Flight Scientist Report
Monday 03/08/2021 ACTIVATE RF51

Flight Type: Statistical Survey Flight (cloudy)
Flight Route: KLFI KECG OXANA 3215N07430W OXANA KECG KLFI
Special Notes: This was an excellent cold air outbreak day. We were limited in that the Falcon had to repair tires in the morning; otherwise we would have planned for back-to-back flights. Instead, we did a late takeoff and tried to characterize the CAO event in a single joint flight. Note that on the leg from Oxana to southeast, we hit a clear patch so on the way back up to Oxana we shifted to the right a bit to hit clouds. That pair of level legs is a good contrast for clear and cloudy conditions.

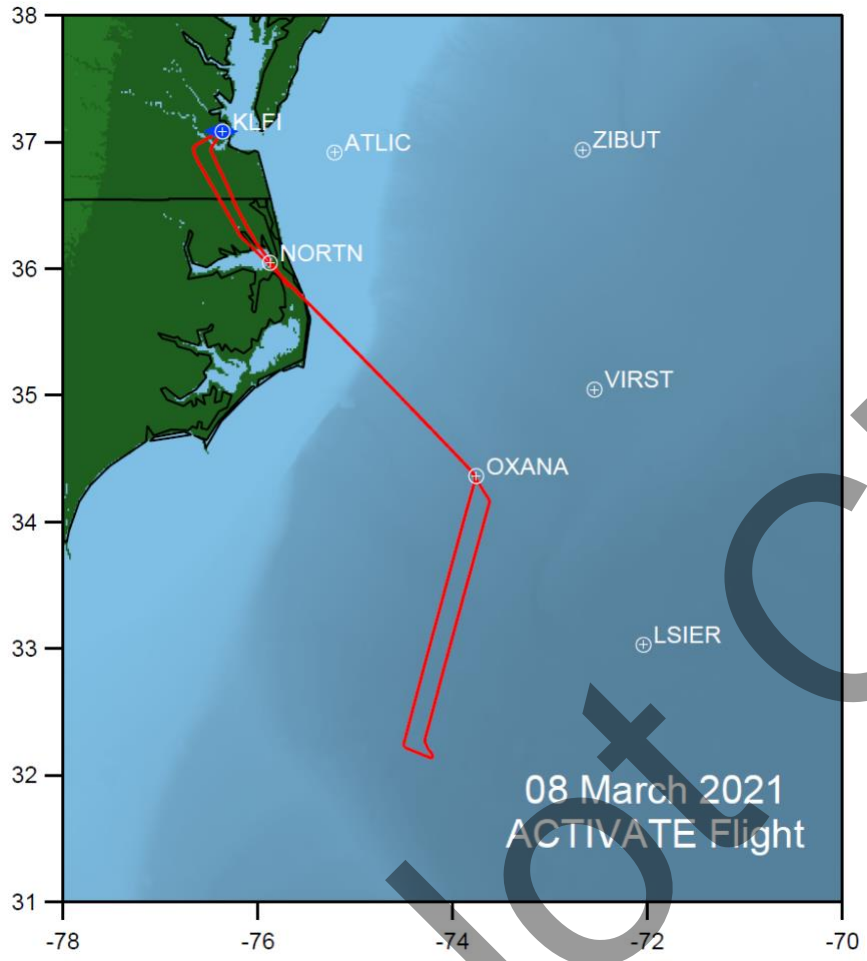
King Air
Pilot report (Mike Wusk): Excellent Science day. UC12 and HU25 dual ship research flight. Crew was Thorson, Wusk, Seaman. Take-off as scheduled at noon local. Flight flown as planned KLFI ECG OXANA 3515N07430W OXANA ECG KLFI, FL280 with the following notes; ATC held us down at 7000' for an extended time (past Dismal Swamp) so climb to altitude was somewhat delayed, and leg returning 3515N07430W to OXANA was flown with a 10nm offset to the SE (as requested via chat and coordinated with ATC). 4 sondes dropped. Geolocation coordination between aircraft was good throughout flight. Aircraft performed well and should be ready for next flight.

Flight scientist report (Shane Seaman): RF051 (3/8/2021) on the UC12 was a statistical survey joint flight with the HU25 Falcon. The UC12 took off from KLFI approx. 1159 EST, and executed "Plan D" flying: KLFI KECG OXANA 3215N07430W OXANA KECG KLFI. There were multiple aerosol layers present with one at altitude with the UC12. There was more aerosol at the coast on the return leg than on the outbound leg. A total of 4 sondes were dropped. Shane Seaman was the solo operator for HSRL-2, RSP, the cameras, and sondes. All instruments operated nominally.

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. At reduced electrical power and limited research equipment configuration. Radio and external power issues, but will be fixed for 3/12 sorties.

Flight scientist report (Ewan): Notes: ATC issues prevented a quick descent but fortuitously we made a few passes through the inversion at ~5000ft during that time. There was a clear slot along the planned line south of OXANA and we were advised to offset east 10nm to get better cloud conditions. The edge of the slot was not obvious from our perspective and there were still some small Cu within the slot. The clouds near OXANA on the return allowed for an

increased amount of time on the BCT leg to get CW samples. The clouds were shallow overall, and appeared to be strongly affected by the overlying dry air. Bases were high and the sub-cloud layer seemed to be well-mixed. Aerosol gradient was notable with distance downwind.


38
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-78
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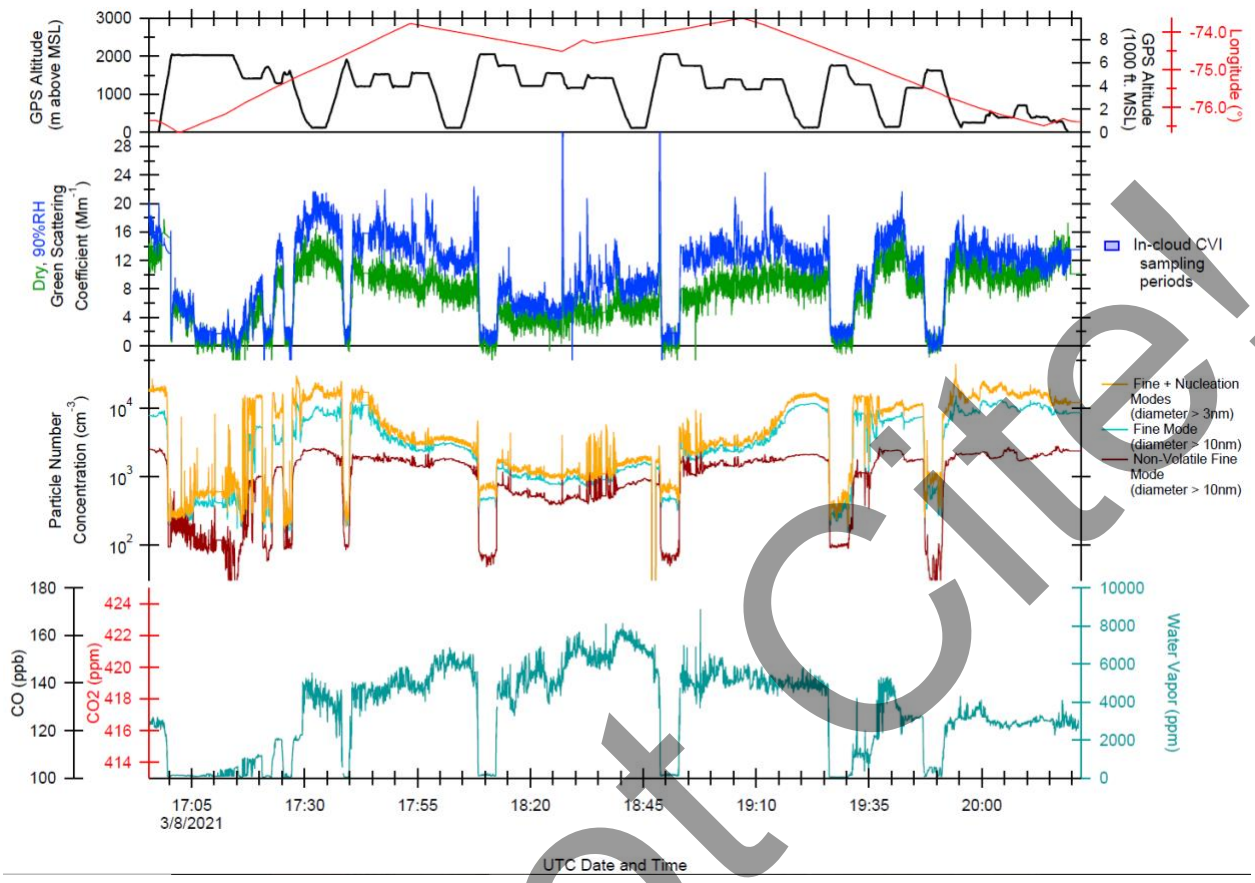
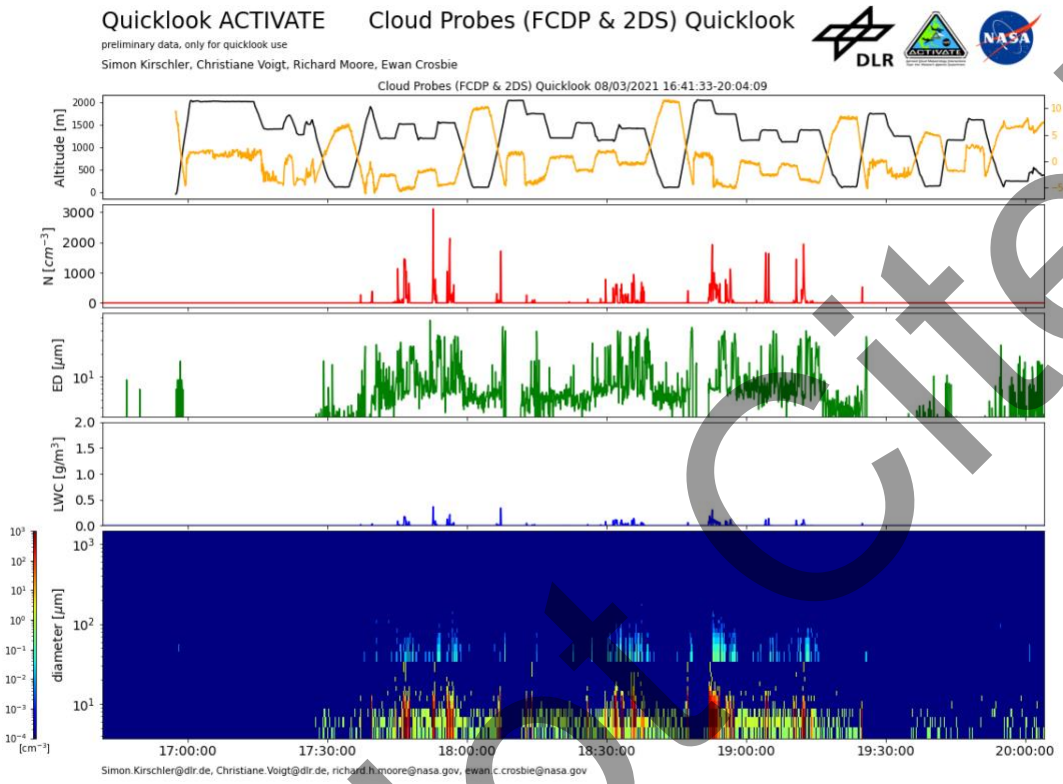
KLFI
ATLIC
ZIBUT
NORTN
VIRST
OXANA
LSIER
08 March 2021
ACTIVATE Flight

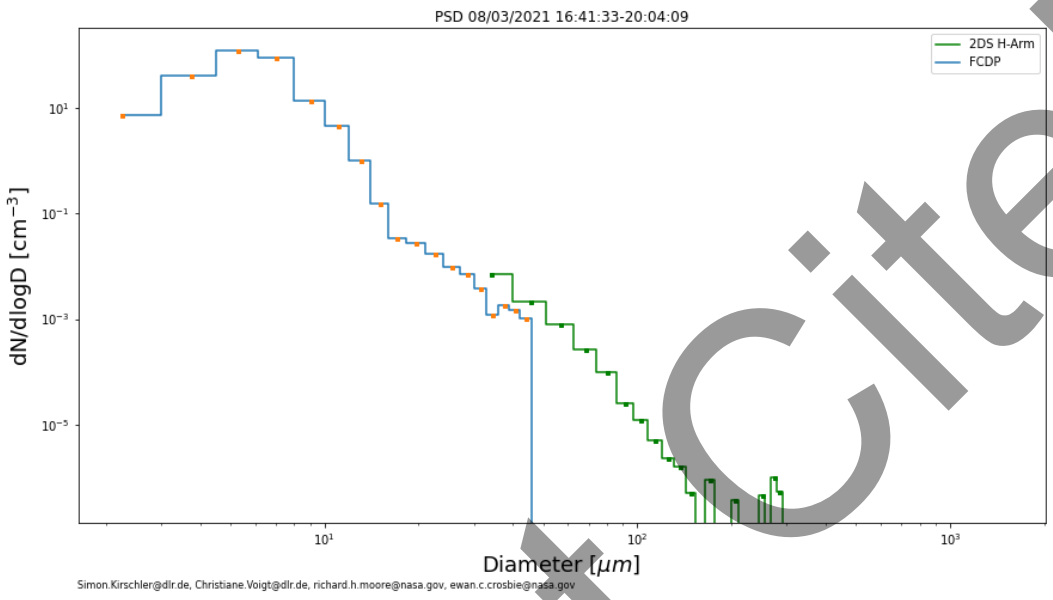

GPS Altitude (m above MSL)
GPS Altitude (1000 ft. MSL)
Longitude (°)
Dry, 90%RH Green Scattering Coefficient (Mm-1)
In-cloud CVI sampling periods
Particle Number Concentration (cm-3)
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
CO (ppb)
CO2 (ppm)
Water Vapor (ppm)
17:05
3/8/2021
17:30
17:55
18:20
18:45
19:10
19:35
20:00
UTC Date and Time

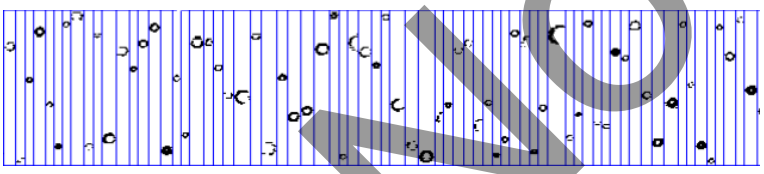

Quicklook ACTIVATE
Cloud Probes (FCDP & 2DS) Quicklook
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie
Cloud Probes (FCDP & 2DS) Quicklook 08/03/2021 16:41:33-20:04:09
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
17:00:00
17:30:00
18:00:00
18:30:00
19:00:00
19:30:00
20:00:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

PSD ACTIVATE

preliminary data, only for quicklook use

Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie

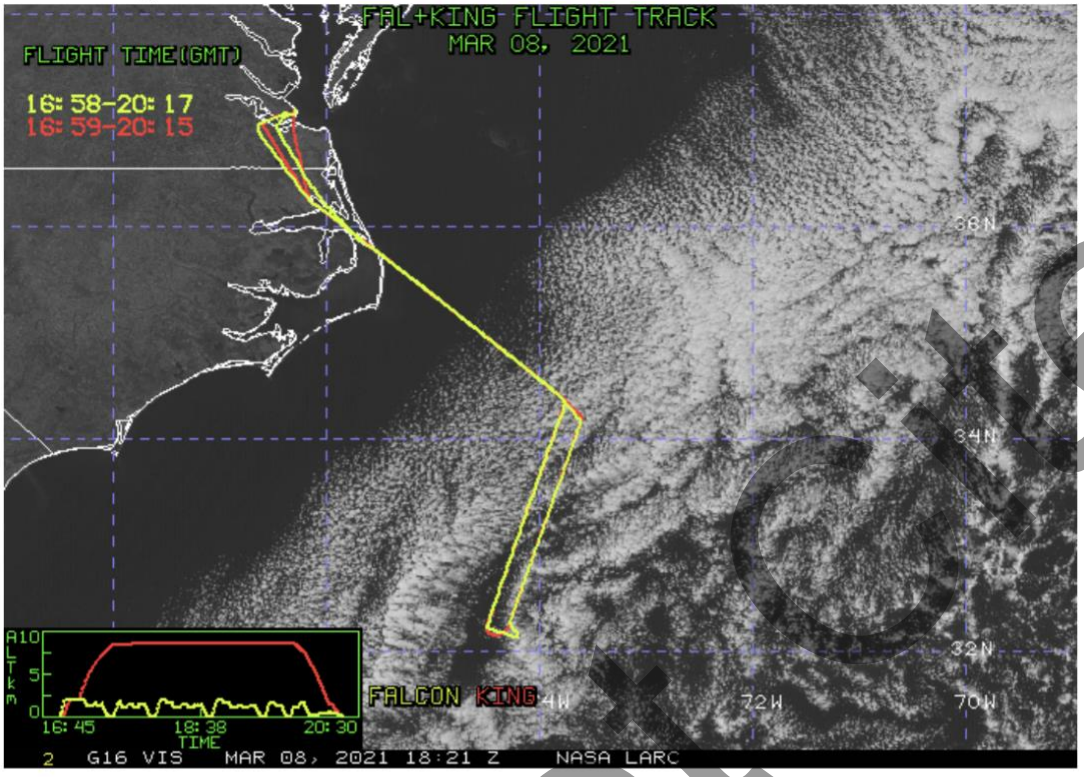




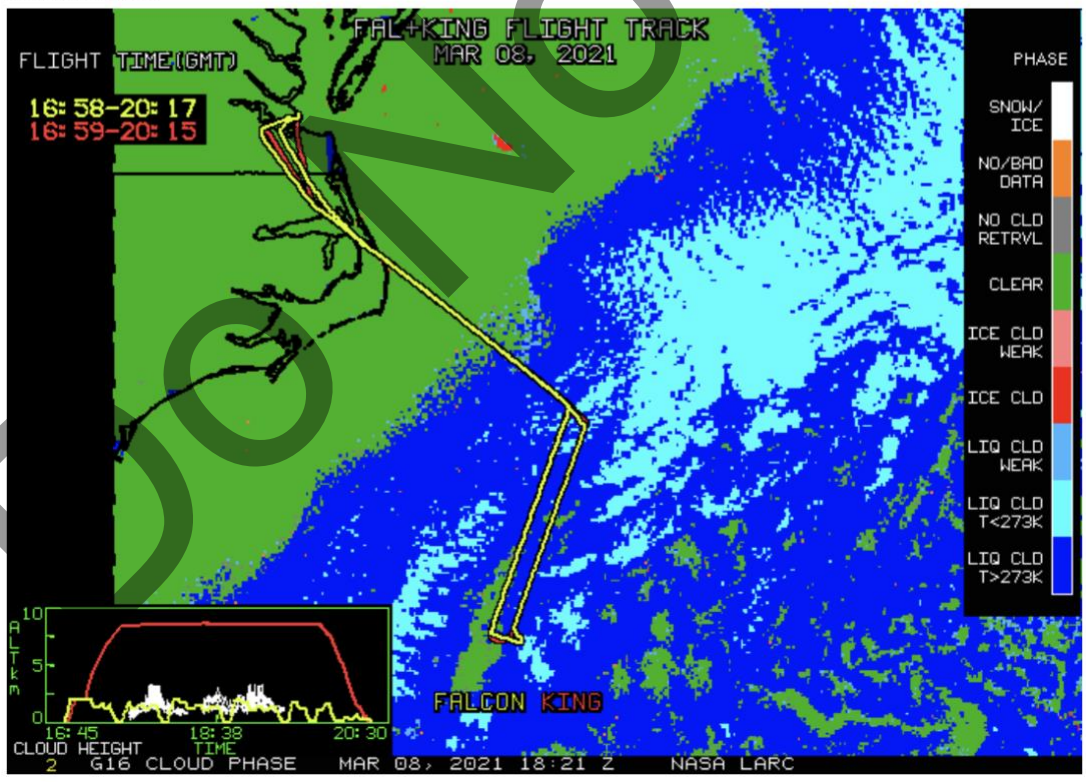
Only pure liquid clouds during flight

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 51, 18:21 UTC Mar 08, 2021

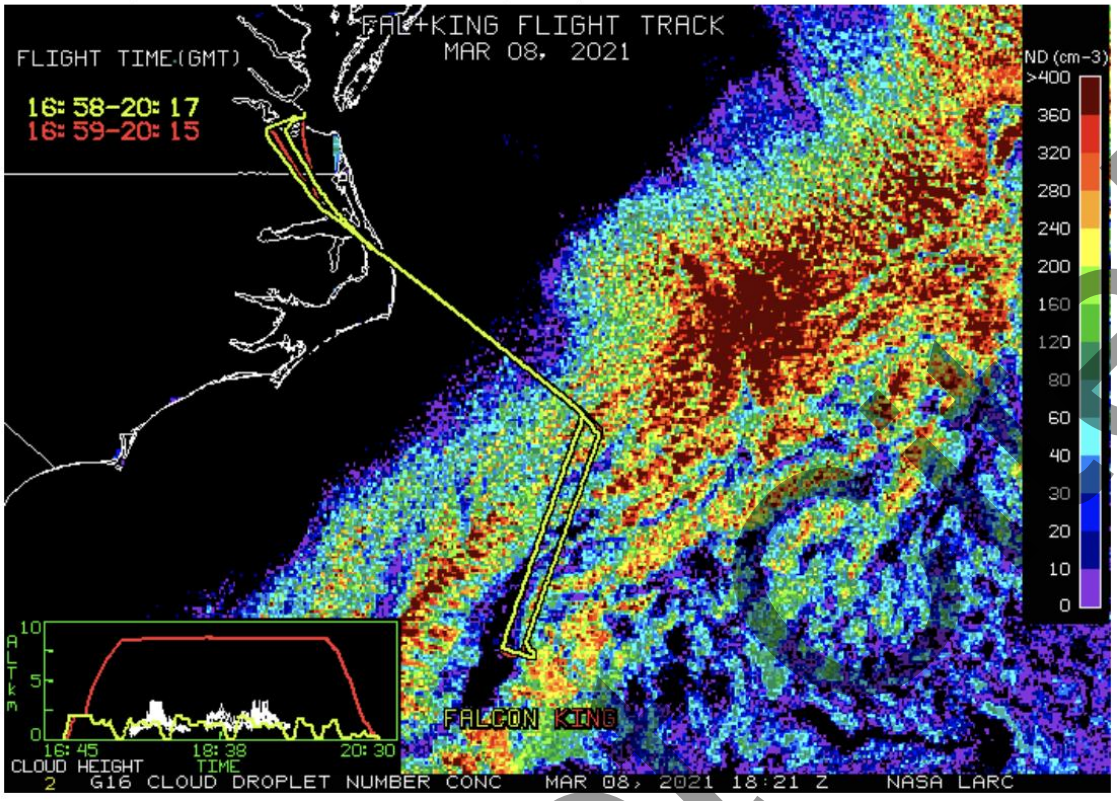
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)