Flight Scientist Report
Thursday 03/03/2022 ACTIVATE RF131

Flight Type: Statistical Survey Flight
Flight Route: KLFI-ECG OXANA 3530N07115W OXANA ECG KLFI
Special Notes: First of two flights today. Clear air characterization flight with relatively high AOD for wintertime and smoke-dust influence. We conducted a "unicorn module" just like yesterday with a Falcon spiral with King Air overhead. Really intriguing flight for aerosol science.

King Air
Pilot report (Wusk):
Planned as a double flight day. Route planned was KLFI-ECG OXANA 3530N07115W OXANA ECG KLFI. UC took off 2 minutes after the HU. Good ATC climb out. The UC 12 pressed ahead of the HU. Approaching the planned turn point the HU turned about 7.5 minutes early to effect separation for the spiral. THe UC12 turned just a minute or so early and overflew the spiral point at 1518 as teh HU was descending through the last 2-4k feet. Sondes were dropped at the turn point, the spiral and the coast. Normal descent and an RNAV 08 approach and landing. Crew was Jamison, Wusk, Harper.

Flight scientist report (Shingler):

KLFI ECG OXANA 3035N07115W OXANA ECG KLFI

Planning for a Unicorn Module on the return.

On the climb out there was a midlayer that reached up to approx. 14kft and very light wispy cirrus above.

Clear off the coast with a thin MBL forming as extending east along the track. MBL growing, currently at approx 2kft JOELO. Elevated depol in the boundary layer (up to 18-19%). From OXANA east, the lidar curtain is very consistent with the boundary layer up to aprx 3kft and the residual layer up to 5kft. There is weak scattering up to aprx 15kft.

Turned slightly early to facilitate timing with the spiral. Lower troposphere looked fairly consistent with remarks from earlier. No cirrus noted above.

The return trip was similar to the way out. The boundary layer descended out all the way to the surface on the way in from OXANA.

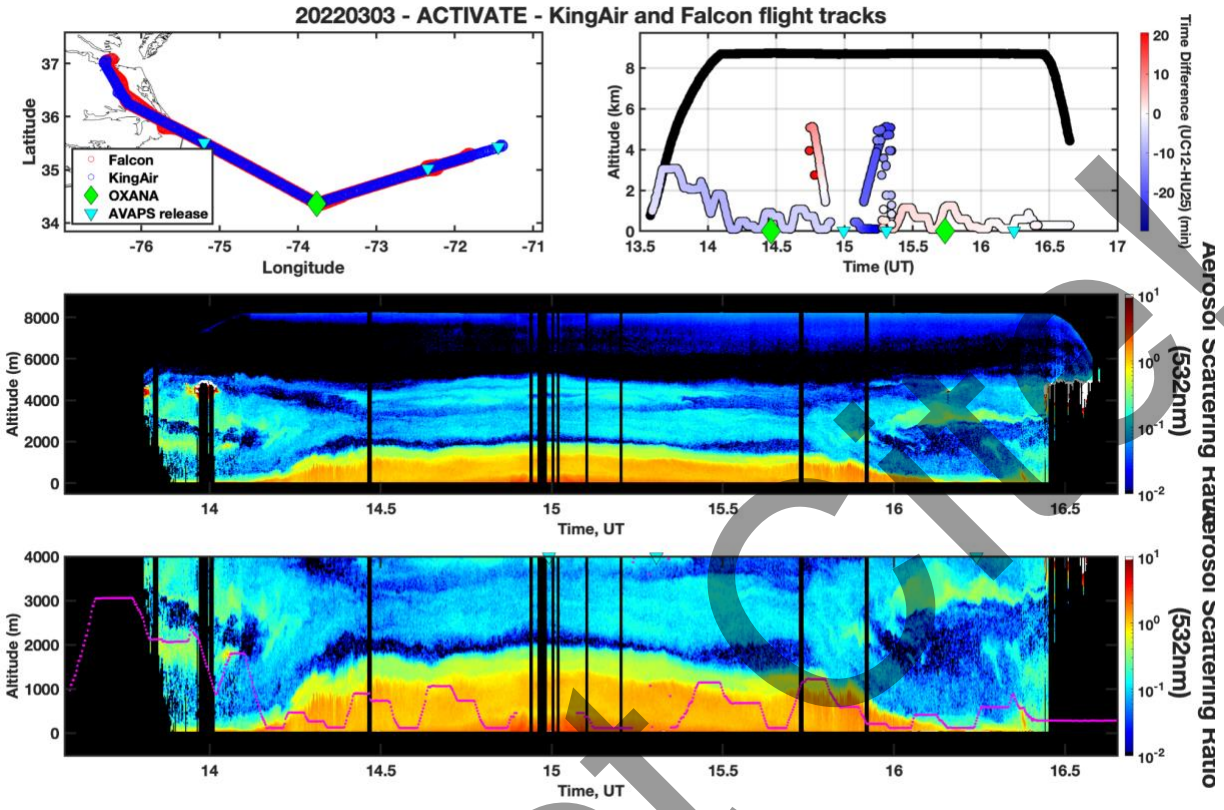
3 SONDES

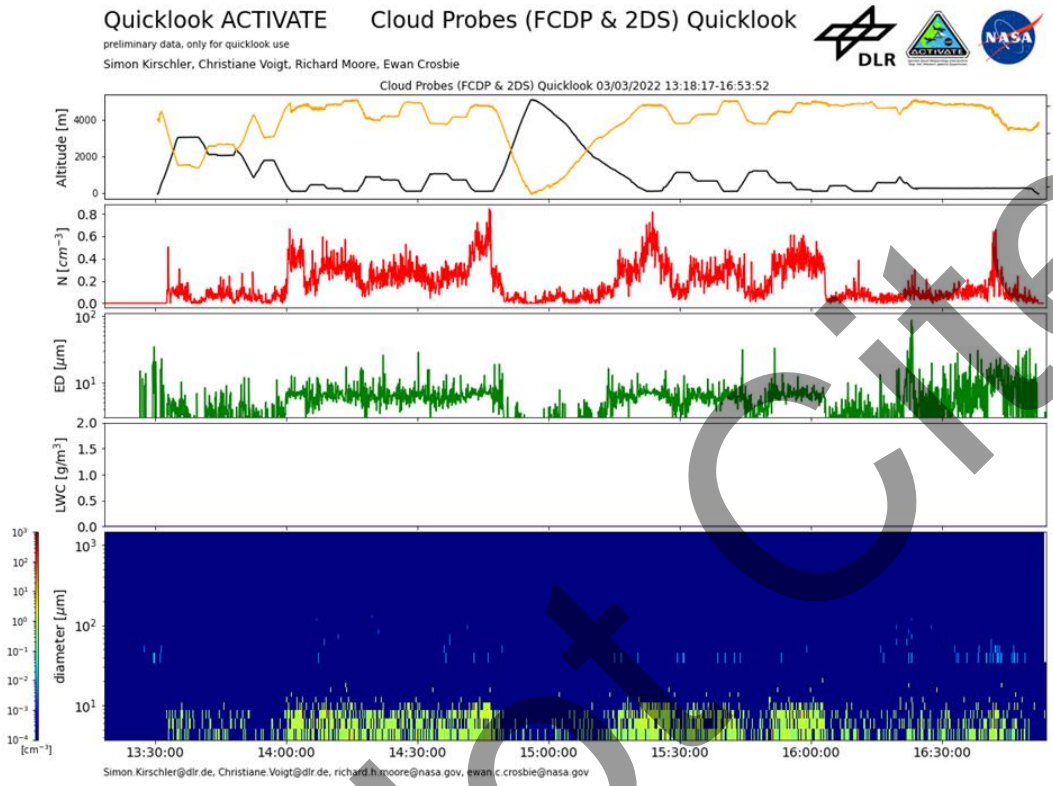
TURN
SPIRAL
COAST

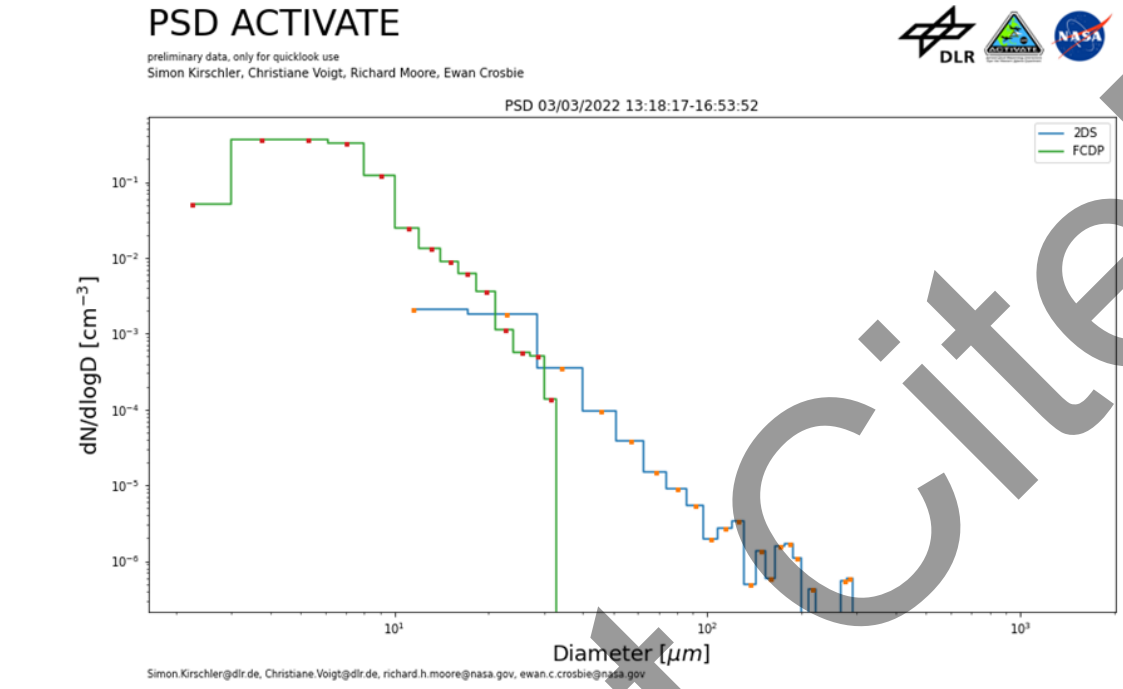
Falcon

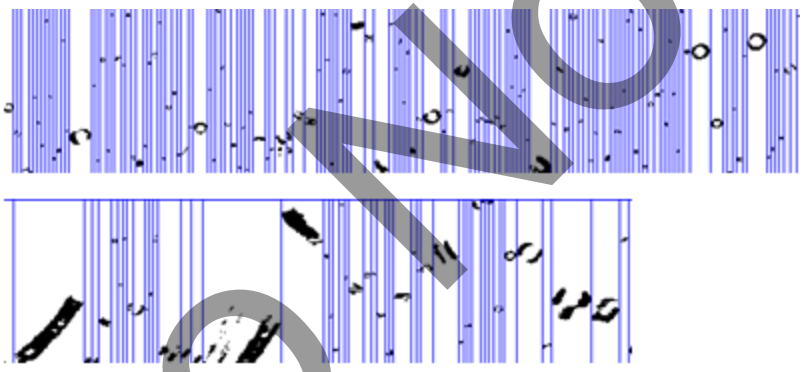
Pilot report (Slover):
ACTIVATE research flight. Clear air module flown from KLFI ECG OXANA 3530N07115W OXANA ECG KLFI as planned. A spiral down on return leg was flown from 16000' to 500' at approximately 3502N07218W with the UC-12 overflying while descending through 3000'. A large field/brush fire was visible at approximately 3546.7N07544.6W and was able to fly towards the fire at 1000' AGL in the plume downwind.

Flight scientist report (Crosbie):
Stat survey OXANA-NE. Clear modules for aerosol characterization. A spiral was conducted on the return leg for detailed aerosol characterization. An organic rich layer was observed at low altitudes interacting with the marine boundary layer. Aloft, the organic aerosol decreased but sulfate remained albeit at lower overall aerosol concentrations. The sulfate had some structure through the column in the free troposphere extending up to 16000ft. The marine boundary layer was very shallow and in general, the organic aerosol layer was not significantly different in concentration between the part within the marine layer and the part above.


20220303 - ACTIVATE - KingAir and Falcon flight tracks
Latitude
Longitude
Falcon
KingAir
OXANA
AVAPS release
Altitude (km)
Time (UT)
Time Difference (UC12-HU25) (min)
Altitude (m)
Time, UT
Aerosol Scattering Ratio (532nm)

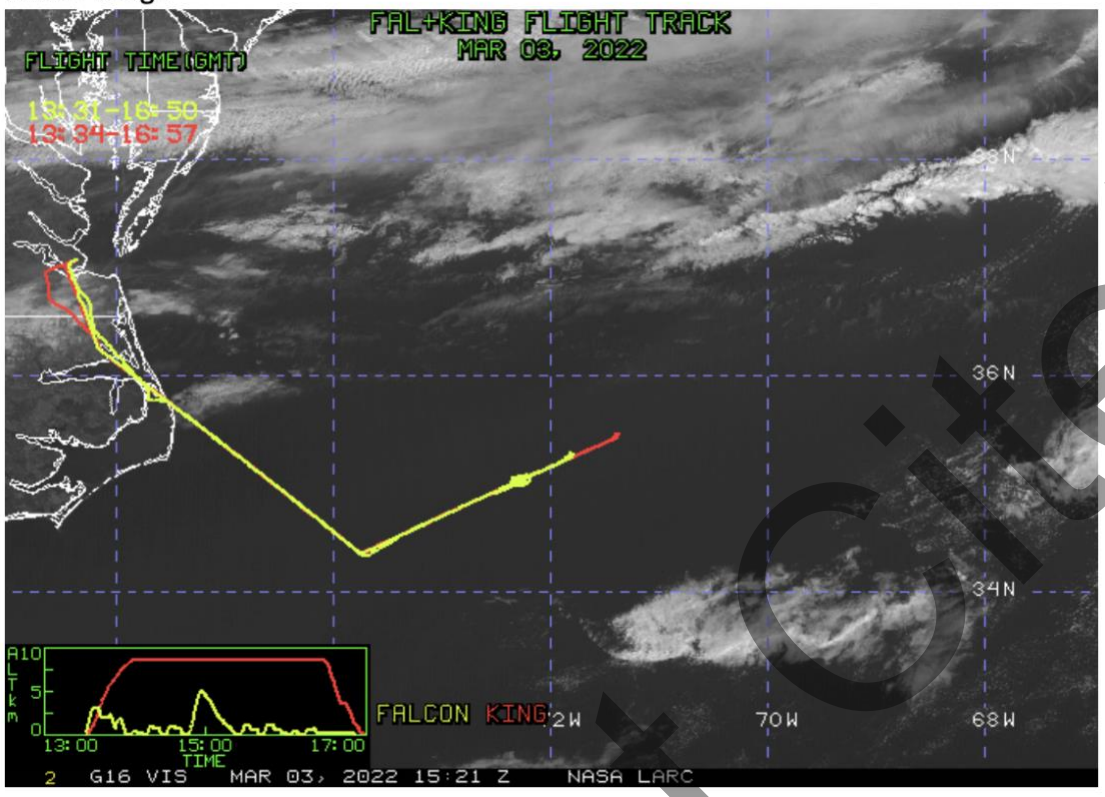

Quicklook ACTIVATE
Cloud Probes (FCDP & 2DS) Quicklook
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie
Cloud Probes (FCDP & 2DS) Quicklook 03/03/2022 13:18:17-16:53:52
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
13:30:00
14:00:00
14:30:00
15:00:00
15:30:00
16:00:00
16:30:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov



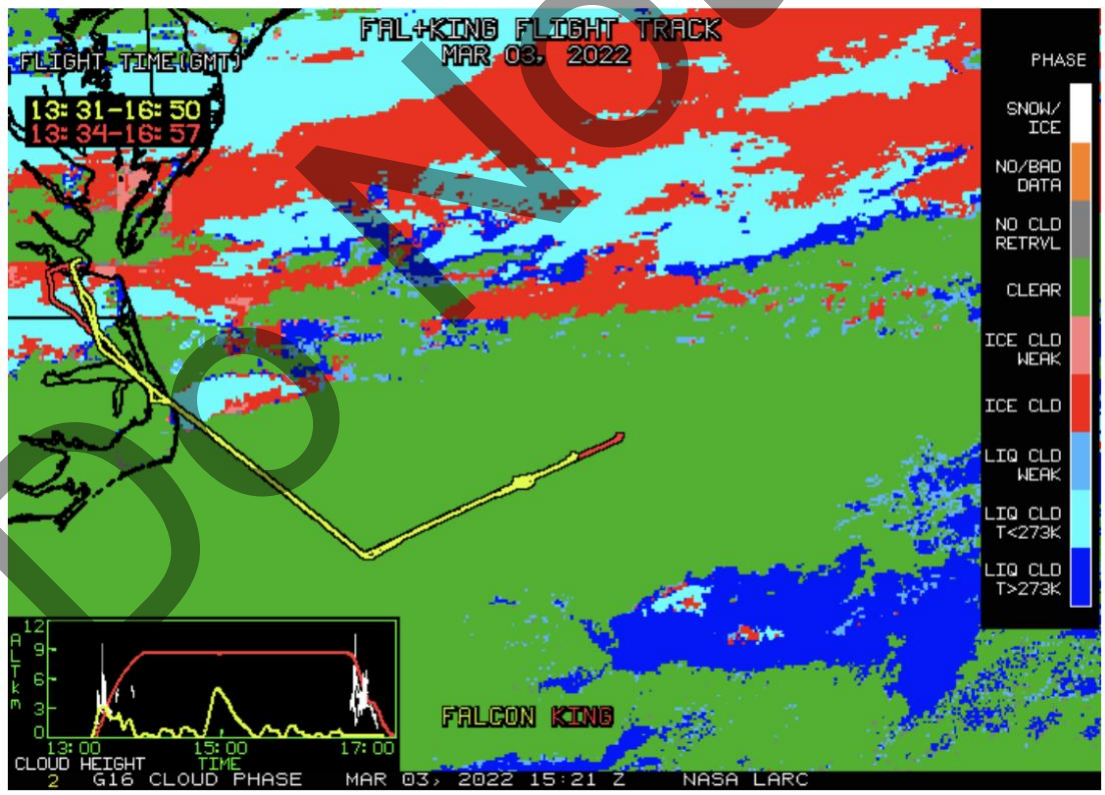


Mixed phase clouds

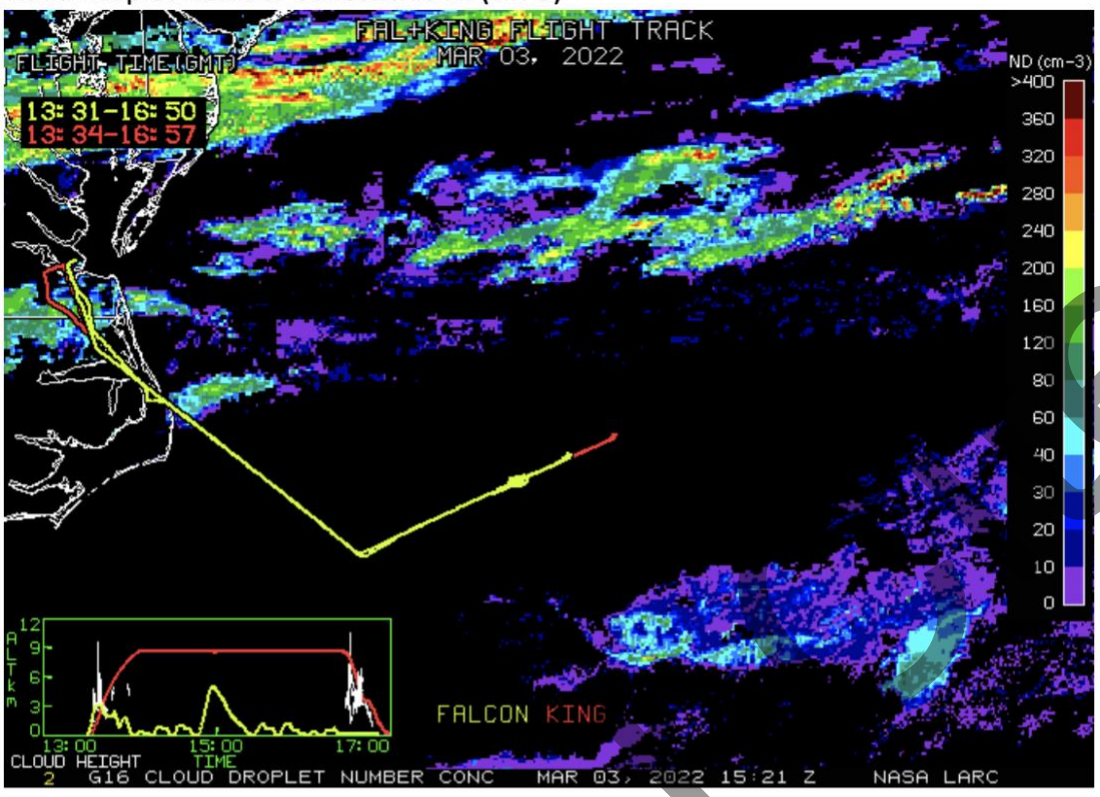
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)