

ACLOUD Flight #22 - Polar 6 - 20170623

Mission PI P6: Mario Mech

Objectives: Flight over and in the vicinity of Ny Ålesund, dedicated to the columnar comparison over Ny Ålesund . P5 would probe the clouds from above, whereby P6 would collect in situ measurements.

Crew:

Polar 6	
PI	Mario Mech
Basis Data Acq.	Cristina Sans i Coll
ALABAMA	Franziska Köllner
A + TG	Oliver Eppers
CVI	Stephan Mertes
PMS	Guillaume Mioche

Flight times:

Polar 6	
Take off	10:37 UTC
Touch down	14:52 UTC

Important remarks:

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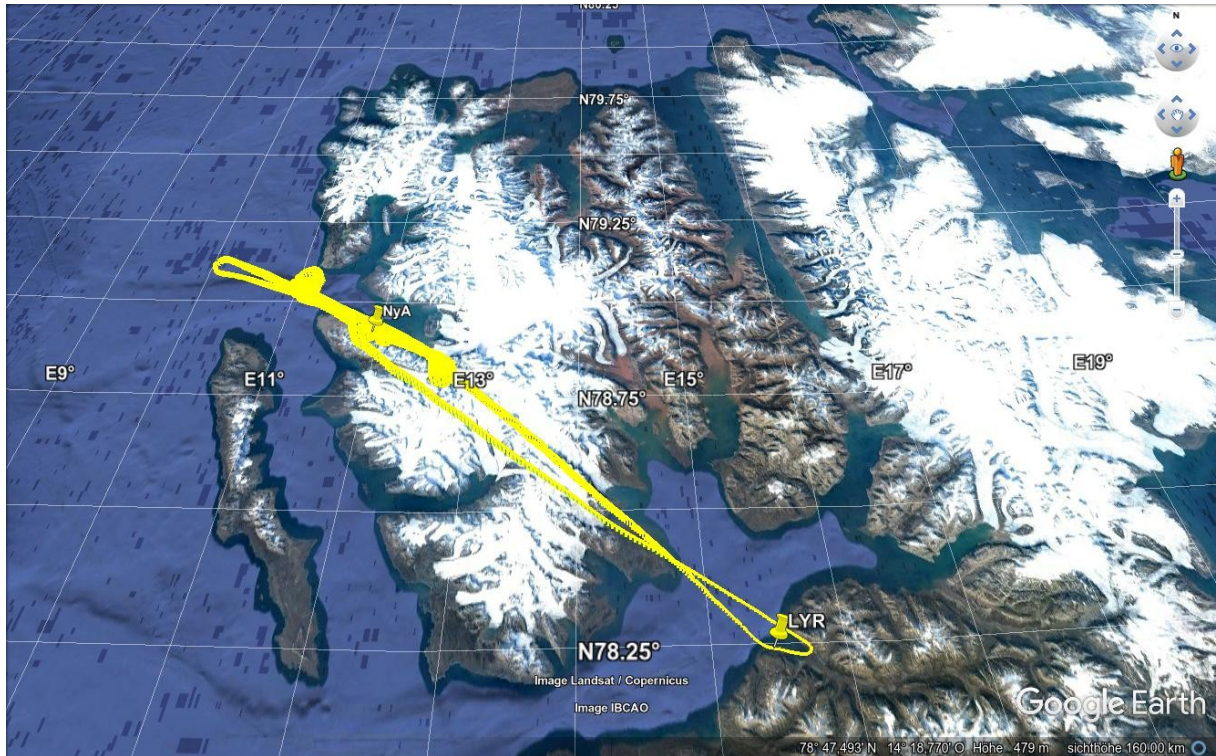
Weather situation as observed during the flight (compare to forecast):

Mid-level and low-level clouds were encountered during the flight (no cirrus above). The structure of the clouds changed quite quickly which might it hard to sample them in different layers. The observed clouds were almost exactly the same as predicted by ECMWF (see report of Polar 5).

Overview:

After taking of in Longyearbyen and the ascend over the glacier Sveabreen we entered the airspace over Ny Alesund. Since the cloud structure allowed us to do so, we started by descending down to lower levels in the fjord to get an idea of the clouds. Once being in lower levels and having an idea we started be sampling different clouds in different levels up to the uppermost layers just below Polar 5. This has been done by flying in and out of the fjord passing over Ny Alesund. In the end after several legs we performed a spiral from 200 ft up to cloud top over the Ny Alesund station. Thereby we drifted due to the wind which has been corrected for in upper levels.

Flight track and pattern:



Left: Pictures from cloud or ice

Instrument Status:

Polar 6	
Basis data acquisition	
Nose Boom	
PHIPS	
SID-3	
CIP	
PIP	
ALABAMA	
CVI	
CVI UHSAS	
CVI ???	
AWI SP2	
AWI UHSAS	
CO/CO2/O3	

Problem with CVI inlet: CVI inlet heating is not working. When the inlet freezes it does not operate at its full functionality.

Detailed Flight Logs (Name of author... more than one is possible):

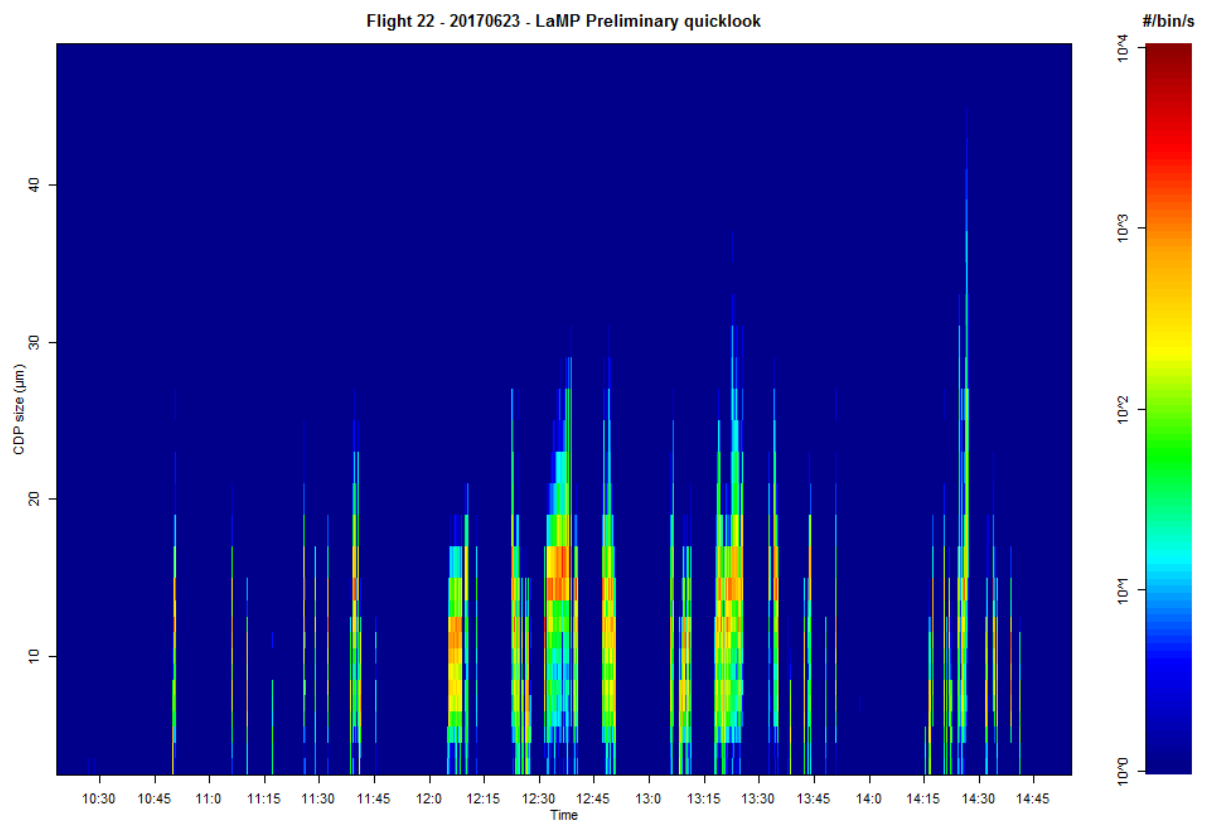
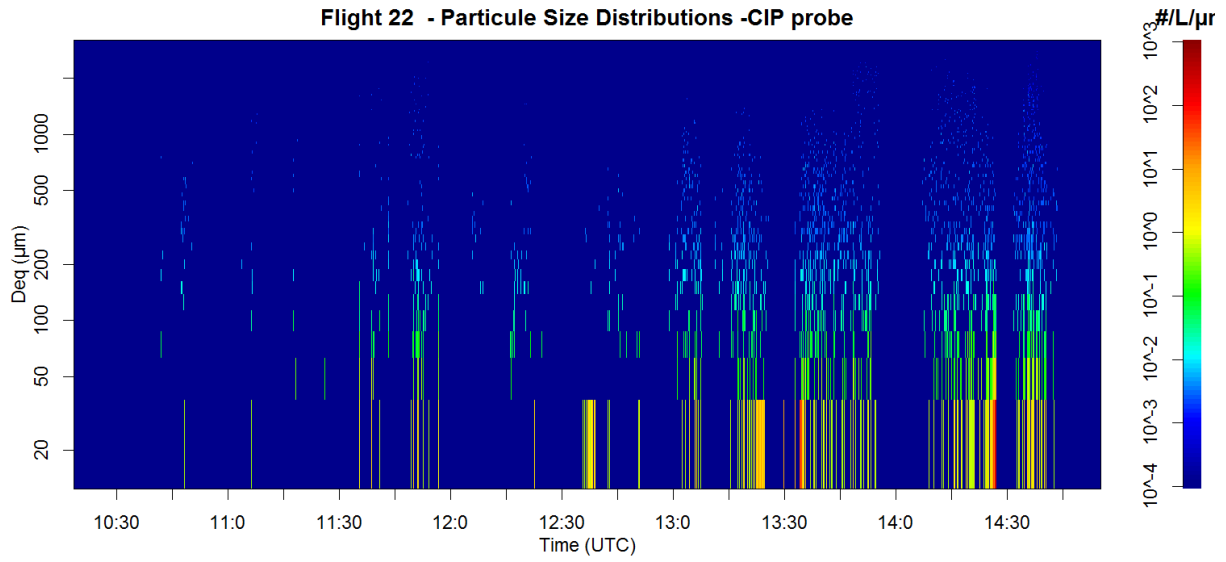
Mario Mech (times UTC)

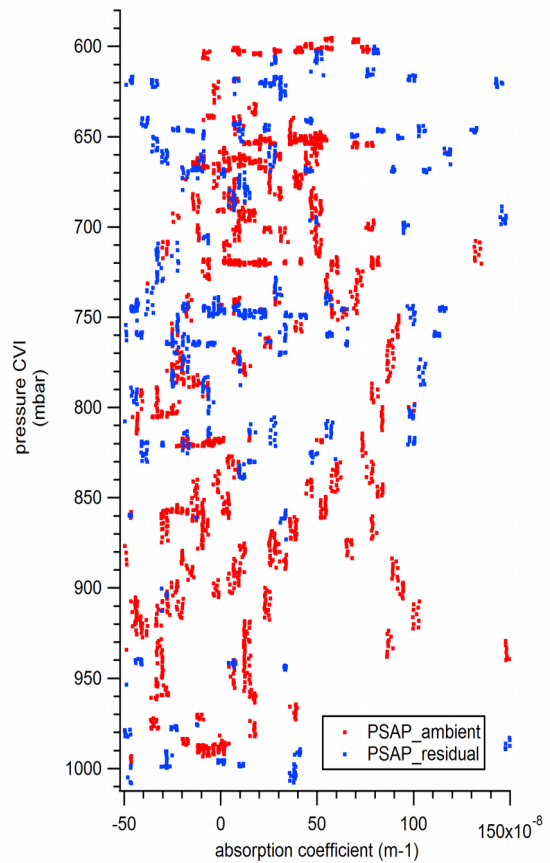
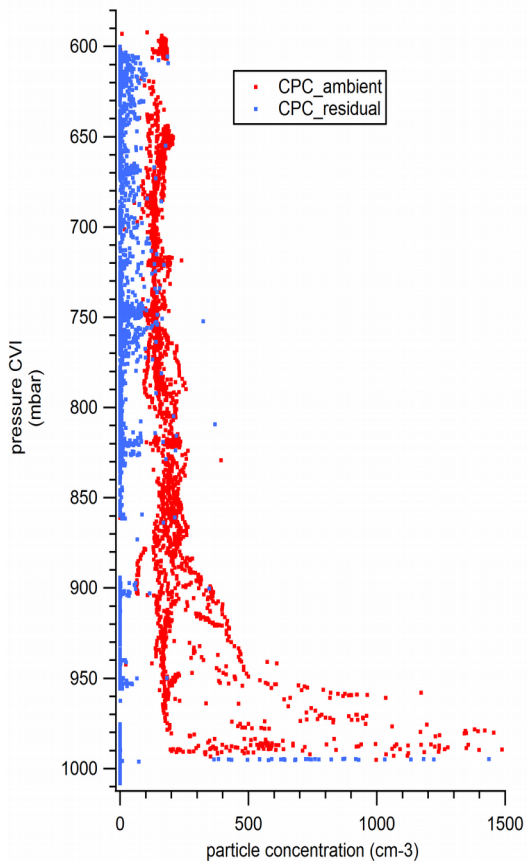
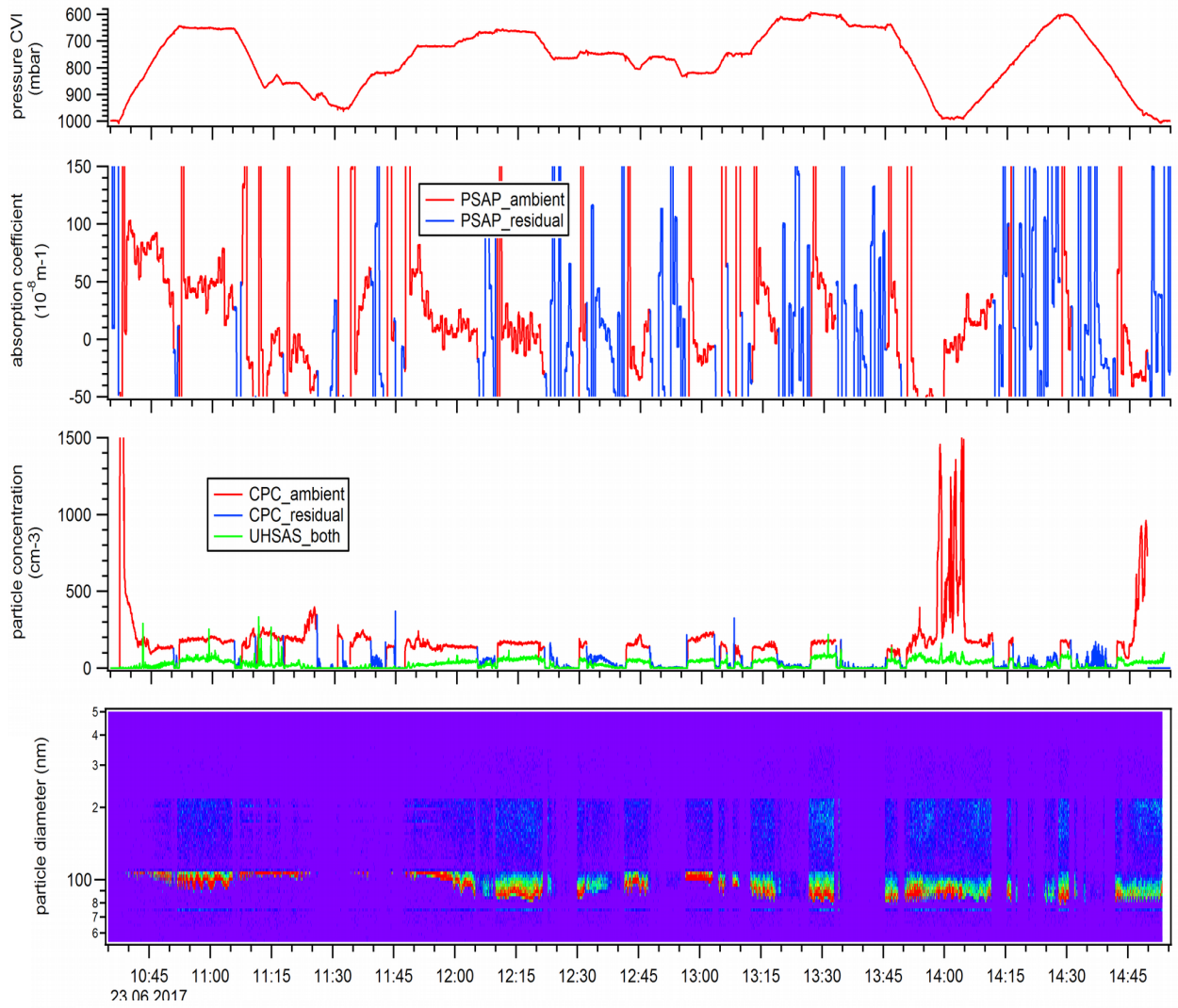
10:37 take off

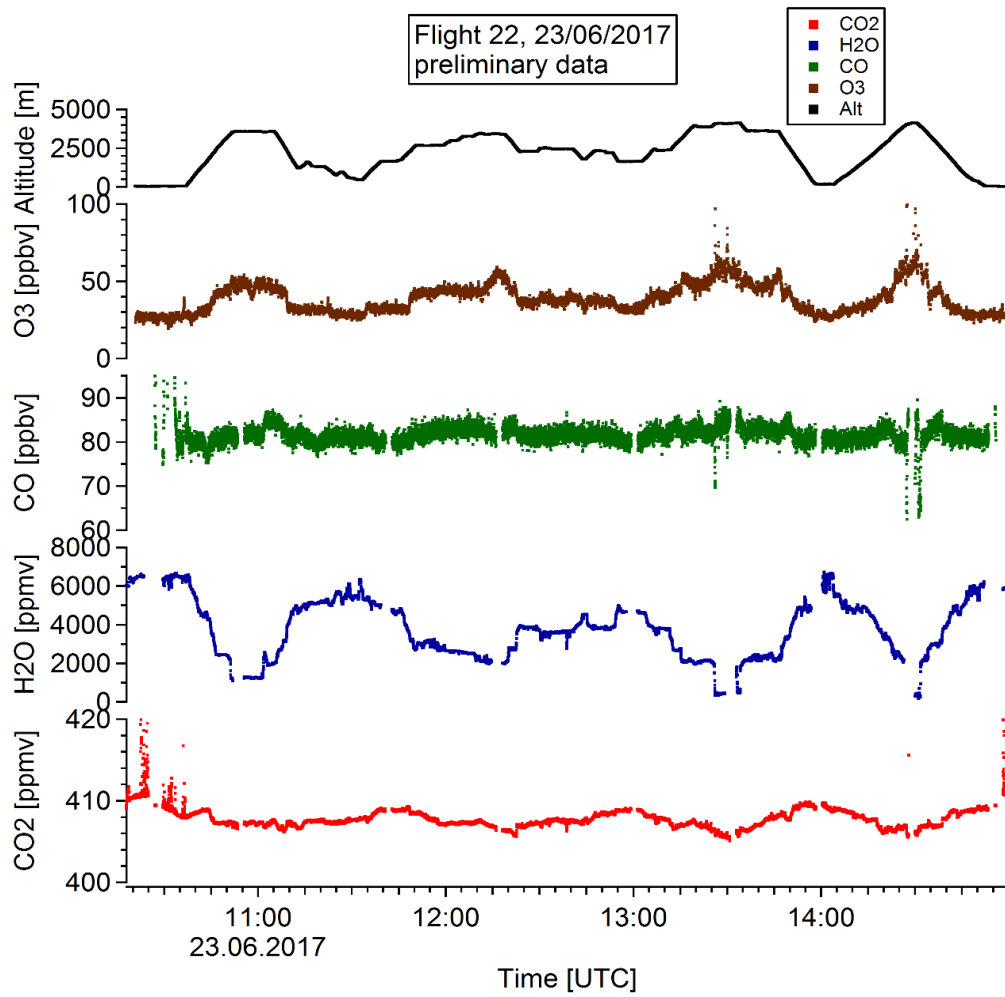
10:42 first cloud at 1000 ft 300 ft thick
10:51 11000 ft liquid clouds in PMS detected
10:52 11000 ft cloud top
10:53 12000 ft no radiation square due to cirrus
10:56 closed cloud deck
11:03 NyA
11:06 start descent to check cloud structure
 11200 ft in liquid clouds but some crystals present
 10700 ft cloud base
 6400 ft cloud with very low vertical extend
11:29 cloud hanging over mountain in 1900 ft
11:32 cloud in 1500 ft
11:34 climb
11:39 cloud base 4800 ft after turn at C2
 in cloud at 5200 ft - mixed phase with droplets and crystals
11:51 9000 ft snow flakes
11:57 cloud cover in the fjord changes quite quickly
11:58 thick cloud below and thin above us; we are at 9000 ft
12:04 turbulent at 10300 ft
12:06 11000 ft droplets, drizzle
12:08 crystals
 climb above the clouds at 11500 ft towards C2
12:19 descending
12:23 cloud top 8600 ft, cloud base 7500 ft
 in lower part of cloud to C1
 lot of droplets and few ice crystals
12:32 back to C2 in 8250-8400 ft
12:36 only liquid and very few crystals
 higher lwc than in the lower leg
12:37 icing starts
12:45 no low level clouds - climb back to 7800 ft
12:48 ice and liquid below the clouds; in the clouds only liquid
12:56 5500 ft nothing
12:57 droplets in 8100 ft
13:09 small droplets
13:14 climb to highest layer
13:20 liquid and ice in high level cloud
13:29 leg above top layer in 13700 ft
13:35 13600 ft droplets and ice
 12000 ft no more liquid, only ice precipitation
13:43 12200 ft large ice crystals
13:49 no more droplets only ice
13:52 7300 ft droplets - going down to 500 ft
14:05 spirals over NyA starting at 500 ft with 700 ft/min, speed 120 kt, and 20°
 bank angle
 7200 ft droplets
 7800 ft out of cloud
 9400 ft liquid droplets

horizontal drift, corrected for between 11000 and 12000 ft
droplets and ice at 12300 ft
cloud top at 13500 ft
14:20 heading back home
14:52 touch down

Quicklooks:







stratospheric air masses?

