

RACEPAC Flight #10 – Polar 6 – 140514

Report by Stephan Borrmann

General remark: The aim of this flight was to characterize microphysics and radiation of a cloud area opposed to a “long line of though-flight” as before. The sampling in an area covering pattern was ended after C10, because already during the first leg between C1 and C2 icing occurred at the probe pylons and the wings. The icing was serious enough to not go deeper into the cloud deck anymore and rather spend the first areal pattern up to C10 at a safe altitude above the cloud deck. Nevertheless from cumuliform protrusions, little puffs, and cloud/haze segments some sampling occurred between C1 and C10 albeit not at levels where the plane was fully inside the cloud deck.



The upper left two pictures demonstrate the icing accumulated in a matter of less than a minute shortly after entering the cloud at C1. The upper right picture showing icing at wing and pylon was taken at 12:58 LT, i.e. one hour after the icing event, and this ice cover persisted for more than 90 minutes after we had left the cloud. The lower photo shows the cloud deck near C1.

Take off time: 11:07 LT

Situation on the way to C1:

- * Scattered cumulus humilis and mediocris at low levels with some cloud streaks higher up as well. Strong winds, quite turbulent.
- * 11:26 LT and later: Solid stratus cloud deck below us with a thickness around 2500 ft from pilot reports.
- * Cruising to C1 at 4500 ft.
- * 11:40 LT: The cloud deck reaches our cruising altitude near 4600 ft. We decide not to enter before C1 to avoid early icing.

Experiment 1: Area cover pattern between C1 and C10.

* 11:50 LT: Arrive at C1, start first leg at 4000 ft inside cloud top. Immediate icing, accumulation of ½ inch of clear ice very fast. It is decided to not fully enter the cloud again. We rather scratch along the cloud top level –more outside than inside– and proceed along the planned pattern to C10.

* 12:52 LT: Arrive at C10. End of Experiment.

Experiment 2: Aerosol and trace gas experiment on way to YEV at three different altitudes.

* 12:52 LT – 12:54 LT: Climb from previous 4500 ft to 6000 ft.

* 13:03 LT: Climb to 8000 ft.

* 13:15 LT: Climb to 10000 ft. At both altitudes a haze is visible.

* 13:27 LT: End of Experiment 2 heading for YEV.

Experiment 3: Short cut through the thinning cloud deck on way to YEV.

* 13:30 LT: Enter the clouds coming down from 10000 ft at 3000 ft. Immediate icing but not severe.

* 13:33 LT: Clouds are now scattered and we are inside and outside.

* 13:35 LT: End experiment on approach to YEV.

Landing in Inuvik at about 13:51 LT.

Polar 6 UserEvents 14. May 2014

0	2014-05-14 16:58:28.949	Lat= 68° 18,339' N Lon=133° 29,976' W Taxi
1	2014-05-14 17:07:54.673	Lat= 68° 18,236' N Lon=133° 28,613' W Takeoff
2	2014-05-14 17:15:51.980	Lat= 68° 31,704' N Lon=133° 25,176' W Rollerdoors and KT19 open
3	2014-05-14 17:50:51.435	Lat= 70° 0,122' N Lon=132° 56,008' W C1
4	2014-05-14 18:02:11.812	Lat= 70° 8,300' N Lon=132° 0,356' W C2
5	2014-05-14 18:03:10.624	Lat= 70° 9,979' N Lon=132° 1,916' W C3
6	2014-05-14 18:12:58.426	Lat= 70° 10,463' N Lon=132° 59,353' W C4
7	2014-05-14 18:17:53.762	Lat= 70° 20,146' N Lon=132° 58,526' W C5
8	2014-05-14 18:25:49.116	Lat= 70° 20,822' N Lon=132° 0,344' W C6
9	2014-05-14 18:30:33.202	Lat= 70° 29,978' N Lon=132° 2,857' W ScreenDump_DMS- OPERATOR1_MapViewer_2014_05_14_18_30_33.jpg
10	2014-05-14 18:30:37.920	Lat= 70° 29,996' N Lon=132° 3,247' W C7
11	2014-05-14 18:42:34.547	Lat= 70° 36,324' N Lon=132° 59,535' W C8
12	2014-05-14 18:52:19.736	Lat= 70° 39,026' N Lon=131° 55,736' W C10
13	2014-05-14 19:02:42.117	Lat= 70° 14,763' N Lon=132° 13,563' W climbe to 8000ft
14	2014-05-14 19:15:13.338	Lat= 69° 43,877' N Lon=132° 34,647' W climbe to 10000ft
15	2014-05-14 19:34:33.356	Lat= 68° 54,369' N Lon=133° 7,055' W Rollerdoors and KT19 closed
16	2014-05-14 19:51:15.890	Lat= 68° 18,254' N Lon=133° 27,954' W Touchdown

Polar 5 - 14. May 2014

1709 UTC Messung ueber Land. Einzelne kleine WOLken unter uns. Ueber uns blauer Himmel. AOD von 0.07 bei 500nm. 10000ft und 55m/s Ground Speed. Noch sehr ssehr wenig Wolken.

1715 UTC Messung ueber Land. Einzelne kleine WOLken unter uns. Ueber uns blauer Himmel. AOD von 0.07 bei 500nm. 10000ft und 55m/s Ground Speed. Noch sehr ssehr wenig Wolken. Wolkenfeld dichter werdend.

P5 Tim ... Flug-Nr.: 14.05.2014

Datum: 14.05.2014, Zeiten sind LT

Take-off: 11:02

Start von SMART: 11:08

Aufgerissene tiefe Wolkenfetzen unter uns, blauer Himmel über uns (zum Horizont hin Etwas diesig), Lagestabilisierung hat bei Roll unten wieder gemuckert vor Start, hat Homes aber gefunden und Korrektur sieht gut aus

11:15: 2900m, 60m/s (starker Gegenwind)

11:18: Sonnenphotometer vereist (Heizung war aus)

11:30: geschlossene Wolkendecke unter uns, über uns Richtung Horizont hohe Wolken

11:54: C1 passiert, Beginn der Boxen

11:59: keine hohen Wolken über uns, AOD=0,1 (diesig), schöne homogene Wolkendecke
Unter uns mit Wellenstruktur

12:01:50: Linkskurve, C2

12:07:10: Linkskurve, C3

12:18: Rechtskurve, C4

12:23: Rechtskurve, C5

12:26: Dropsonde #1

12:29: 2850m, 84m/s

12:30: Linkskurve, C6

12:35: Linkskurve, C7

12:36: Wolkensituation quasi konstant

→ Homogene (nicht mehr so wellige) Wolkenschicht unter uns, WOG=1400m

→ Über uns keine Wolken, nur diesig, AOD=0,1, zum Horizont hin höhere Wolken

12:45: Rechtskurve, C8

12:50:30: Rechtskurve, C9

C10

13:05: Rechtskurve, C11

NIR Irradianz oben → Shutter Problem, scheint komplettes Signal abzuziehen

(Nullkurve), offenbar Wackelkontakt, kurz ambient auf 3, dark 3 gestellt zum Testen

Irgendwann ging es wieder (13:24) → wieder ambient spectra auf 30 gestellt

13:08: C12

13:18: C13

13:22: C14

13:27: Dropsonde #2

13:29: C15

13:33: C16

13:43: Linkskurve, C17

13:46:55: Linkskurve, C18

13:54: C19, Kurs Inuvik

13:59: 100m/s, 2900m

14:08: tiefe Wolken unter uns zeigen wieder deutlich Wellenstruktur, über uns unverändert

14:12: Stop der Messungen

14:37: Landung Inuvik, Flugdauer: 3h35min

Polar 5 UserEvents 14. May 2014

0	2014-05-14 16:52:21.694	Lat= 68° 18,314' N Lon=133° 29,964' W Video start
1	2014-05-14 16:52:33.816	Lat= 68° 18,314' N Lon=133° 29,964' W Canon start
2	2014-05-14 16:52:52.112	Lat= 68° 18,314' N Lon=133° 29,964' W KT19 on
3	2014-05-14 16:53:05.722	Lat= 68° 18,314' N Lon=133° 29,964' W AMALI on
4	2014-05-14 16:53:17.769	Lat= 68° 18,314' N Lon=133° 29,964' W Eagle on
5	2014-05-14 16:53:32.394	Lat= 68° 18,315' N Lon=133° 29,972' W TAXI
6	2014-05-14 16:55:07.872	Lat= 68° 18,317' N Lon=133° 29,511' W Sun Photometer on
7	2014-05-14 17:01:18.196	Lat= 68° 18,254' N Lon=133° 28,019' W rolling
8	2014-05-14 17:01:45.318	Lat= 68° 18,219' N Lon=133° 29,243' W Takeoff
9	2014-05-14 17:01:58.131	Lat= 68° 18,195' N Lon=133° 30,129' W Deicing on
10	2014-05-14 17:06:44.661	Lat= 68° 24,041' N Lon=133° 25,052' W Rollerdoors open
11	2014-05-14 17:07:16.677	Lat= 68° 25,022' N Lon=133° 23,847' W Q Switch on
12	2014-05-14 17:08:58.656	Lat= 68° 28,130' N Lon=133° 21,060' W Sun Photometer start
13	2014-05-14 17:09:17.609	Lat= 68° 28,758' N Lon=133° 21,190' W AMALI start
14	2014-05-14 17:09:40.871	Lat= 68° 29,466' N Lon=133° 21,529' W SMART start
15	2014-05-14 17:19:26.535	Lat= 68° 47,417' N Lon=133° 21,679' W Sun Photometer vereist
16	2014-05-14 17:54:11.095	Lat= 69° 59,432' N Lon=133° 0,250' W Waypoint C1
17	2014-05-14 18:01:56.785	Lat= 70° 0,159' N Lon=132° 4,049' W Waypoint C2
18	2014-05-14 18:07:38.851	Lat= 70° 9,883' N Lon=132° 1,717' W Waypoint C3
19	2014-05-14 18:18:47.474	Lat= 70° 10,659' N Lon=133° 0,290' W Waypoint C4
20	2014-05-14 18:23:22.736	Lat= 70° 19,693' N Lon=132° 59,455' W Waypoint C5
21	2014-05-14 18:26:54.737	Lat= 70° 19,992' N Lon=132° 31,620' W
	Dropsonde_17_20140514	
22	2014-05-14 18:30:26.880	Lat= 70° 20,044' N Lon=132° 2,847' W Waypoint C6
23	2014-05-14 18:35:24.735	Lat= 70° 29,456' N Lon=132° 0,014' W Waypoint C7
24	2014-05-14 18:45:48.440	Lat= 70° 30,038' N Lon=132° 58,779' W Waypoint C8
25	2014-05-14 18:51:01.621	Lat= 70° 39,981' N Lon=132° 58,622' W Waypoint C9
26	2014-05-14 19:05:08.748	Lat= 70° 39,888' N Lon=131° 2,340' W Waypoint C11
27	2014-05-14 19:08:37.152	Lat= 70° 30,933' N Lon=131° 0,118' W Waypoint C12
28	2014-05-14 19:12:27.168	Lat= 70° 30,034' N Lon=131° 21,647' W System Warning
29	2014-05-14 19:12:50.384	Lat= 70° 30,006' N Lon=131° 23,877' W System Warning -->
	DMS Hardware Monitoring	
30	2014-05-14 19:18:53.322	Lat= 70° 29,991' N Lon=131° 58,601' W Waypoint C13
31	2014-05-14 19:22:35.798	Lat= 70° 20,707' N Lon=131° 59,785' W Waypoint C14
32	2014-05-14 19:27:07.072	Lat= 70° 20,070' N Lon=131° 24,538' W
	Dropsonde_18_20140514	
33	2014-05-14 19:29:38.151	Lat= 70° 20,013' N Lon=131° 3,830' W Waypoint C15
34	2014-05-14 19:33:17.564	Lat= 70° 10,807' N Lon=131° 0,217' W Waypoint C16
35	2014-05-14 19:43:44.389	Lat= 70° 9,875' N Lon=131° 59,261' W Waypoint C17
36	2014-05-14 19:43:51.076	Lat= 70° 9,725' N Lon=131° 59,750' W AIMMS 20 stop
37	2014-05-14 19:54:27.436	Lat= 69° 59,668' N Lon=131° 3,616' W Waypoint C19
38	2014-05-14 20:14:56.139	Lat= 68° 59,578' N Lon=132° 19,763' W AMALI off

39	2014-05-14 20:15:26.529	Lat= 68° 58,104' N Lon=132° 21,416' W Q Switch off
40	2014-05-14 20:15:39.613	Lat= 68° 57,497' N Lon=132° 22,094' W Canon Stop
41	2014-05-14 20:20:14.118	Lat= 68° 45,553' N Lon=132° 35,752' W Rollerdoors closed
42	2014-05-14 20:26:51.340	Lat= 68° 29,850' N Lon=132° 52,579' W KT19 stop
43	2014-05-14 20:35:41.932	Lat= 68° 18,363' N Lon=133° 24,009' W Eagle stop
44	2014-05-14 20:36:46.694	Lat= 68° 18,243' N Lon=133° 28,358' W Touchdown