Flight Scientist Report
Tuesday 11/30/2021 ACTIVATE RF94

Flight Type: Statistical Survey Flight
Flight Route: ECG OXANA LSIER OXANA ECG
Special Notes: 1st flight of Deployment 5.

King Air

Pilot report (Wusk):

1st Research flight of Campaign 5, 3.5 hours flown; KLFI-ECG-OXANA-LSIER-(3243N7138W)-LSIER-OXANA-ECG-KLFI. Taxi out with HU-25, held for landing traffic after HU25 departed. ATC held us at 4000' and runway heading longer than normal after departure. Forward FOD door opened fully under electrical power. Direct ECG and up to FL240. ATC longer than normal hold at FL240 by Giant Killer, until well out over the ocean. Relay ATC comms for HU25 (they ended up going Due Regard). Continued climb to FL280 and proceeded with flight plan. Coordinated a 5 min extension past LSIER to lat/long. HF comm required beyond LSIER. Dropsondes dropped as planned along route. On return maintained FL280 until just short of ECG. Performed uneventful RTB and ILS approach for KLFI runway 26. All aircraft systems performed nominally. Aircraft position coordination acceptable throughout flight, with B200 behind at TO, passing HU eastbound with strong tailwind, then being passed by HU westbound due to headwinds. Aircraft ready for next research flight planned on 12/1/2021. Crew was Coldsnow, Wusk, and Harper.

Flight scientist report (Harper):

Takeoff: 16:23:42utc (6min after Falcon takeoff)
Clear skies above aircraft for entire flight.
Low level cloud tops max ~2km for throughout flight.
No mid level clouds throughout flight.
Very clear atmosphere (little to no aerosols) between aircraft and low level cloud tops

B200/HU25 coordination: within 10min outbound
and ~ 5min inbound.

Sonde 1: 17:16:00utc at OXANA
Sonde 2: 17:43:37utc - ~2min before outbound turn point past LSIER.
Sonde 3: 18:15:45utc at midpoint of inbound leg.
Sonde 4: 18:59:53 approx 12 mi from coastline

Landing: 19:54:55utc

HSRL2 instrument status: No issues except manual tuning of Interferometer due to known seed laser issue. Was able to maintain good contrast ratio throughout flight.

RSP status: No issues.
AVAPS status: No issues.
Satcom: Lost comm for most of flight some time after 16:31utc

Falcon
Pilot report (Slover):
ACTIVATE science flight #1 for campaign 5. Complete/effective. One research instrument inop. Flown as planned via KLFI-ECG-OXANA-LSIER, plus 5 minutes extra past LSIER and then reverse. Statistical sampling at min altitude of 500 ASL, below cloud base, above cloud base (aka below cloud top), above cloud tops. Data collection delayed about 10 min over water while awaiting ATC clearances with poor communication.

Flight scientist report (Crosbie):
We were halted from starting our modules because of ATC which meant that an extended period on the outbound was at 7000ft well above the cloud tops. Once we started conditions were good with a well defined shallow cloud layer. The sub cloud layer was quite energetic and appeared well mixed. There was quite low aerosol abundance throughout once over water. There was a leg flown near Elizabeth City on the outbound which was enhanced and indicated signatures of smoke but this was shortlived and difficult to trace.

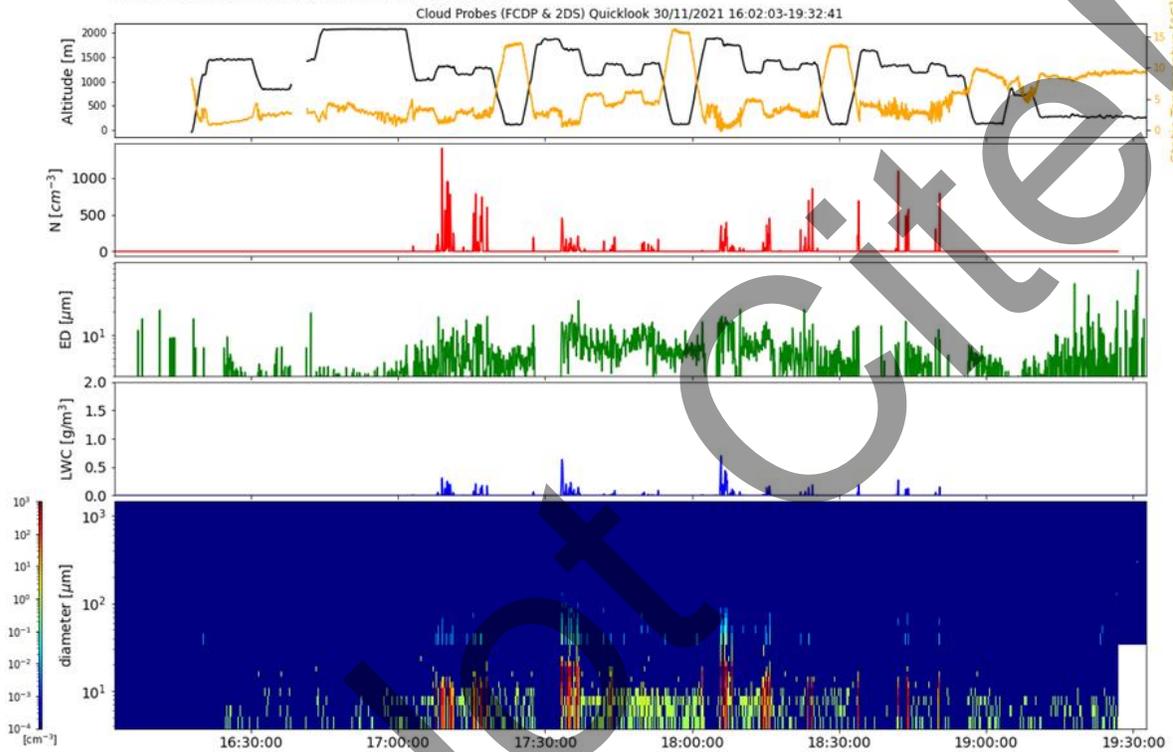CCN counter not functional and waiting to be repaired.
SMPS encountered leak issue during flight

30 November 2021
ACTIVATE Flight
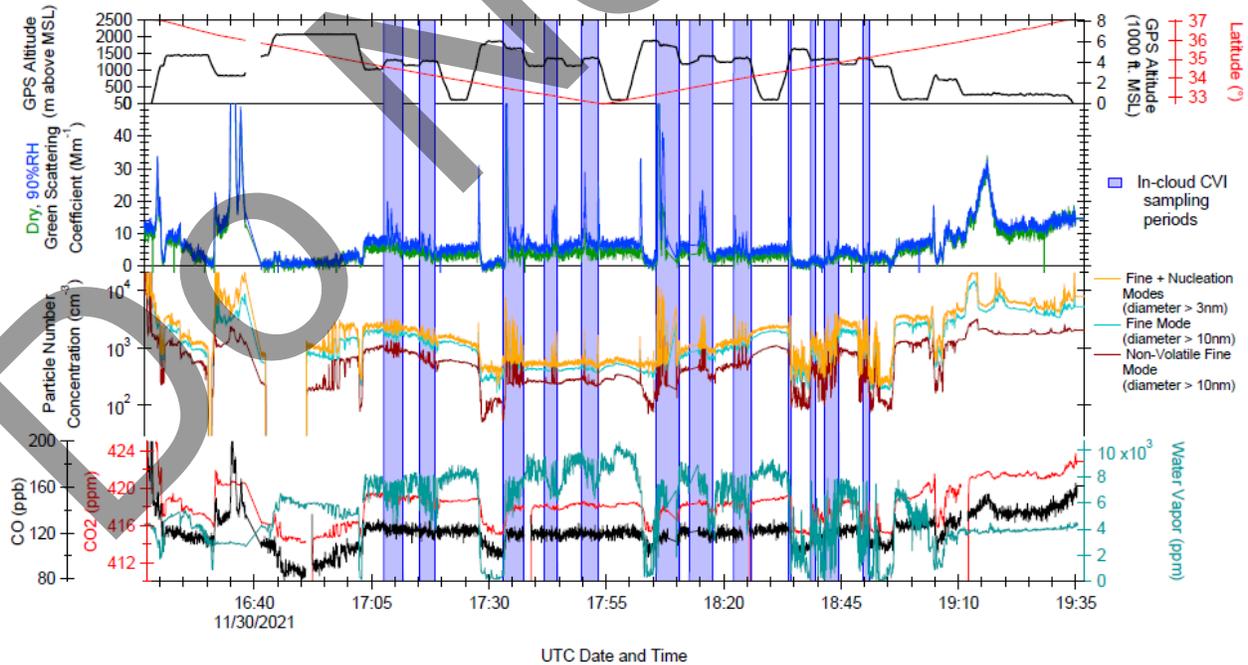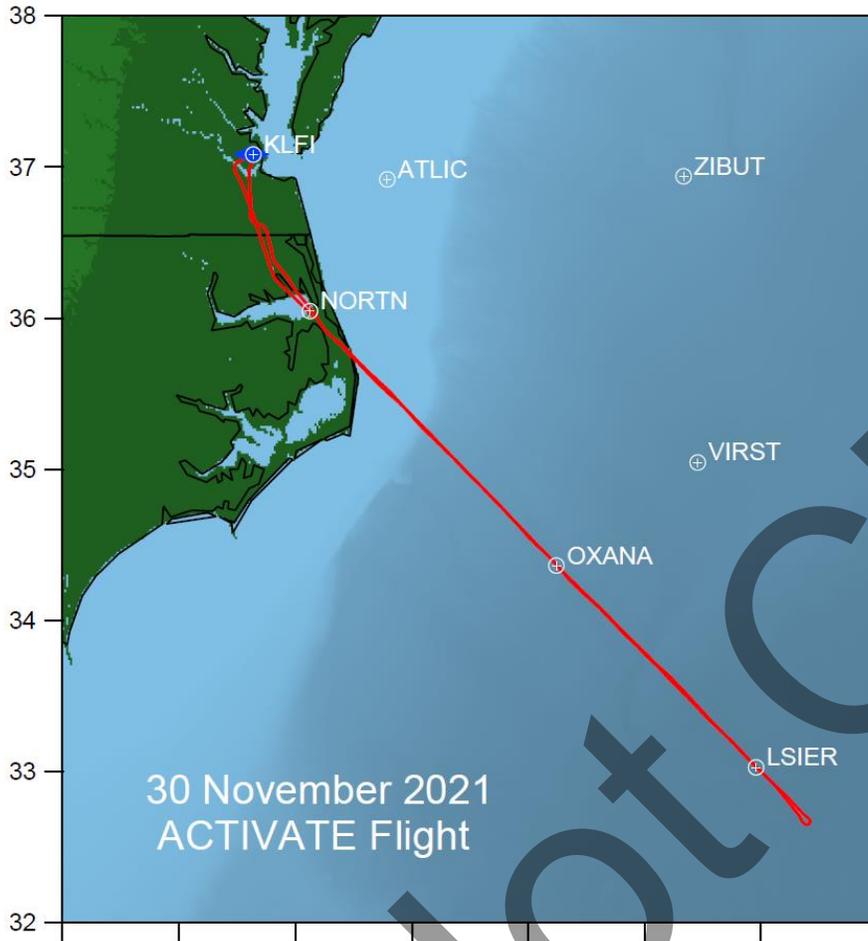
Quicklook ACTIVATE   Cloud Probes (FCDP & 2DS) Quicklook

preliminary data, only for quicklook use

Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie

Cloud Probes (FCDP & 2DS) Quicklook 30/11/2021 16:02:03-19:32:41
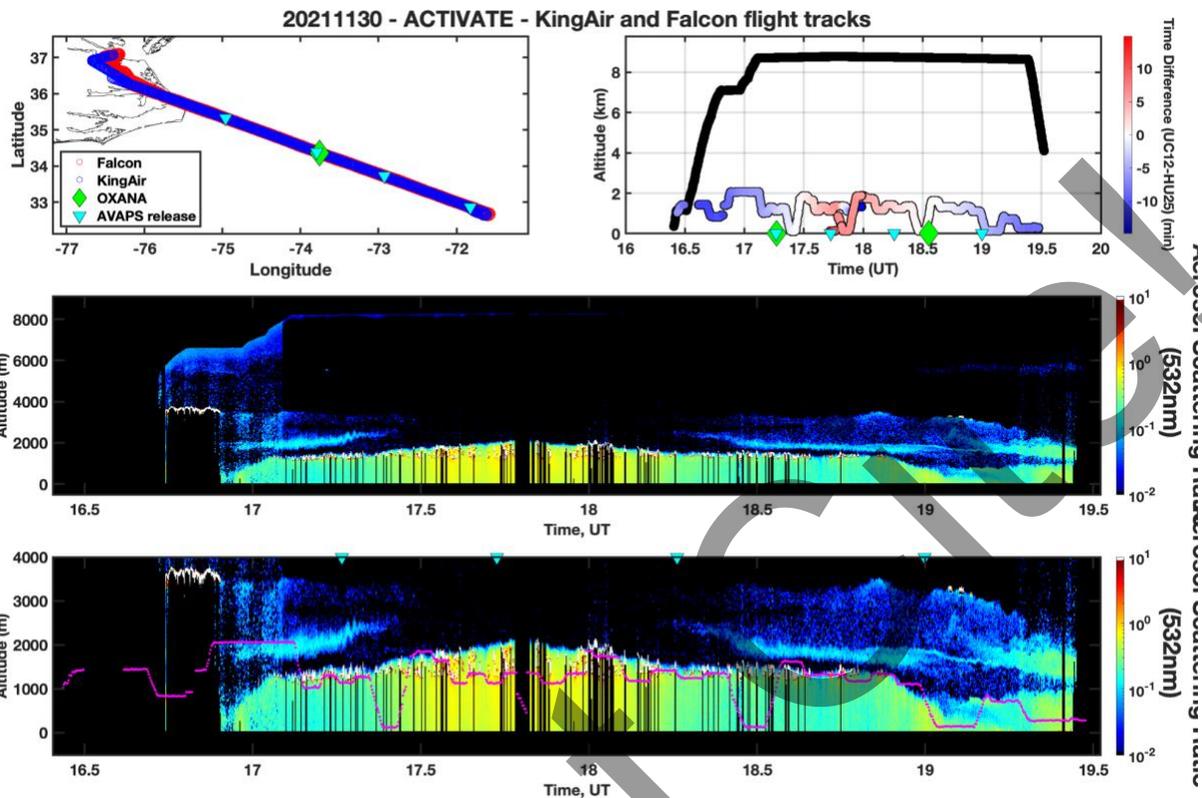
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.e.crosbie@nasa.gov

PSD ACTIVATE

preliminary data, only for quicklook use
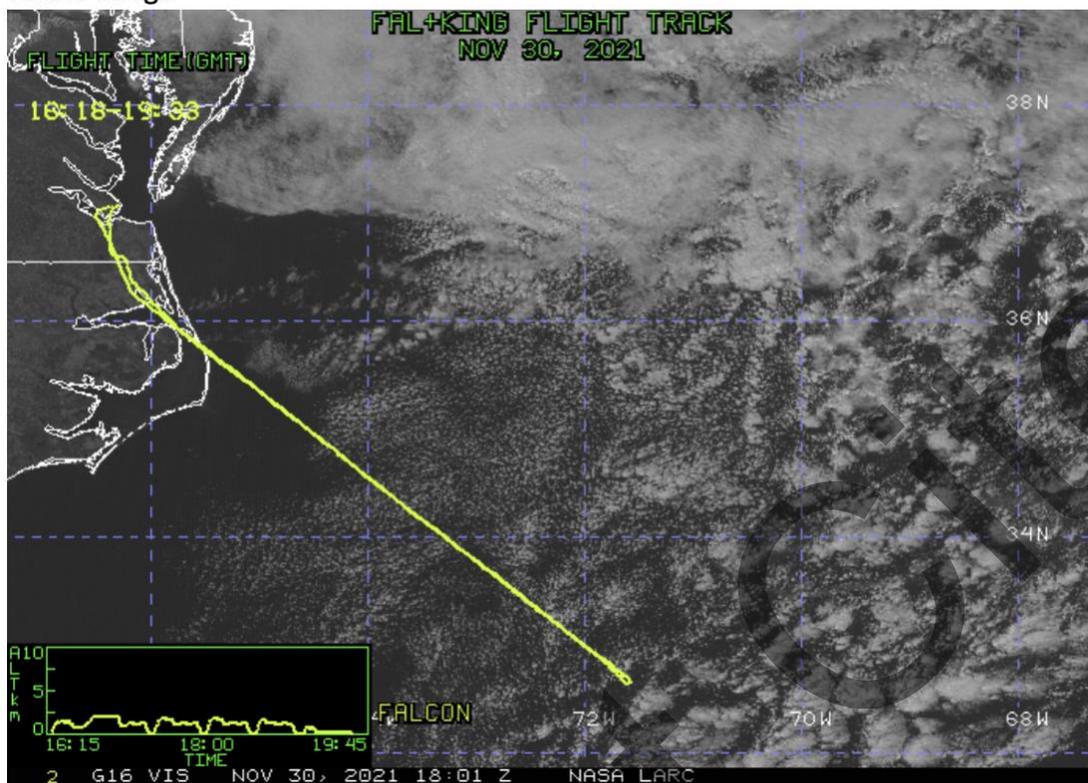Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie

PSD 30/11/2021 16:02:03-19:32:41
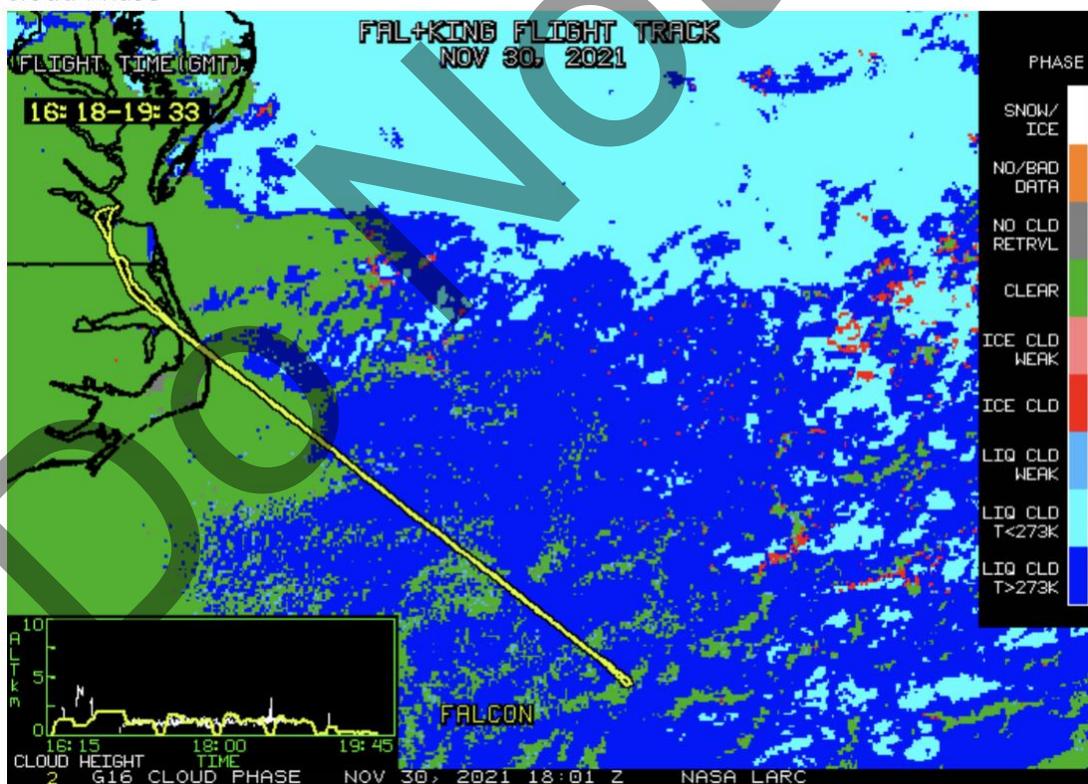
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov
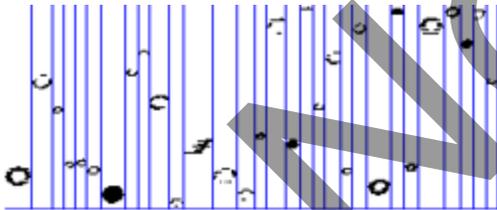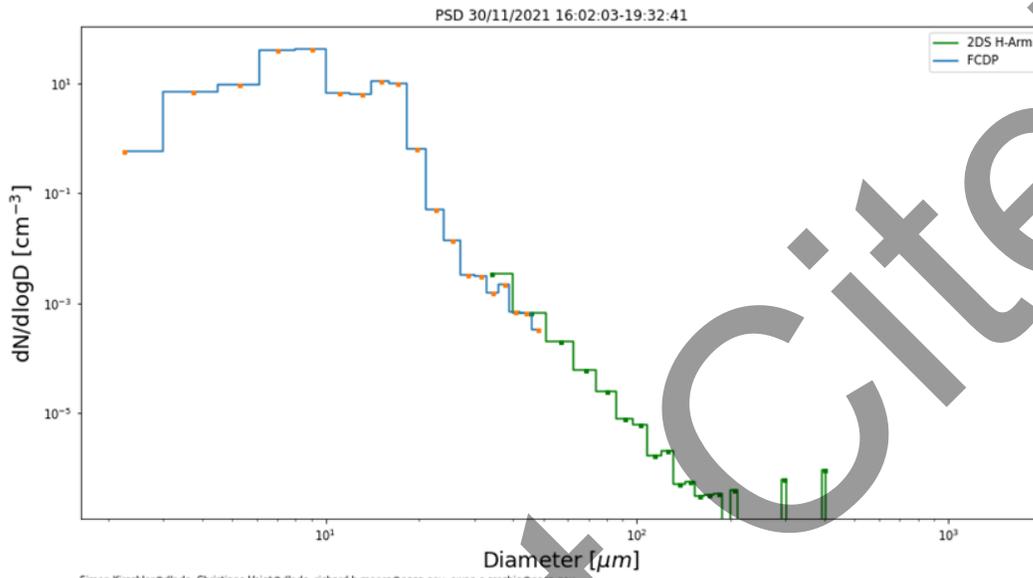
- Only shallow liquid clouds

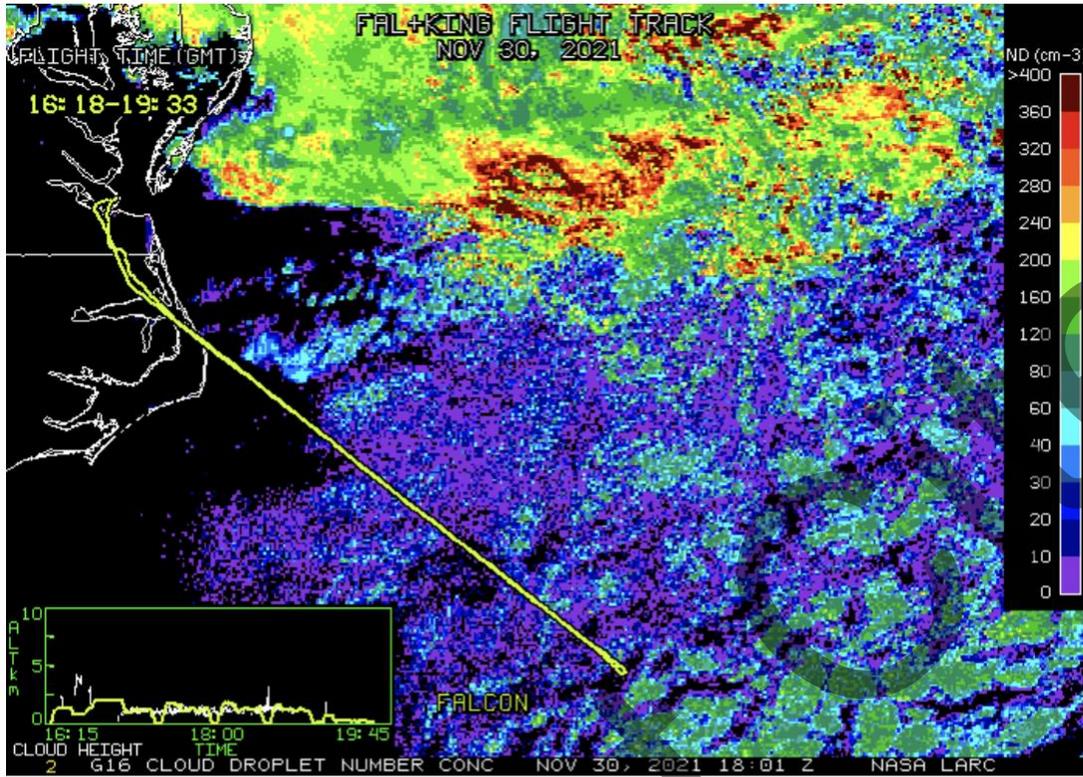NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 94, 18:01 UTC Nov 30, 2021

Visible Image

FAL+KING FLIGHT TRACK
NOV 30, 2021

FLIGHT TIME (GMT)
16:18-19:33

38N
36N
34N

FALCON

72W   70W   68W

A10
LT
km
5

16:15   18:00   19:45
TIME

2   G16 VIS   NOV 30, 2021 18:01 Z   NASA LARC

Cloud Phase

FAL+KING FLIGHT TRACK
NOV 30, 2021

FLIGHT TIME (GMT)
16:18-19:33

PHASE

SNOW/ICE
NO/BAD DATA
NO CLD RETRVL
CLEAR
ICE CLD WEAK
ICE CLD
LIQ CLD WEAK
LIQ CLD T<273K
LIQ CLD T>273K

FALCON

ALT
km
10
5

16:15   18:00   19:45
CLOUD HEIGHT   TIME

2   G16 CLOUD PHASE   NOV 30, 2021 18:01 Z   NASA LARC

Cloud Droplet Number Concentration (cm-3)

Cloud-Top Height (Kft-ASL)