Flight Scientist Report
Saturday 02/05/2022 ACTIVATE RF119

Flight Type: Statistical Survey Flight
Flight Route: KLFI JAMIE RADDS ZIZZI FISSH LYNUS FISSH LYNUS FISSH ZIZZI RADDS JAMIE KLFI
Special Notes: Planned first of 2 flights today (although 2nd flight got scrubbed due to aircraft issue). Some mid-level clouds to deal with above the low-level clouds. The flight was designed to characterize upwind conditions by a clear-to-cloudy transition near the coast to build on in the 2nd flight that will sample the air mass farther downwind in a Lagrangian way. This flight in essence captures the air mass prior to cloud processing and the next flight samples the air after a few hours of cloud processing.

King Air
Pilot report (Wusk):
First flight of a planned two flight day of cooperative flights with the HU25. Planned take-off for 0830. Planned route JAMIE RADDS ZIZZI FISSH LYNUS FISSH LYNUS FISSH ZIZZI RADDS JAMIE. Strong winds at FL. Filed for FL240 due to expected high clouds. prep calls to ZNY and ZDC due to IFR flight plans needed through the B24 corridor, and actual IMC conditions for HU25. Take-off at 8:44. Good climb out and coordination through duration of the flight. 3 sondes dropped at second pass of LYNUS then 1/2 way to FISSH then FISSH. ATC directed a cut from FISSH WARNN SWL on the route home for both aircraft. Maintained FL240 until SWL then descent to RNAV 26 at KLFI. Landed at 1207 L. Quick turn and brief second flight out ZIBUT. Good engine starts but HU had a hydraulic light that would not clear and had to shutdown. Flights cancelled due to the late time of day not sufficient to allow fix and fly. Post flight discussion of Sunday/Monday plan for potential swap over or fly Tuesday.

Flight scientist report (Shingler):

KLFI JAMIE RADDS ZIZZI FISSH LYNUS FISSH LYNUS FISSH ZIZZI RADDS JAMIE KLFI

On the first pass between FISSH and LYNUS there were scattered cu up to 3kft along the leg out to LYNUS. About halfway down the leg a very low scattering mid cloud deck was present between 5-9 kft and a lower deck with tops near 3kft. Cloud scene was messy and variable out near the turn.

At the 180 turn at FISSH there was a decent low cloud deck with tops between 3-4kft. Scattered shallow cu in the leg between FISSH and LYNUS with tops reasonably stable at about 3kft. Low cloud deck is fairly stable along this second pass with tops between 3-4 kft.

On the return leg from FISSH to KLFI CTHs were aprx 4kft with a very thin and light scattering aerosol layer above the clouds at 5kft.

3 Sondes dropped
LYNUS (2nd)
1/2 LYNUS (2ND)/FISSH(3RD)
FISSH (3RD)

Falcon in nadir at 160050

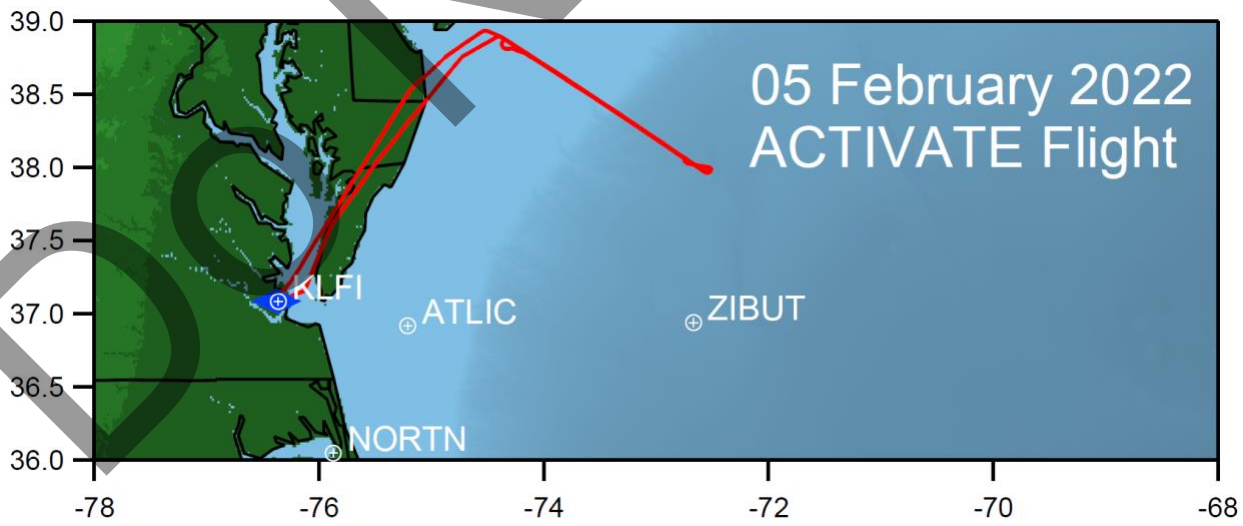
Falcon

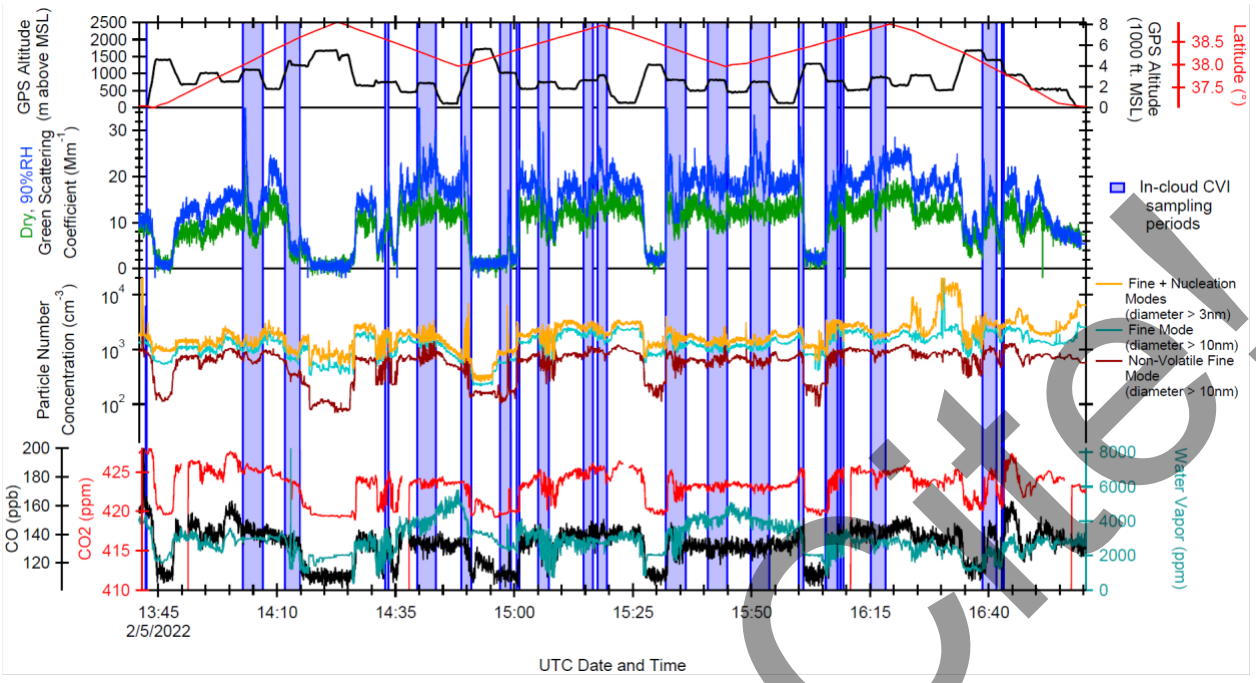
Pilot report (Slover):

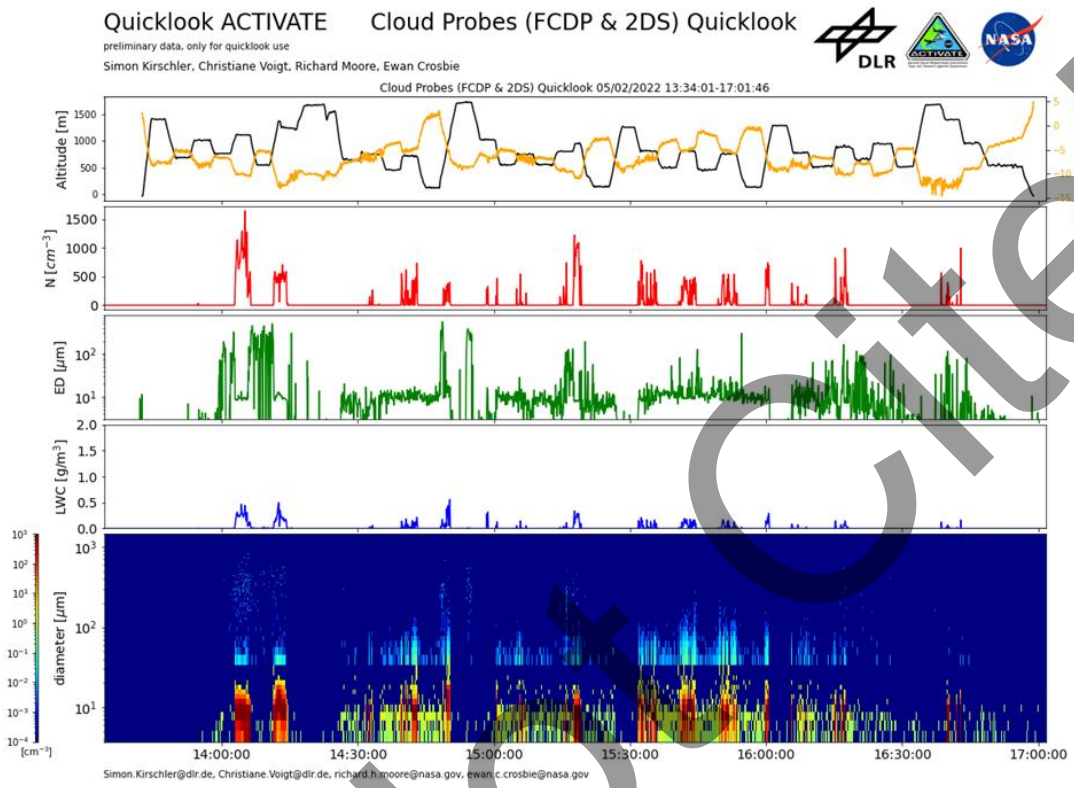
Flown as planned KLFI JAMIE RADDS ZIZZI FISSH LYNUS FISSH LYNUS FISSH ZIZZI RADDS JAMIE KLFI with a small deviation on return over land to send us through a warning area. Second sortie cancelled following engine start due to a mechanical malfunction with a rudder pressure switch.

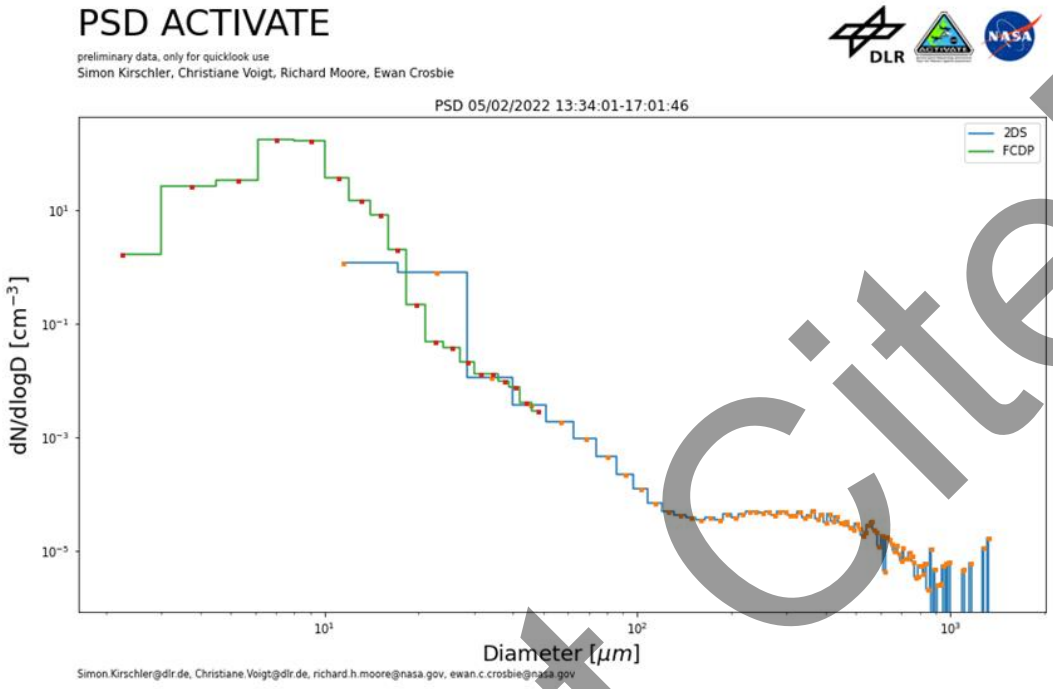
Flight scientist report (Crosbie):

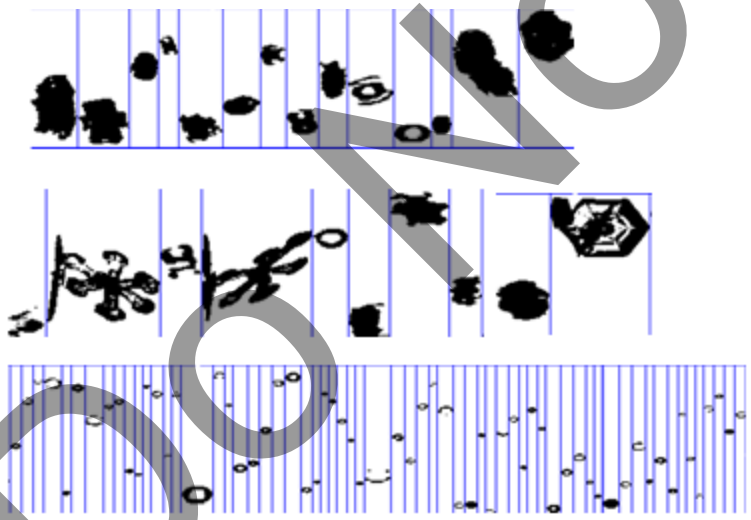
Stat survey ZIZZI-LYNUS (x2). A stat survey flight was performed in the airway to the southeast of the Delaware Bay. The purpose was to characterize the initial stages of the post-frontal environment as it advects offshore. The region was sampled twice using the normal survey module. There were cloudy conditions over the DELMARVA coastal region so cloudy modules were started early. There was a region of lower cloud fraction that was connected to the NJ coast, which contrasted to the more cloudy region to the south. Further offshore, the clouds developed and thickened and started to fill in which reached near overcast at the eastern turnpoint. During the first leg, the far turn at LYNUS was at the edge of the frontal cloud with a second layer of cloud above the PBL and some more complex layers visible to the east. By the second time at LYNUS this had moved off to the east.



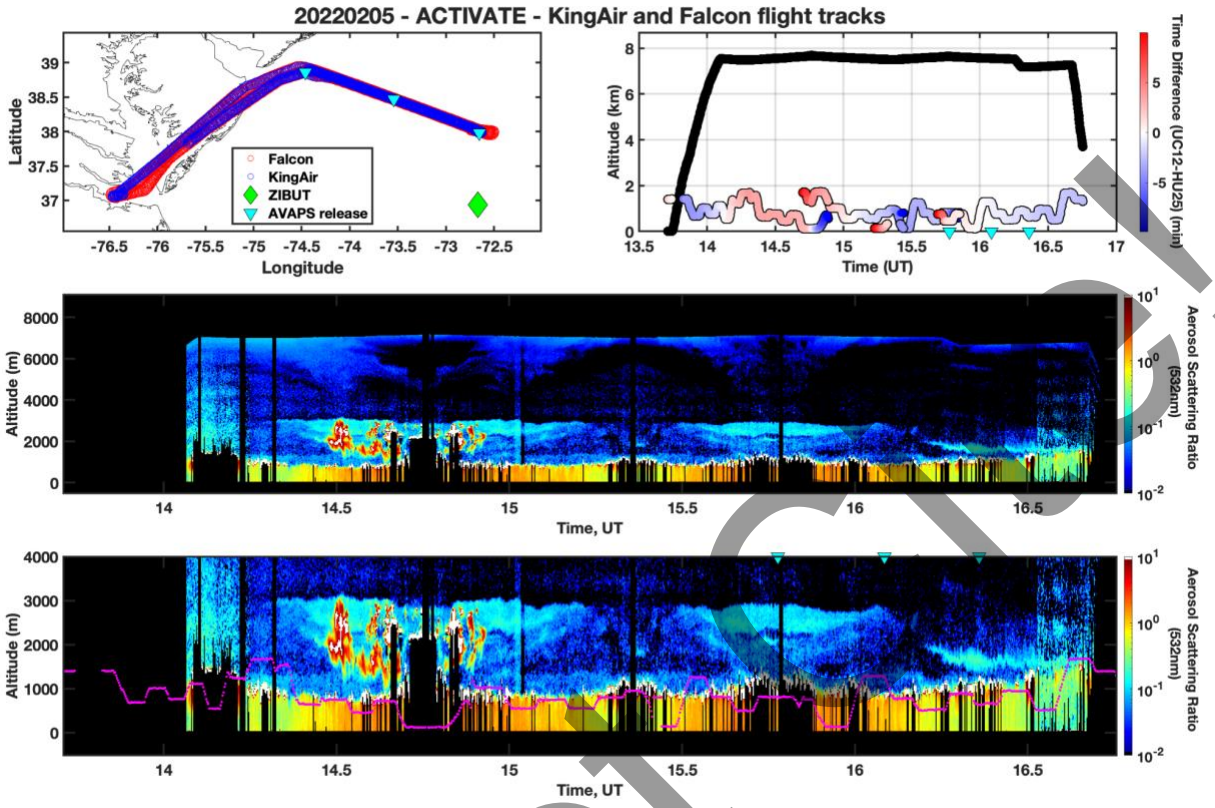

GPS Altitude (m above MSL)
2500
2000
1500
1000
500
0
GPS Altitude (1000 ft. MSL)
8
6
4
2
0
Latitude (°)
38.5
38.0
37.5
Dry, 90%RH Green Scattering Coefficient (Mm^{-1})
30
20
10
0
In-cloud CVI sampling periods
Particle Number Concentration (cm^{-3})
10^4
10^3
10^2
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
CO (ppb)
200
180
160
140
120
CO2 (ppm)
425
420
415
410
8000
6000
4000
2000
0
Water Vapor (ppm)
13:45
2/5/2022
14:10
14:35
15:00
15:25
15:50
16:15
16:40
UTC Date and Time


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 05/02/2022 13:34:01-17:01:46
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
14:00:00
14:30:00
15:00:00
15:30:00
16:00:00
16:30:00
17:00:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov



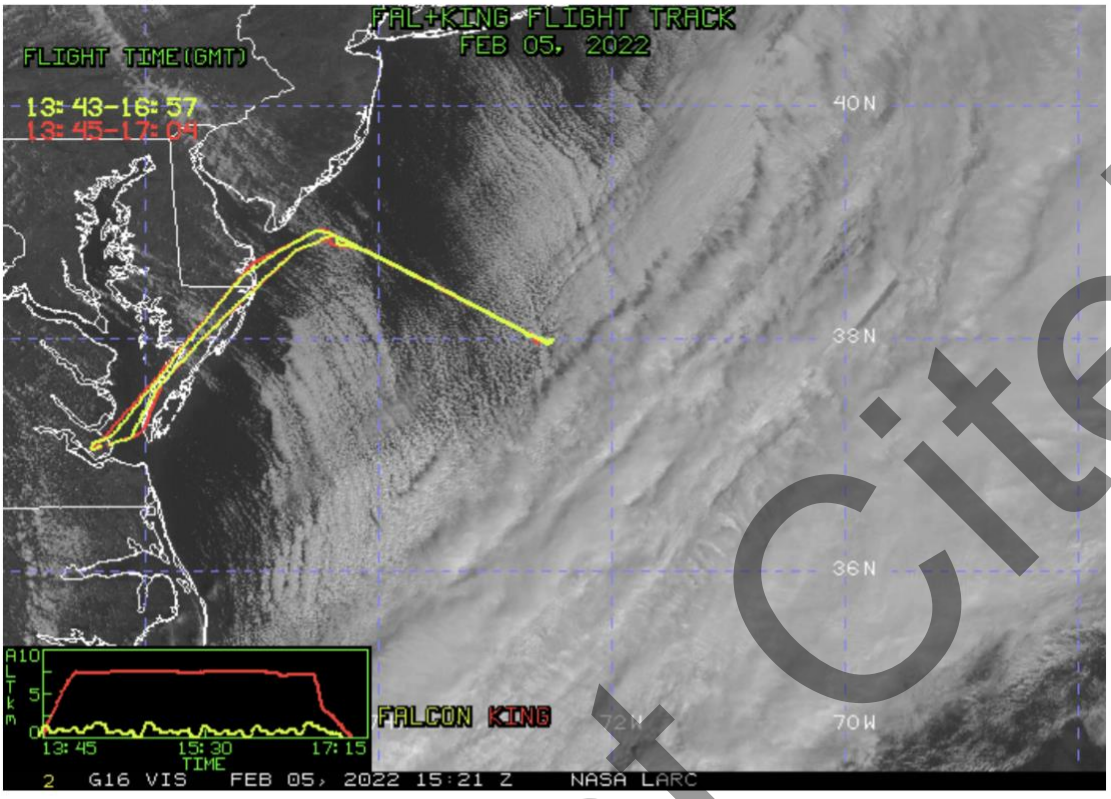


Mixed phase and liquid clouds with dominantly ice Precip.

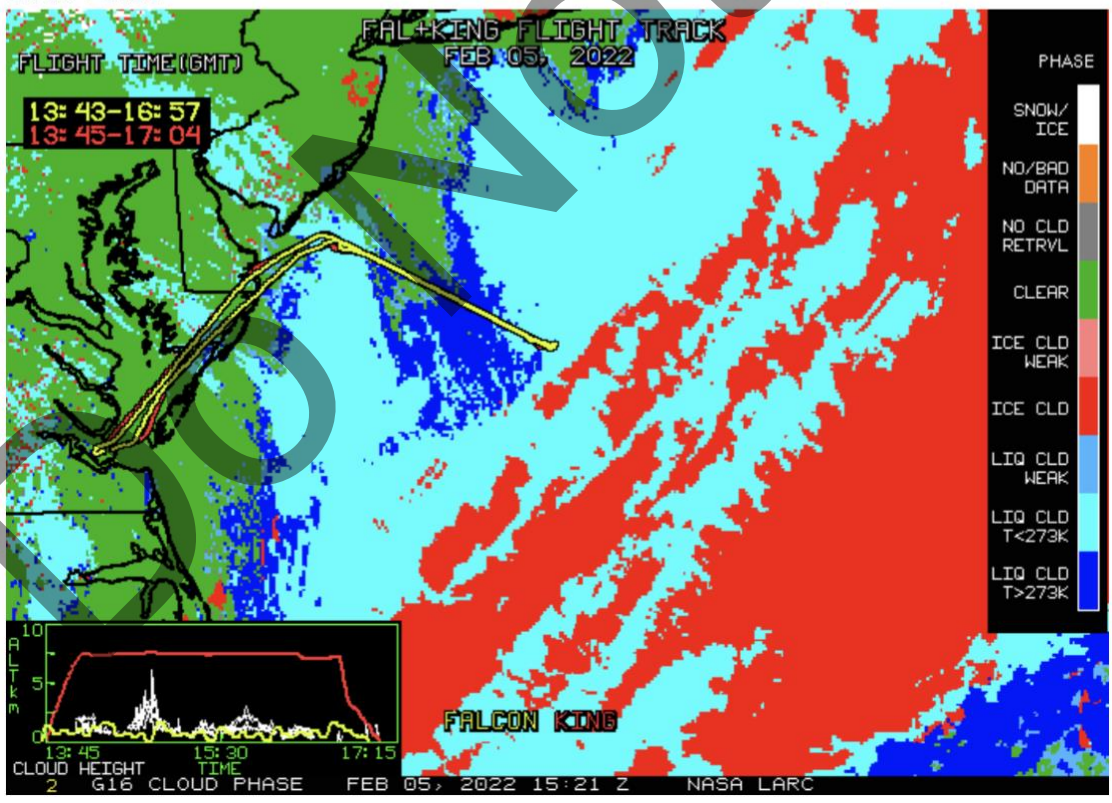

20220205 - ACTIVATE - KingAir and Falcon flight tracks
Latitude
Longitude
Falcon
KingAir
ZIBUT
AVAPS release
Altitude (km)
Time (UT)
Time Difference (UC12-HU25) (min)
Altitude (m)
Time, UT
Aerosol Scattering Ratio (532nm)

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 119, 15:21 UTC Feb 05, 2022

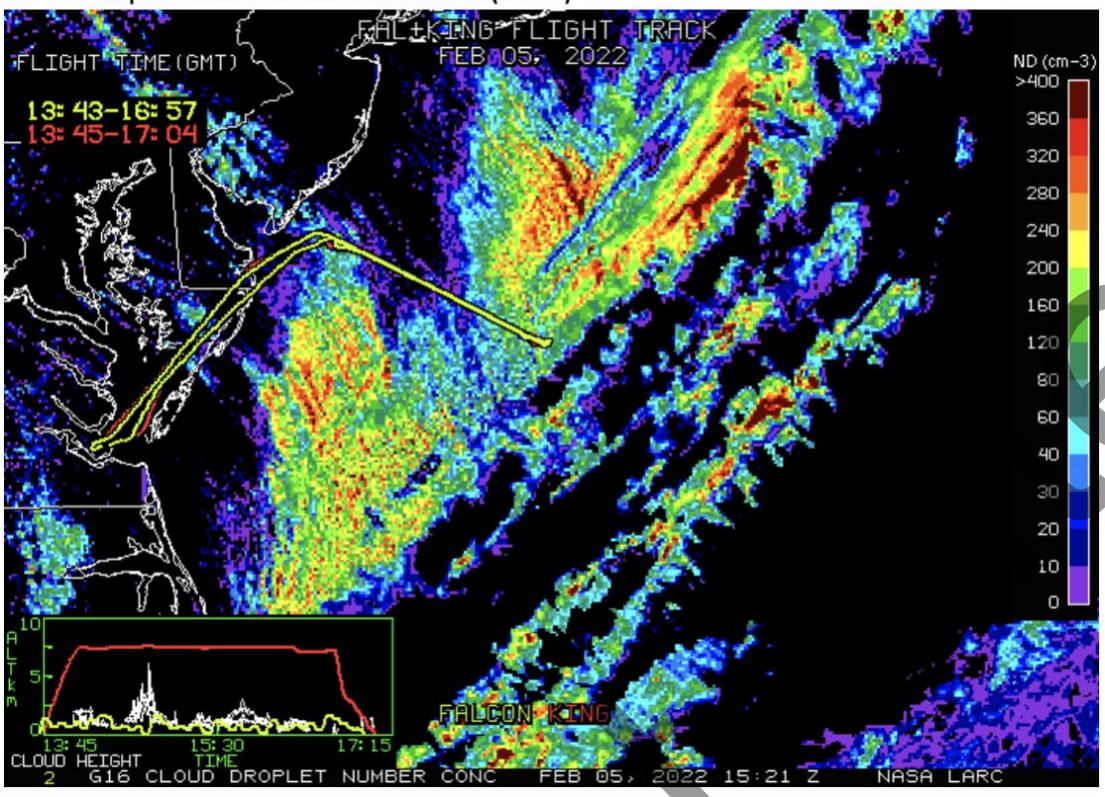
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)