Flight Scientist Report
Thursday 03/12/2020 ACTIVATE RF21

Flight Type: Statistical Survey Flight – ASTER Under Flight
Flight Route: ZIBUT - ENE to northern point of ASTER ground track - SSW along track - ZIBUT

Special Notes: Preflight brief indicated that take off for the UC12 should be 0940-0945 EDT (local) to hit the ASTER leg (middle) at 1131 EDT (local) or 1531 UTC. The winds aloft are predicted to be low (30knts) for the first part then cross winds of 50knts along ASTER track. The Falcon plan is to sample as a stat. survey.

Called audible to change route to go out towards a southern point on the ASTER track and then go to the northern point before turning and heading back along original track. This provides two passes along the northern end that is looking more free of cirrus clouds and only added 11nm to the flight path.

Northern end of the ASTER did not have cirrus as reported by crew on UC12.

Most of the track had thin cirrus. The cirrus were much more thick betwen the coast and ZIBUT where convection was taking place south. The scattered cu was present most of the outbound flight and then at the South Eastern most point there was clear sky conditions below the cirrus.

On leg back from satellite track, clouds cleared down low until about 70nm east of ZIBUT. A few mid-level clouds in the lidar data as well. HU25 entered back into cloud modules at this point. Decided to drop sonde in the scatter clouds about 40 nm past ZIBUT at the end of the cirrus anvil coming from the convection South.

There were several areas along the track that had the low scattered clouds but also areas that had clear sky conditions and from the real time data assessment it was not obvious the reason for the differences in the regions.

Aerosol coming across the front had a lot of vertical structure even above the cloud tops near the end of the flight.

King Air

- Good take-off timing on this flight. Matched well on the timing for the overpass. Might have been a few minutes ahead of schedule of the ASTER overpass at 1534UTC by 5-10mins.

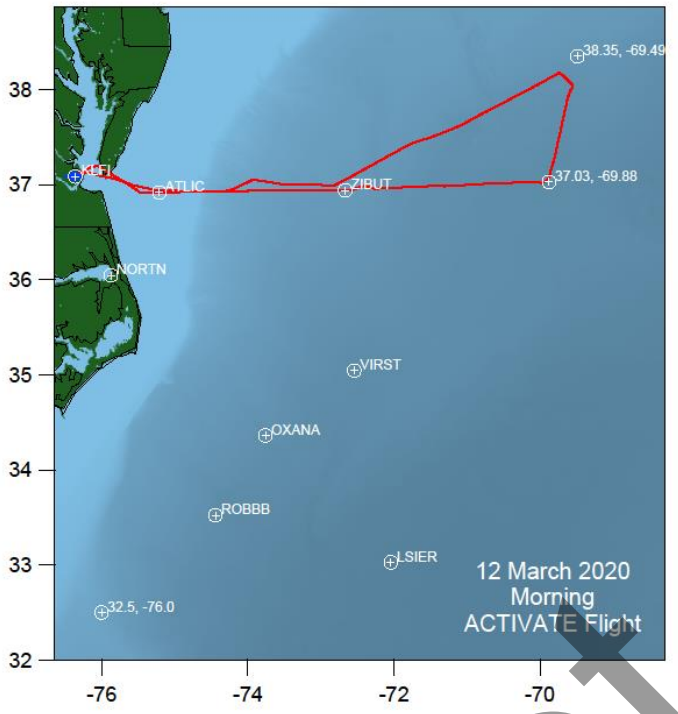
Instruments:
All instruments worked nominally. There were cirrus above that will likely impact some of the retrievals from RSP. Sonde dropped along ASTER track and then just after ZIBUT on the return. Garmiin nadir camera was operational and the operators verified that the time stamps were updating when checked before the ASTER run.

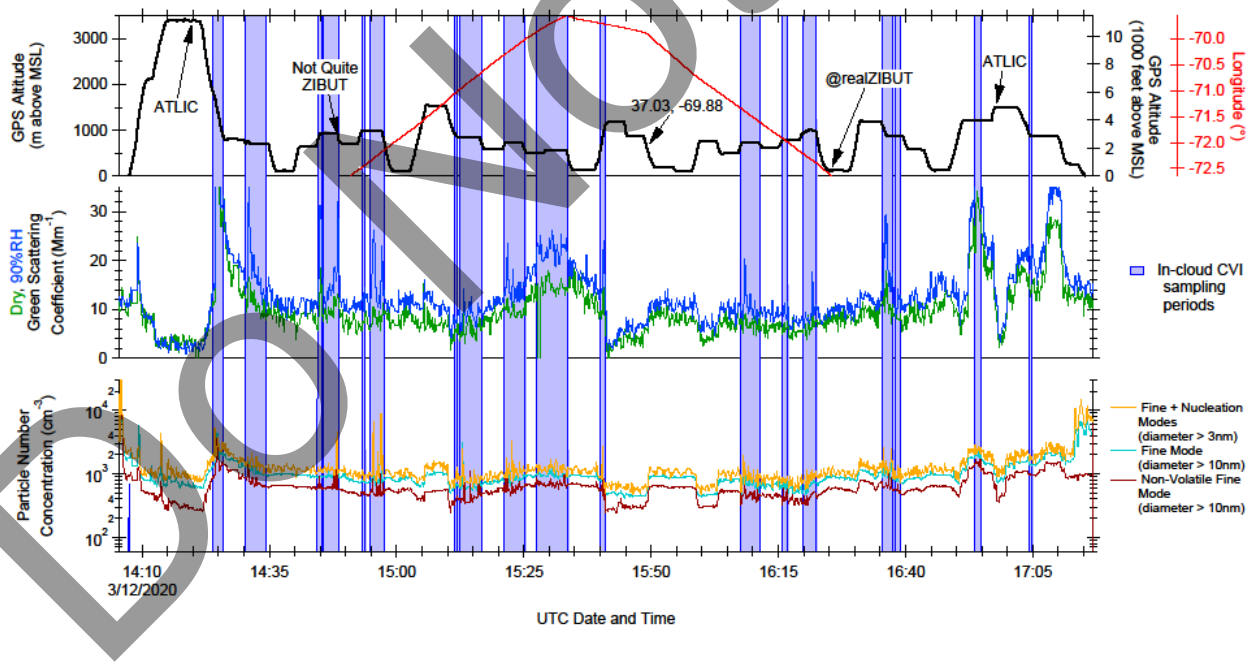
Falcon

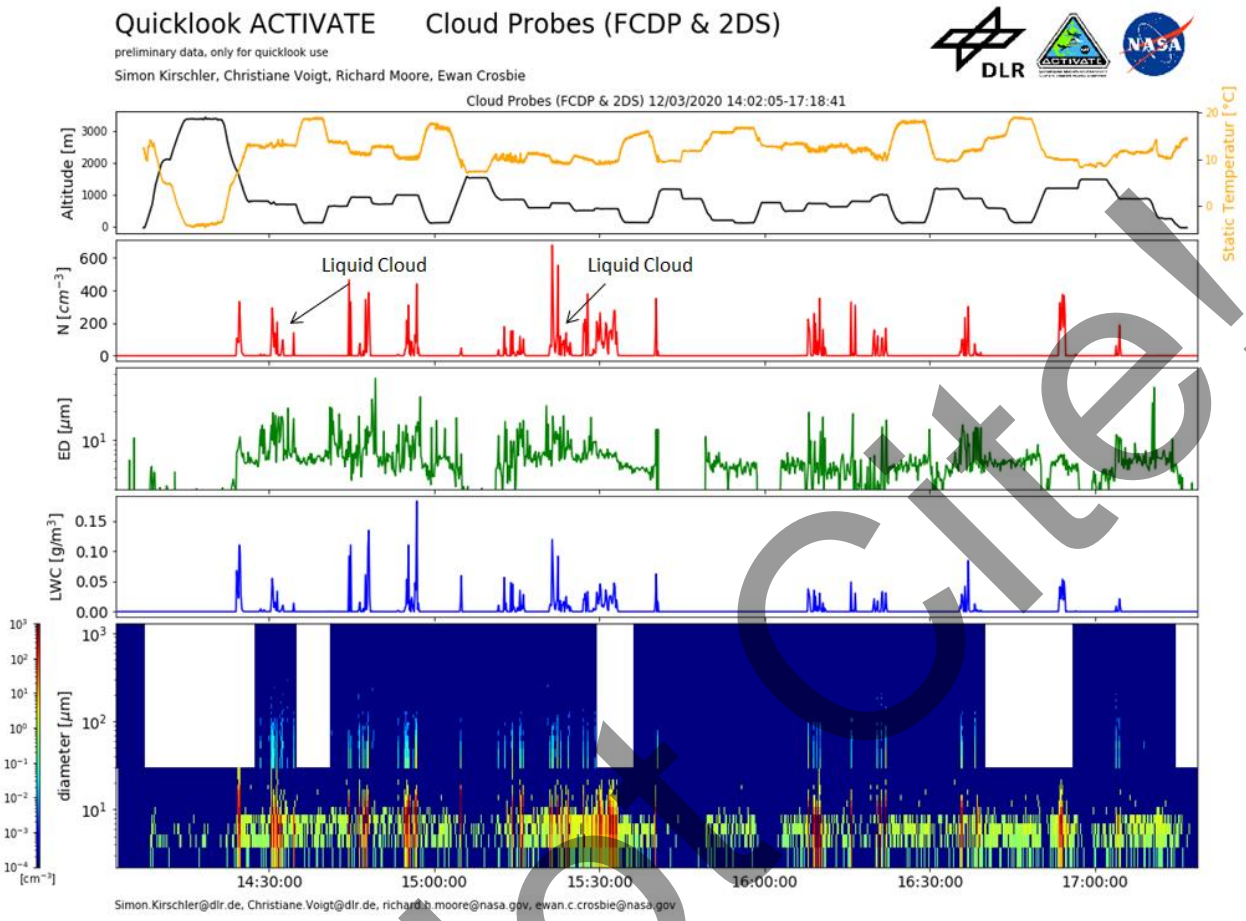
- During startup the scroll pumps did not start properly.

Instruments: All instruments were reported as working nominal during the flight.

Rich Moore Quicklook Images:



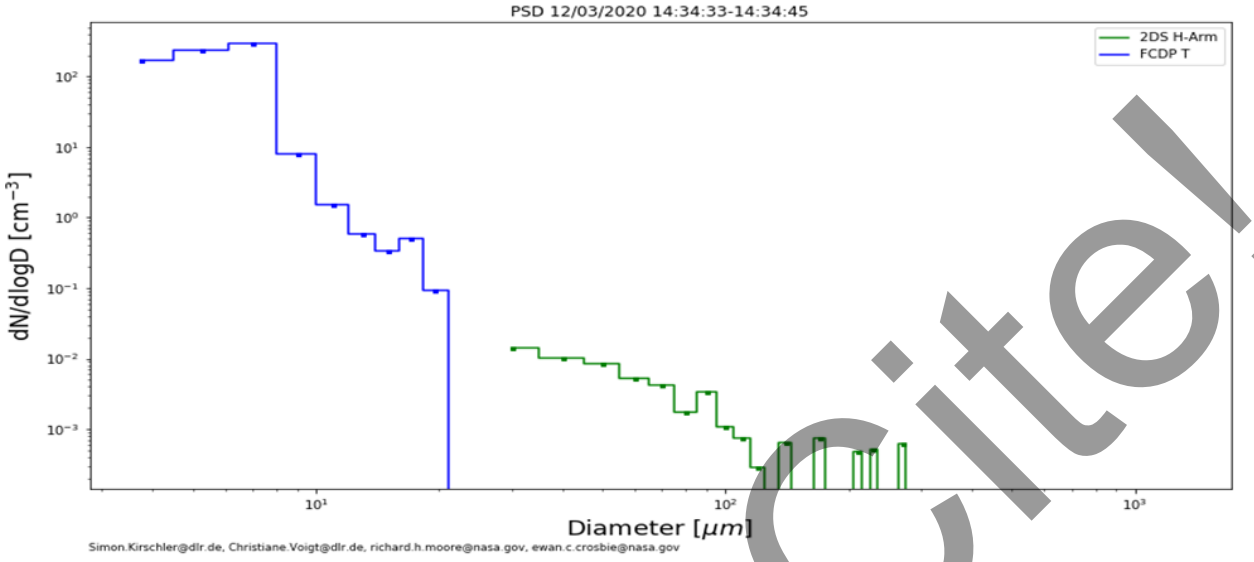



Quicklook ACTIVATE Cloud Probes (FCDP & 2DS)
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie
Cloud Probes (FCDP & 2DS) 12/03/2020 14:02:05-17:18:41
Altitude [m]
Static Temperatur [°C]
N [cm⁻³]
Liquid Cloud
Liquid Cloud
ED [µm]
LWC [g/m³]
diameter [µm]
[cm⁻³]
14:30:00
15:00:00
15:30:00
16:00:00
16:30:00
17:00:00
Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

PSD ACTIVATE

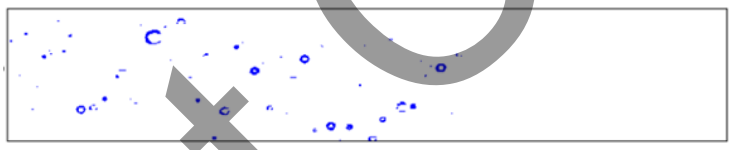
preliminary data, only for quicklook use

Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie

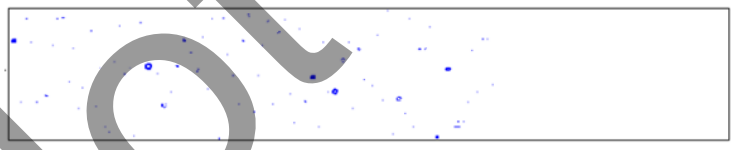


Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

Liquid Cloud: 14:32:29

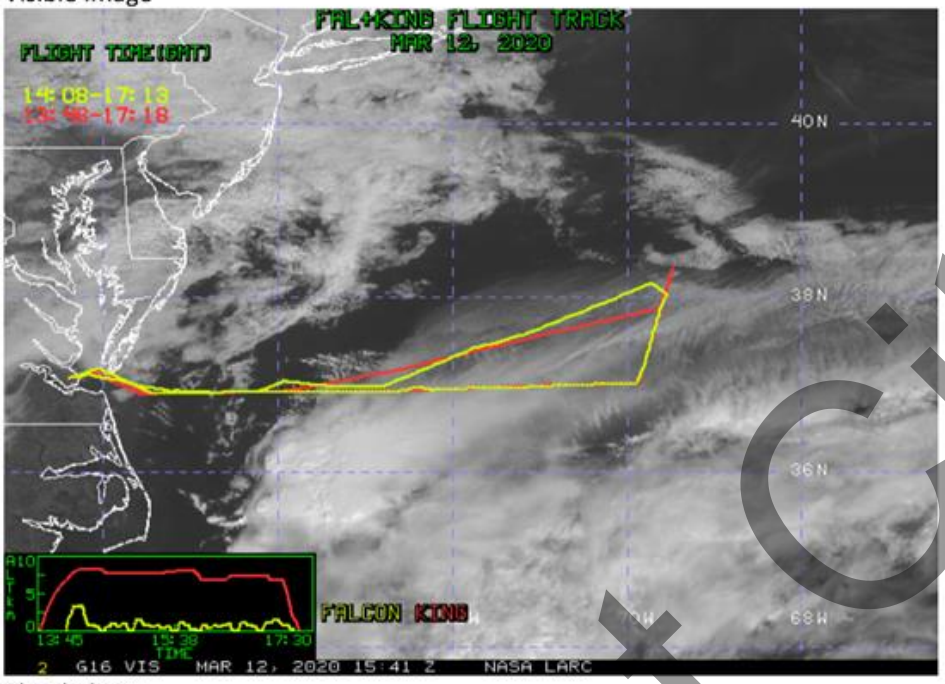


Liquid Cloud: 15:23:28

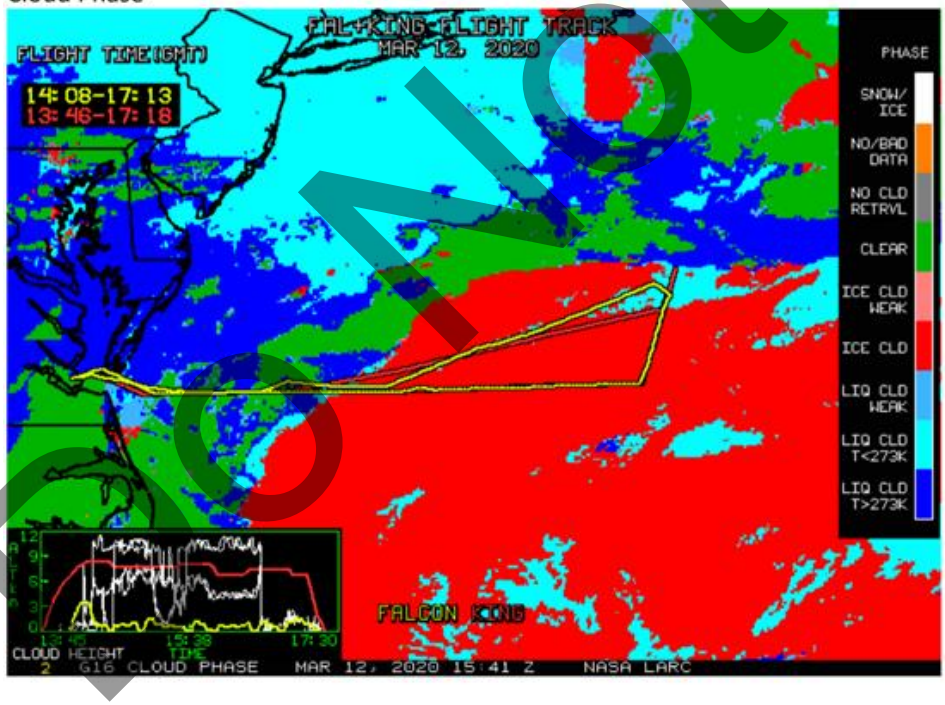


NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 21, 15:41 UTC Mar 12, 2020 (near middle of flight)

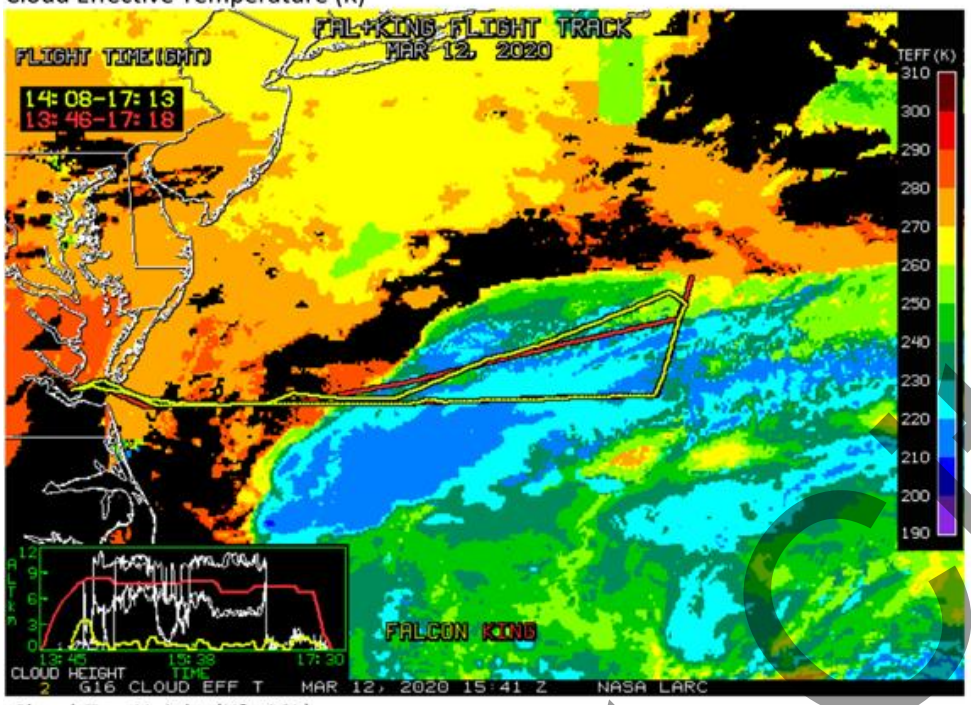
Visible Image



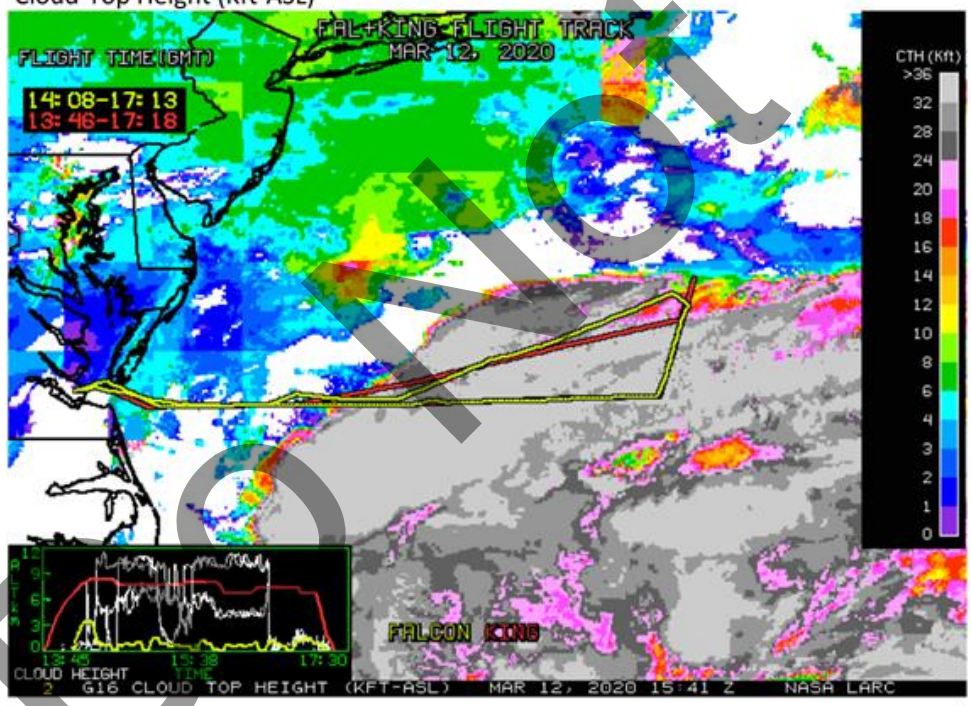
Cloud Phase



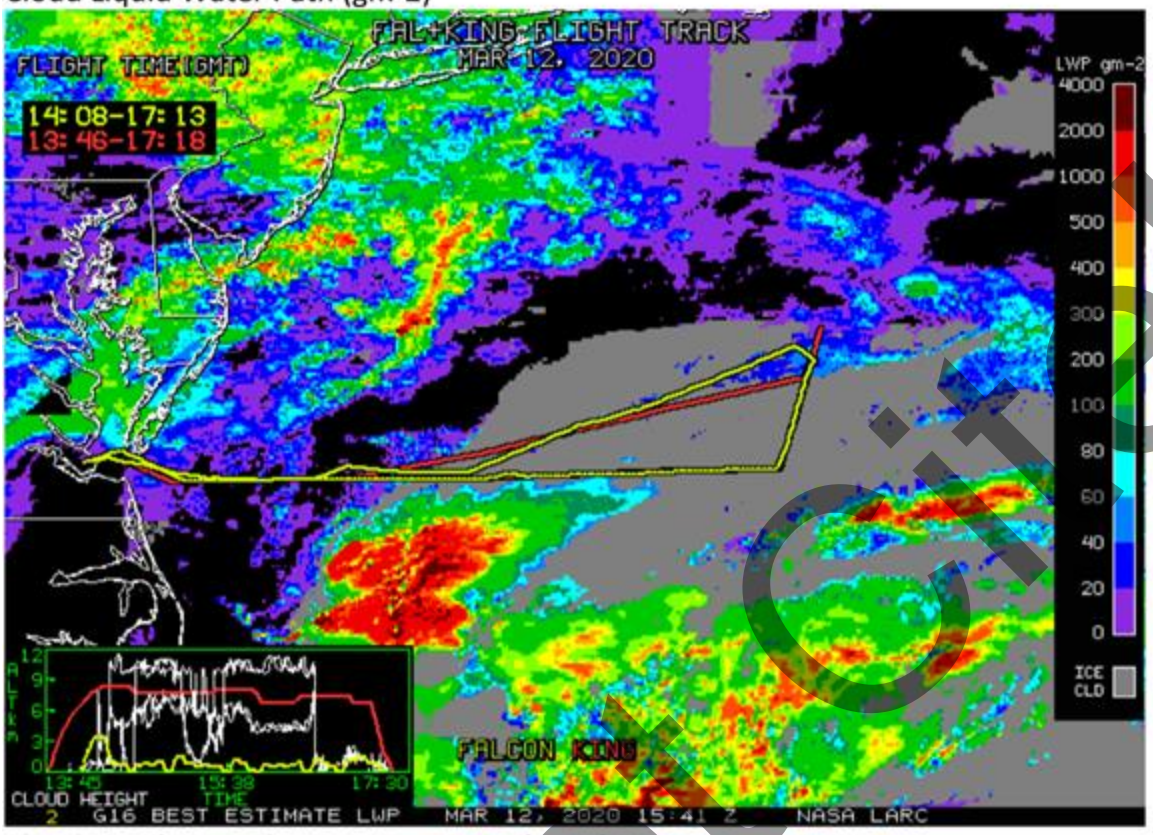
Cloud Effective Temperature (K)



Cloud-Top Height (Kft-ASL)



Cloud Liquid Water Path (gm-2)



Cloud Droplet Number Concentration (cm-3)