Flight Scientist Report
Wednesday 01/12/2022 ACTIVATE RF102

Flight Type: Statistical Survey Flight
Flight Route: ATLIC ZIBUT 3570N ZIBUT ATLIC
Special Notes: This is an excellent flight day with this being the first of two flights to characterize the cloud field a day after a CAO event.

King Air

Pilot report (Jamison):
First (morning) of two cooperative flights with HU-25. Route of flight: KLFI-ATLIC-ZIBUT-35.25N069.75W-ZIBUT-ATLIC-TURET-KLFI. Weather clear with winds out of the west at 12 knots for KLFI departure. Uneventful climb with no undue delays from departure control; continued uninterrupted climb to FL280 and turn through north back towards ATLIC. Positioning with HU-25 was maintained within 10 minutes through duration of science collection. Conditions at altitude were smooth air and clear the entire routing. 4x dropsondes deployed; ZIBUT, turn/reverse point, half way between turn point and ZIBUT, and at ATLIC prior to descent. Maintained FL280 until final dropsonde release at ATLIC then commenced ~ 2600 fpm descent in effort to achieve 12,000 ft altitude by TURET per ATC instructions. During this descent, researcher requested to reduce rate of descent due to condensation concerns for HSRL. Note: the descent between ATLIC and TURET needs to be well timed to lose sufficient altitude for complying with ATC sequencing or descent can be commenced earlier if expected to keep rate of decent no greater than 2000-25000 fpm. Uneventful recovery to runway 26 at KLFI.

Flight scientist report (Shingler):

KLFI ATLIC ZIBUT 35.35/-69.75 ZIBUT ATLIC KLFI

Cloud free boundary layer on most of the leg from ATLIC to ZIBUT. BLH increasing from 1500' to 3000' along this leg. Scattering increased in the BL along the leg as well. Shallow fair weather cu developed around ZIBUT and slowly transitioned to more variable CTHs from 3000' up to 6000' along the SE leg. Conditions on return are fairly consistent with outbound legs.

Nadir camera inop for this flight.

4 Sondes dropped

ZIBUT
TURN
HALFWAY

COAST

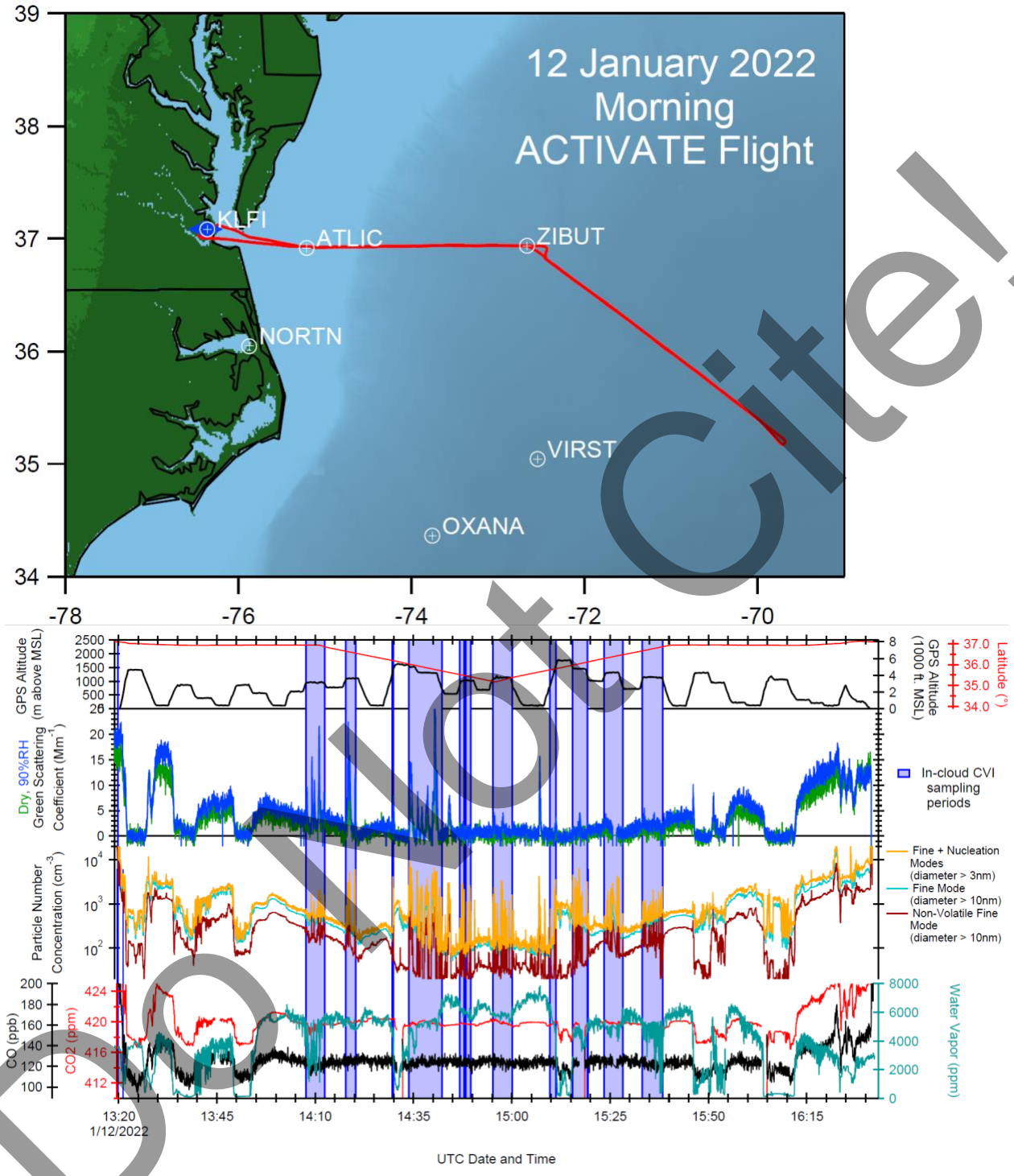
Falcon

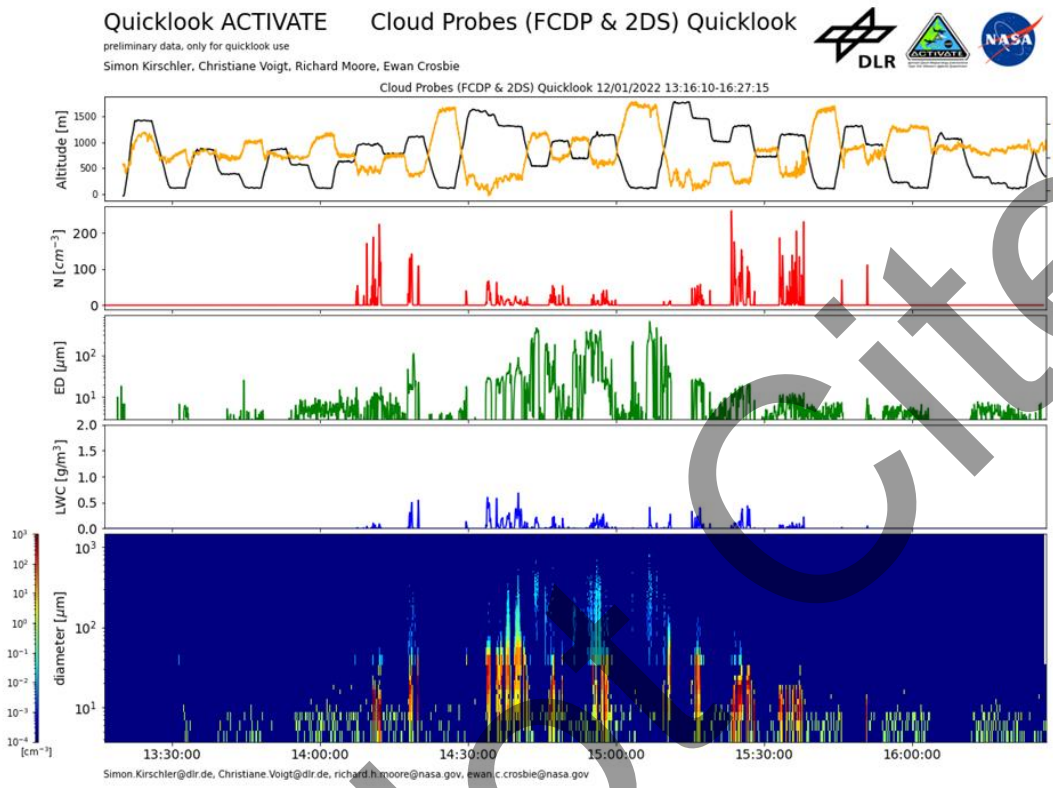
Pilot report (Baxley):

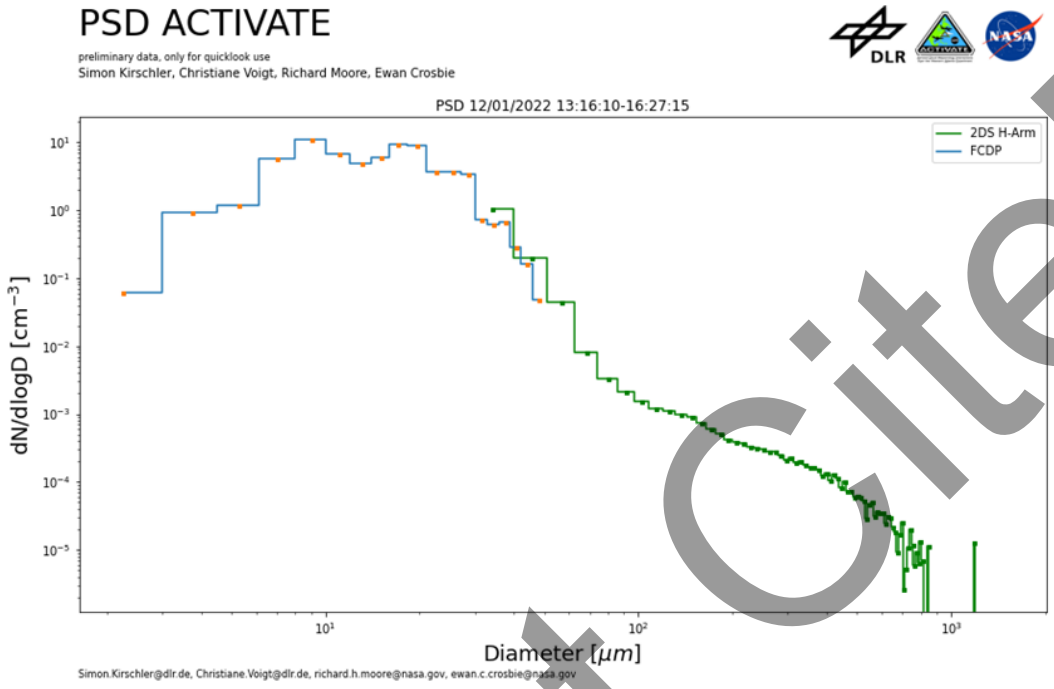
KLFI-ATLIC-ZIBUT-3500N07000W-ZIBUT-ATLIC-KLFI Baxley, Thorson, Crosbie, Winstead Mission flown as planned, weather as expected. Clear modules until just prior to ZIBUT on outbound leg and after ZIBUT on return, cloud sampling to the east of ZIBUT. Within 10 minutes of the B200, no issues noted.

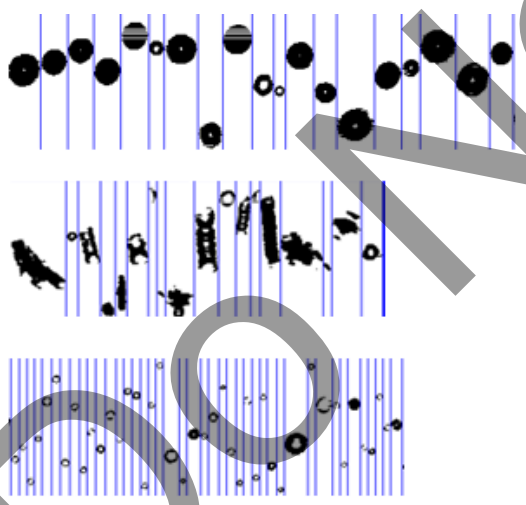
Flight scientist report (Crosbie):

2 Cloudy Modules, 1 part cloudy, 4 Clear Modules. Not nearly as cold as the previous day's flights. The samping region was now more under the influence of anticyclonic conditions and southwestly flow was observed along the near coast region while ENE winds were observed at the eastern extent. There was a marked cloud edge present near the GS with clear conditions over the colder water to the west. In this coastal region, the boundary later was quite shallow but deepened steadily to where the clouds started. Thereafter, cloud conditions thickened somewhat but the overall appearance of the clouds remained quite similar. Near the far turn, there were some larger cells that were precipitating, however unlike the previous day, there was not a significant change to the overall environment and cloud base and tops were still quite well defined. A marked gradient in drop number concentration was observed along the flight track decreasing from ~200-300 to ~50-70 and this appeared to correlate with an increase in the prevalence of precipitating cells. Some variation in cloud coverage was observed, but from the aircraft there was not any obvious organization patterns. Enhanced small particle concentrations were observed in the FT in different regions with low non-volatile counts suggestive of formation of secondary particles (but not with a strong signature of recent formation). A gradient in aerosol was observed within the boundary layer with distance from the coast with very clean conditions observed in the cloudy region as quantified by scattering. AMS mass was also low.

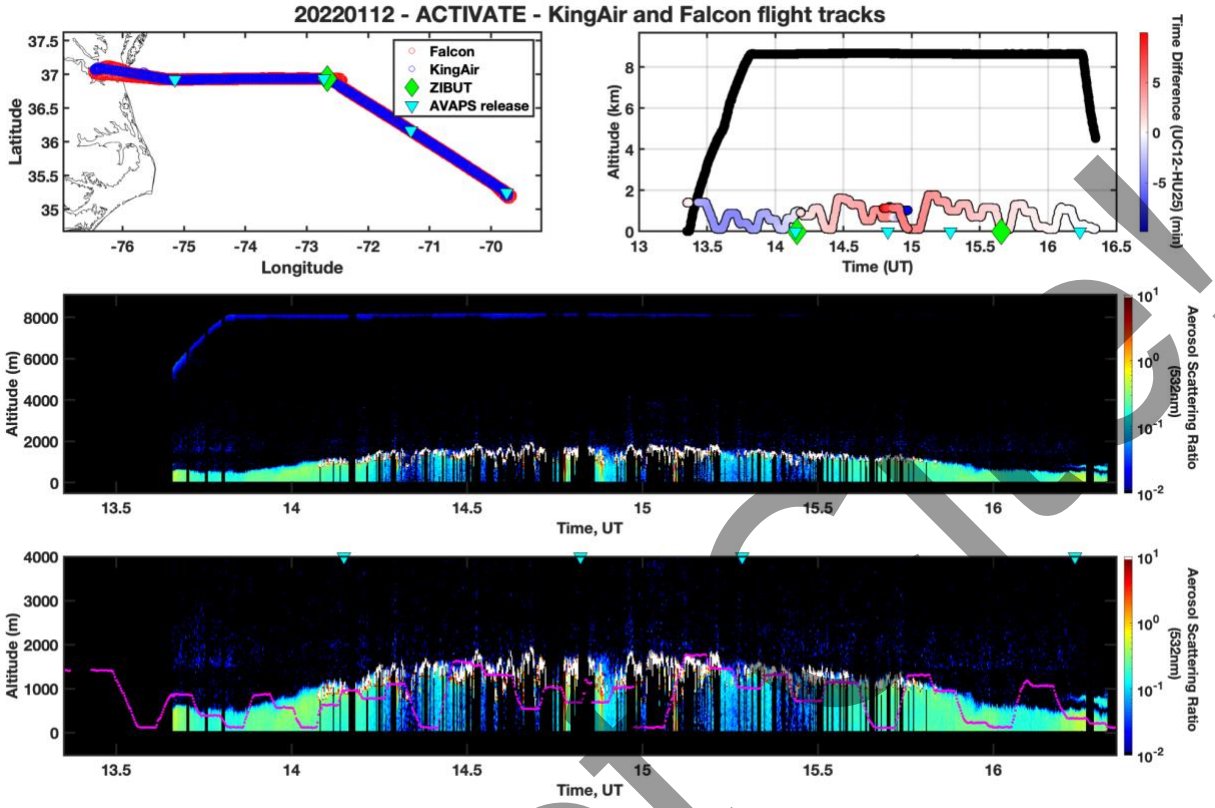

12 January 2022
Morning
ACTIVATE Flight
KLFI
ATLIC
ZIBUT
NORTN
VIRST
OXANA
39
38
37
36
35
34
-78
-76
-74
-72
-70
GPS Altitude (m above MSL)
GPS Altitude (1000 ft. MSL)
Latitude (°)
Dry, 90%RH Green Scattering Coefficient (Mm-1)
In-cloud CVI sampling periods
Particle Number Concentration (cm-3)
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
CO (ppb)
CO2 (ppm)
Water Vapor (ppm)
13:20
1/12/2022
13:45
14:10
14:35
15:00
15:25
15:50
16:15
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 12/01/2022 13:16:10-16:27:15
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
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov



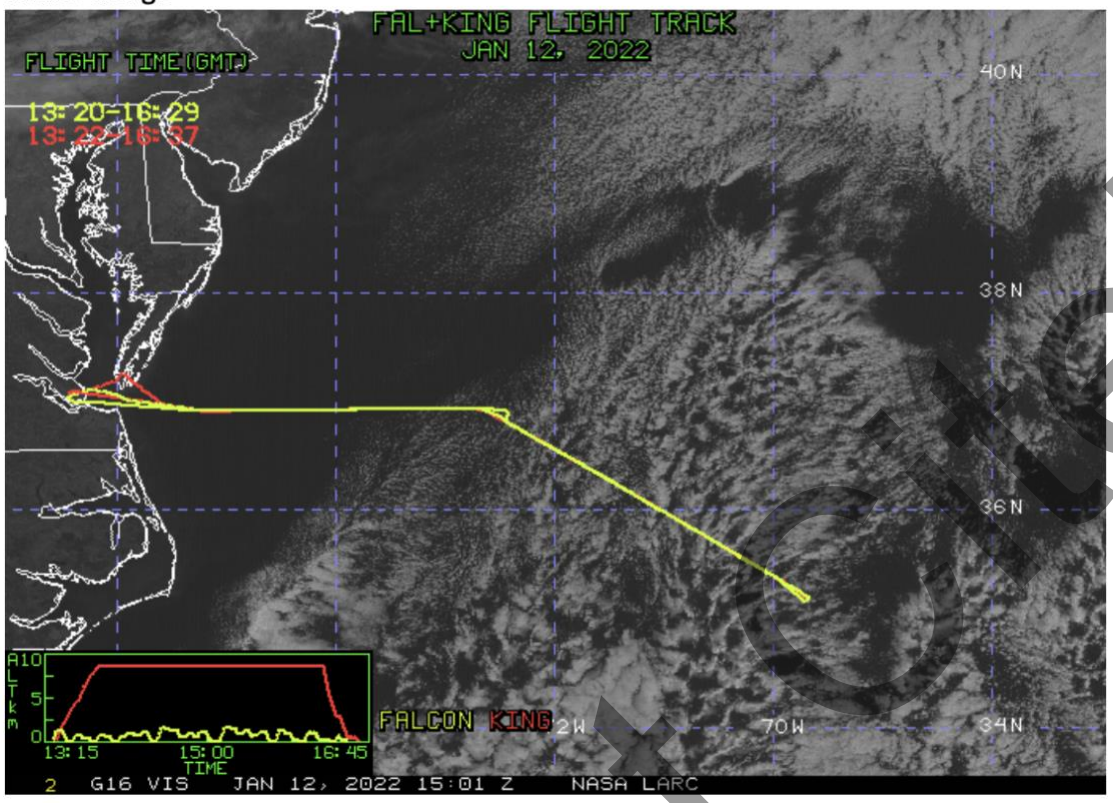


Pure liquid and mixed phase clouds.
Dominantly columnar ice crystals.

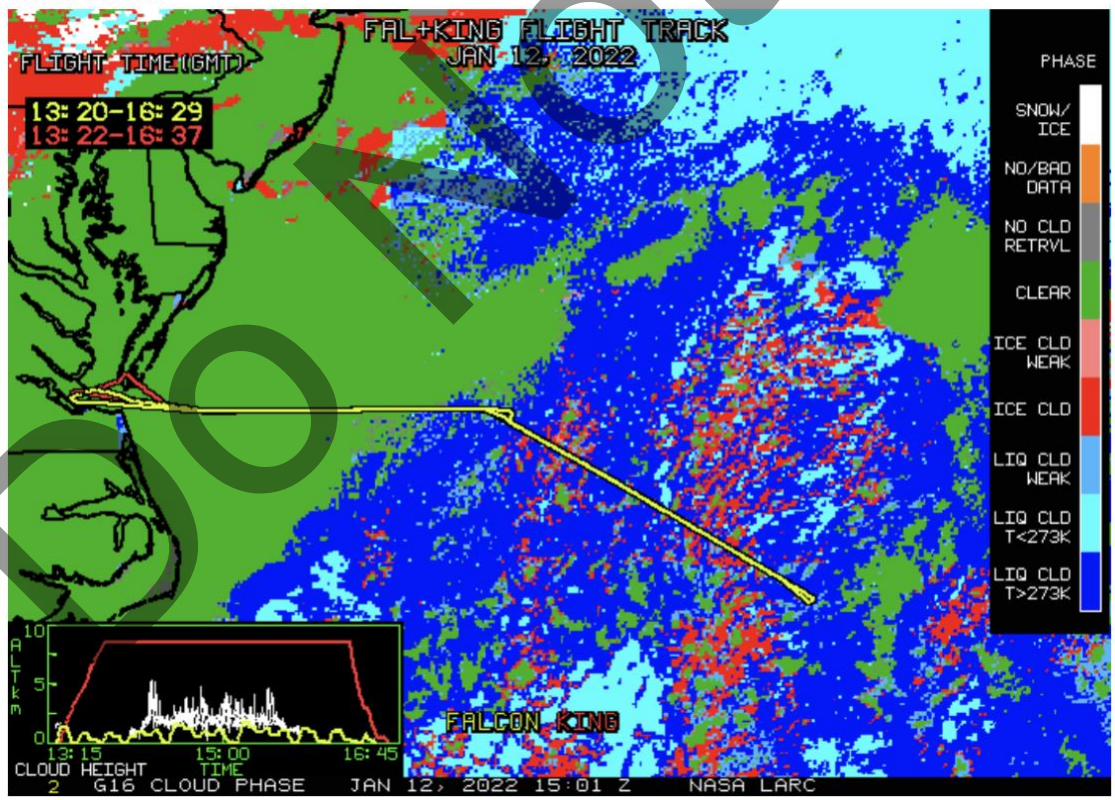


NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 102, 15:01 UTC Jan 12, 2022

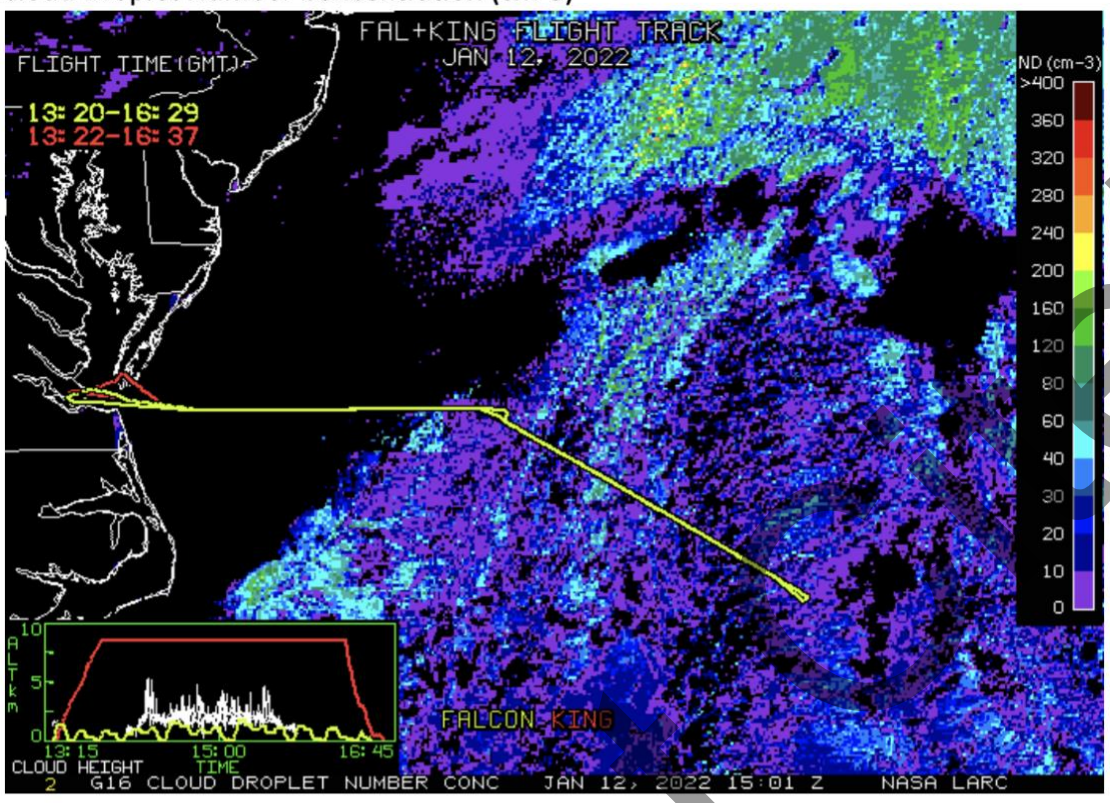
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)