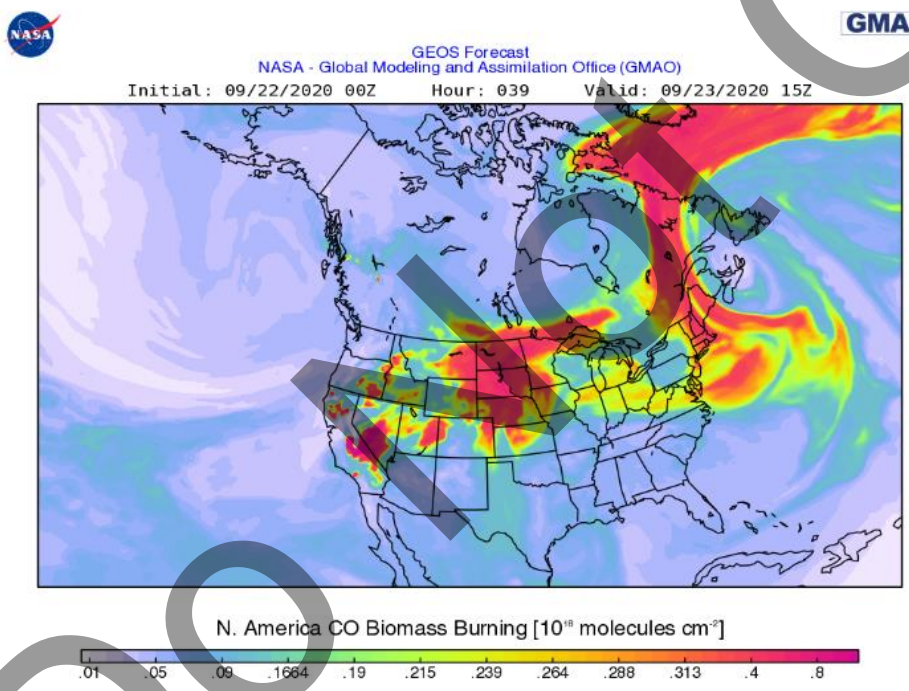
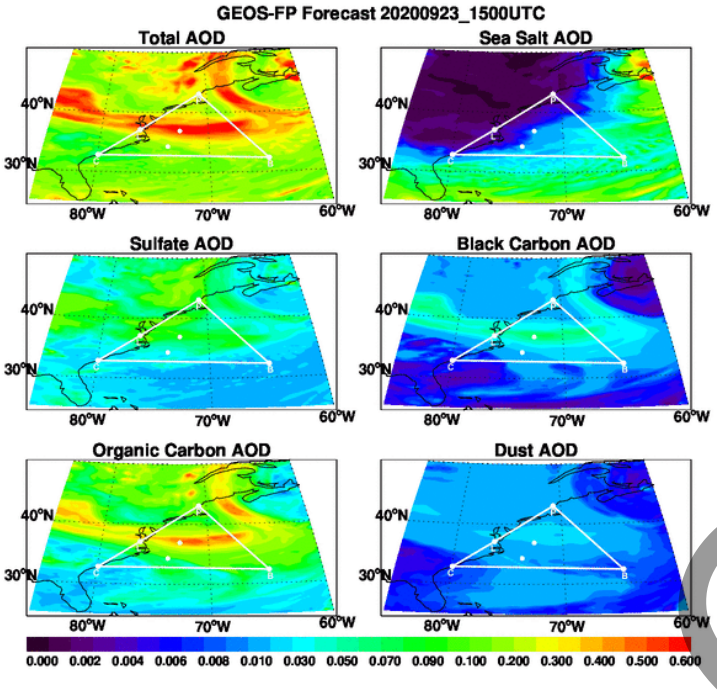
Flight Scientist Report
Wednesday 09/23/2020 ACTIVATE RF38

Flight Type: Statistical Survey Flight and CALIPSO underflight: Zibut to the north
Flight Route:
Falcon = KLFI ATLIC ZIBUT 36.116667/-70.783333 35.95/-69.6 36.3997/-69.7303 37.0009/-69.9074 37.6019/-70.0867 ZIBUT ATLIC KLFI
UC-12 = KLFI ATLIC ZIBUT 36.116667/-70.783333 35.5176965/-69.4734192 35.7983/-69.5552 35.95/-69.6 36.3997/-69.7303 37.0009/-69.9074 37.6019/-70.0867 ZIBUT ATLIC KLFI

Special Notes:
Clear day with low cirrus and lots of western US smoke.





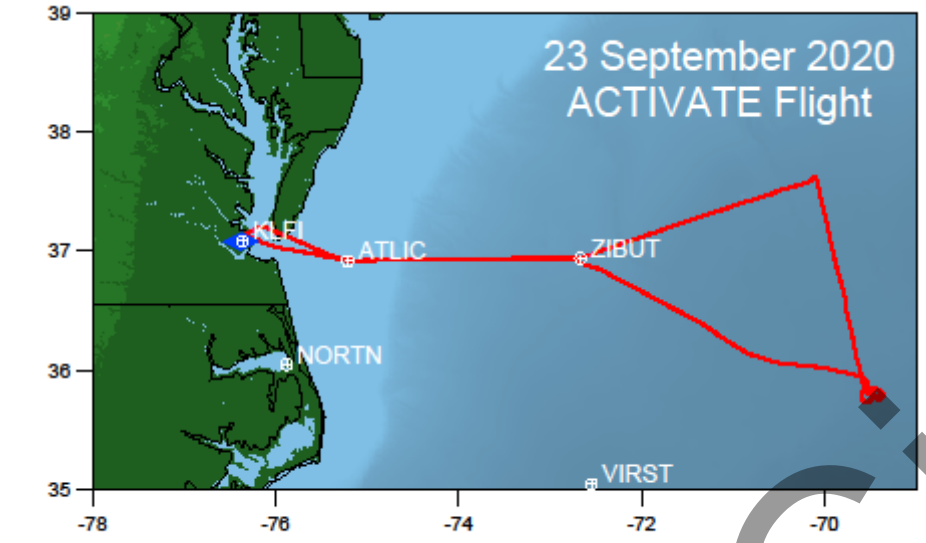
King Air

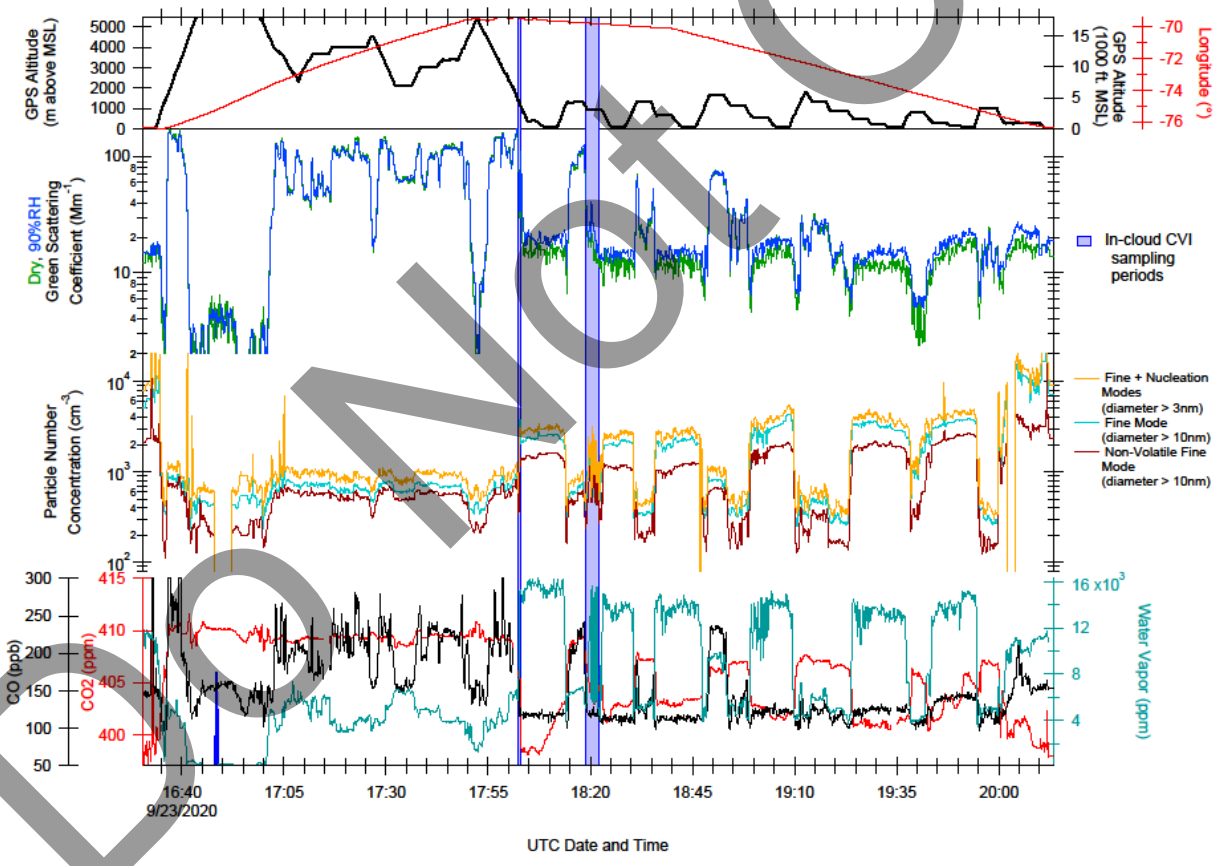
Flight executed well.
HSRL-2 issues halfway to 2/3 of the way between Zibut and CALIPSO line. Back on line for the 2nd half of the CALIPSO leg.
Launched 8 sondes

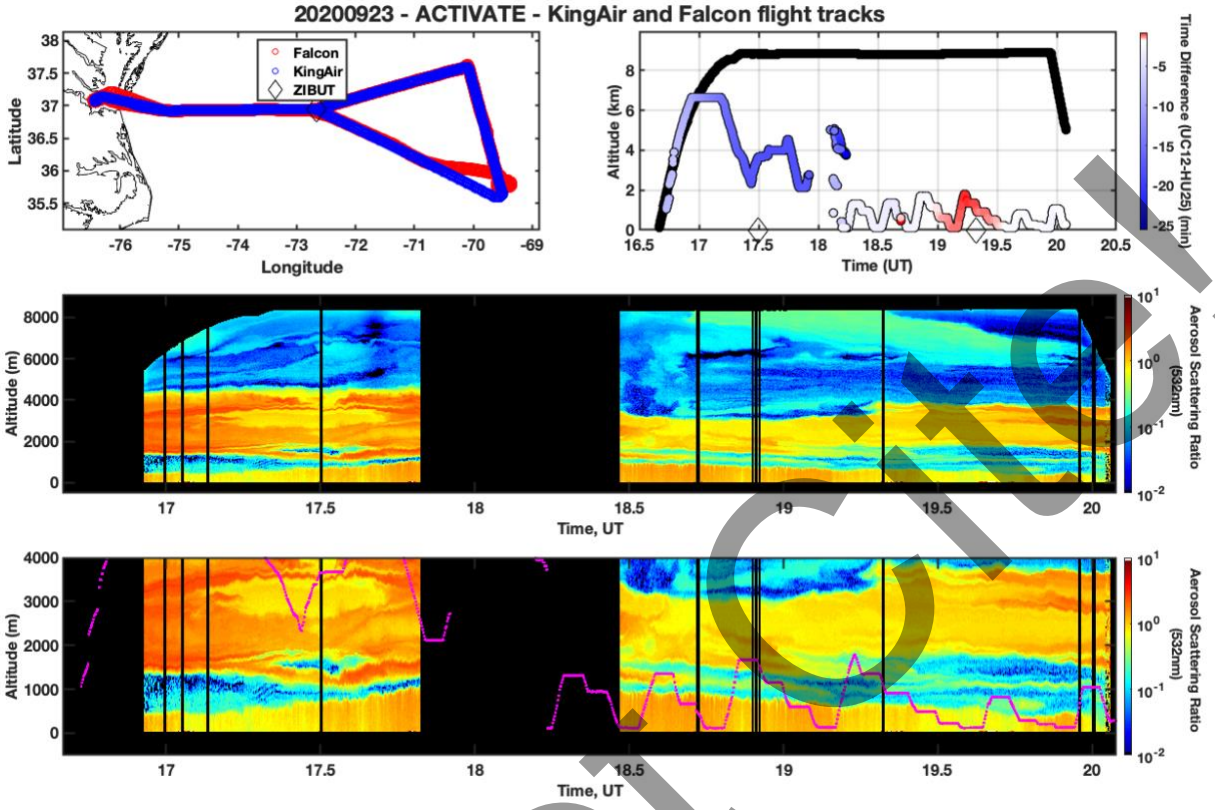
Falcon

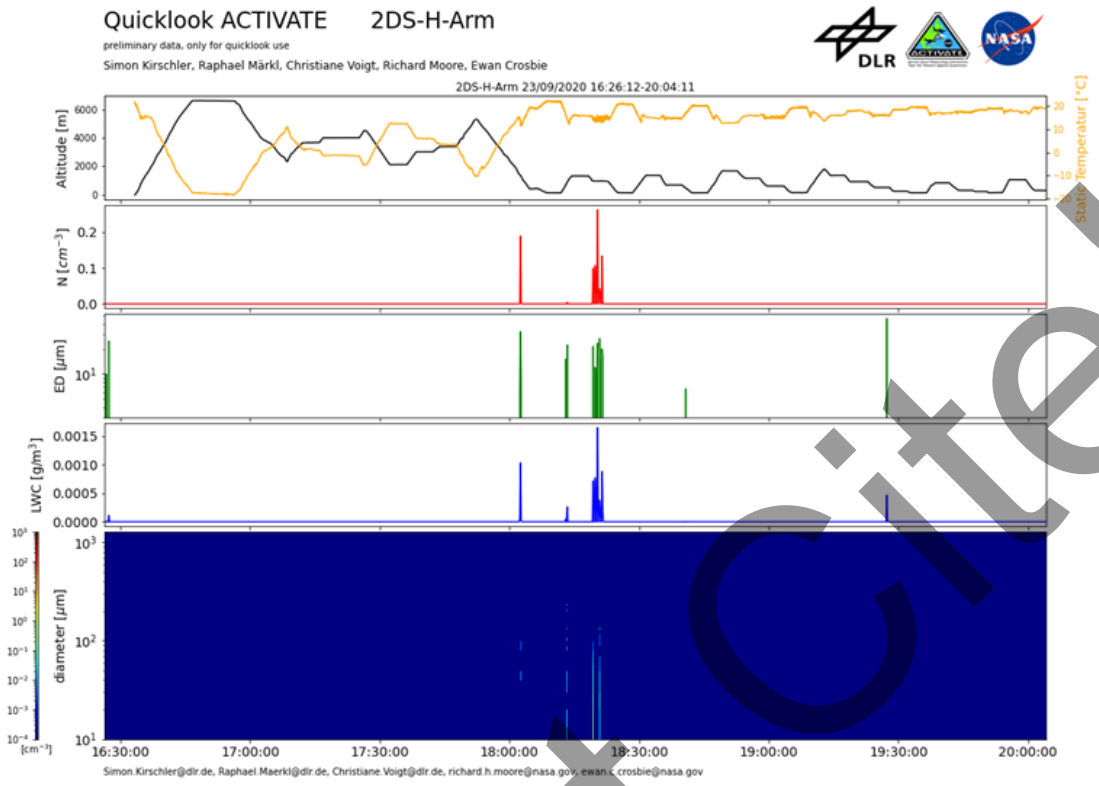
Flight executed well and instruments worked well.
Tried to get FCDP issue resolved but it wasn't possible.
Smoke between 7-14k ft. Varying composition in the smoke layer at different levels.

Rich Moore Quicklook Images:





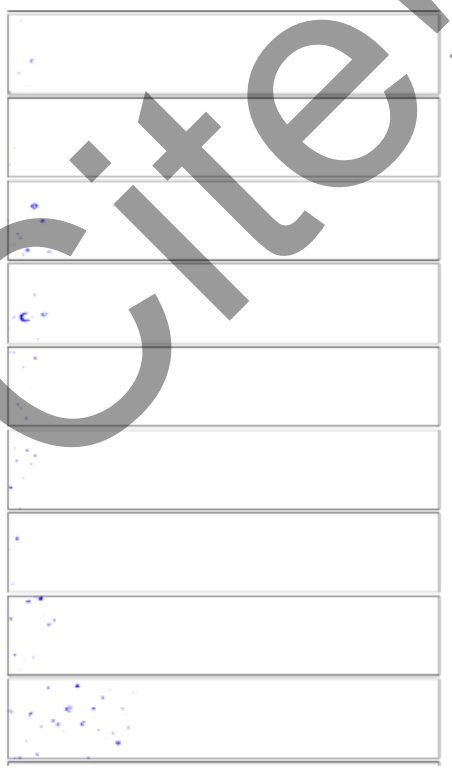

20200923 - ACTIVATE - KingAir and Falcon flight tracks
Falcon
KingAir
ZIBUT
Latitude
Longitude
Altitude (km)
Time (UT)
Time Difference (UC12-HU25) (min)
Altitude (m)
Time, UT
Aerosol Scattering Ratio (532nm)



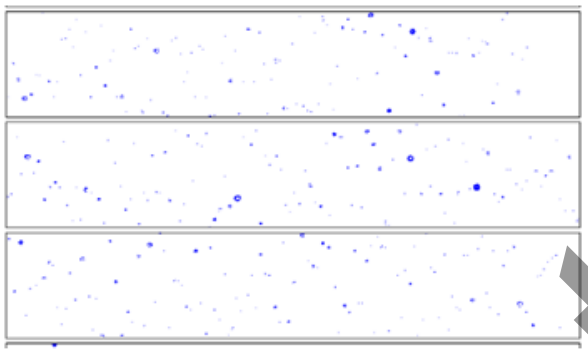
No FCDP Data available for this day. Only 2DS H-arm data shown.

Again, the phenomenon of droplets sometimes only appearing on the left side of images can be seen.

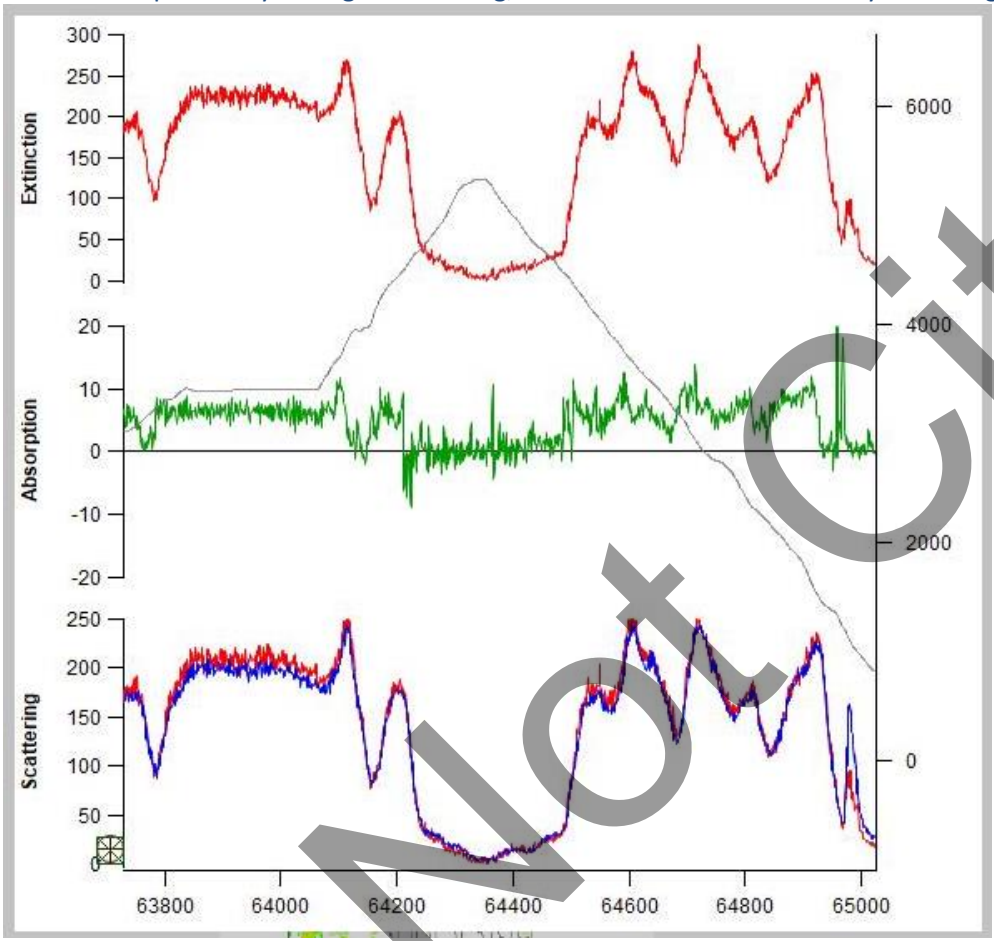
18:13



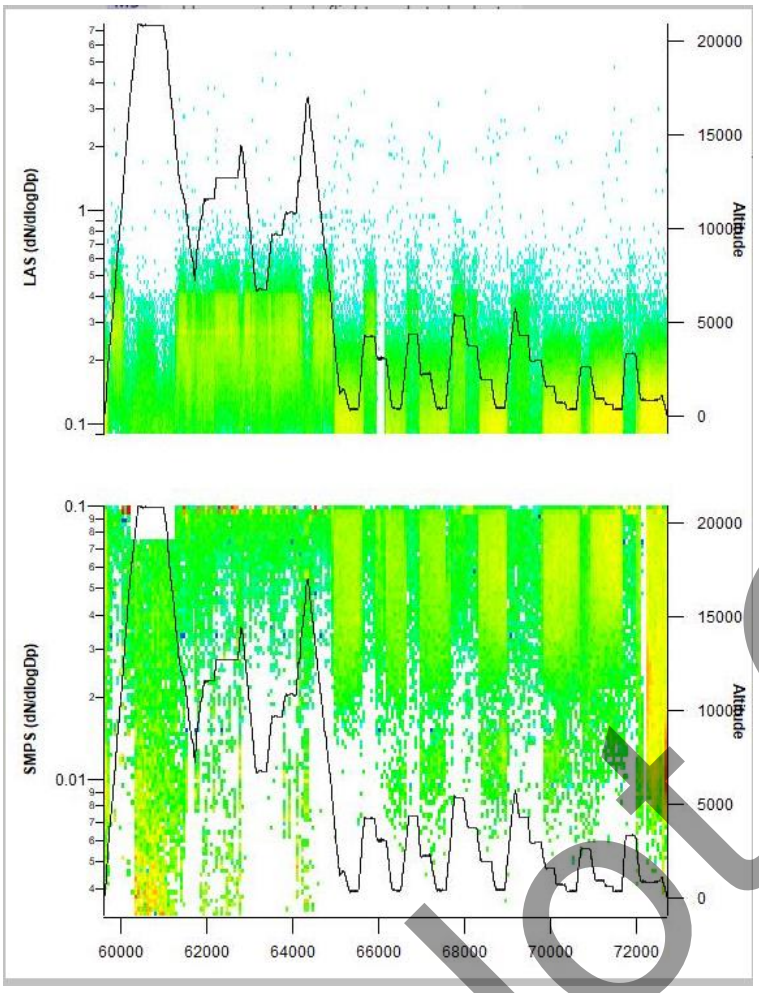
18:02



Here is snapshot of Scattering and Absorption data from the smoke sampling. Altitude is on the right seems like a possibility during the level leg, which is not obvious in the layers during the descent.

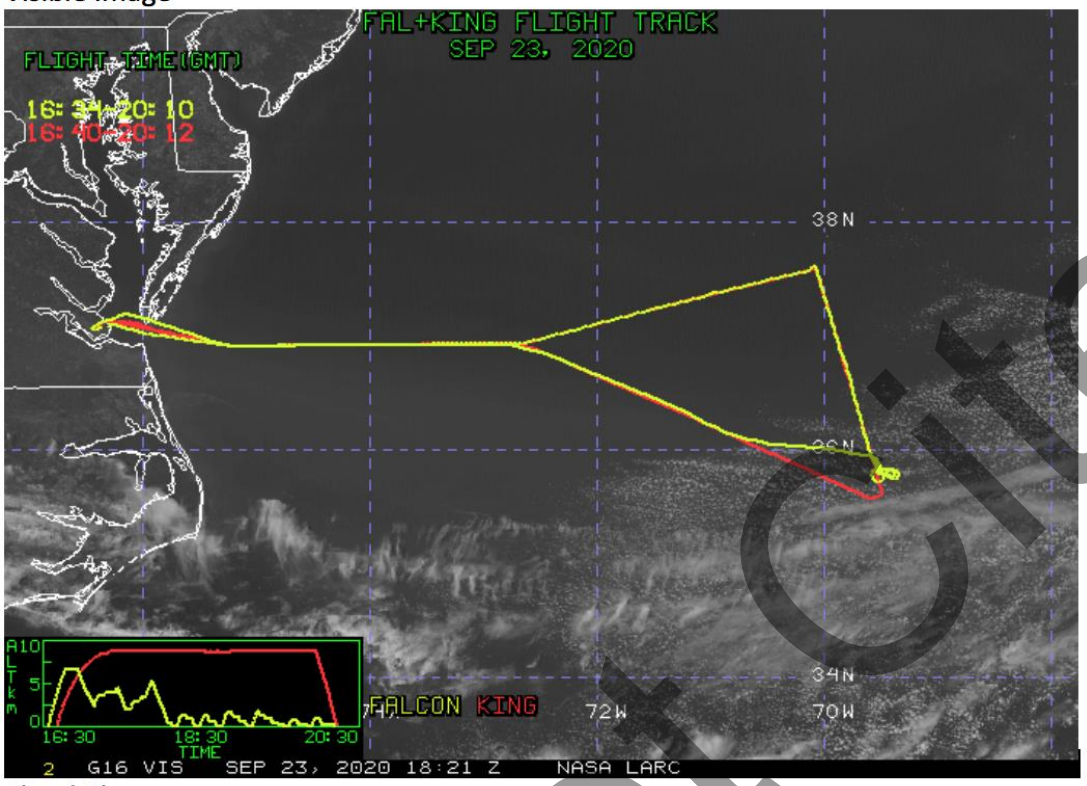


Below is an image plot of LAS (top) and SMPS (bottom) for the whole flight. From the LAS, the smoke had 200-400nm size which is typical for biomass burning. Note that in the BL during the clear-air ensembles the distribution is shifted to much smaller sizes (peak at 100nm) and the smoke sizes are not observed. Seems like what is in the BL doesn't look like entrained smoke but something else entirely that is likely continental outflow (higher concentrations closer to shore). Also note the huge concentrations of 10-20nm particles over land at the end of the flight.

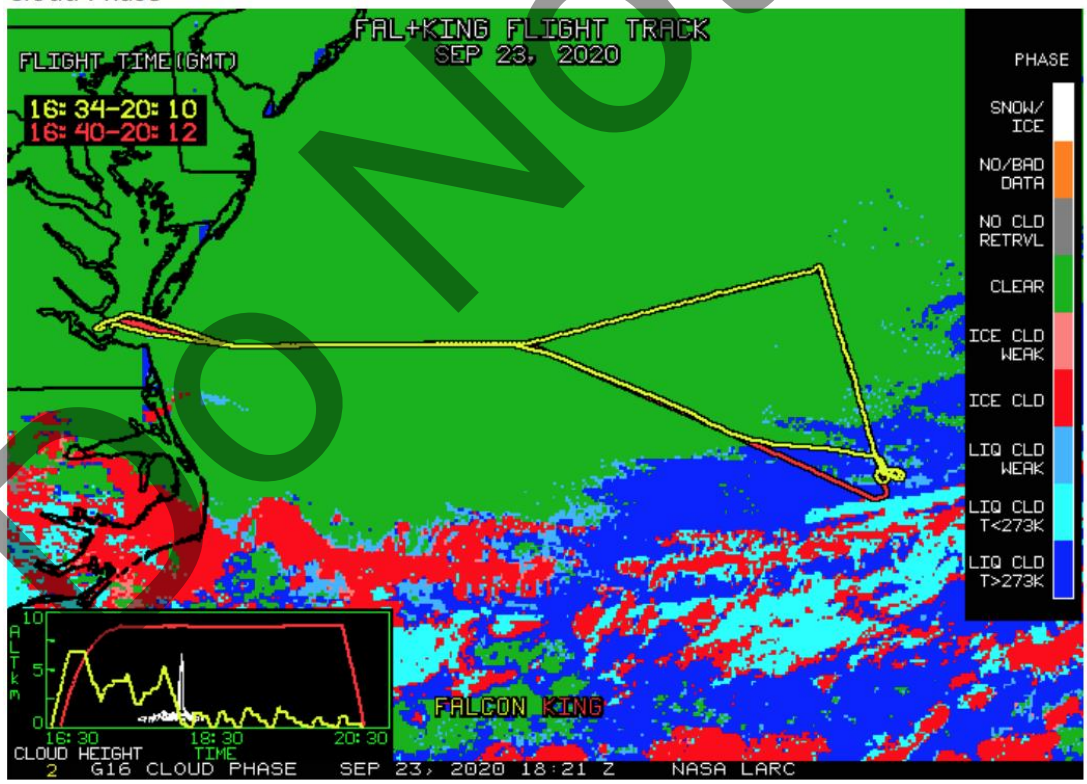

LAS (dN/dlogDp)
SMPS (dN/dlogDp)
Altitude
20000
15000
10000
5000
0
60000
62000
64000
66000
68000
70000
72000

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 38, 1821 UTC Sep 23, 2020

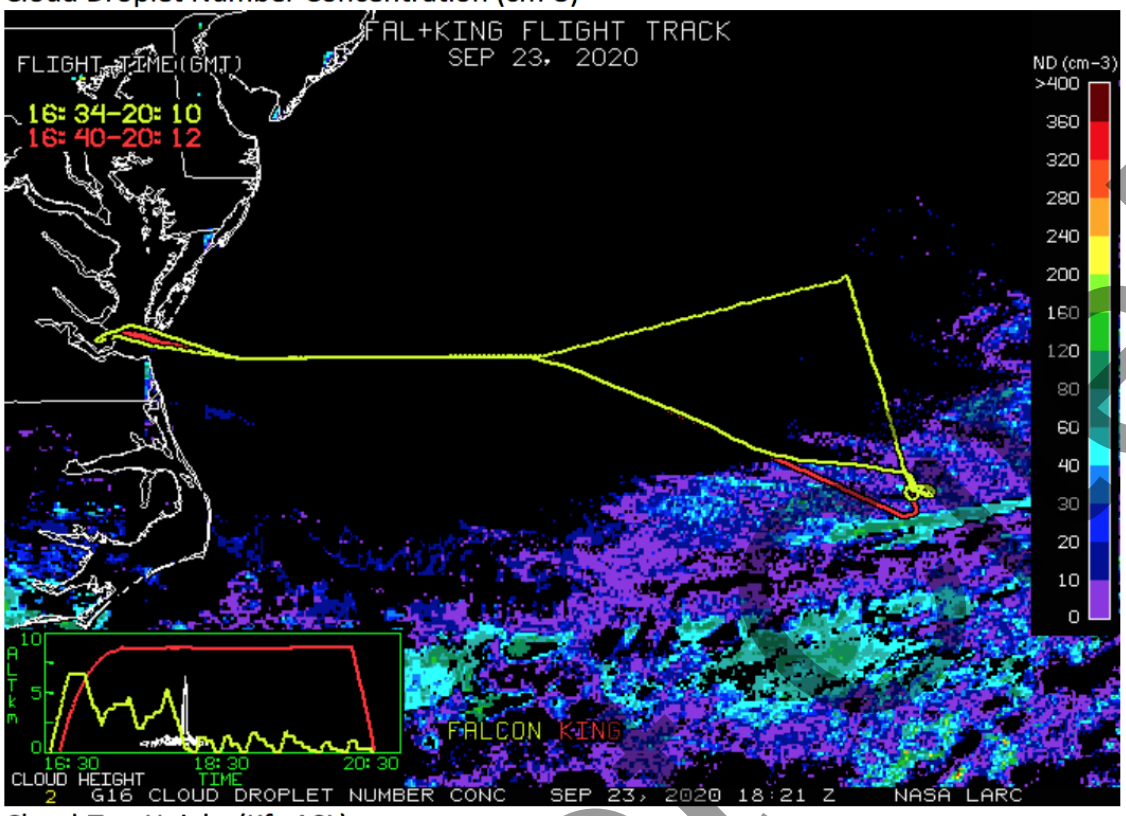
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)