Flight Scientist Report
Friday 03/05/2021 ACTIVATE RF50

Flight Type: Process study flight (2nd of 2)
Flight Route: KLFI SIE AGUNE 3771N ZIBUT ATLIC KLFI
Special Notes: This second joint flight is to capture the upwind aerosol size distribution characteristics that are impacted the cloud field associated with the cold air outbreak.

King Air

Pilot report (Luke Delaney): Science flight for the UC-12 in support of ACTIVATE Campaign #3, conducted cooperatively with the HU-25. Departed Rwy26 and climbed to 25000 ft MSL heading north to SIE for the northern oceanic corridor. The weather was clear with a scattered/broken layer at approximately 5000 ft overwater (~50nmi offshore) transitioning to clear overland. Predominant wind from the northwest at 100 knots. Data was collected initially at 25000 ft MSL for the overland portion, and then a climb was conducted for collection at 28000 ft MSL for the remainder of flight. The laser was secured for about 15 seconds ~40nmi south of SIE for an aircraft under-flight. Several dropsondes were deployed on the route between SIE-AGUNE-37N71W-ZIBUT-ATLIC. Remained with 20 nmi of the HU-25 geolocation throughout the data collection effort. Takeoff was delayed by about 10 min due troubleshooting requiring instrument resets. Some minor instrument degraders were encountered and resolved during initial portion of flight (~45 min).

Flight Scientist report (Shane): RF50 (sortie #2 on 3/5/2021) was a joint statistical survey flight in which the UC-12 ran HSRL-2, RSP, the forward camera, the nadir camera, and dropped 5 sondes. Overall all instruments operated successfully.Shane Seaman was the operator for HSRL-2, RSP, and the cameras. Claire Robinson operated the sondes.

HSRL-2 and RSP both had some issues in startup that resulted in about a 6 minute takeoff delay.

- HSRL-2 did not power up detectors or lock the seed laser.
- RSP maintained a failure warning light, despite appearing to work otherwise.
- A restart of HSRL-2's software fixed the issue, and it was decided to run RSP as-is with the fail light on.
- Later in the flight, RSP's software was restarted to fix the fail light, which was successful. Waiting on confirmation from Brian Cairns if all RSP data was good throughout the flight.

All 5 sonde drops were successful.

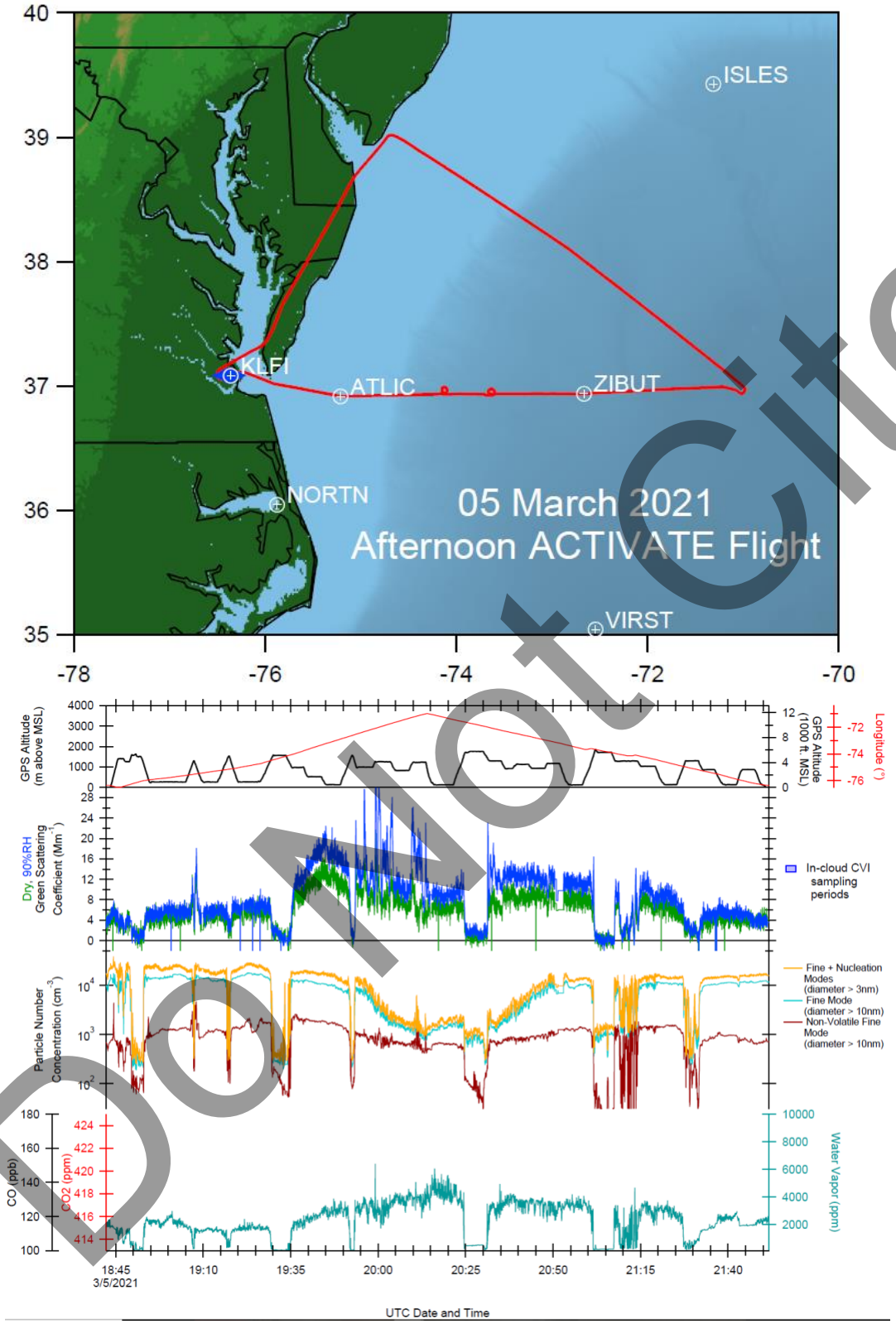
Falcon

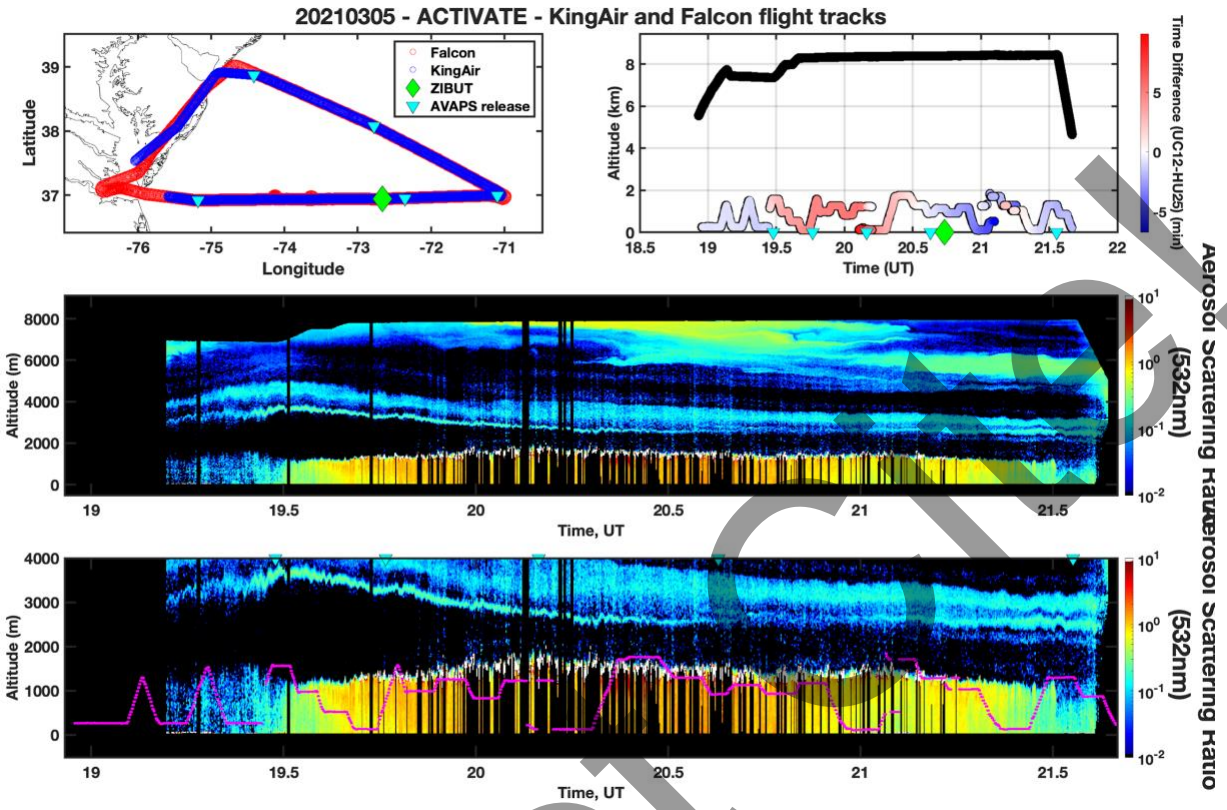
Pilot report (Baxley):
KLFI – KLFI, 3.5 hrs, Slover/Baxley

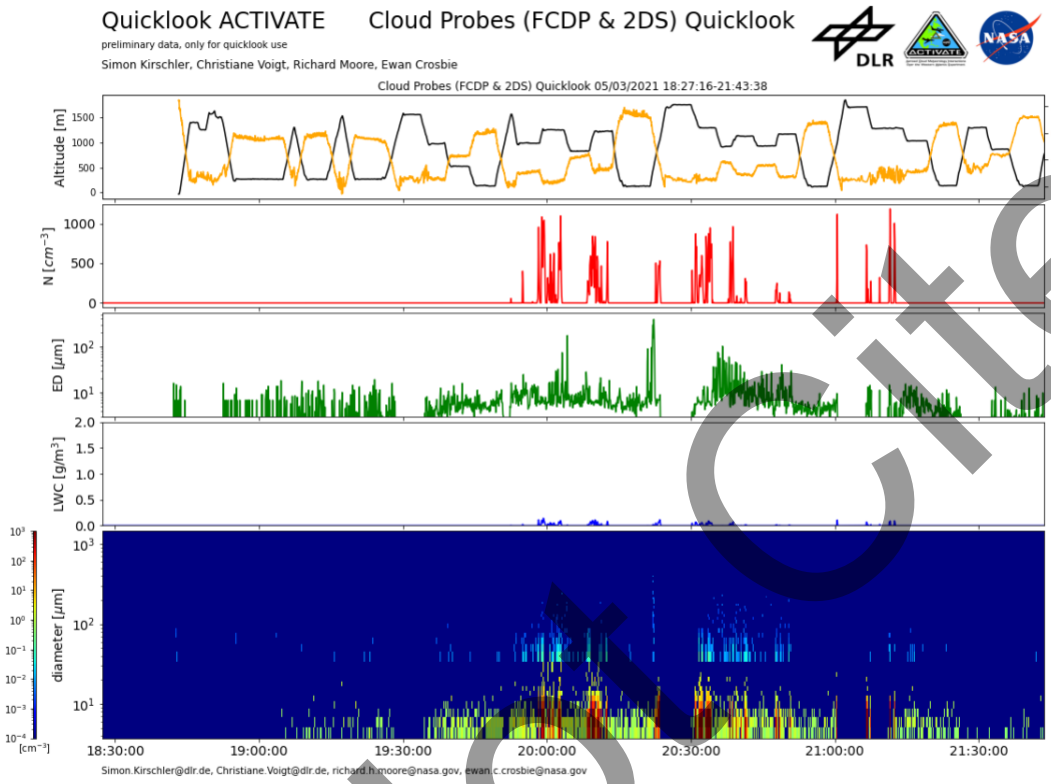
Clear air and cloud modules, with the aircraft's sampling altitude varying between 500' AGL to 7500' MSL. Due to lack of airspace availability in the Atlantic, the afternoon mission was flown low altitude from KFLI to SIE, then AGUNE, 37N/071W, ZIBUT

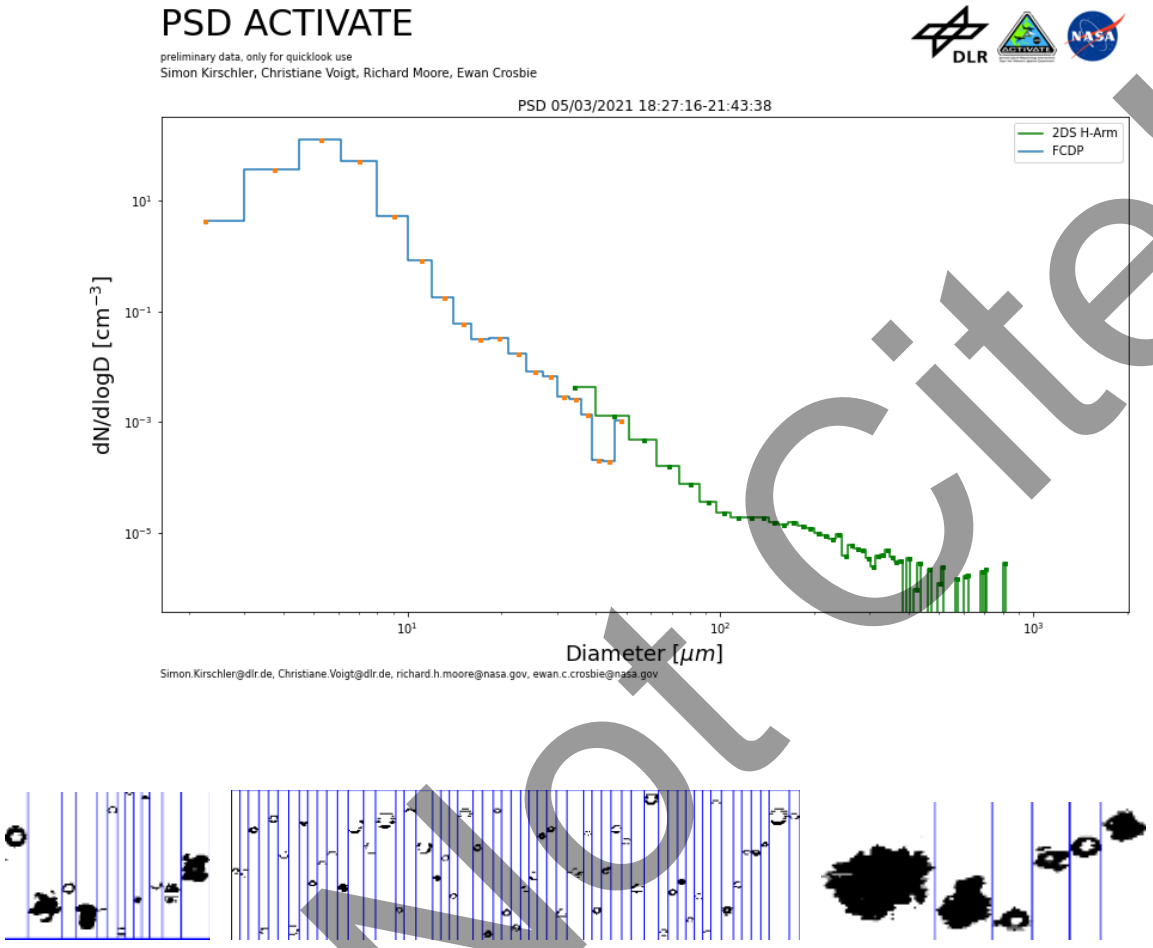
Was not able to get a clearance from Potomac Approach into NY Center, therefore had to proceed VFR 'Due Regard' over water. At reduced electrical power and limited research equipment configuration.

Flight Scientist report (Ewan): See notes from RF49 too as they are relevant to this flight. The overland sampling at the beginning of the second flight was successful. We were able to get established early and did some MINALT sampling. The aerosol concentrations did not seem to change a lot during that 10 min leg so it seemed like a worthwhile opportunity to get in some profiling. Conditions also seemed to be well mixed from 1000 to 3500-4500 ft overland. This type of upwind sampling may offer a lot of potential for other flight scenarios and may be quite a nice complement to the low level overland sampling that has been conducted to date in the region south of Norfolk towards the outer banks.


ISLES
KLFI
ATLIC
ZIBUT
NORTN
VIRST
05 March 2021
Afternoon ACTIVATE Flight
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)
3/5/2021
UTC Date and Time


20210305 - 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)

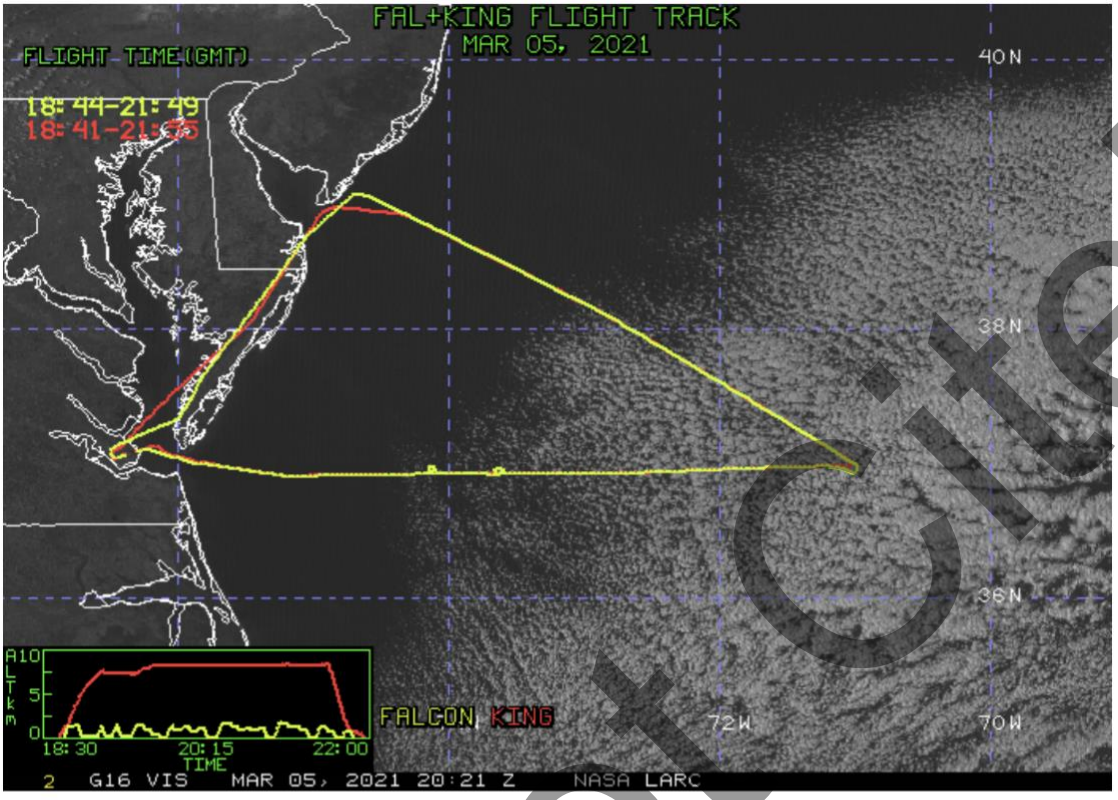

Quicklook ACTIVATE
Cloud Probes (FCDP & 2DS) Quicklook
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie
Cloud Probes (FCDP & 2DS) Quicklook 05/03/2021 18:27:16-21:43:38
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
18:30:00
19:00:00
19:30:00
20:00:00
20:30:00
21:00:00
21:30:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov



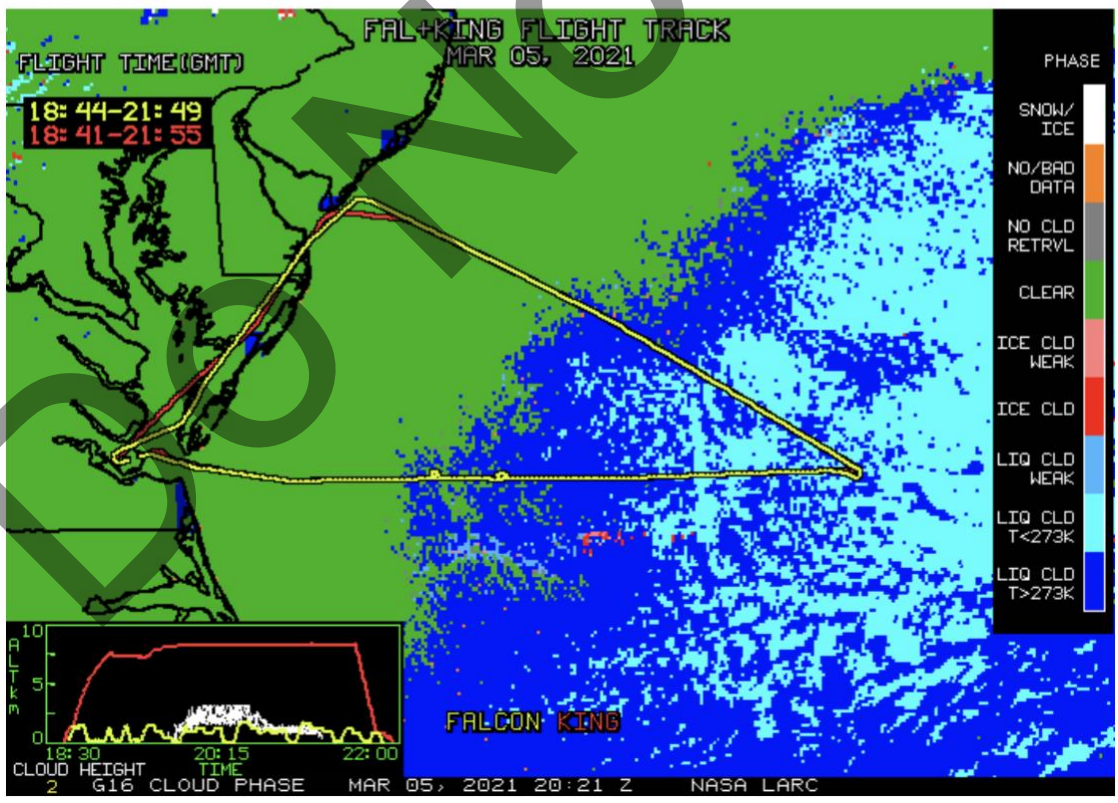
Mixed phase clouds were seen around 20:00 UTC and 20:23 UTC and pure liquid cloud in between around 20:11 UTC.

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 50, 20:21 UTC Mar 05, 2021

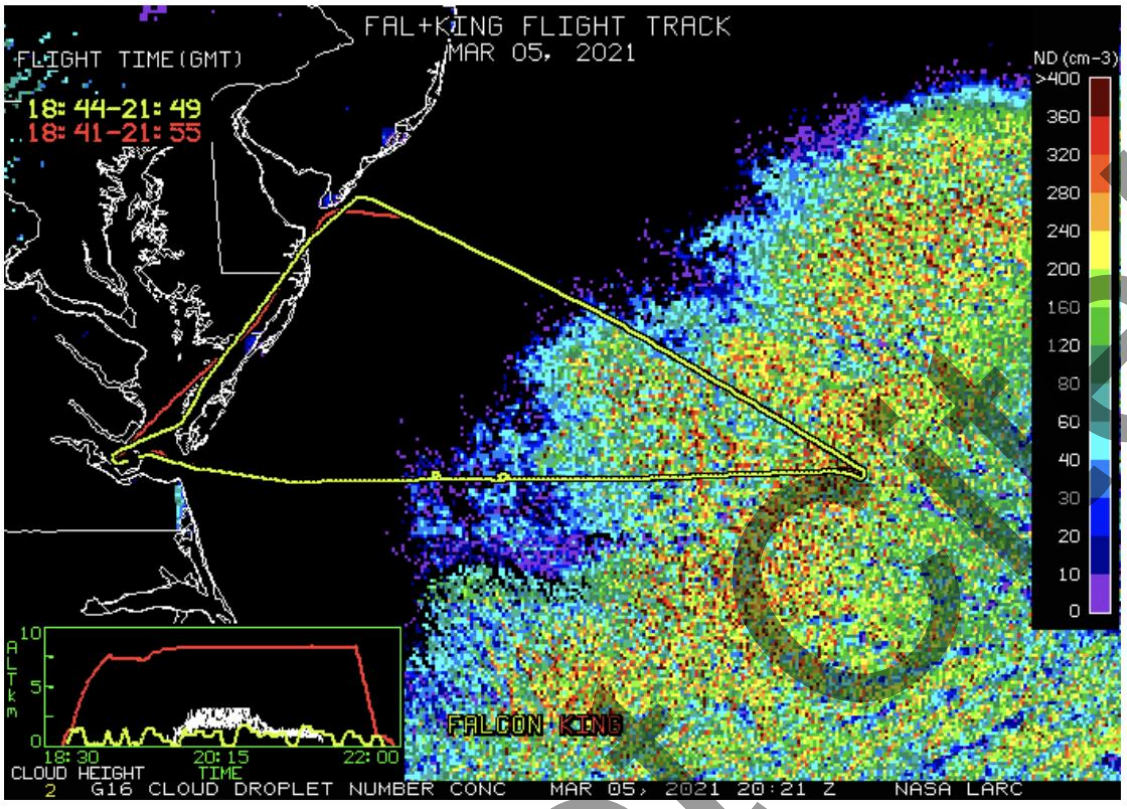
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)