

MOSAIC Flight #02 – 30 August 2020

Mission PI: Manfred Wendisch

Objectives

- Test of instrumentation, procedures and communication during flight
- Wing by wing flight with Polar 6 for instrument intercomparison
- Five-hole nose boom calibration pattern
- Microwave radiometer calibration, radiation pattern
- Check microphysical probes

Crew

Polar 5	
Pilot	William Houghton (Kenn Borek Air)
Co-Pilot	Michelle Lacey (Kenn Borek Air)
Mission-PI	Manfred Wendisch
Basis Data Acq.	Martin Germann
SMART/Eagle Hawk	Michael Schäfer
Cloud Probes	Manuel Moser
MiRAC	Mario Mech
Extra Seat	Stephan Schön

Flight times

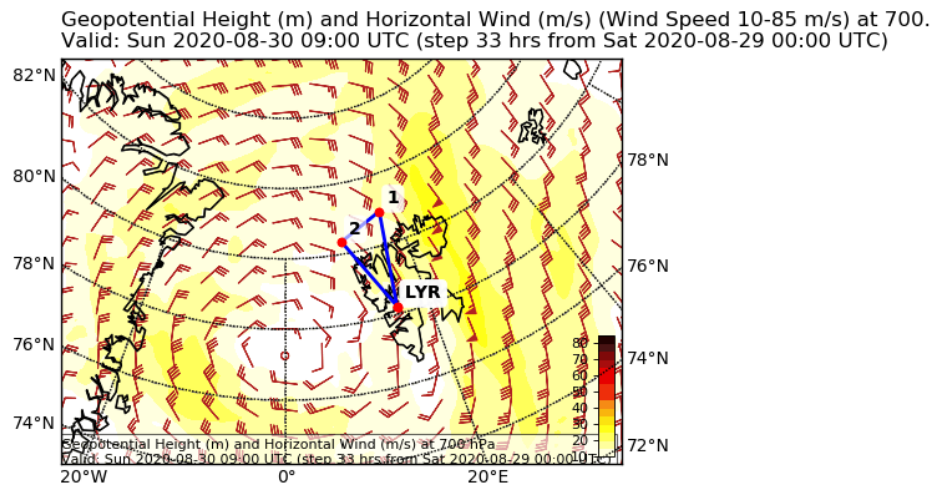
Polar 5	
Take off	08:14 UTC
Touch down	11:07 UTC

Overview

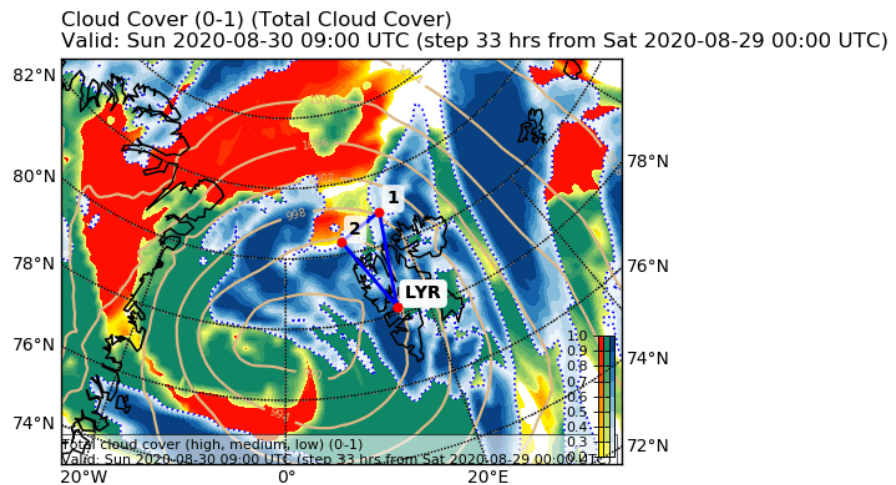
This test flight served to check the instrumentation, train the turn-on and shutdown procedures for the instruments, practice communication between crew and pilots during the flight, and perform some special calibration maneuvers. Furthermore, we had planned to fly wing by wing with Polar 6 for instrument intercomparison. The weather conditions were extremely challenging, clouds in all vertical levels with icing prevailed. Thus, we tried to find some way in between the clouds until reaching about 7000 ft where we started one of the special flight patterns to calibrate the nose boom. We actually managed to find a straight flight path at constant altitude along the wind direction, as desired. However, after finishing this 20 NM flight path in wind direction and returning to fly in opposite direction, clouds had moved into that pathway. Therefore, we had to discontinue the flight after about one hour. The originally planned flight pattern could not be completed. Nevertheless, parts of the objectives (check instrumentation, practicing procedures and communication during the flight) could be reached.

Weather

The weather at Svalbard was dominated by an almost stationary low pressure system west of the island. The low caused a multitude of clouds in all vertical levels. The wind at the ground was from southeast (20-35 KT) with decreasing tendency during the day. Clouds base: SCT/BKN 2000-4000FT Southern Part, SCT FL080-100 Northern Part. Clouds top: FL080-100 Southern Part, FL180 Northern Part. Precipitation: Scattered rain part. 0 °C-isotherm: 3000FT.



700 hPa wind vectors as predicted by ECMWF showing the low west of Svalbard.



Clouds in all altitudes as predicted by ECMWF. Blue indicates high, green mid-level, and green low-level clouds.

Flight path



Some notes taken during the flight

After take-off (8:14 UTC) we ascended until about 7000 feet into a cloud-free layer between low and mid-level clouds. At 8:30 UTC we started to fly the first straight leg with 120 KN in wind direction. We encountered a thin cloud field on this path, which caused some icing. This straight leg ended at 8:40 UTC. We returned and tried to repeat the leg in opposite direction (for nose boom calibration). Clouds had moved into the flight path, we changed the heading slightly, but then realized we had no chance to fulfill this straight leg pattern as planned. At 8:50 UTC we decide to discontinue the flight and to return. We touched down at 9:07 UTC.

Drop sonde

No drop sondes were released.

Instrument Status

The radiation instruments worked okay, radar and MW radiometer also. The polar nephelometer didn't work, the lidar was not switched on.