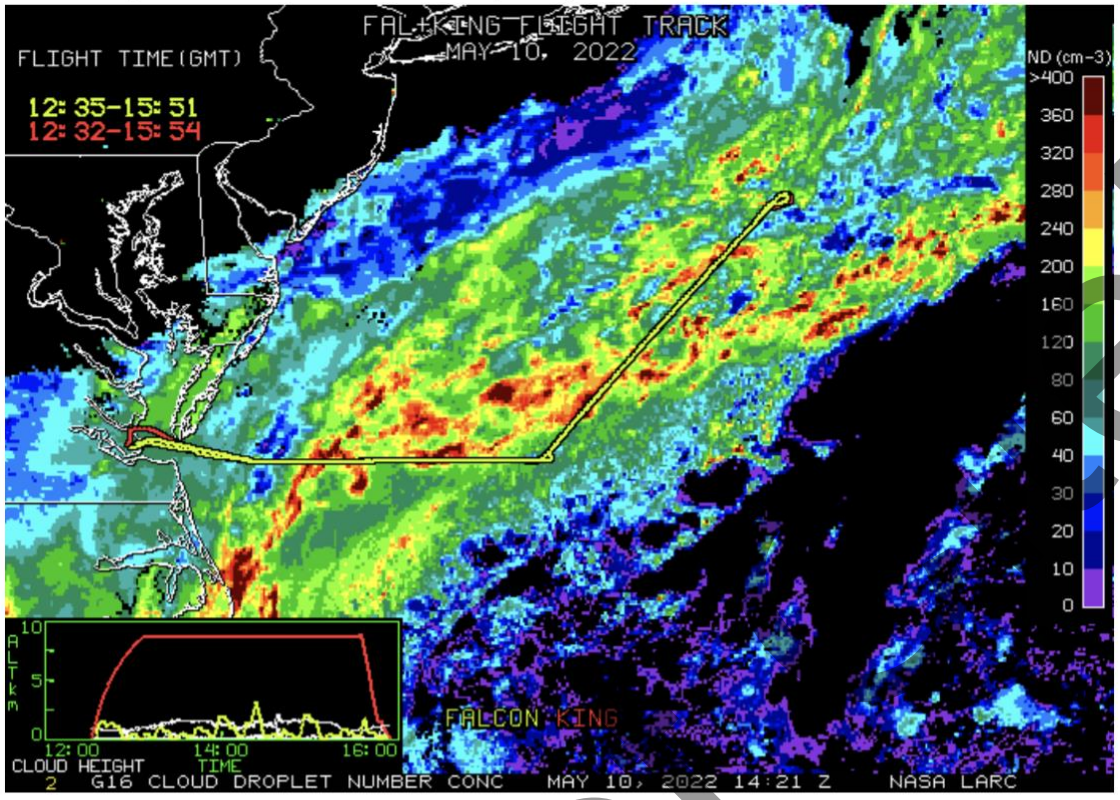
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)