Zooming in: In-situ validation of microphysical retrievals in mixed-phase clouds during CELLO

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CELLO-ARCTIC

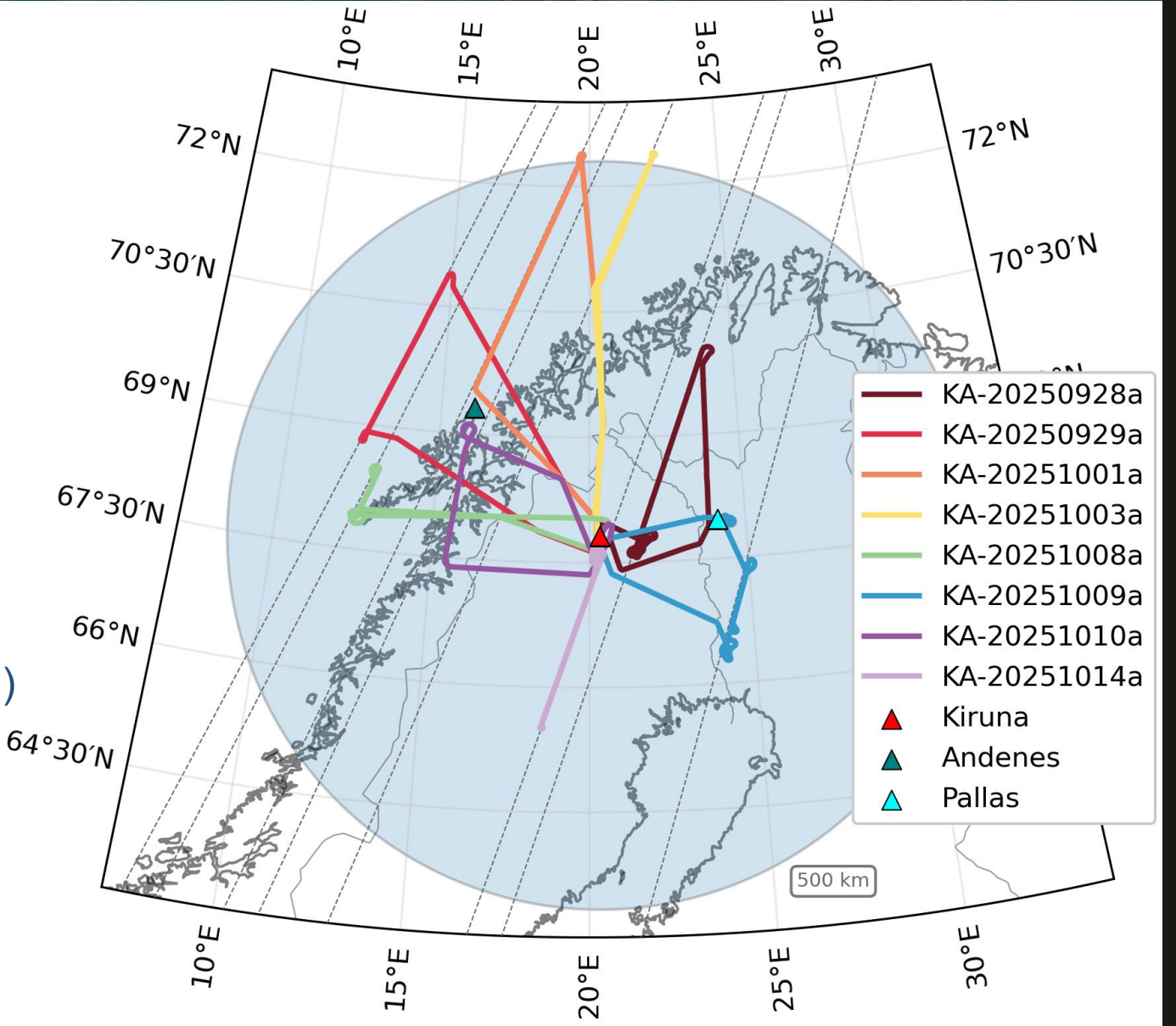
25 September – 15 October 2025

8 targeted EarthCARE orbits

In-situ instrumentation on the INCAS King Air

SPEC Hawkeye (FCDP, 2DS 10µm, 2DS 50µm)

- Cloud droplets (2-50 µm)
- Ice crystals (up to 6.4 mm)



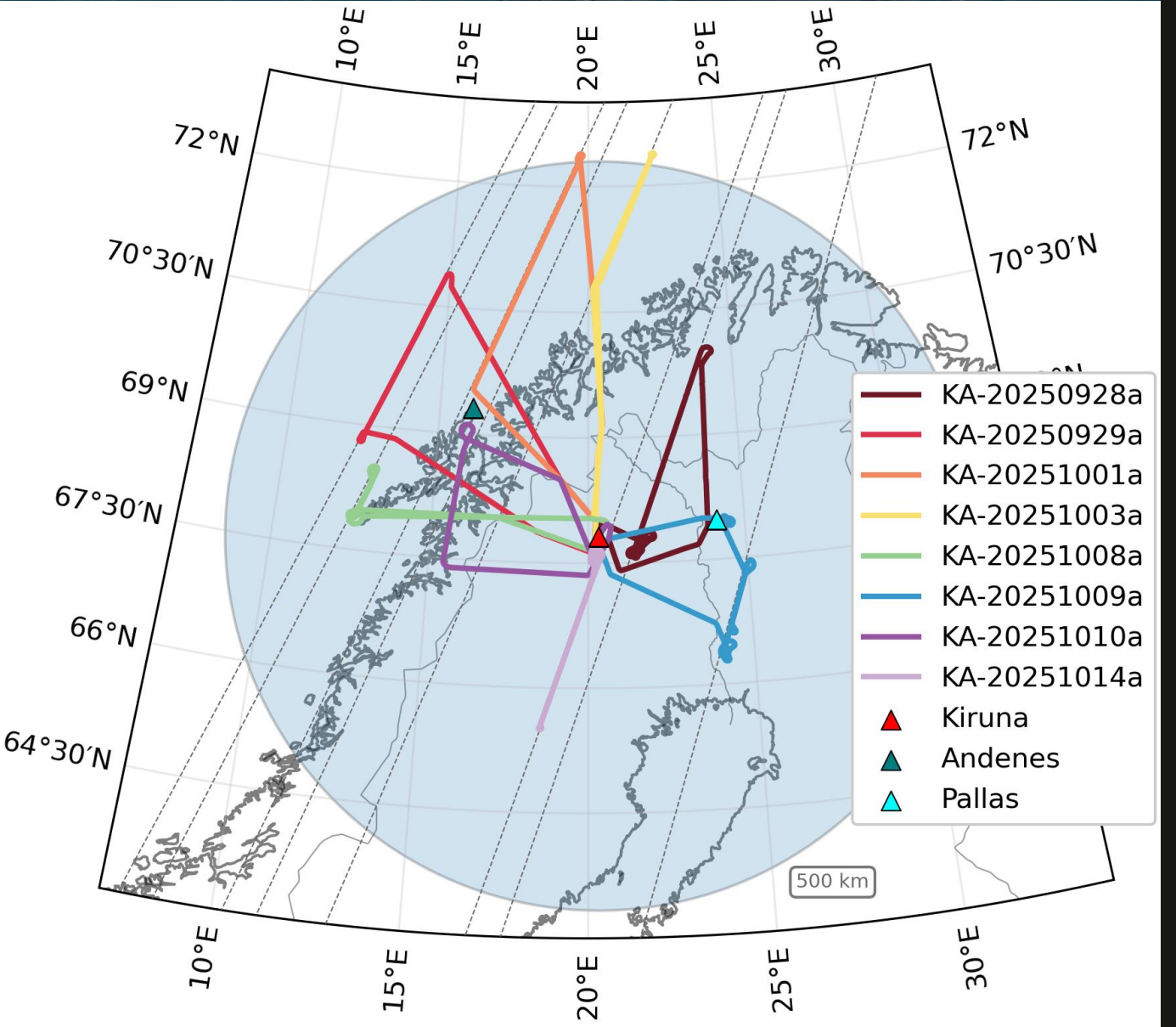
CELLO-ARCTIC

25 September – 15 October 2025

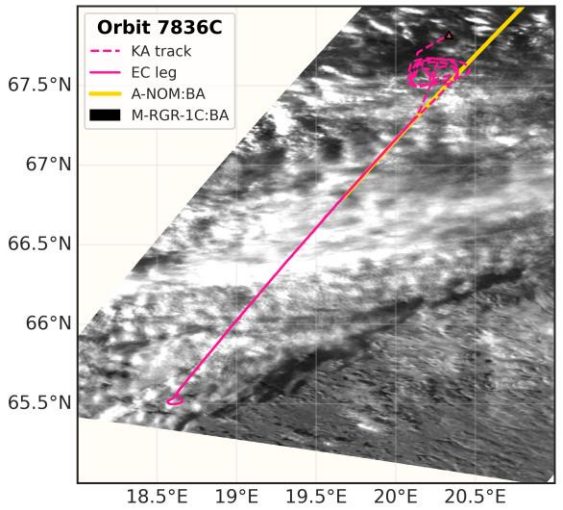
8 targeted EarthCARE orbits

Target scenarios covered

Stratiform rain	2
Stratocumulus	3
Cb anvils	1
MPC Ac + CAOs	2
Melting layer	3
Cirrus	5
Multi-layer	5

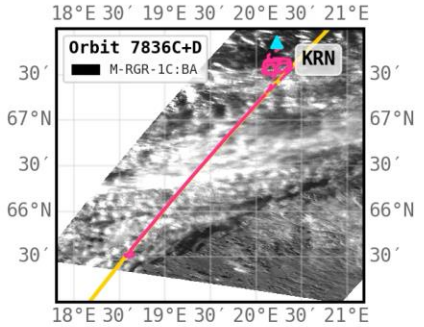


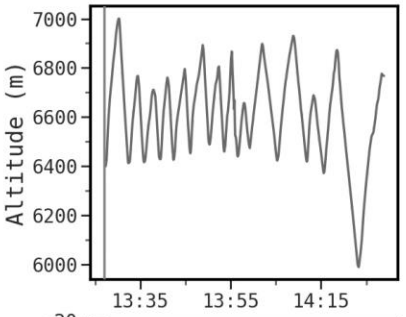
Zooming in

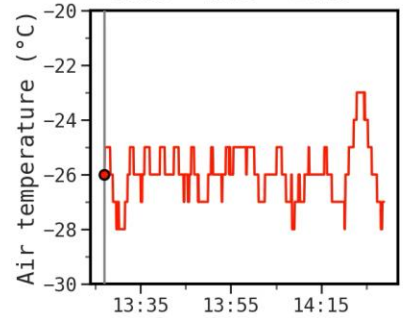


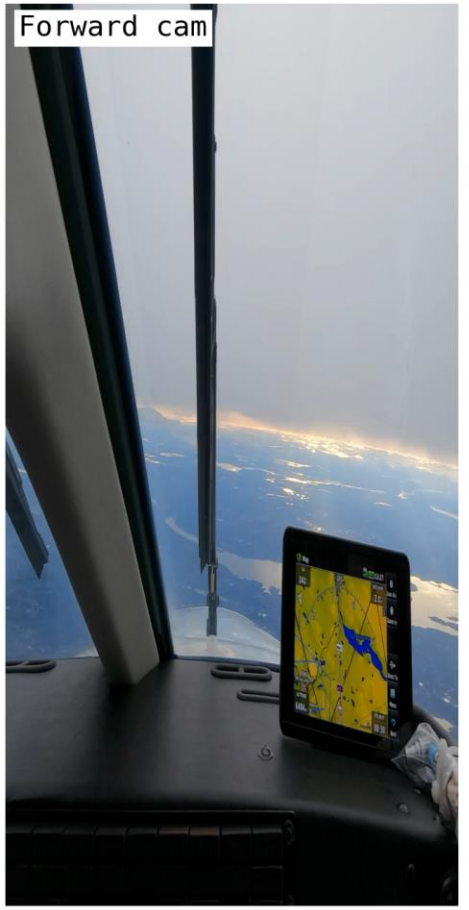
Flight on 14th October 2025:
target orbit #7836

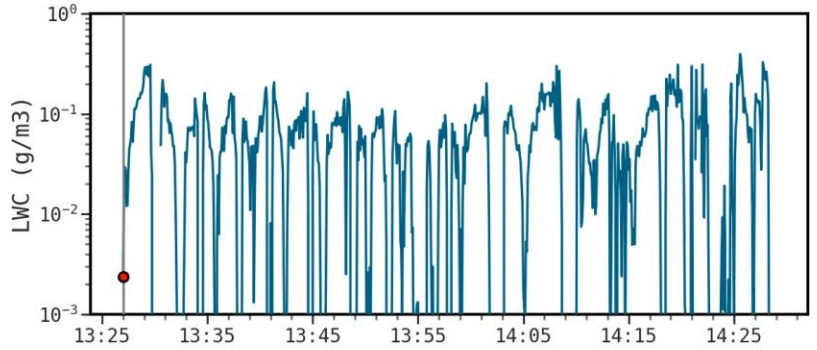
Strategy:
EarthCARE overpass
Porpoising through altostratus

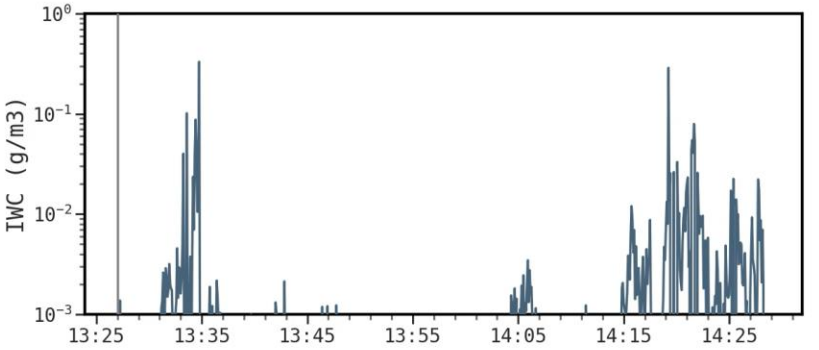












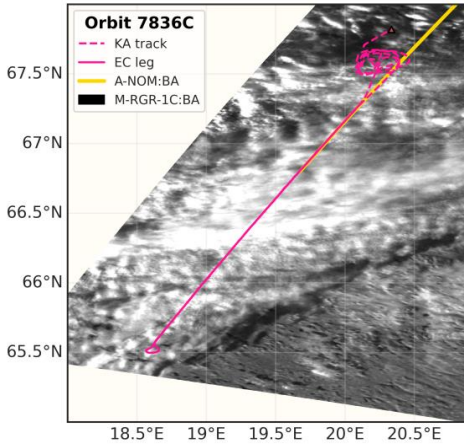
KA-20251014a
14-10-2025
Supercooled stratus

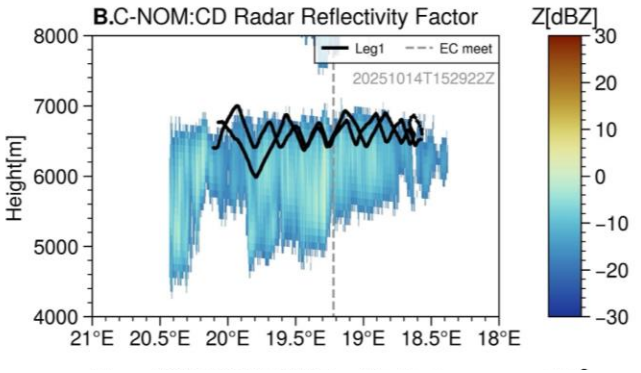
Time:	**13:27:00**	UTC
Longitude:	nan	°
Latitude:	nan	°
Altitude:	nan	m

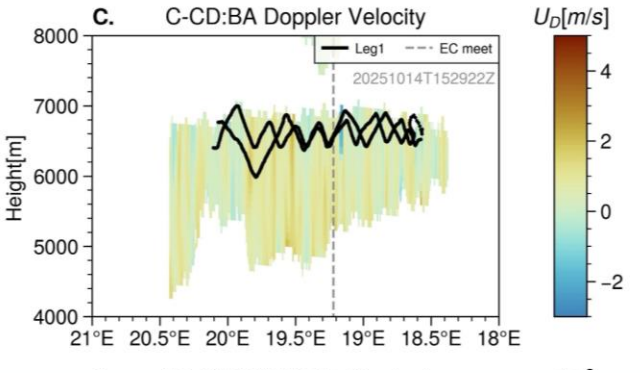
Live data

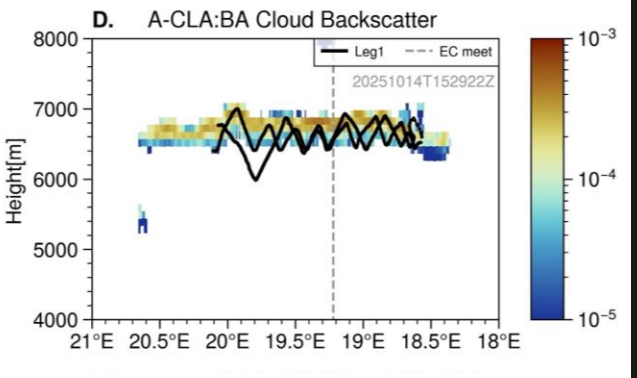
Air Temp:	**-26.0**	°C
TAS:	119.4	m/s
LWC:	0.0	g/m3
IWC:	0.0	g/m3

Supercool(ed) stratus: Tokyo

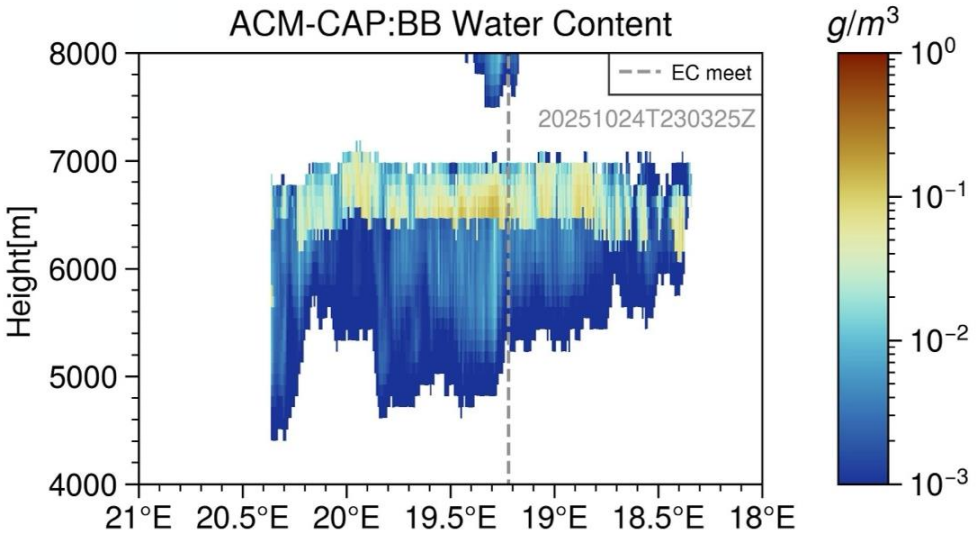




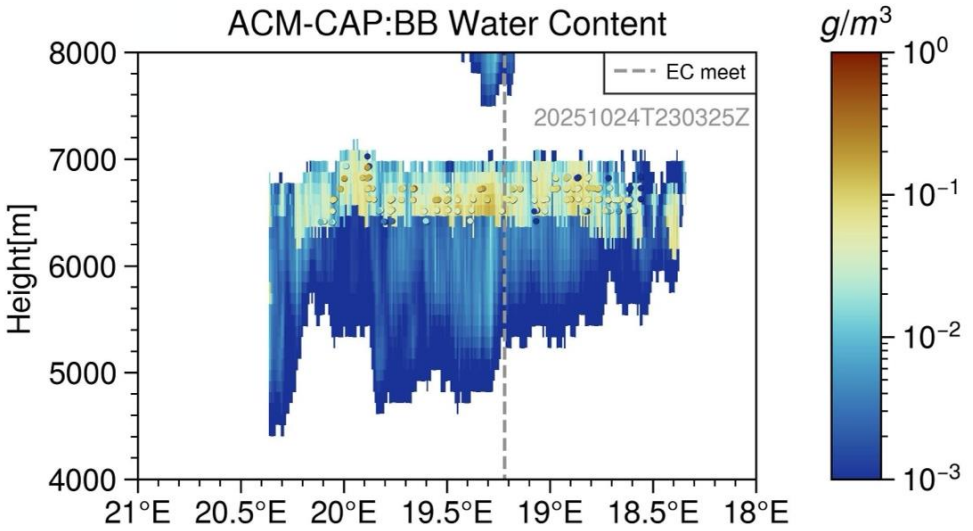




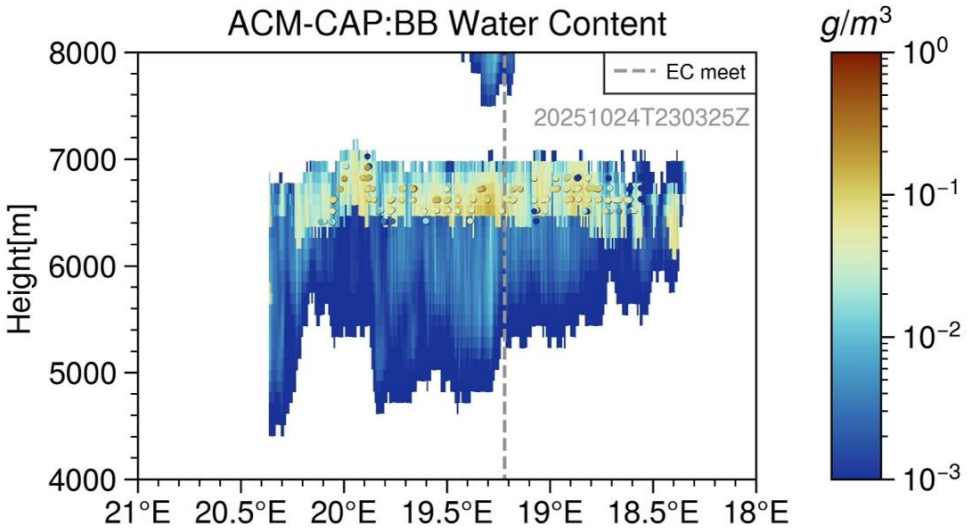
Supercool(ed) stratus: Tokyo

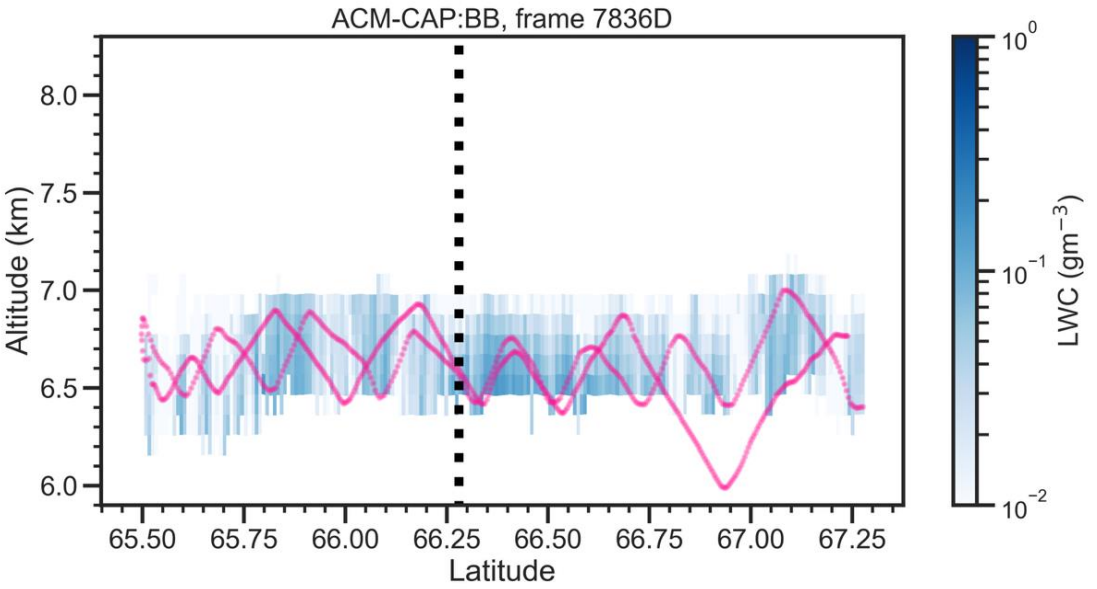


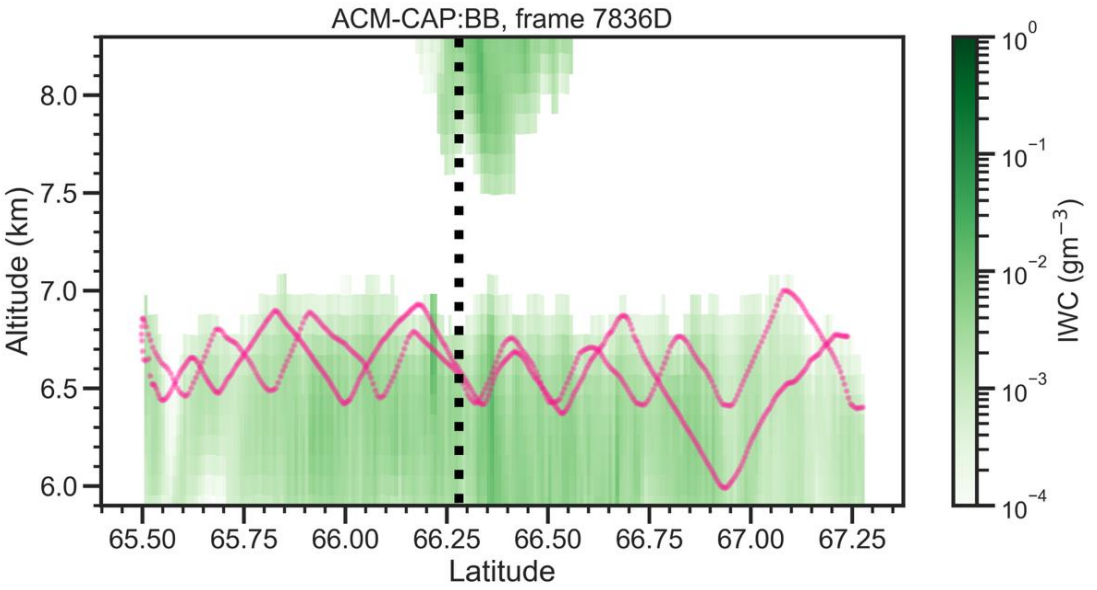
Supercool(ed) stratus: Tokyo



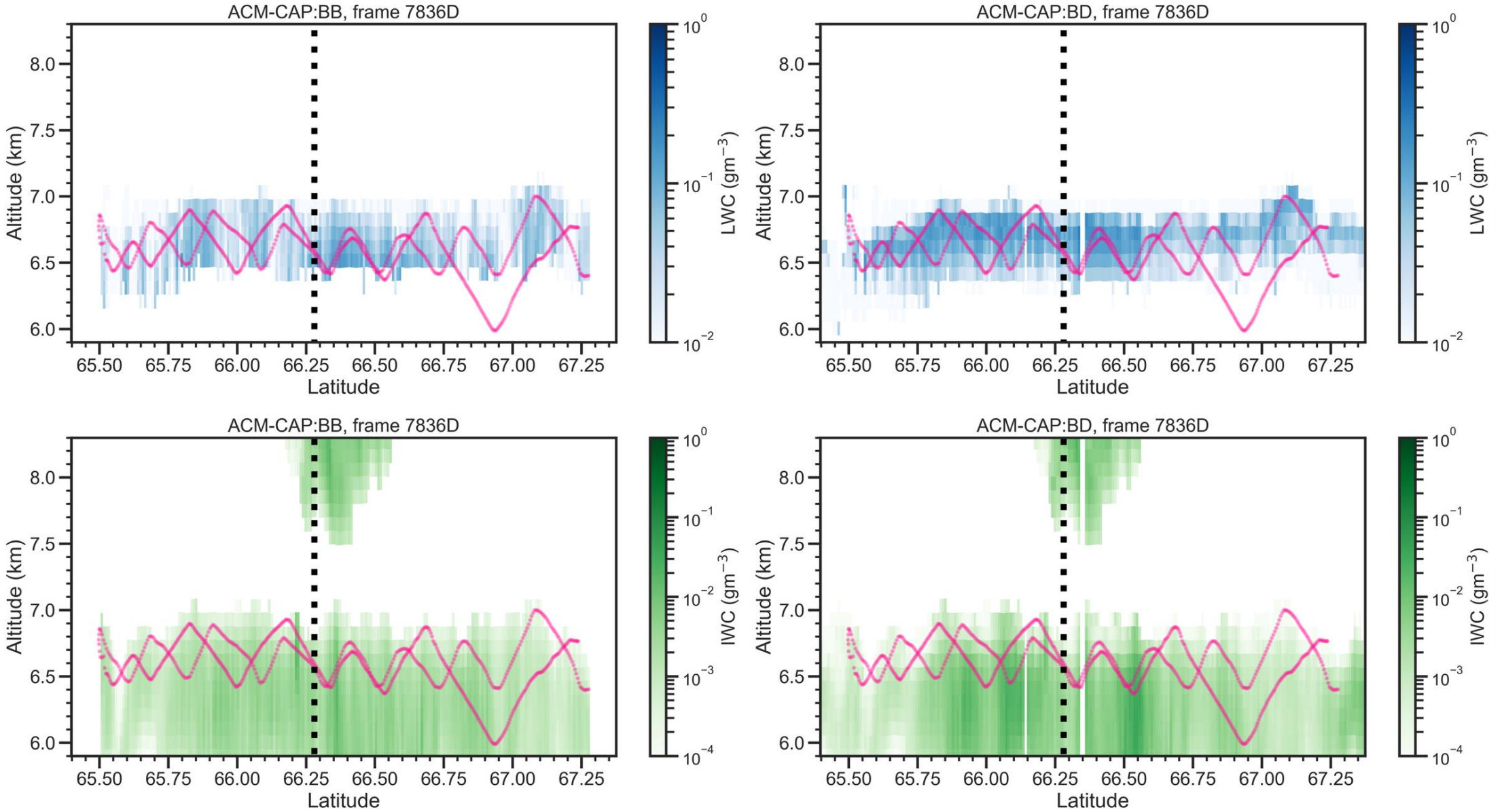
Supercool(ed) stratus: Oxford



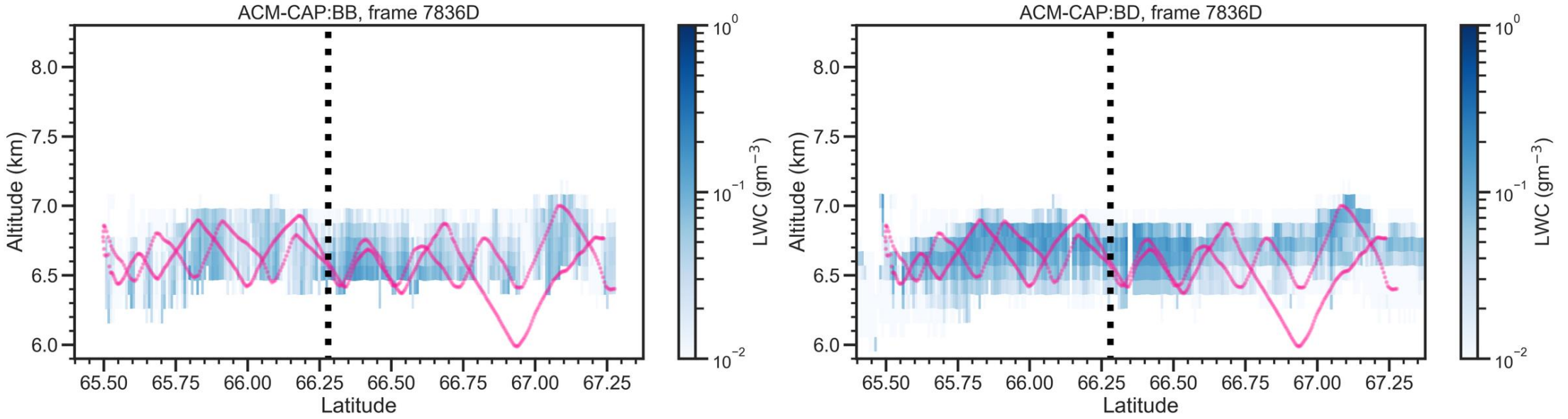




From BB to BD

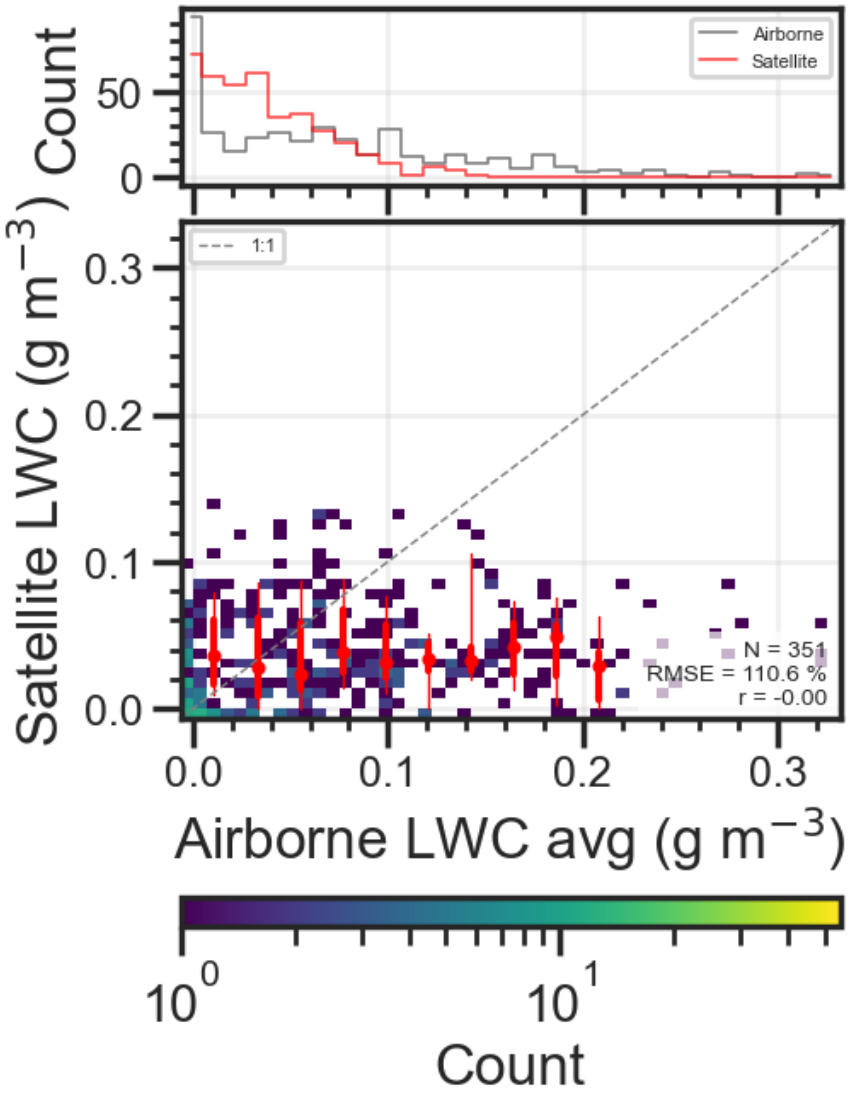

ACM-CAP:BB, frame 7836D
ACM-CAP:BD, frame 7836D
ACM-CAP:BB, frame 7836D
ACM-CAP:BD, frame 7836D
Altitude (km)
Latitude
LWC (gm^{-3})
IWC (gm^{-3})
8.0
7.5
7.0
6.5
6.0
65.50
65.75
66.00
66.25
66.50
66.75
67.00
67.25
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}

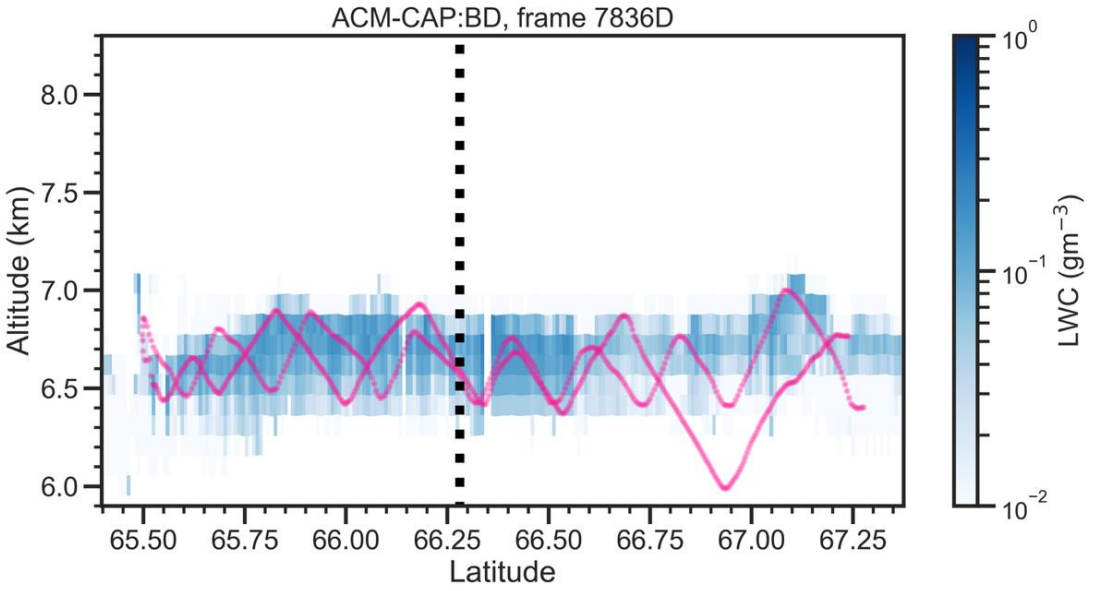
BB to BD: Liquid



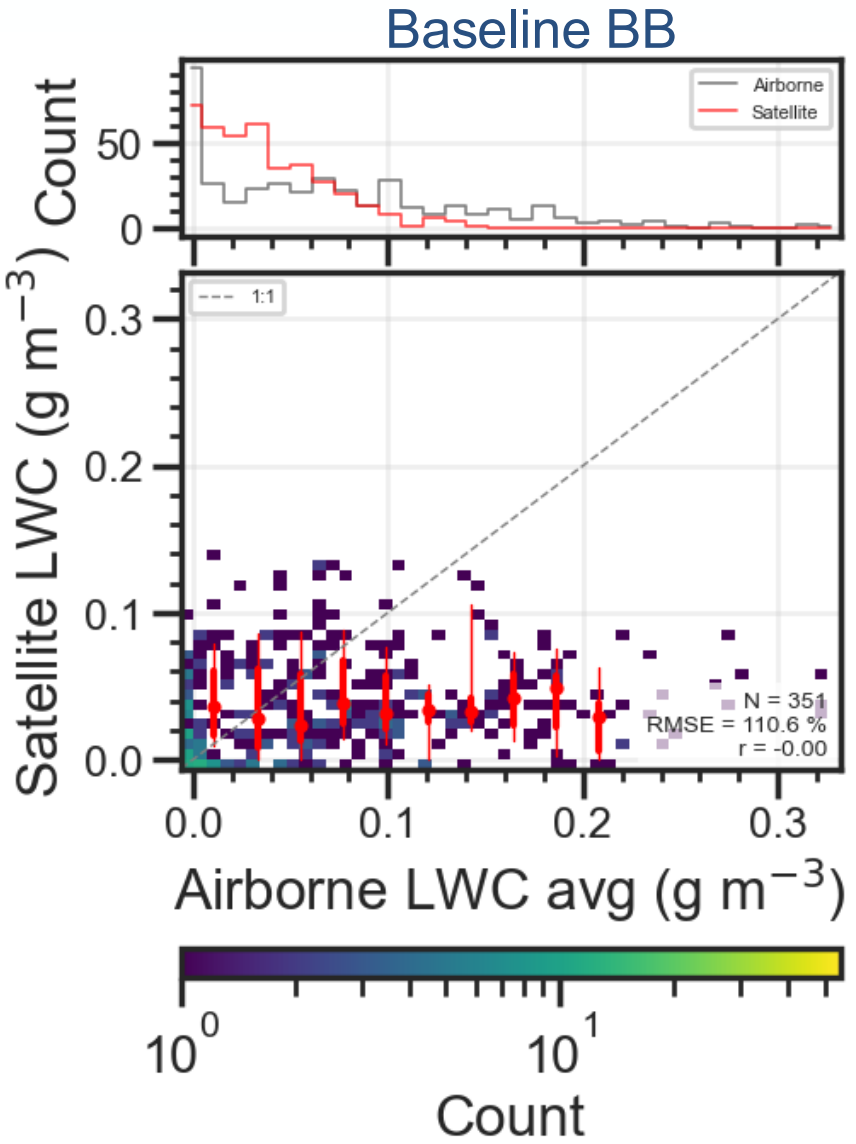
BB to BD: Liquid

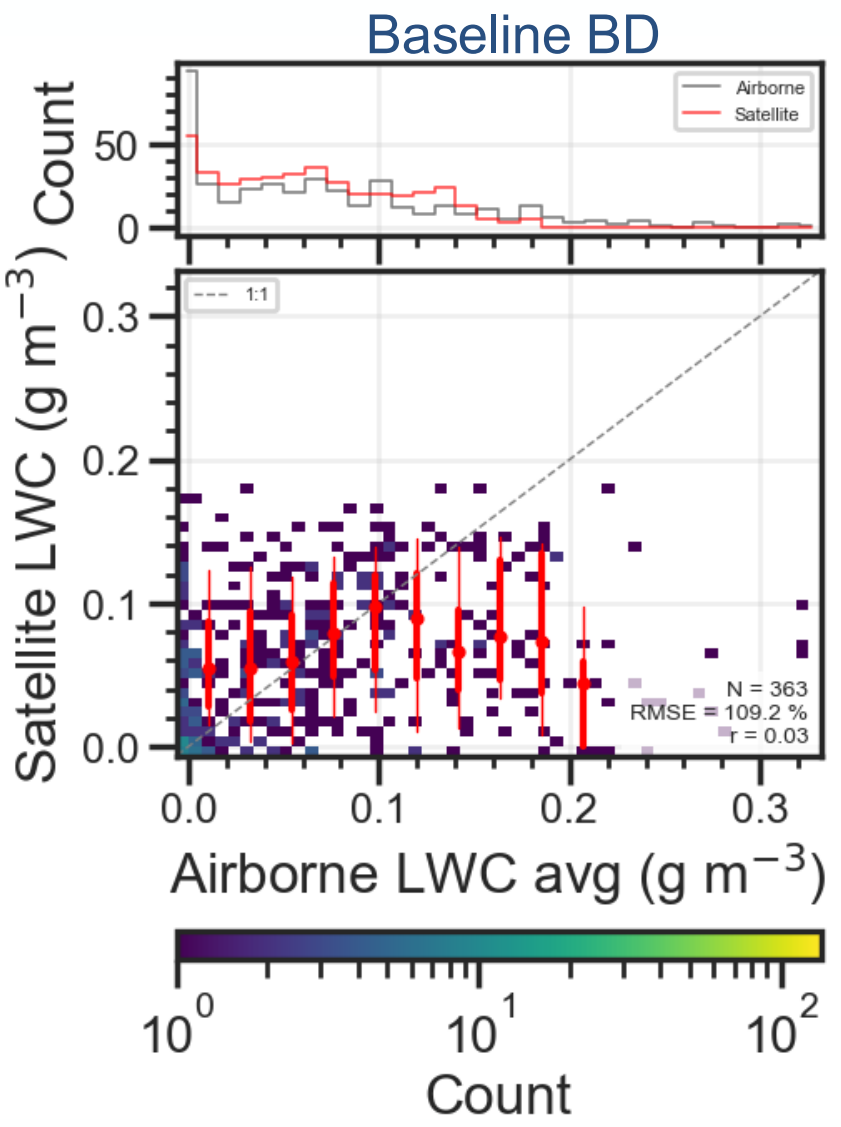
Baseline BB





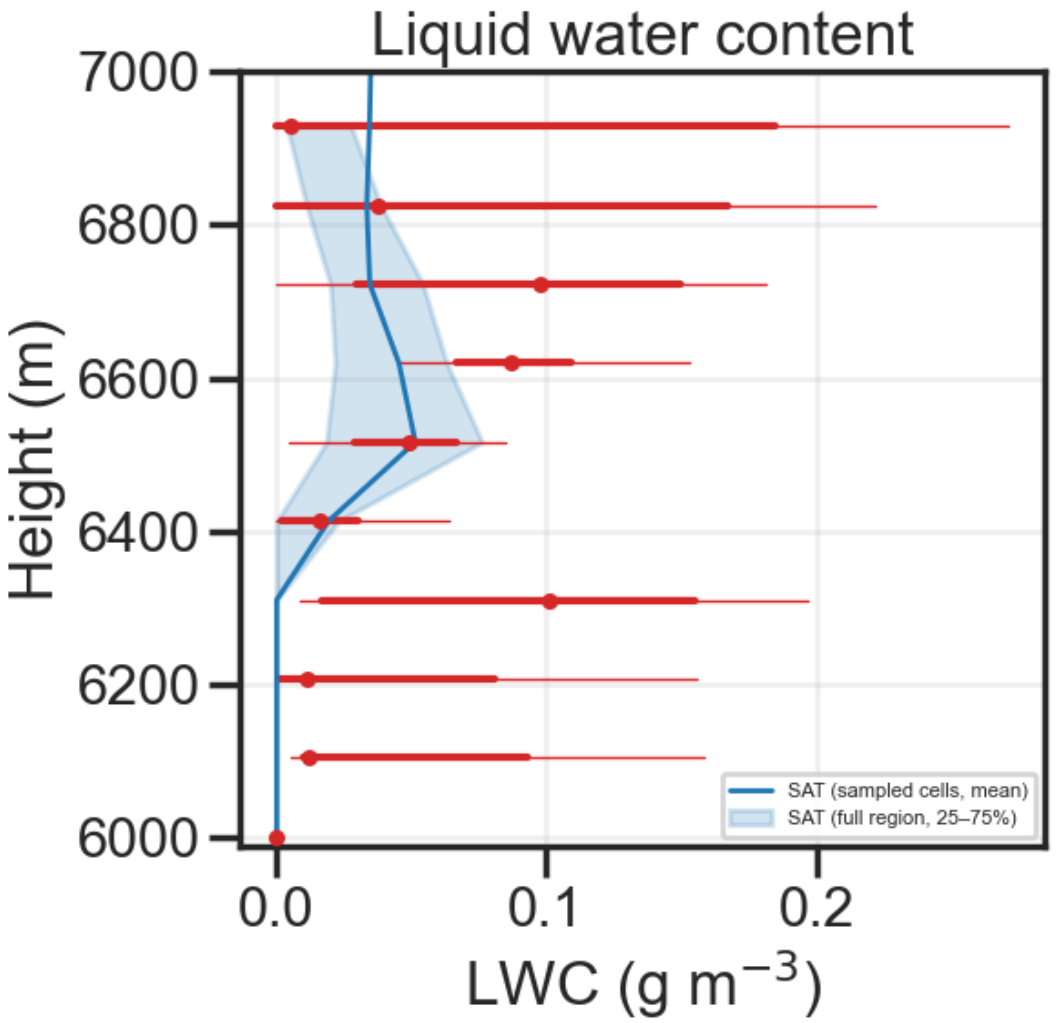
BB to BD: Liquid





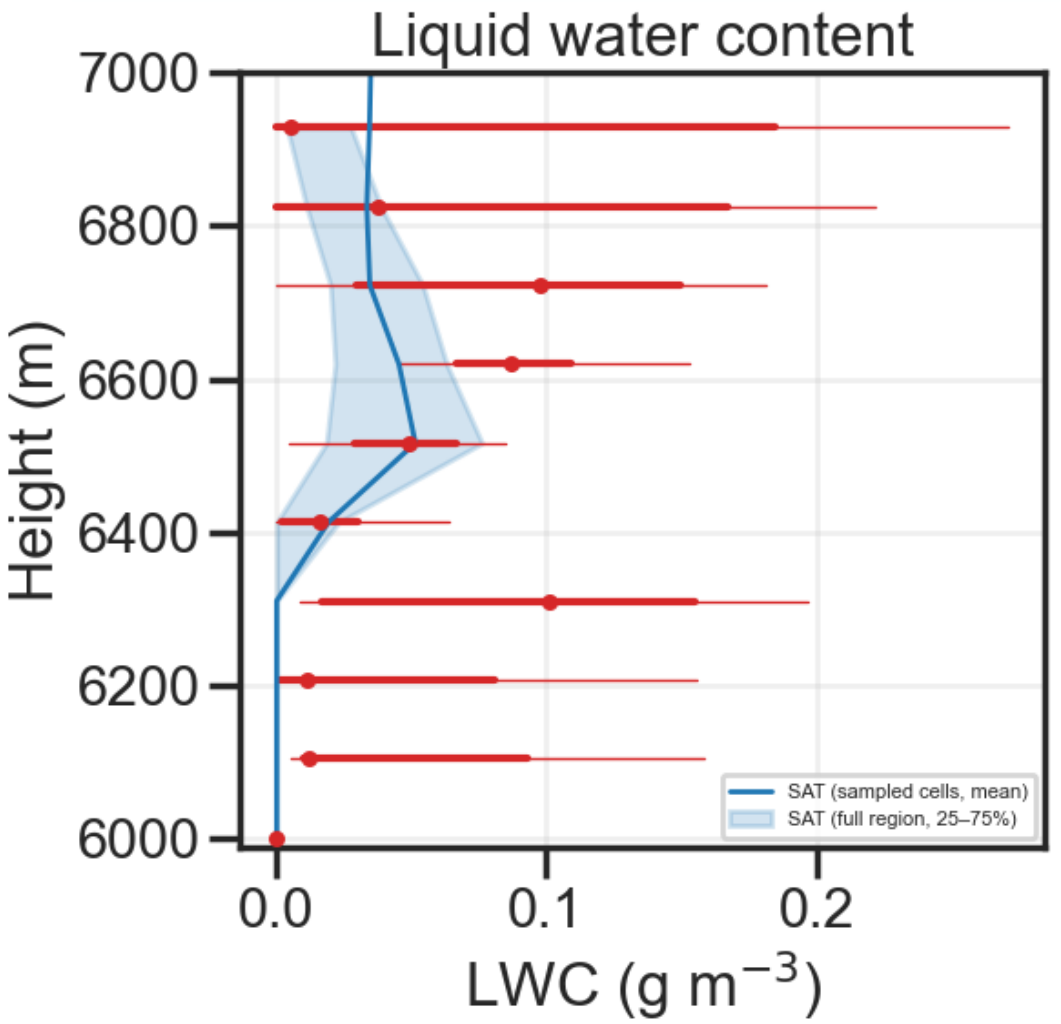
BB to BD: vertical profiles

Baseline BB

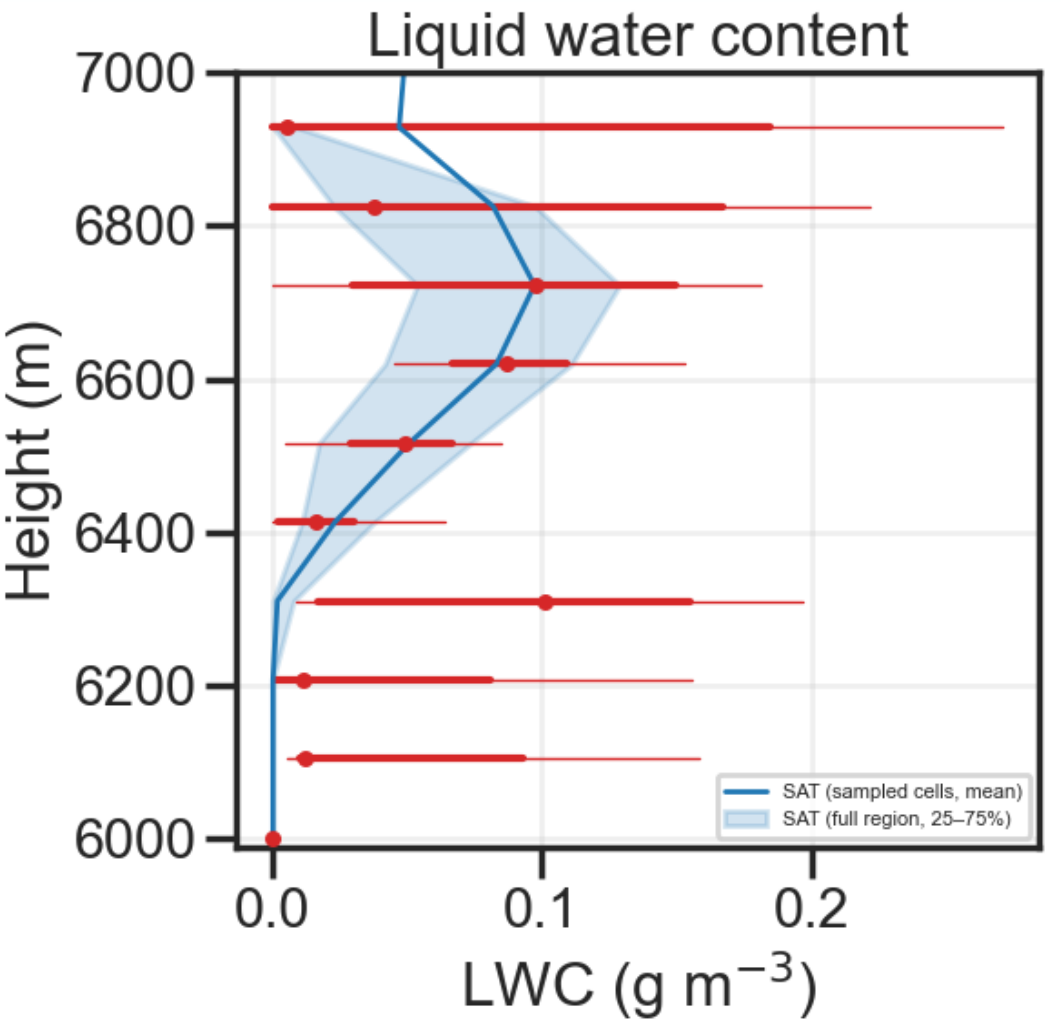


BB to BD: vertical profiles

Baseline BB

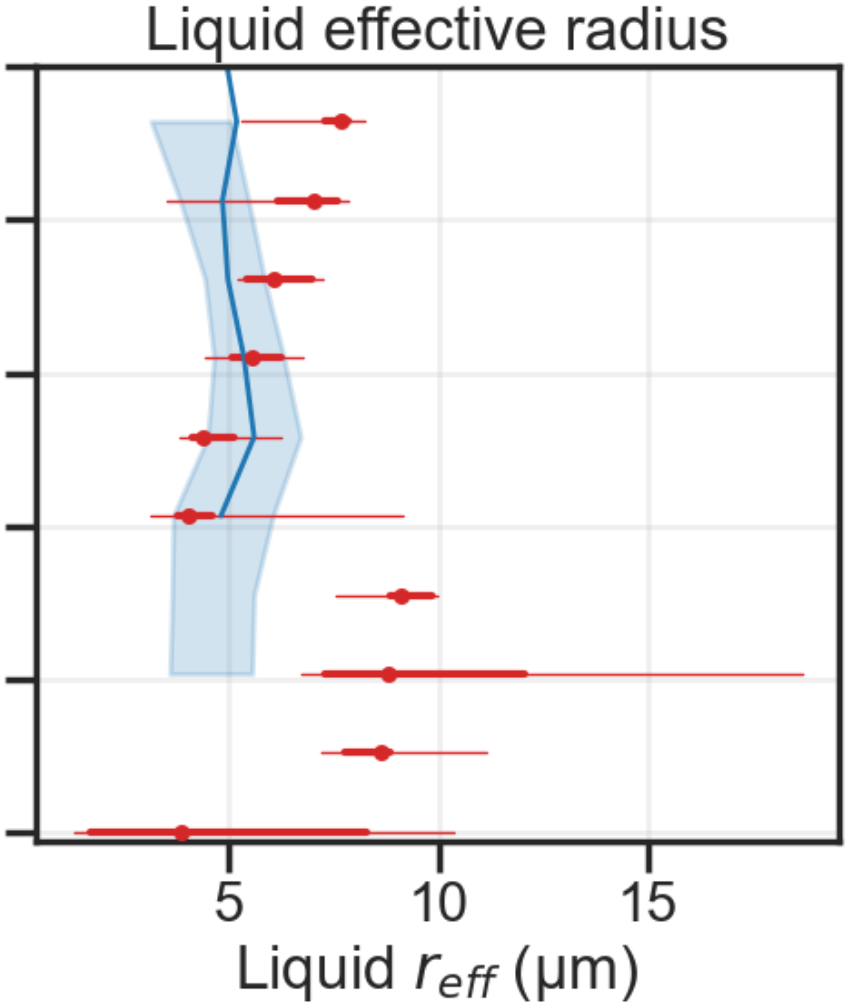


Baseline BD

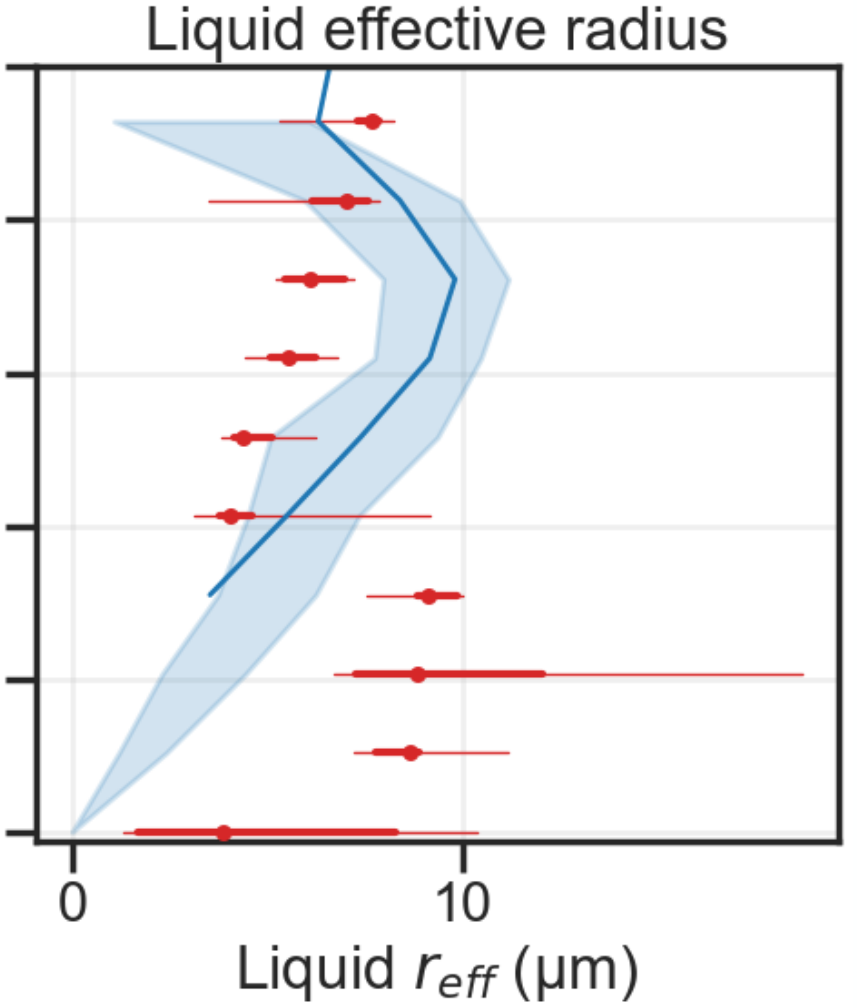


BB to BD: vertical profiles

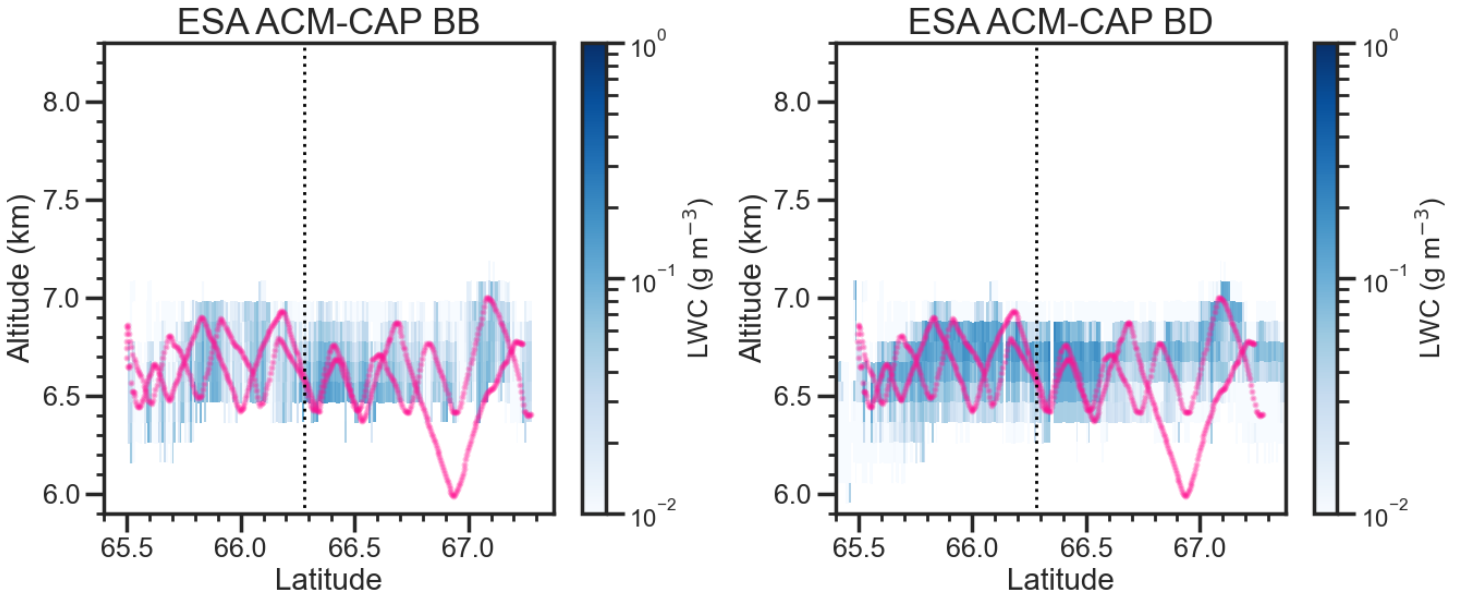
Baseline BB

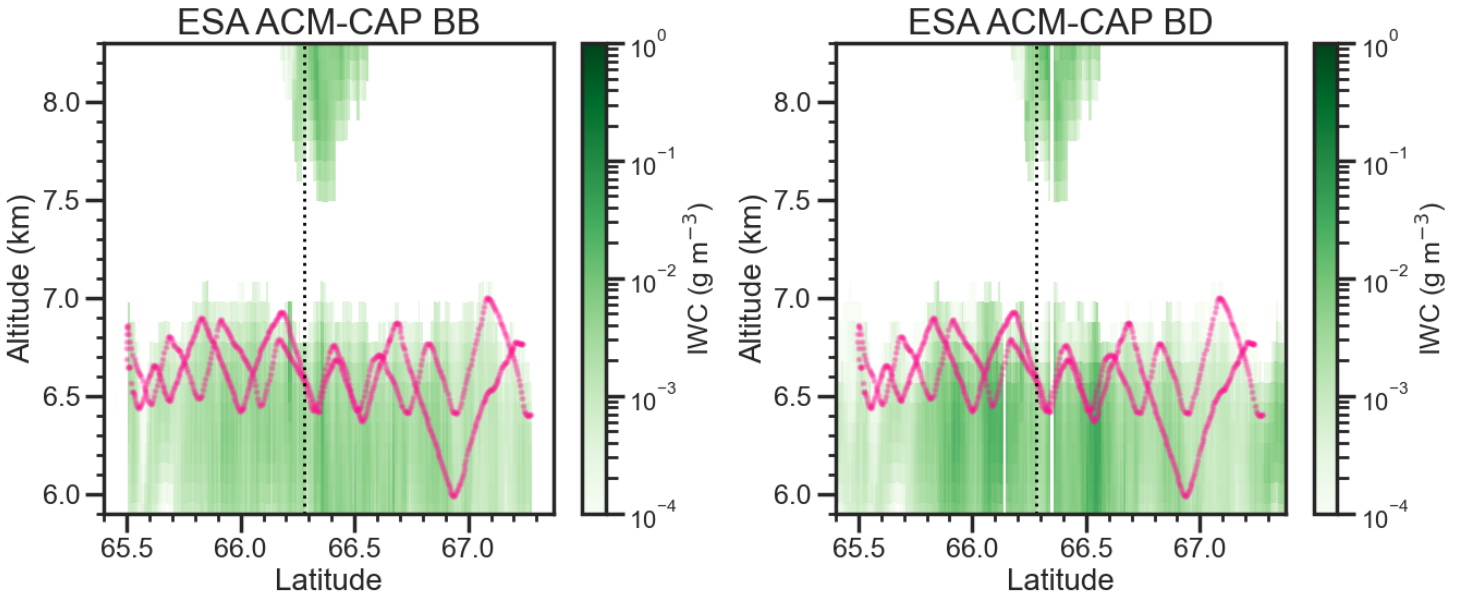


Baseline BD

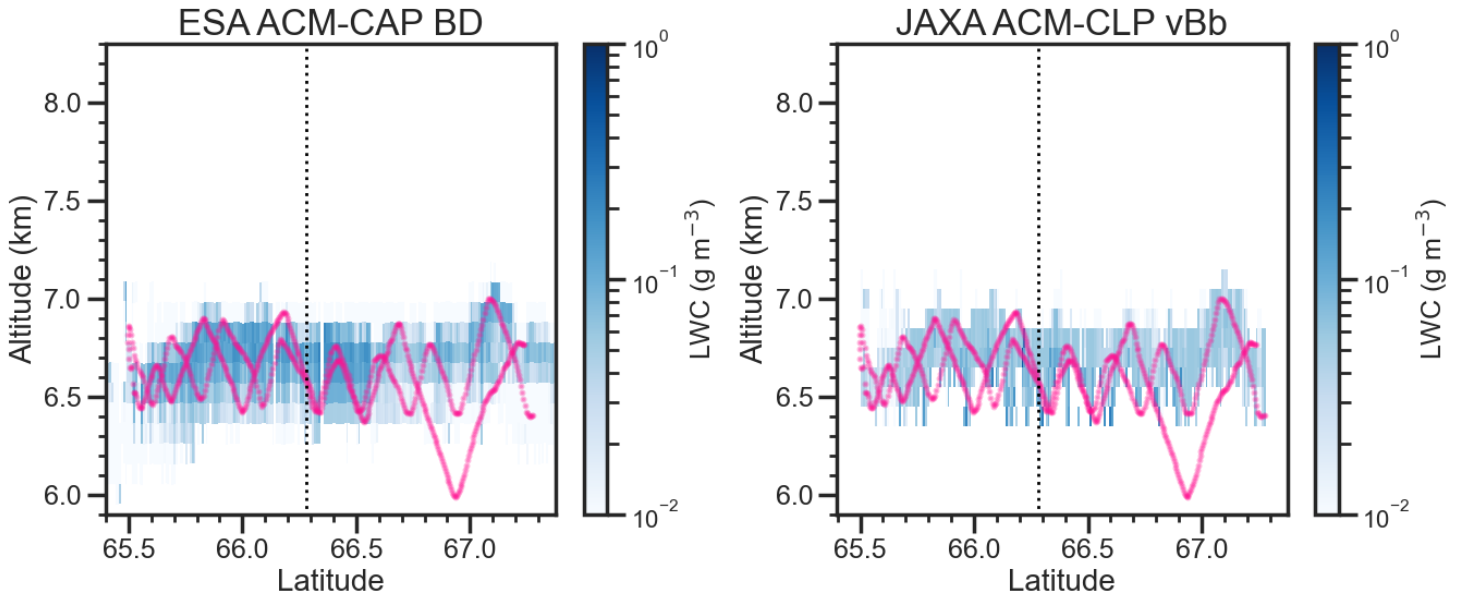


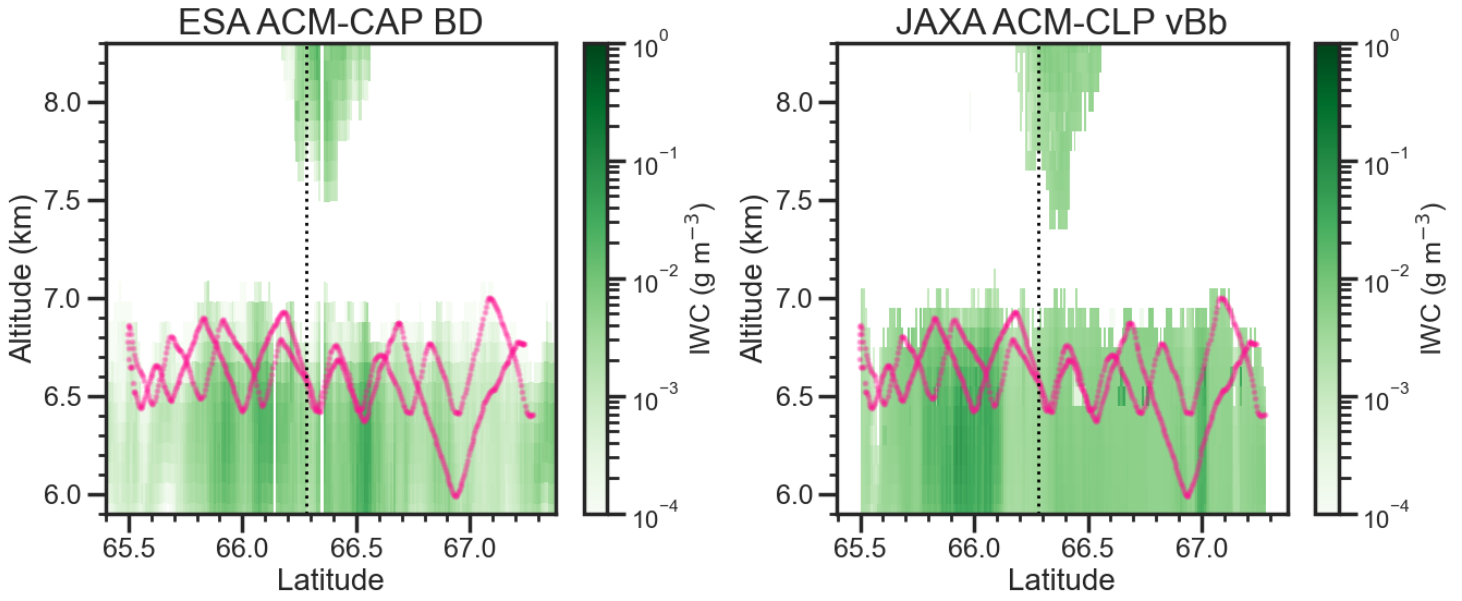
Comparing CAP to CLP





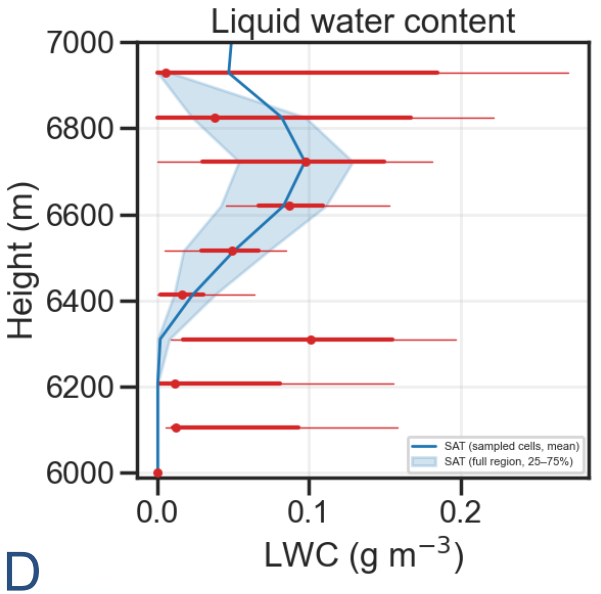
Comparing CAP to CLP

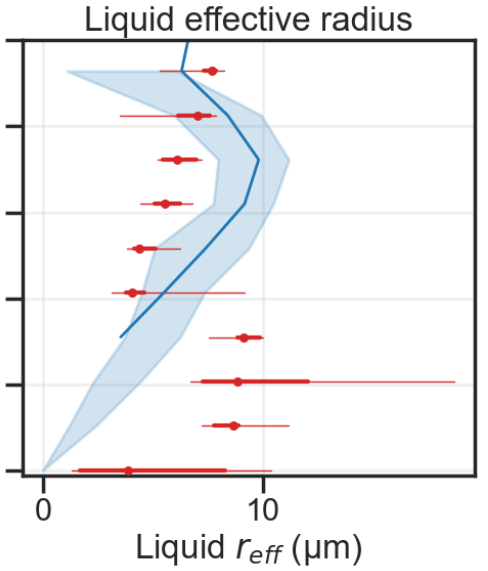




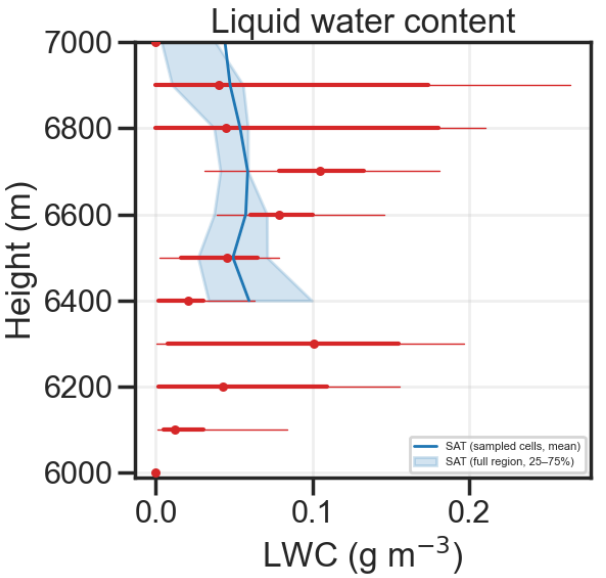
Comparing CAP to CLP

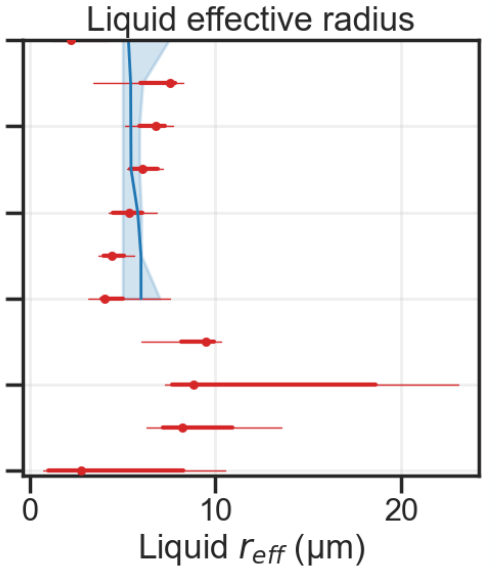
ACM-CAP:BD





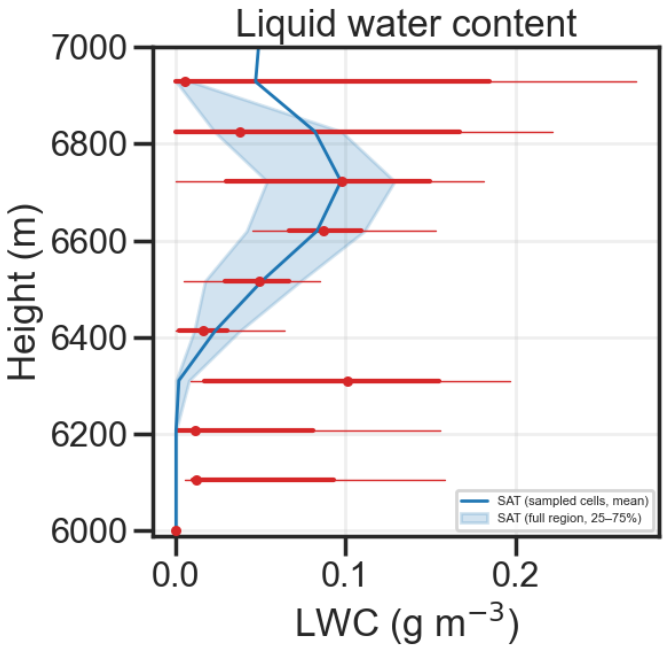
ACM-CLP:vBb

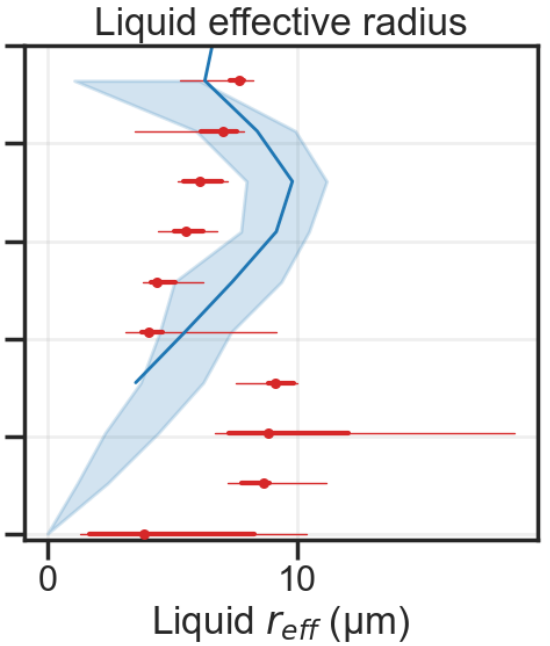




A closer look

LWC improved from BB to BD





r_{eff} increase

CLP: thinner liquid layer