Flight Scientist Report
Thursday 03/04/2021 ACTIVATE RF48

Flight Type: Joint flight, cloud statistical survey
Flight Route: KLFI ATLIC ZIBUT A F G BEHHR ZIBUT ATLIC KLFI
KLFI ATLIC ZIBUT 36.9/-72.5203 36.5/-72.4024 38.2/-72.9116 BEHHR ZIBUT ATLIC KLFI
Special Notes: First joint flight with Falcon back at reduced payload (no aerosol composition or trace gases). This flight was executed to align with a A-Train overpass very close to ZIBUT.

King Air

Flight Scientist report (Taylor S): The UC12 flew out through AR9 to catch a CALIPSO underflight east of ZIBUT. The CALIPSO track was flown to the NNW and then we headed to the East to catch some low level clouds. There was also a notable dust plume aloft on the eastern end of this leg. Mid level cirrus was encountered between ZIBUT and ATLIC on RTB. A total of six sondes were dropped, including three along the CALIPSO track. All instruments were fully operational.

Falcon

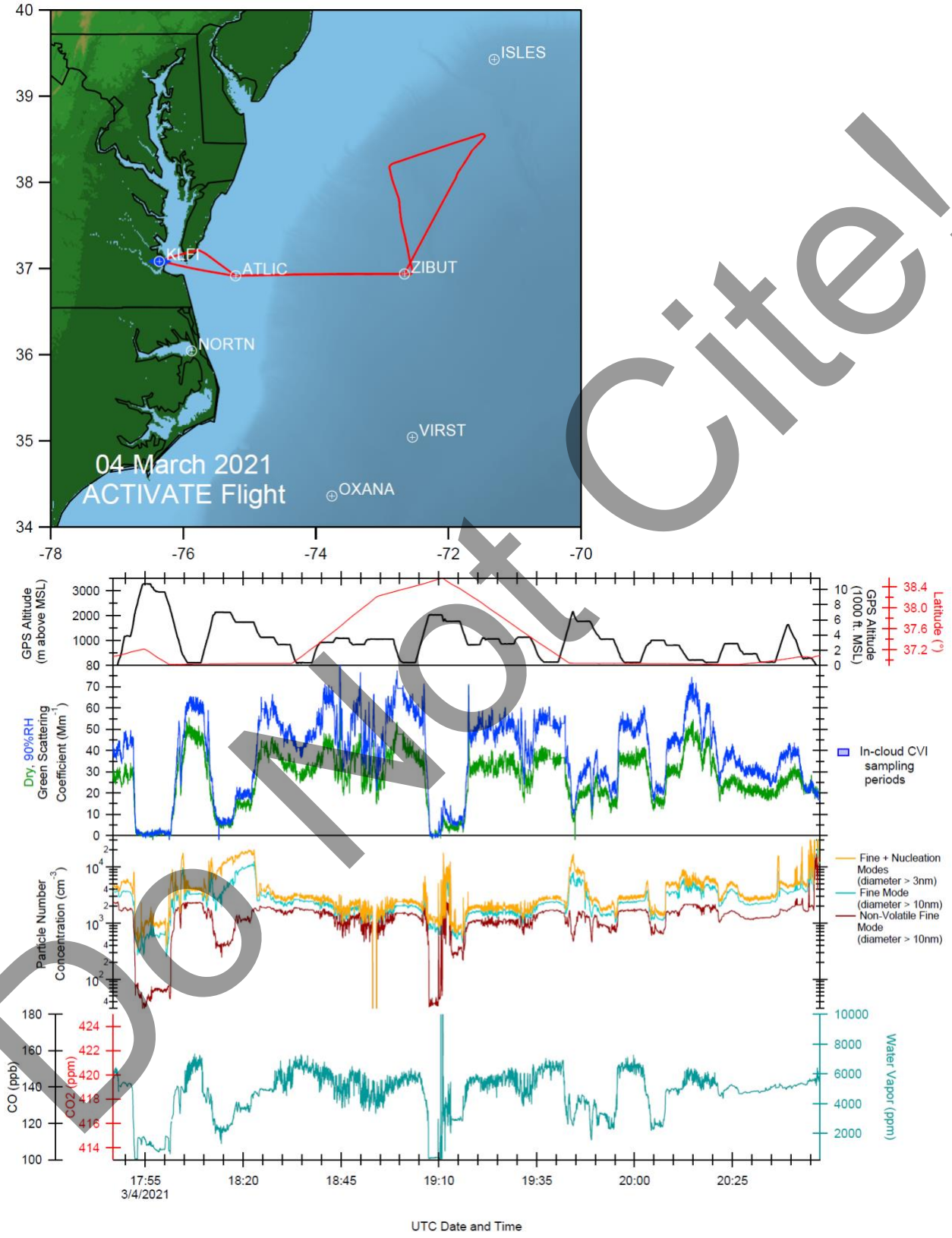
Pilot report (Brian Baxley):
KLFI – KLFI, 3.1 hrs, Slover/Baxley
Clear air and cloud modules, with the aircraft's sampling altitude varying between 500' AGL to 7500' MSL. At reduced electrical power and limited research equipment configuration.

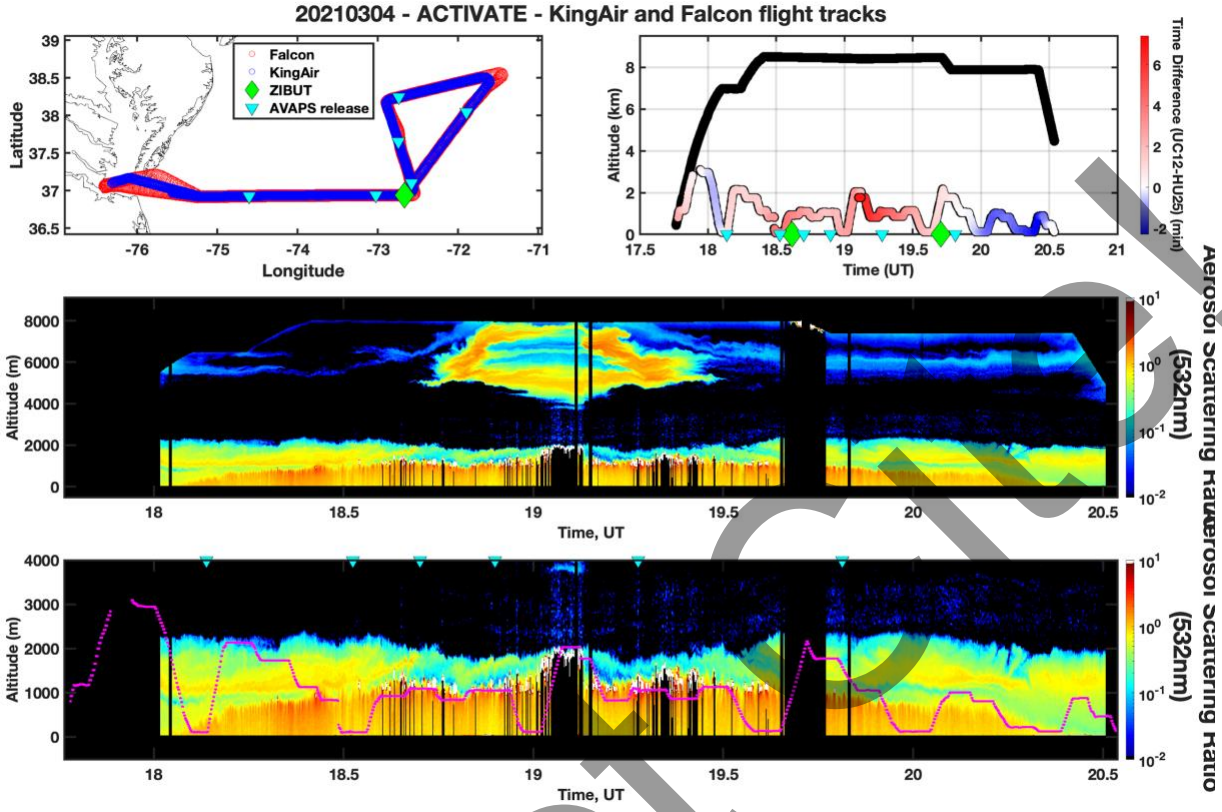
Flight Scientist report (Ewan):2 cloudy and 2 clear ensembles

Boundary layer conditions were hard to understand at the beginning in the clear section. Once we reached Zibut the clouds started and we shifted to the cloud modules. The cloud conditions gradually got more extensive to the north and east. Mostly fair weather cumulus with no obvious precip and all liquid even though icing conditions at the top of the profile. No cloud water although if timing/phasing had been better for us, we possibly could have got some at the NE turn. Clouds thinned out heading back towards zibut and we returned to the clear module. Very shallow marine layer as we got closer to shore (expected given the wind conditions.

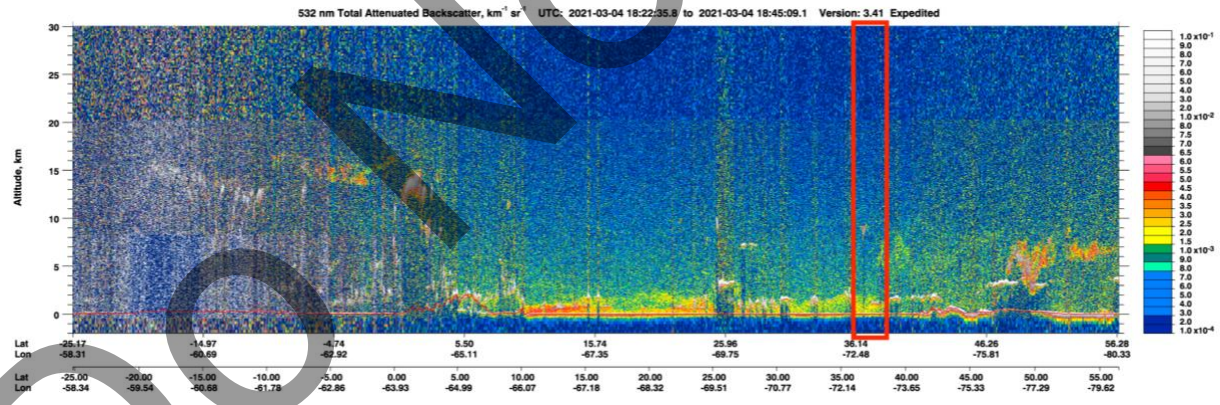
I did not foresee this before the flight (assumed that things were going to be easier because of fewer instruments) but it was actually quite a bit more challenging to execute the clear sections today without having the information from the gas instruments and the AMS. I really could not understand what I was seeing in the profile so it made it more difficult to know which levels to pick. The conditions were quite polluted (as judged by the scattering) but it was not confined to the marine layer. There was also extensive NPF in various places but it was hard to understand the mechanisms with the reduced payload. It is perhaps something to think about,

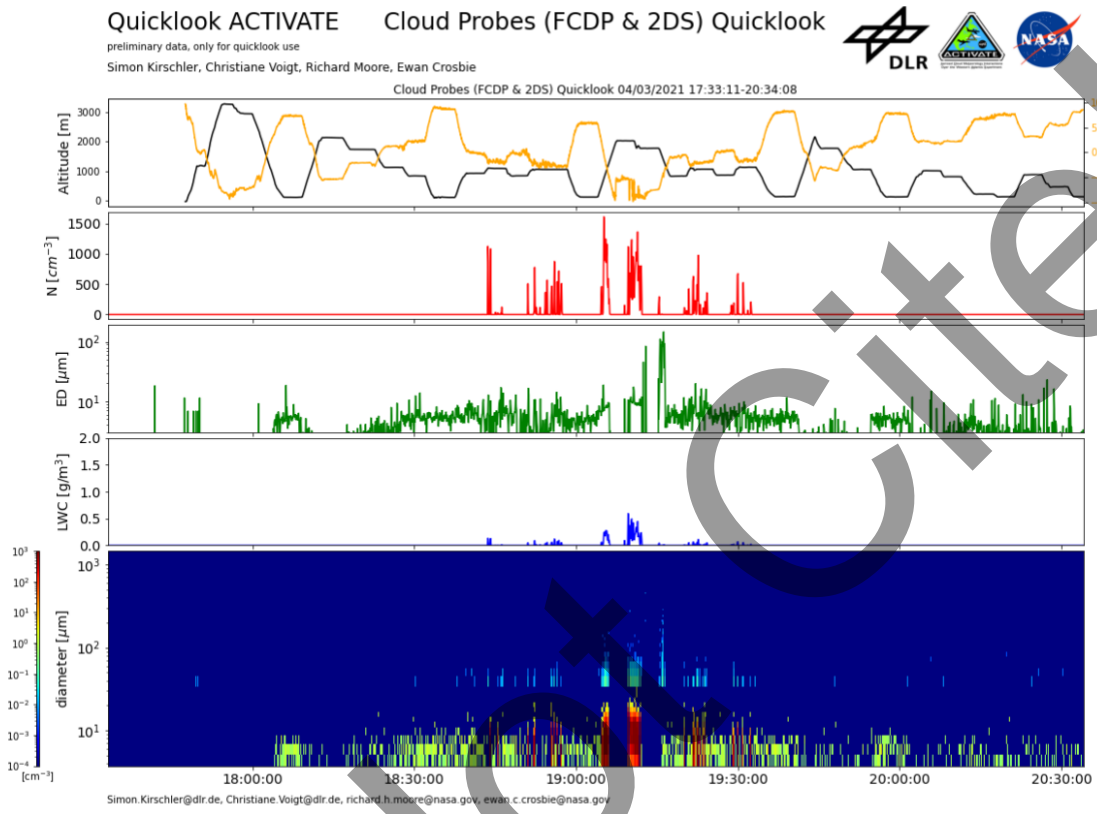
since I assume when the time comes to analyze these flights people may have an even harder time making sense of the aerosol data.

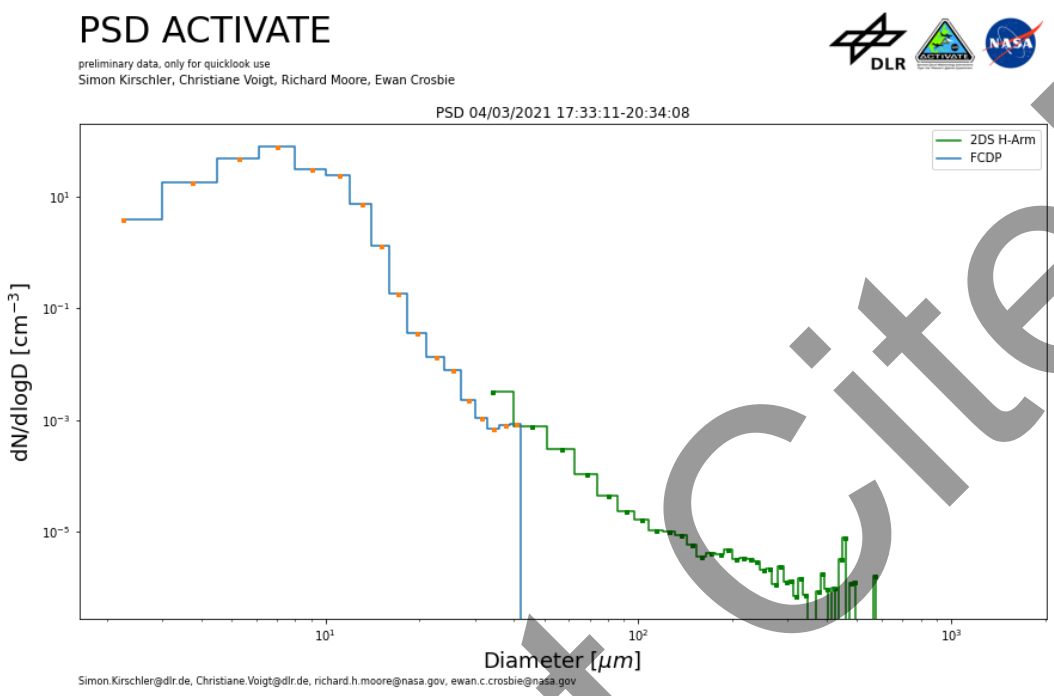

ISLES
KHF
ATLIC
ZIBUT
NORTN
VIRST
OXANA
04 March 2021
ACTIVATE Flight
GPS Altitude (m above MSL)
GPS Altitude (1000 ft. MSL)
Latitude (°)
Dry, 90%RH Green Scattering Coefficient (Mm-1)
In-cloud CVI sampling periods
Particle Number Concentration (cm-3)
Fine + Nucleation Modes (diameter > 3nm)
Fine Mode (diameter > 10nm)
Non-Volatile Fine Mode (diameter > 10nm)
CO (ppb)
CO2 (ppm)
Water Vapor (ppm)
17:55
3/4/2021
18:20
18:45
19:10
19:35
20:00
20:25
UTC Date and Time

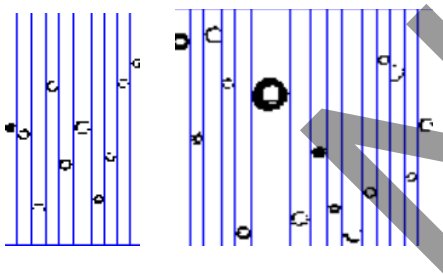


CALIPSO track through domain, region of RF48 in red box




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 04/03/2021 17:33:11-20:34:08
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
18:00:00
18:30:00
19:00:00
19:30:00
20:00:00
20:30:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

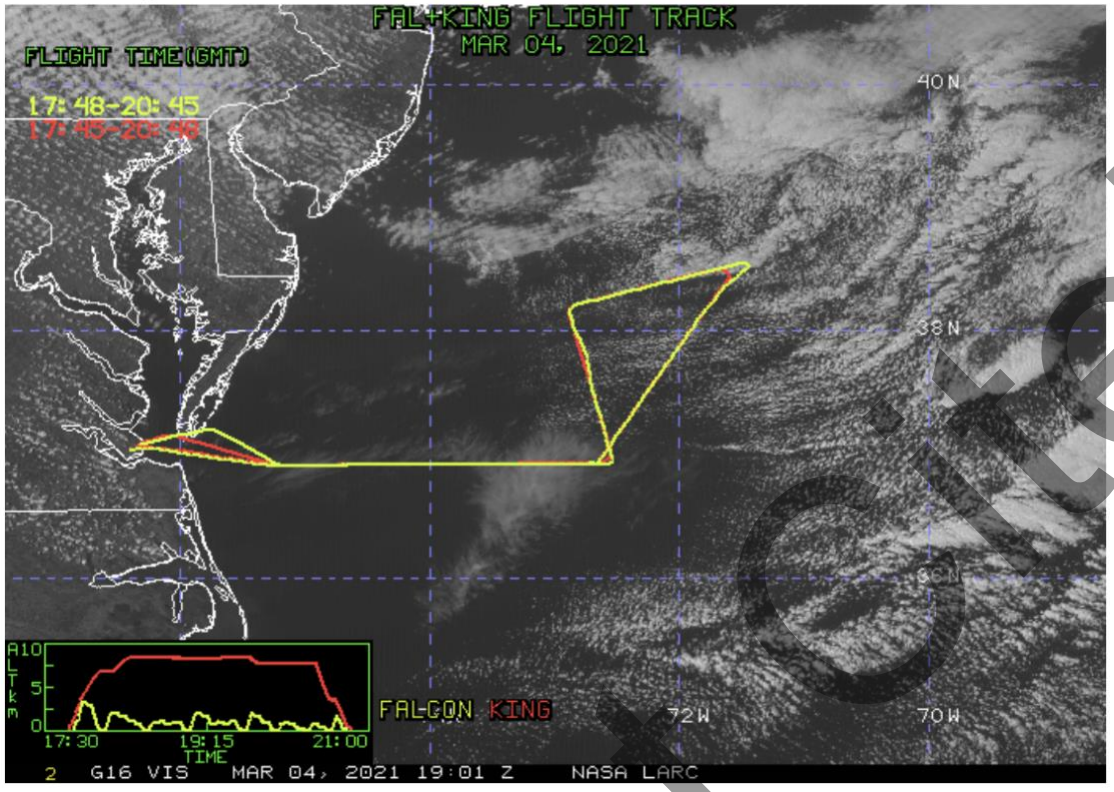




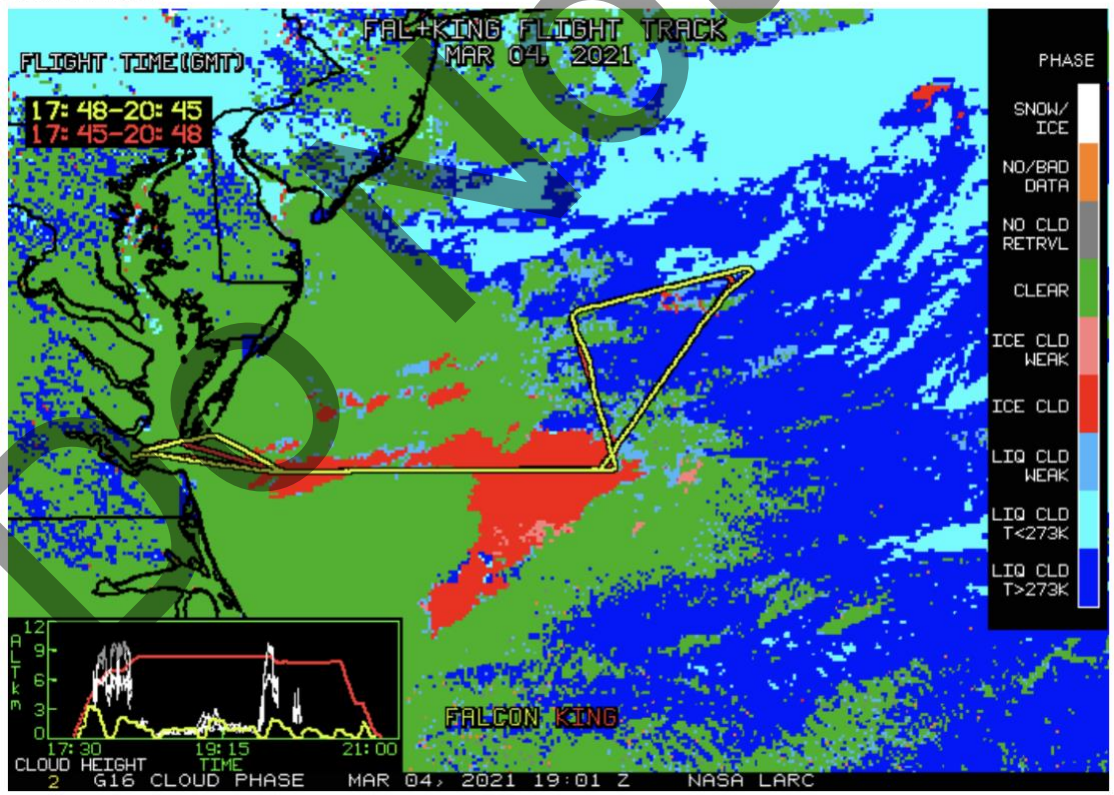
pure liquid clouds during the flight

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 48, 19:01 UTC Mar 04, 2021

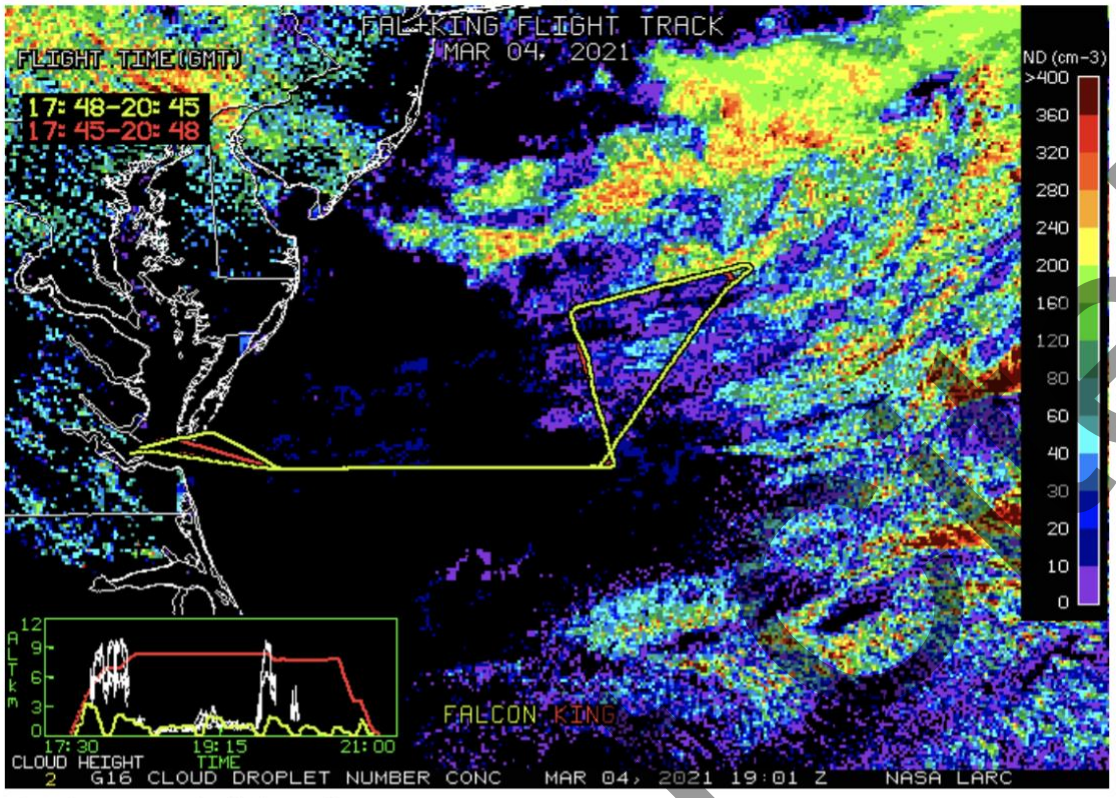
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)