RACEPAC Flight #4 – Polar 6 – 140503

Report by Sergej Molleker

Take off time: 16:16 UT (always in UT here)

General remark: This flight was conducted exactly according to the flight plan with the way points C1-C4. The main focus of the flight was aerosol and trace gas measurements, especially over Tuktoyaktuk, where a ground station was operated. Mainly low and thin stratiform water clouds, where encountered during the flight. The cloud layers had varying cloud top altitudes. In the first part of the flight some patchy fog below the main cloud layer could be observed when flying close to the ground.

Situation on the way to C1: After the take of a cruise altitude of 3000 ft was reached (16:20). A cloud layer appeared below and was penetrated from above (16:34), with the cloud top on 2600 ft. After exiting the cloud on the bottom the flight continued for one minute just below the cloud (16:36:30 - 16:37:30). The same cloud layer war penetrated upward and the cloud top layer was sampled between 16:39:00 - 16:40:30, whereby the cloud top altitude increased to 3400ft. The flight continued above the cloud to the point C1 (16:45).

Situation on the way from C1 to C2: here clouds were penetrated three times, usually going slowly down and upward in steps of typically 100 ft.
16:47: penetration of the cloud layer from above, with one minute sampling on the cloud top.
16:49 – 16:54: five minutes on constant level just below the cloud layer.
16:54 – 17:02 penetration of the cloud layer in steps upward and sampling on the cloud top for two minutes.
17:03 – 17:08: five minutes of level flight just above the cloud at 4100 ft.
17:08: descend, crossing the cloud top and staying there for two minutes (17:09 - 17:11), slow descend of 300 ft/min till a cloud free air at about 17:13:30.
17:14 – 17:19: five minutes of level flight, just below the cloud at 2800 ft, then descend to 600ft.
17:21 – 17:25 turn at the waypoint C2, also on 600 ft.

Situation on the way back C2 to C1:
17:25 – 17:30 level flight for 5 minutes at 600 ft.
17:31: going upward with 300 ft/min and crossing a thin cloud between 17:34 – 17:35 with a flight on the cloud top between 17:35 – 17:36, then ascend to 3500 ft.
17:38 – 17:41: descend, penetration of the cloud from above, cloud top between 17:39 – 17:40, cloud bottom between 17:41:30 – 17:42:30, ascend in steps, though the cloud layer disappeared while flying on the second step.
17:45 – 17:48: level flight in cloud free air at 4200 ft.
17:49 – 17:54: level flight in cloud free air at 5000 ft.
17:56 – 18:01: level flight in cloud free air at 7000 ft, then climb to 10000 ft while reaching C1

Situation on the way from C1 to C3 and then between C3 and C4 over Tuktoyaktuk:
6 flight legs on different altitudes.
18:05 – 18:10 flight leg at 10000 ft between C3 and C4.
18:12 – 18:22 flight leg at 80000 ft between C4 and C3 (with a longer turn at C4 to let the Polar 5 flight in advance)
18:25 – 18:31 flight leg at 6000 ft between C3 and C4.
18:35 – 18:44 flight leg at 3300 ft between C4 and C3 (instead of 4000 ft, due to an aerosol layer which was detected by the LiDAR on P5, above the cloud layer), then descend through the cloud layer.
18:46 – 18:52 flight leg at 1500 ft between C3 and C4.
18:54 – 18:59 flight leg at 500 ft between C4 and C3.

19:00: return flight to Inuvik, with a penetration of a patchy cloud layer, and landing at 19:31.

Polar 6 UserEvents 3. May 2014

0	2014-05-03 16:12:07.285	Lat= 68° 18,341' N	Lon=133° 29,976' W	taxi
1	2014-05-03 16:15:32.932	Lat= 68° 18,218' N	Lon=133° 29,344' W	take off
2	2014-05-03 16:15:45.619	Lat= 68° 18,242' N	Lon=133° 28,444' W	Bmed heating on
3	2014-05-03 16:19:40.685	Lat= 68° 24,939' N	Lon=133° 26,182' W	Rollerdoor open KT 19 open, CR2 on
4	2014-05-03 16:34:17.696	Lat= 69° 3,827' N	Lon=133° 30,494' W	found Cloud
5	2014-05-03 16:34:57.945	Lat= 69° 5,445' N	Lon=133° 30,699' W	found Cloud at C1
6	2014-05-03 16:44:51.079	Lat= 69° 29,570' N	Lon=133° 29,897' W	C1
7	2014-05-03 17:23:39.042	Lat= 71° 1,605' N	Lon=133° 27,871' W	C2
8	2014-05-03 17:57:45.601	Lat= 69° 45,950' N	Lon=133° 29,766' W	C c1 -> C3
9	2014-05-03 18:03:25.538	Lat= 69° 29,669' N	Lon=133° 28,782' W	C c1 -> C3 now
10	2014-05-03 18:16:16.679	Lat= 69° 21,935' N	Lon=132° 34,498' W	
11	2014-05-03 18:17:08.671	Lat= 69° 22,942' N	Lon=132° 40,432' W	gelb für alle Displays
12	2014-05-03 19:15:31.212	Lat= 68° 48,503' N	Lon=133° 26,353' W	iagos ist lieb und richt nicht mehr nach Buthanol
13	2014-05-03 19:23:36.196	Lat= 68° 27,022' N	Lon=133° 29,979' W	Cr2 off Rollerdoors close, KT19 close
14	2014-05-03 19:31:20.934	Lat= 68° 18,199' N	Lon=133° 30,064' W	toutchdown
15	2014-05-03 19:38:18.397	Lat= 68° 18,348' N	Lon=133° 30,014' W	Bmetdeicing off
16	2014-05-03 19:39:21.349	Lat= 68° 18,348' N	Lon=133° 30,012' W	ßparkposition

Polar 5 - 3. May 2014

1634 UTC duenne Wolkenschicht unteer uns. Bodenwolken sehr duenn. Aber dicker werdend. Wolkenoberkante 900m. Dick. LIDAR kommt nicht durch. Flug ueber Eis.

1640 UTC dicke gschlossene Wolkendecke unter uns. Wolkenfrei ueber uns. AOD bei 0.06. Flug ueber Eis. Cirrus zieht rein.

1645 UTC Waypoint C1

1646 UTC dicke geschlossene Wolkendecke unter uns. Ueberwiegend wolkenfrei ueber uns. Abr ab und zu Cirrusstreifen. VErgleich SMART oder Sonnenphoometer. AOD steigt langsam aber kontinuierlich an.

1652 UTC dicke geschlossene Wolkendecke unter uns. Homogener Cirrus ueber uns. Sehr milchig. Vergleich Sonnenphotometer.

1657 UTC dicke geschlossene Wolkendecke unter uns. Homogener Cirrus ueber uns. Sehr milchig. Vergleich Sonnenphotometer. Messung ueber Wasser. Fast 1200m WWolkenhoehe.

1703 UTC dicke geschlossene Wolkendecke unter uns. Homogener Cirrus ueber uns. Sehr milchig. Vergleich Sonnenphotometer. Messung ueber Wasser. Fast 1200m Wolkenhoehe. Cloudbow ist zu sehen, also hauptsaechlich Wasser.

1711 UTC dicke geschlossene Wolkendecke unter uns. Homogener Cirrus ueber uns. Sehr milchig. Vergleich Sonnenphotometer. Messung vermutlich ueber Eis. Cloudbow ist zu sehen, also hauptsaechlich Wasser. Wolke Mehrschichtig. Siehe LIDAR oder Dropsonde.

1714 UTC Dropsonde 7

1723 UTC Dicke Wolkenshicht unter uns. Nur Wasser. Bestaetiung von P6 und Cloudbow zu sehen. Messung ueberb Eis. Homogener Cirrus, milchig, ueber uns. Vergleich Sonnenphotometer.

1726 UTC Waypoint C2. Kurve. Eagle miusst weiter und Kurve mit.

1732 UTC Glorie und Cloudbow, d[nner homogener Cirrus ueber uns, AOD bei. 0.1, leichte Kurve wegen falschem Kurs direkt nach C3 anstatt als erstes wieder nach C1. Dicke Wolkendecke unter uns. Messung ueber Wasser. Zum Ende hin yiehen Cirrusstreifen rein.

1759 UTC Dicke geschlossene Wolkendecke unter uns. Messung ueber Eis. Cirrus homogener. Geaenderte Wolkentruktur. Wolkenhoehe 700m. Szmmetrisch zum hinflug

1804 UTC Dicke geschlossene Wolkendecke unter uns. Messung ueber Eis. Kurve. Wolkenoberkante bei 700m. Wolkenschatten. Weiterhin Cloudbow.

1808 UTC Waypoint C1, Linkskurve

1810 UTC Messung ueber Eis, dicke Wolkenschicht unter uns. Wolkenschatten. Zwei Wolkenschichten. Oberkante bei 700m. AOD nimmt zu. Aerosol ueber Wolke nimmt zu. Definierte Cirren ueber uns.

1815 UTC Waypoint C4

P5 Tim … Flug-Nr.: 03.05.2014

Datum: 03.05.2014, Zeiten sind LT
Take-off: 10:17
Messbeginn SMART: 10:24
kein Cirrus über uns, aufgebrochene tiefe Wolken/Nebel unter uns, 3000m, 86m/s
bis 10:31: einige Kurven
10:37: keine Cirrus, aufgebrochene Wolken unter uns
10:37: Start AMALI
10:41: Cirrus am Horizont und etwas näher, aber nicht direkt über uns
10:46: C1 passiert, 2980m, 65m/s, Cirrus über uns, tiefe Wolken unter uns
10:54: milchig über uns (Spektren Zeitreihen zappeln auch kaum)
11:10: immer noch Cirrus über uns, relativ homogene tiefe Wolken unter uns
11:14: Dropsonde #1
11:16: Cirrus über uns, vermutlich Eis unter tiefen Wolken unter uns
11:25: Cirrus über uns wieder homogener
11:26:45: C2 passiert, Rechtskurve, Linkskurve (lang), Linkskurve, Rechtskurve, Linkskurve
11:31: Südkurs, Flug wieder geradeaus, P6 weiter vor uns
11:34: Cirrus über uns, homogene tiefe Wolken unter uns
11:46: die Cirrus direkt über uns eher milchig
11:53: dünner homogener Cirrus
11:54: Rechtskurve, Kurskorrektur, waren direkt auf Kurs C3, wollten aber erst zu C1 zurück → jetzt wieder Richtung C1
11:57: Cirrus über uns nimmt wieder zu
12:08: C1 passiert, Linkskurve, Kurs C3, Cirrus über uns, tiefe Wolken unter uns
12:10:30: C3 passiert, weiter nach C4
12:14: definierter Cirrus über uns
12:15:20: C4 passiert, Rechtskurve, Kurs Inuvik, ca. 3000m, 100m/s
12:23: Wolkengrenze überflogen, keine Wolken mehr unter uns, immer noch Cirrus über uns
12:27: AMALI aus
12:49: Landung Inuvik, Flugdauer: 2h30min

Polar 5 UserEvents 3. May 2014

0	2014-05-03 16:17:17.208	Lat= 68° 18,222' N	Lon=133° 29,166' W	Takeoff
1	2014-05-03 16:21:17.743	Lat= 68° 24,669' N	Lon=133° 26,037' W	Rollerdoors open
2	2014-05-03 16:21:31.306	Lat= 68° 25,068' N	Lon=133° 26,459' W	Video start
3	2014-05-03 16:21:41.306	Lat= 68° 25,430' N	Lon=133° 26,856' W	KT19 open
4	2014-05-03 16:21:59.834	Lat= 68° 26,026' N	Lon=133° 27,582' W	Camera start
5	2014-05-03 16:24:23.912	Lat= 68° 31,397' N	Lon=133° 29,520' W	SMART start
6	2014-05-03 16:28:22.229	Lat= 68° 40,892' N	Lon=133° 28,693' W	Photometer start
7	2014-05-03 16:29:24.341	Lat= 68° 43,891' N	Lon=133° 29,650' W	no conection to video cameras
8	2014-05-03 16:29:47.904	Lat= 68° 44,995' N	Lon=133° 29,871' W	Micha frühstückt
9	2014-05-03 16:34:33.711	Lat= 68° 58,380' N	Lon=133° 29,298' W	Eagle start
10	2014-05-03 16:35:26.431	Lat= 69° 0,914' N	Lon=133° 29,280' W	Video up working
11	2014-05-03 16:36:28.882	Lat= 69° 3,947' N	Lon=133° 29,455' W	Video down working
12	2014-05-03 16:37:25.926	Lat= 69° 6,669' N	Lon=133° 29,878' W	AMALI start
13	2014-05-03 16:50:38.082	Lat= 69° 40,256' N	Lon=133° 30,064' W	C1
14	2014-05-03 17:14:16.052	Lat= 70° 32,447' N	Lon=133° 29,985' W	Dropsonde Nr.7 launched
15	2014-05-03 17:26:57.739	Lat= 71° 0,646' N	Lon=133° 29,909' W	WP C2
16	2014-05-03 18:08:23.029	Lat= 69° 30,087' N	Lon=133° 29,194' W	WP C1
17	2014-05-03 18:15:34.048	Lat= 69° 23,636' N	Lon=132° 44,440' W	WP C4
18	2014-05-03 18:19:29.589	Lat= 69° 12,778' N	Lon=132° 52,872' W	Eagle off
19	2014-05-03 18:27:34.214	Lat= 68° 51,038' N	Lon=133° 23,297' W	AMALI off
20	2014-05-03 18:31:56.215	Lat= 68° 39,763' N	Lon=133° 38,331' W	Camera stop
21	2014-05-03 18:39:19.938	Lat= 68° 23,250' N	Lon=133° 59,944' W	KT19, Rollerdoors still open and can not be closed
22	2014-05-03 18:49:29.900	Lat= 68° 18,241' N	Lon=133° 28,452' W	Touchdown
23	2014-05-03 18:52:51.429	Lat= 68° 18,327' N	Lon=133° 29,992' W	Video stop
24	2014-05-03 18:54:13.595	Lat= 68° 18,331' N	Lon=133° 30,016' W	Park Position