Flight Scientist Report
Thursday 05/05/2022 ACTIVATE RF150

Flight Type: Statistical Survey Flight
Flight Route: KLFI ATLIC ZIBUT 4000N06750W SAILE YAHOO SKOWL KPVD
Special Notes: First of two flights up to Providence. Lots of cloud water samples!

King Air
Pilot report (Coldsnow):
Flight was flown as briefed (KLFI ATLIC ZIBUT 4000N/06750W SAILE YAHOO SKOWL KPVD). Winds at altitude were generally westerly at 30-90 knots. There were no known issues with instrumentation and 4 dropsonds were dropped. All sonds were nominal. Timing was within 5 minutes for the entire overwater portion of the flight.

Flight scientist report (Harper):

UC12 takeoff: 12:27utc

Cloud: thin cirrus above during ascent. Cirrus above dissipated before ZIBUT

Aircraft sync: UC12 trailing 5min during ascent. UC12 Trailing less than 2min at ZIBUT. UC12 2min ahead at SAILE.

Sonde 1: 13:16:30utc at ZIBUT
Sonde 2: 14:24:10 utc at NE to N turn point
Sonde 3: ~14:44utc at waypoint SAILE (N to W turn)
Sonde 4: 15:15:00utc at YAHOO

No instrument issues.

UC12 landed: 15:47utc

Falcon
Pilot report (Baxley):
Elder/Baxley, Crosbie/Winstead KLFI ATLIC ZIBUT 4000N06750W SAILE YAHOO SKOWL KPVD
Weather as expected, route flown as briefed, no unexpected events or anomalies.

Flight scientist report (Crosbie):

Survey to Providence, RI. Extensive cloud conditions through the flight. Near the coast on the outbound, there were several layers but this simplified quickly to a well defined marine layer with a second decoupled cloud layer at approximately 5000ft. This second layer was intermittent and sometimes very thin. The shallow marine layer deepened offshore becoming more Cu-like near ZIBUT over the warm water. On the northeast leg this then descended back to a well capped stratiform deck and we were not able to fly below cloud. There was a marked inversion capping the cloud, with clean conditions aloft. A high number of cloud water samples were collected in the eastern/northeastern extent of the flight track where unbroken long sampling times in cloud were achieved. The inbound leg from YAHOO to the coast was cloud free. The interpretation of the cloud forcing was that warm, relatively moist air was advecting over the cold coastal water. Temperatures near the coast were significantly higher than in the cloud.

From Winstead (applies to both flights this day):
Activate flight to Providence, RI.

12:23:27 Takeoff from LaRC

15:41:20 Landing at Providence

17:14:06 Takeoff from Providence

20:30:32 Landing at LaRC

Notes:

Some issues with scroll pumps during morning start, but worked fine during flights.

12:36 Green dry scattering approx. 40 @ 2000ft AGL

12:40 Green dry scattering approx. 60 @ 500ft AGL

12:50 High scattering & elevate PSAP

14:00 ACT @ 1800 ft: pretty clean

Lost comms before landing

Comms not working during takeoff, but can back not long after takeoff

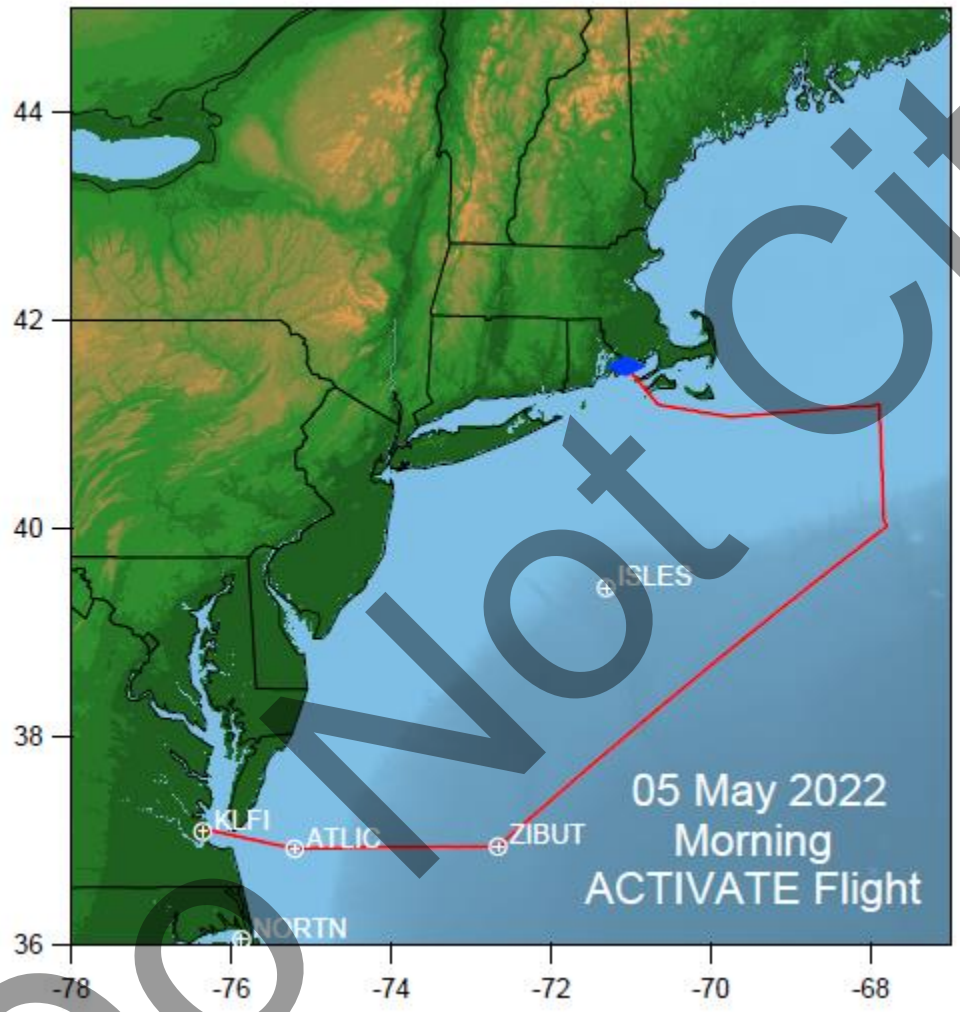
18:37 For most of afternoon flight until now, have been unable to go below 1000 ft because of low clouds

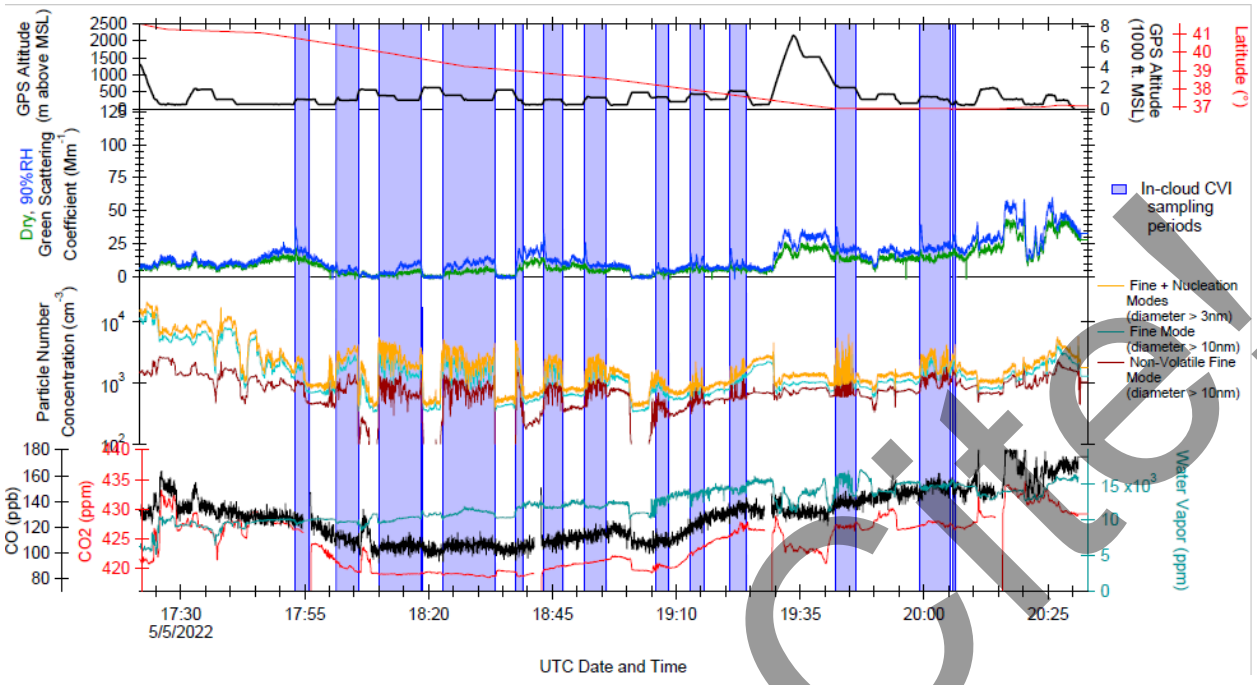
18:39 Break in clouds. Able to go to 500 ft

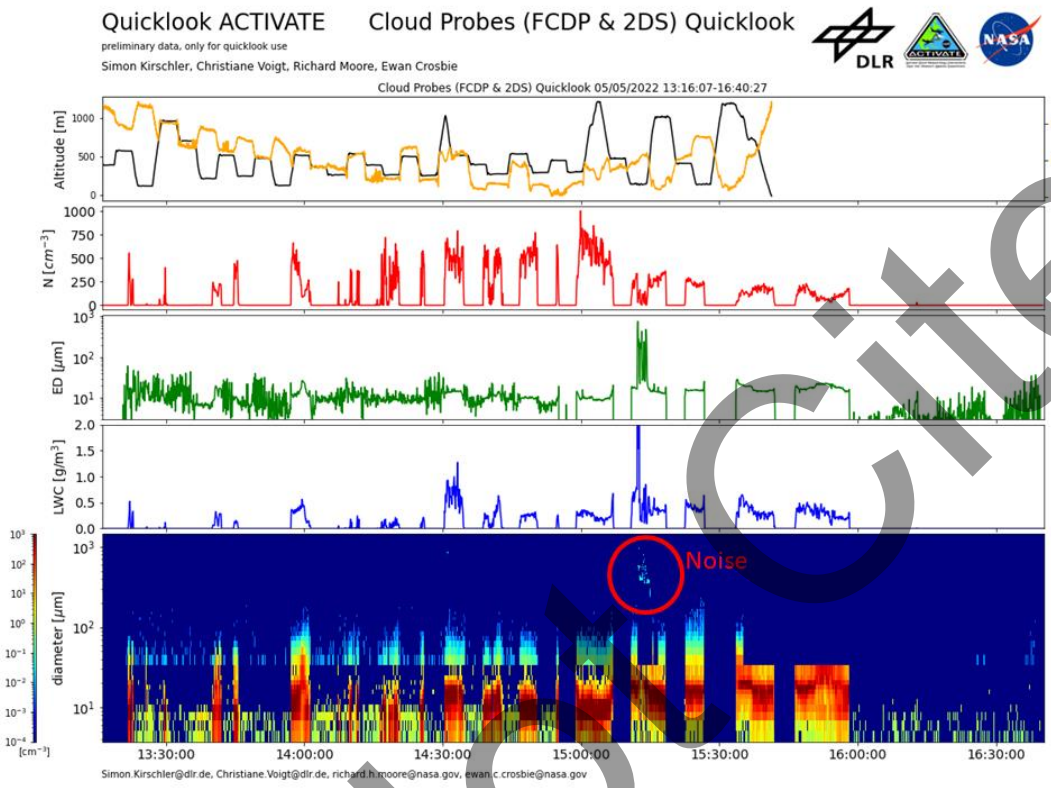
18:58 SMPS software crashed

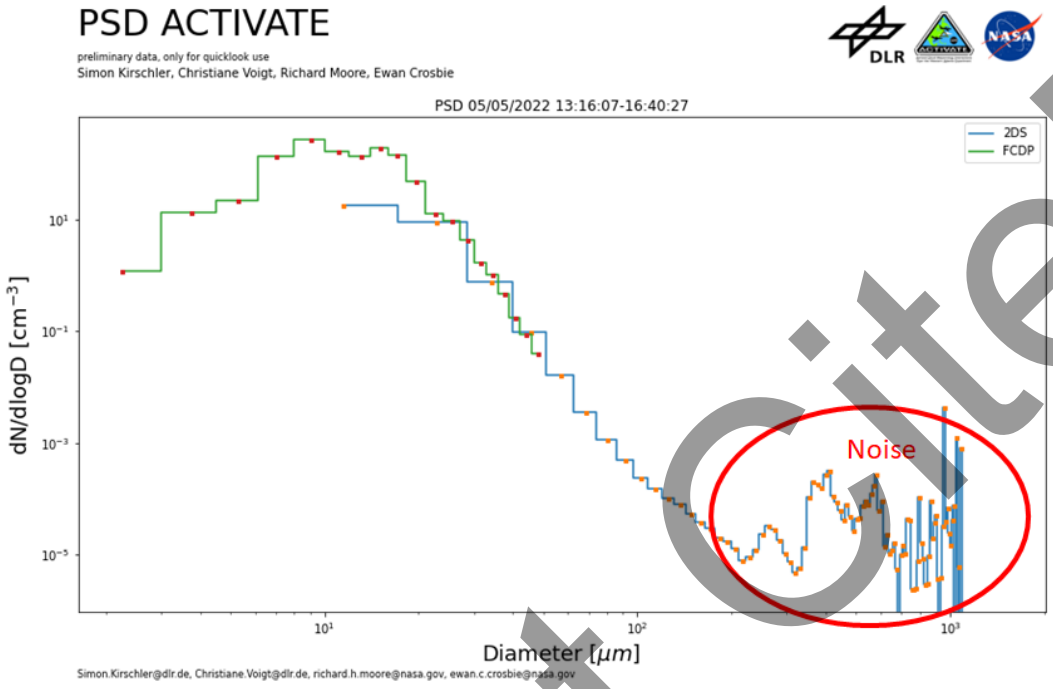
19:00 SMPS software restarted and now working

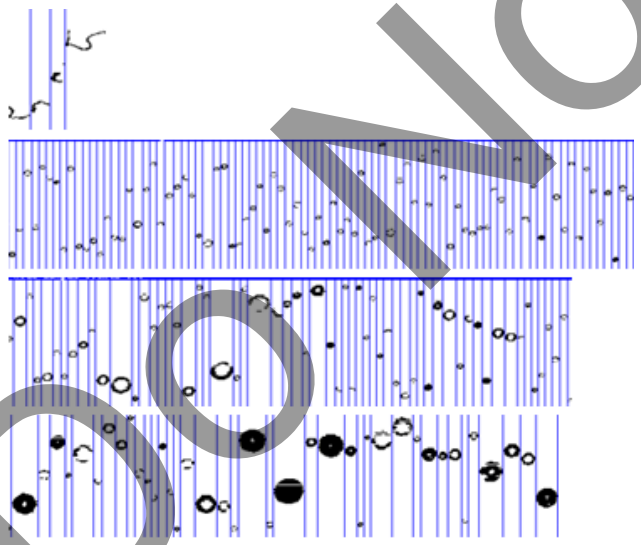
20:26 WCM & humidifier turned off in preparation for landing



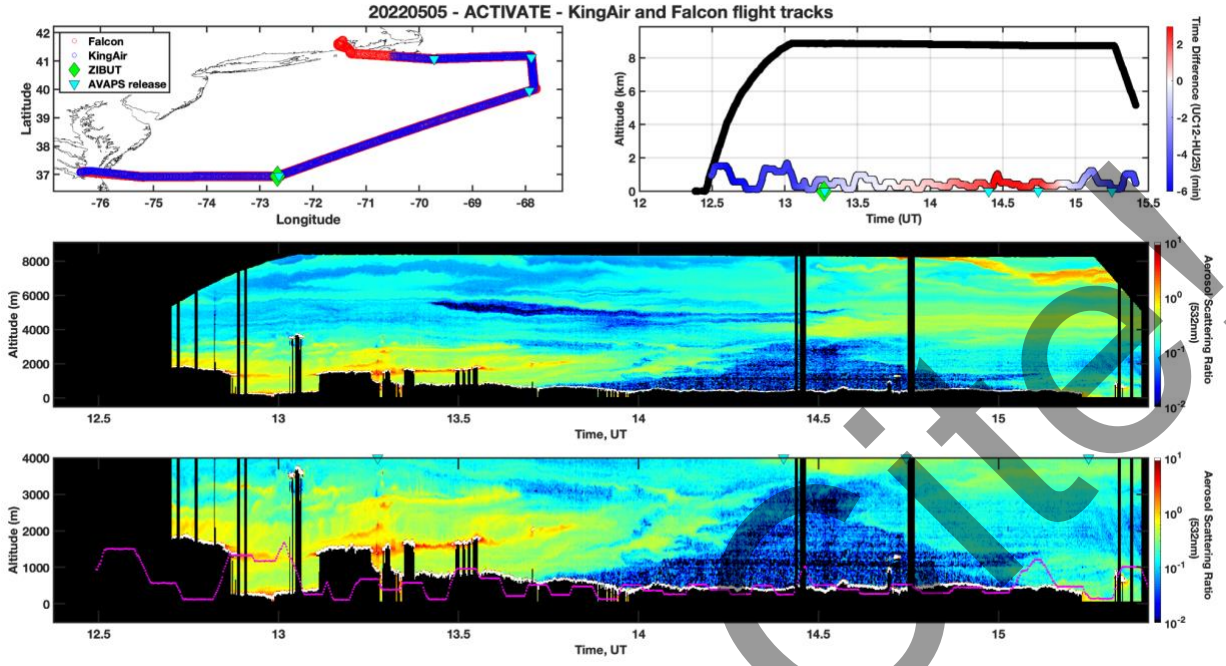

GPS Altitude (m above MSL)
Dry, 90%RH Green Scattering Coefficient (Mm-1)
Particle Number Concentration (cm-3)
CO (ppb)
CO2 (ppm)
GPS Altitude (1000 ft. MSL)
Latitude (°)
Water Vapor (ppm)
In-cloud CVI sampling periods
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
17:30
5/5/2022
17:55
18:20
18:45
19:10
19:35
20:00
20:25
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 05/05/2022 13:16:07-16:40:27
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
Noise
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



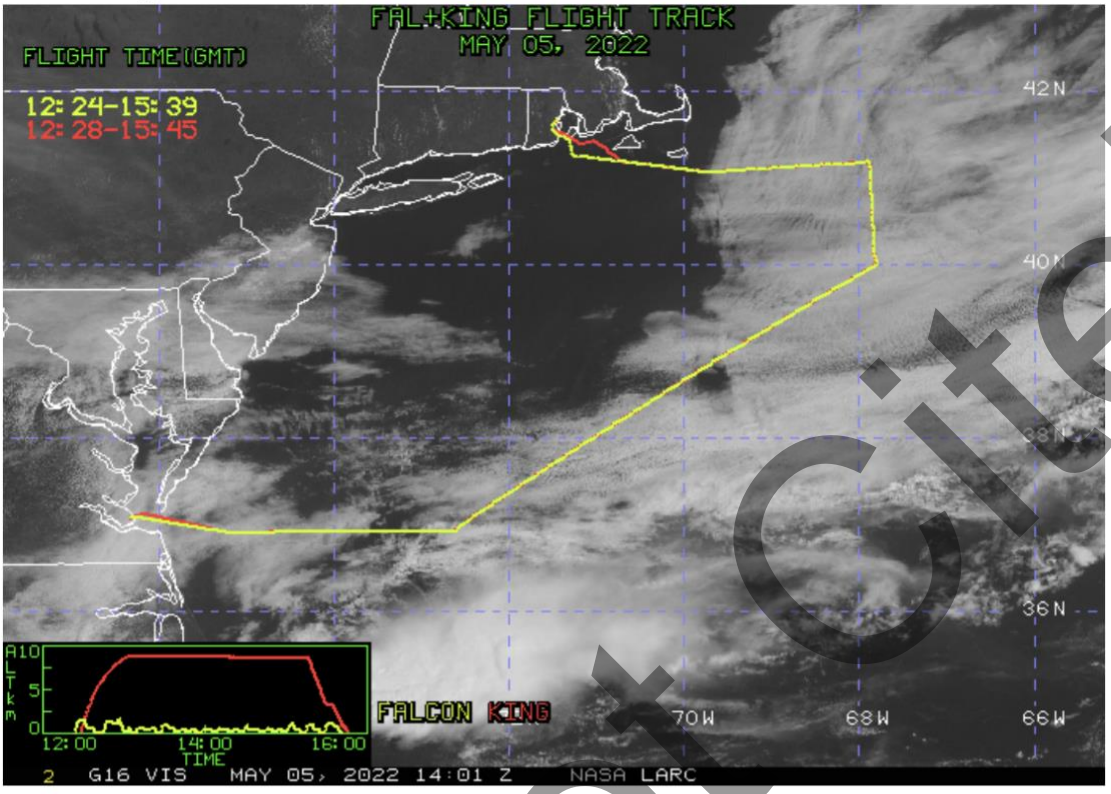


Only pure liquid clouds with occasionally large bio aerosols. Dominantly drizzle and no Precip.

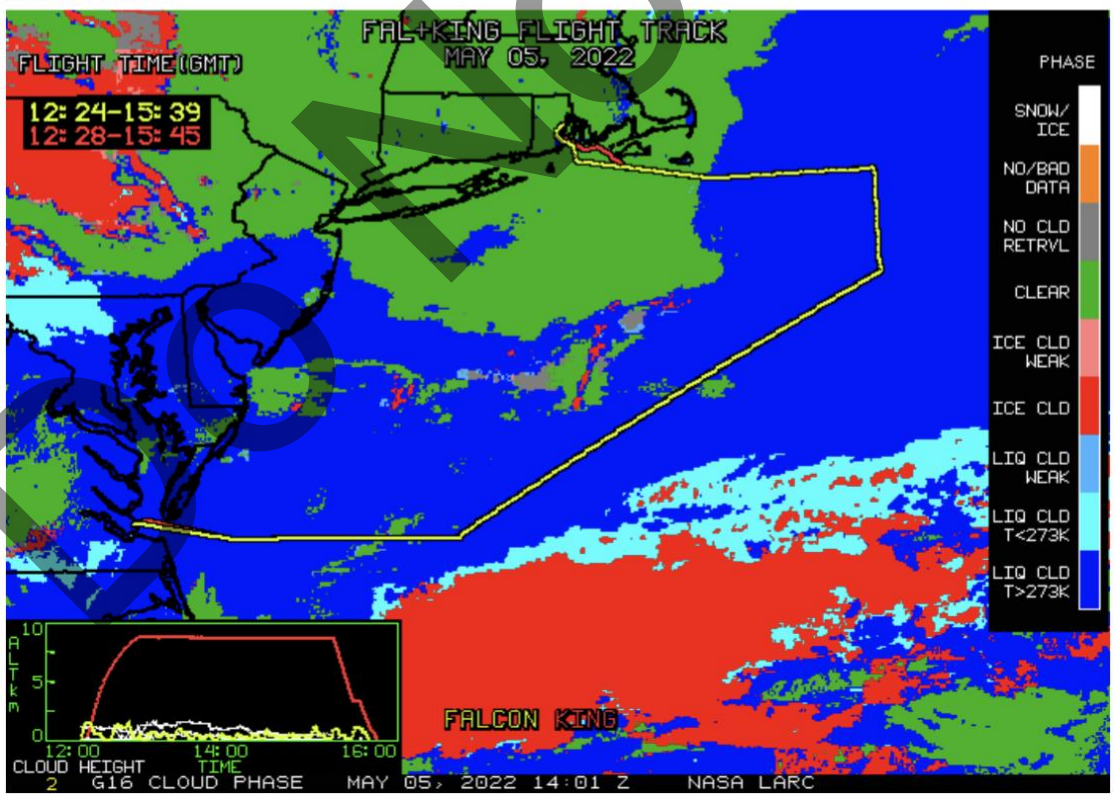

20220505 - ACTIVATE - KingAir and Falcon flight tracks
Falcon
KingAir
ZIBUT
AVAPS release
Latitude
Longitude
Altitude (km)
Time (UT)
Time Difference (UC12-HU25) (min)
Altitude (m)
Time, UT
Aerosol Scattering Ratio (532nm)

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 150, 14:01 UTC May 05, 2022

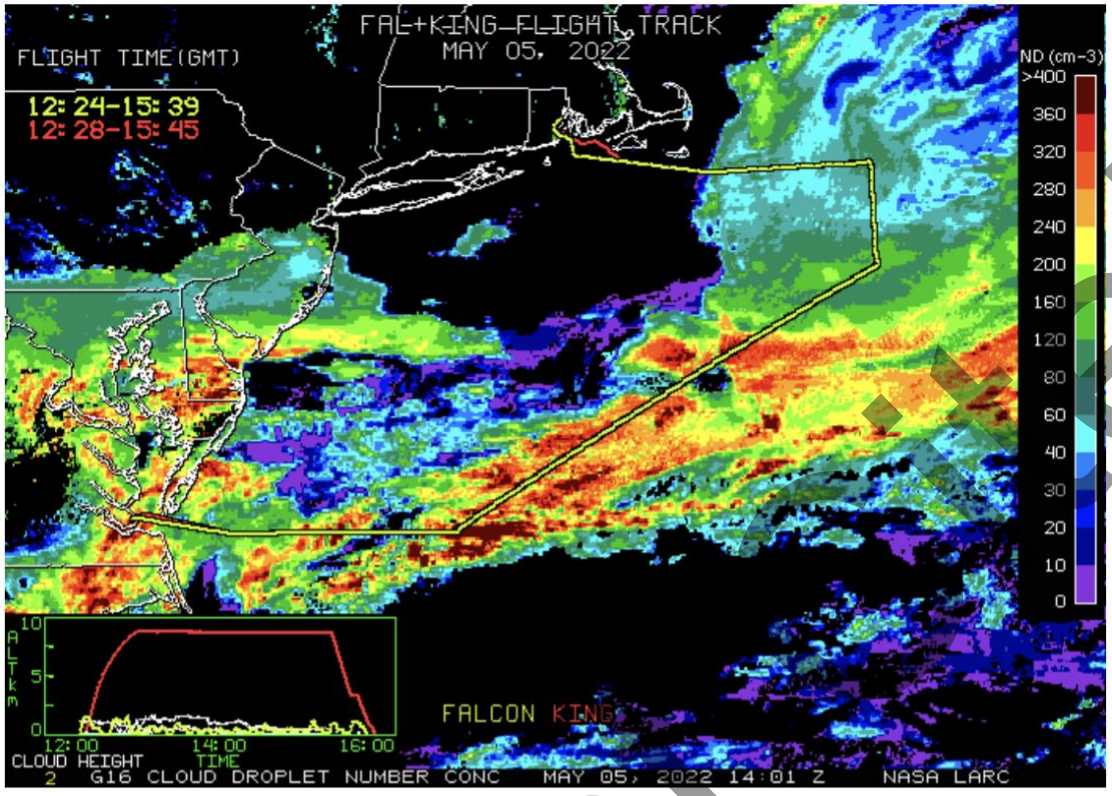
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)