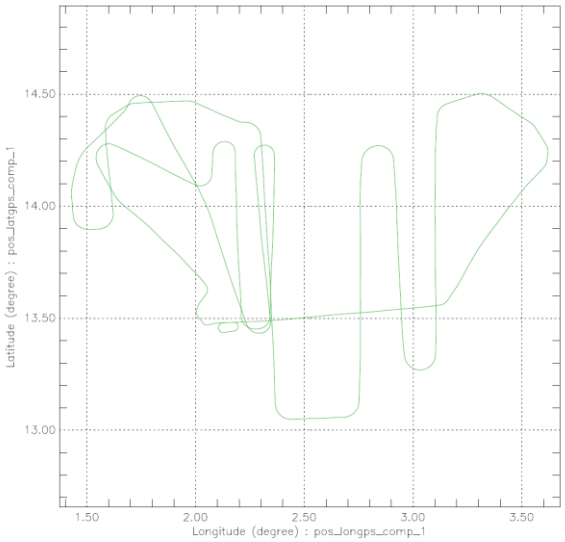
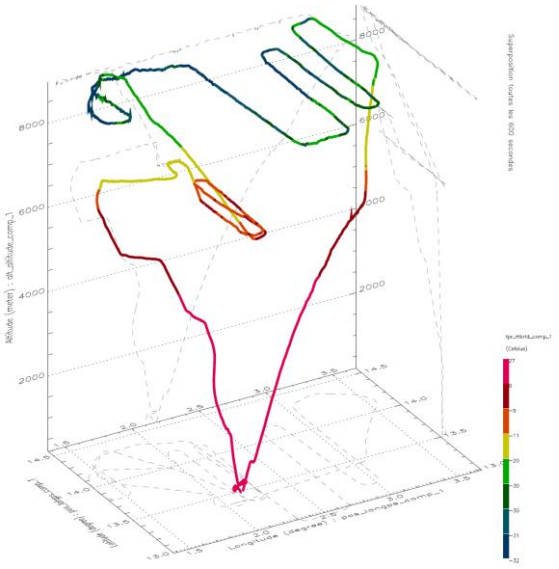
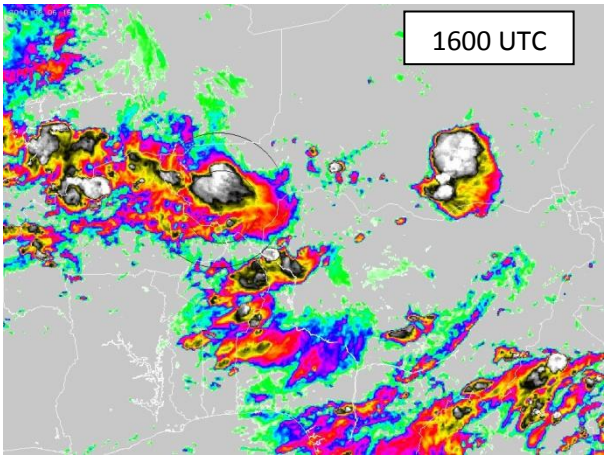
Flight summaries of Megha-Tropiques Africa

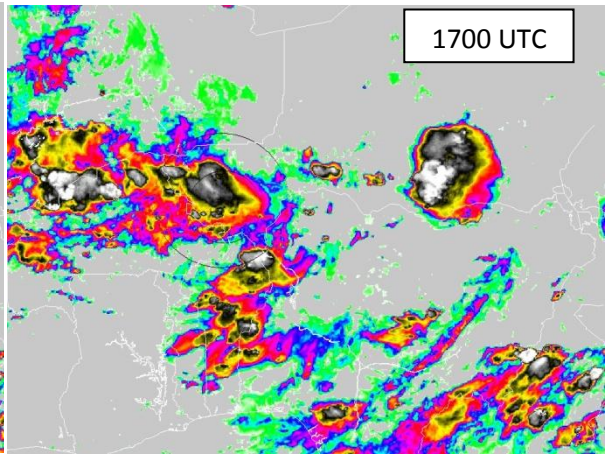
Flight # 1 06 August 2010 : Take-off at 1610 UTC, Landing at 1900 UTC

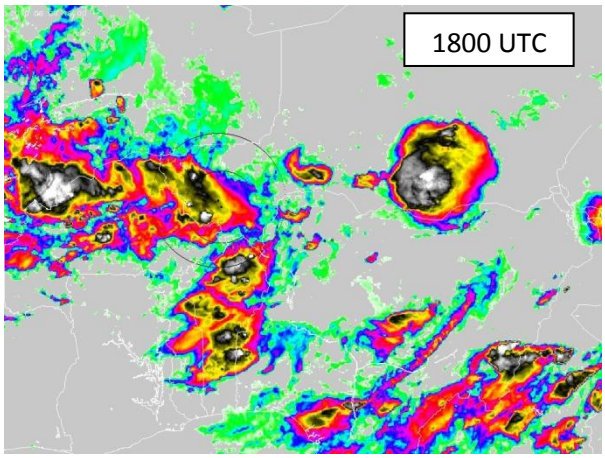
System started late morning from the outflow of a squall line over Benin. Good synoptic convergence in this area between monsoon flow and Harmattan triggered the system east of Niamey. System then moving westward at about 50 kmh^{-1}.

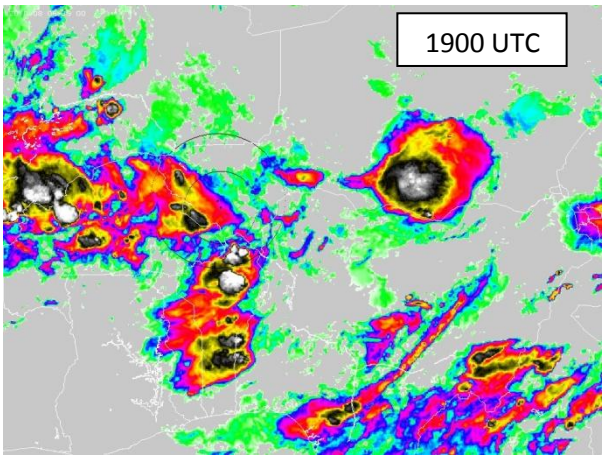


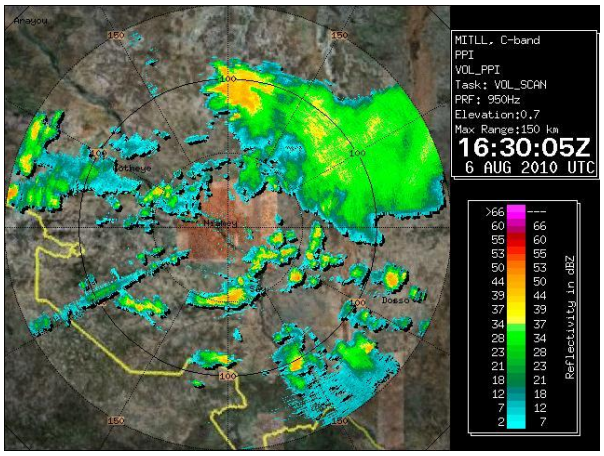


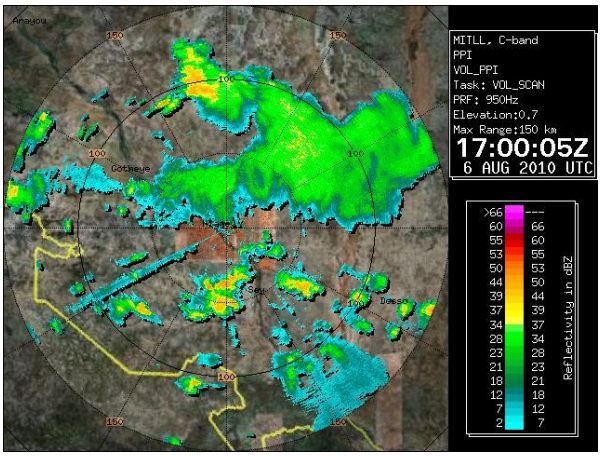


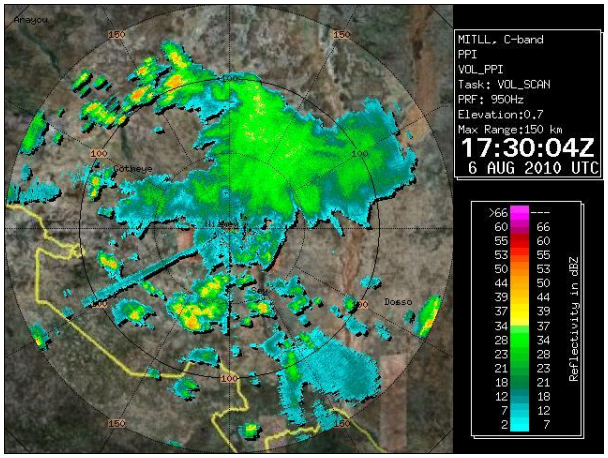


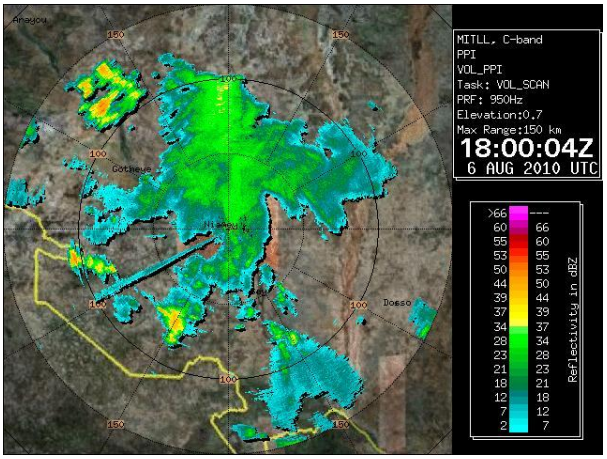


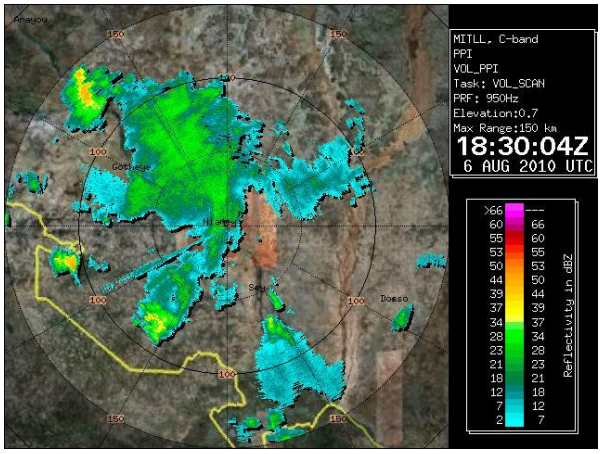


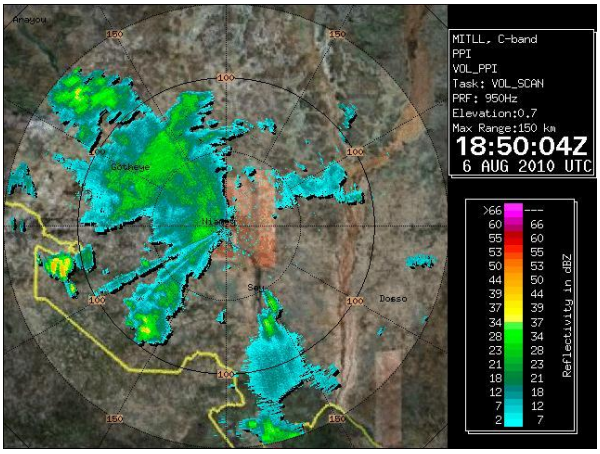

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
16:30:05Z
6 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
17:00:05Z
6 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
17:30:04Z
6 AUG 2010 UTC
Reflectivity in dBZ

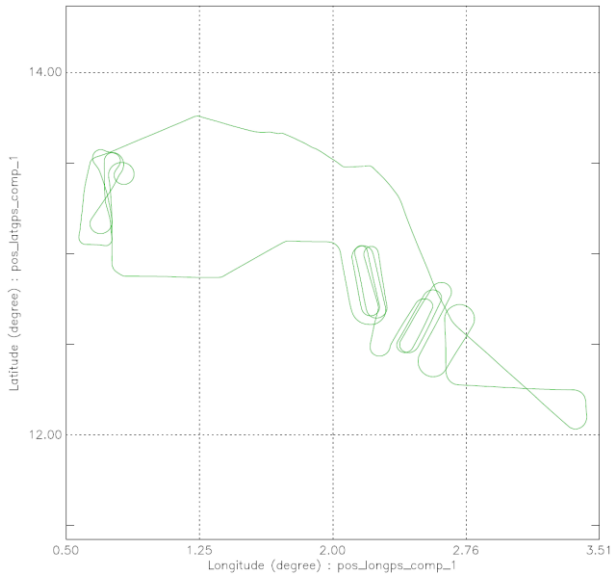

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
18:00:04Z
6 AUG 2010 UTC
Reflectivity in dBZ

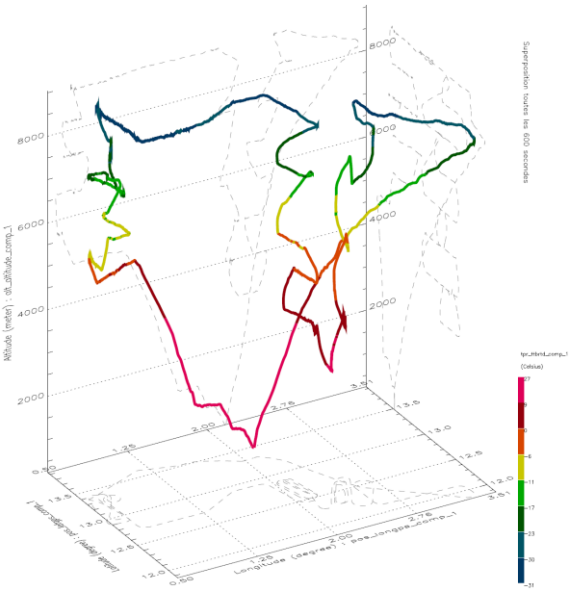

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
18:30:04Z
6 AUG 2010 UTC
Reflectivity in dBZ

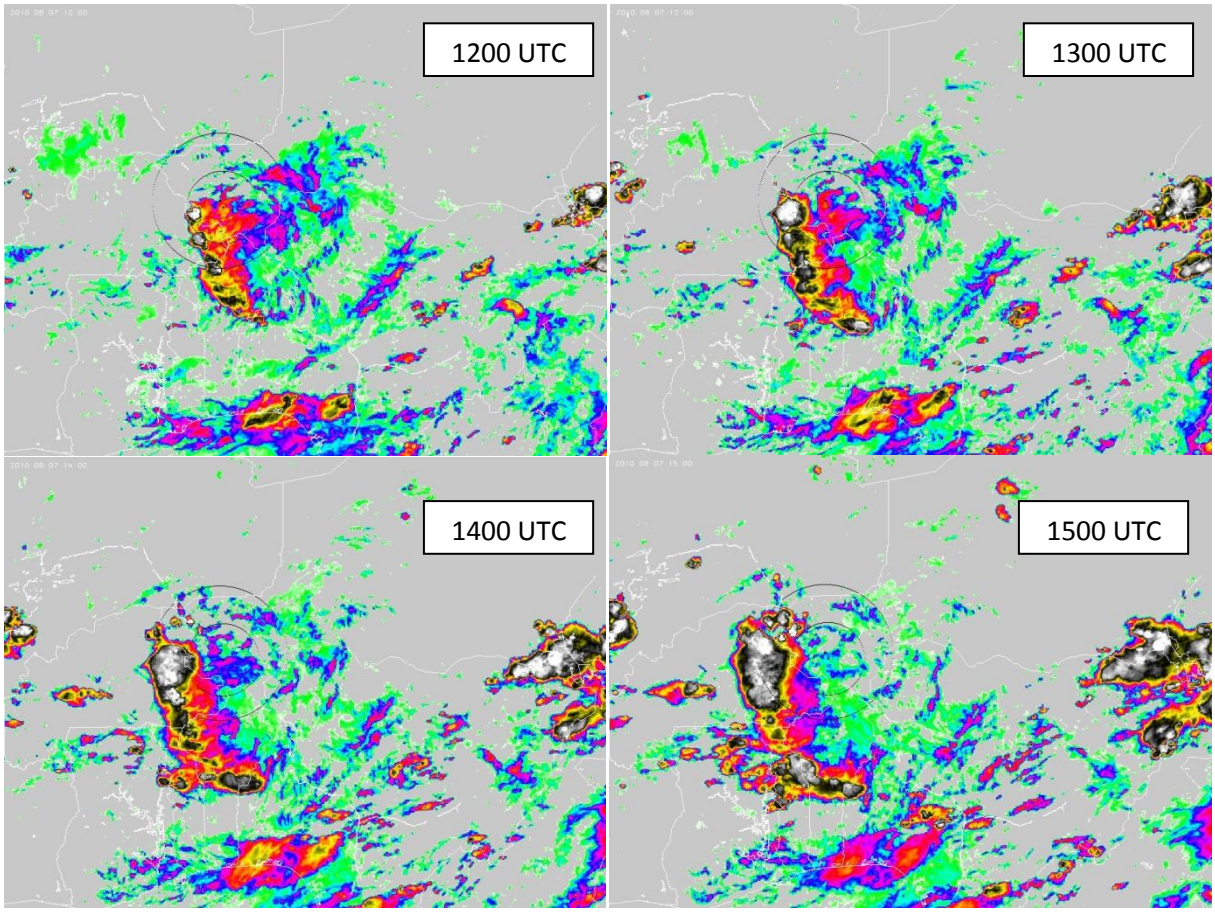

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
18:50:04Z
6 AUG 2010 UTC
Reflectivity in dBZ

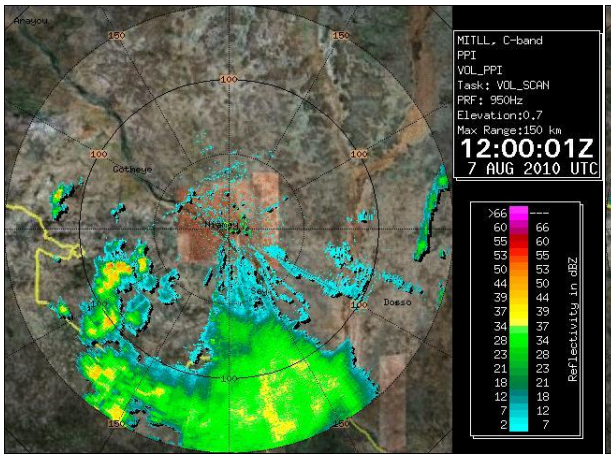
Flight # 2 07 August 2010 : Take-off at 1150 UTC, Landing at 1510 UTC

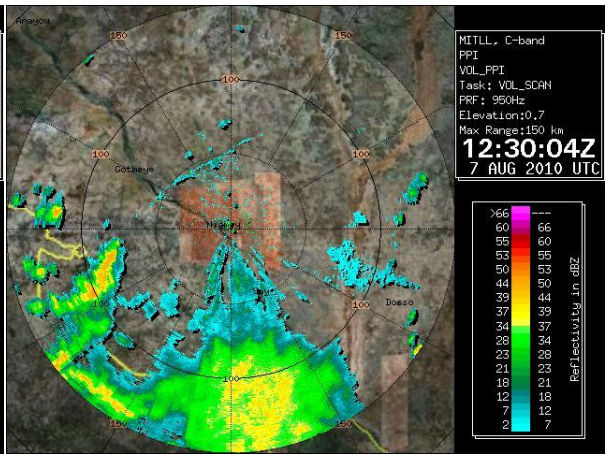
In a system that developed east of that of the first flight and at the same time. Remained active and re-intensified in the morning.

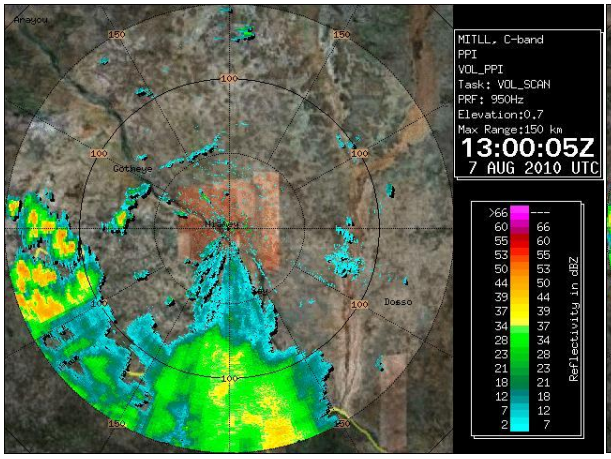


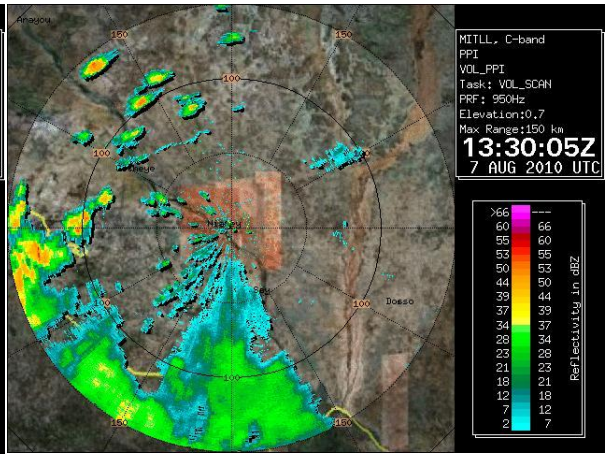


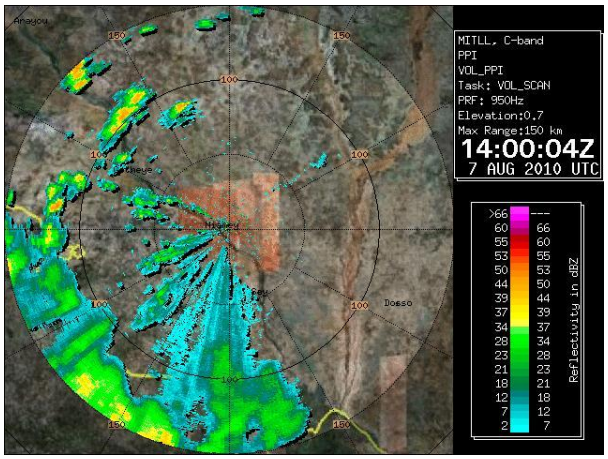



MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
12:00:01Z
7 AUG 2010 UTC
Reflectivity in dBZ
Gotheye
Dosso

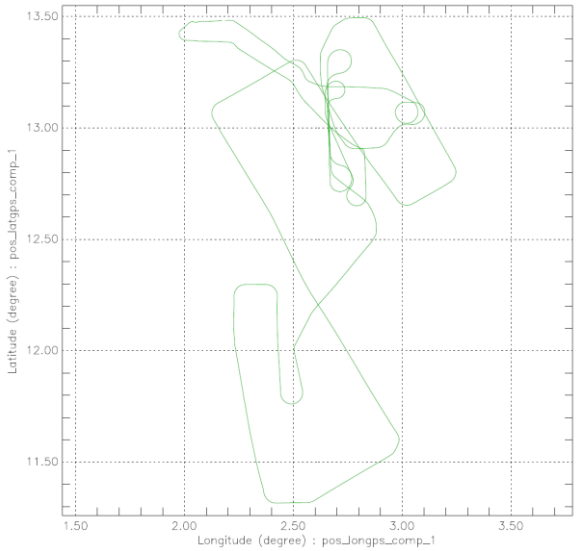

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
12:30:04Z
7 AUG 2010 UTC
Reflectivity in dBZ
Gotheye
Dosso

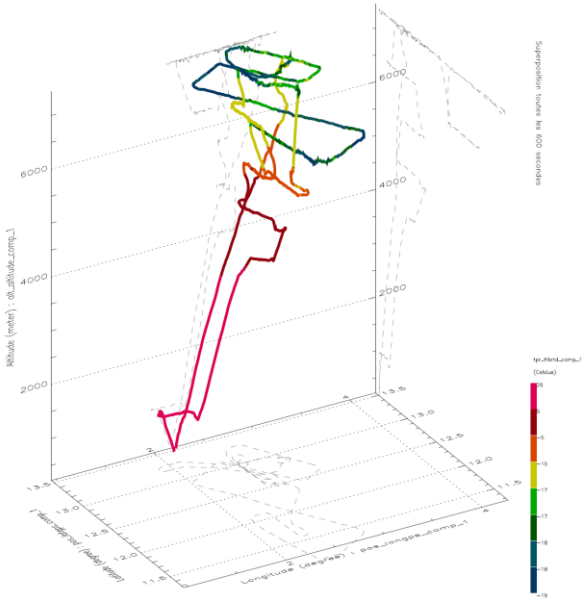

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
13:00:05Z
7 AUG 2010 UTC
Reflectivity in dBZ
Gotheye
Dosso

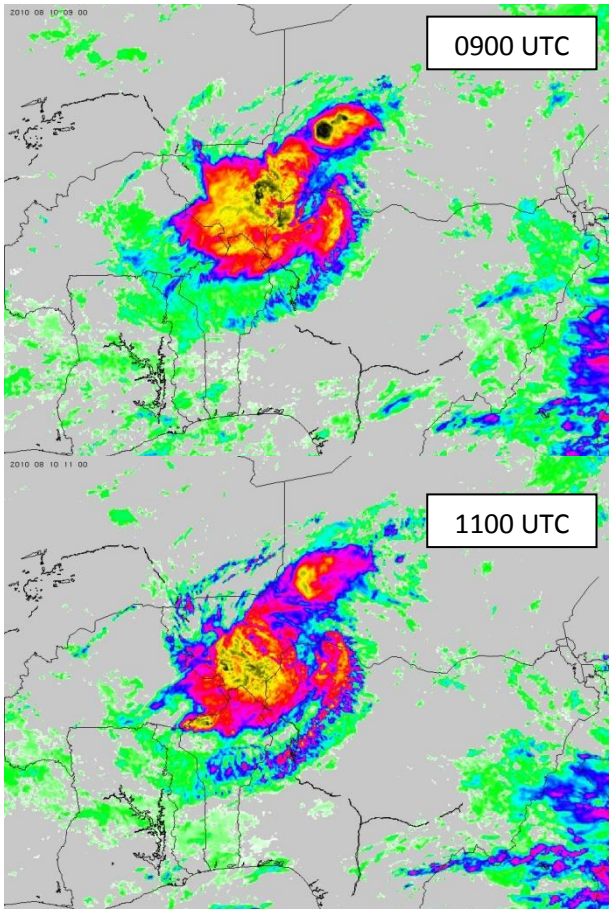

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
13:30:05Z
7 AUG 2010 UTC
Reflectivity in dBZ
Gotheye
Dosso

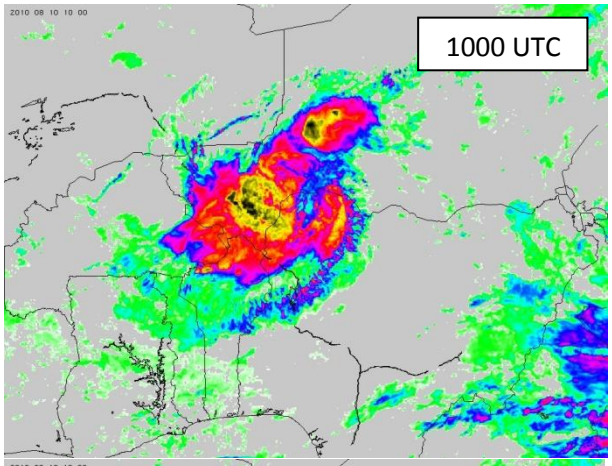

MITLL, C-band
PPI
VOL_PPI
Task: VOL_SCAN
PRF: 950Hz
Elevation:0.7
Max Range:150 km
14:00:04Z
7 AUG 2010 UTC
Reflectivity in dBZ
Gotheye
Dosso

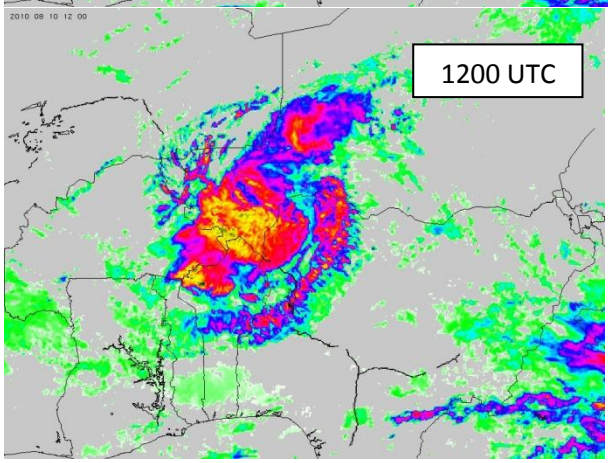
Flight # 3 10 August 2010 : Take-off at 0845 UTC, Landing at 1130 UTC

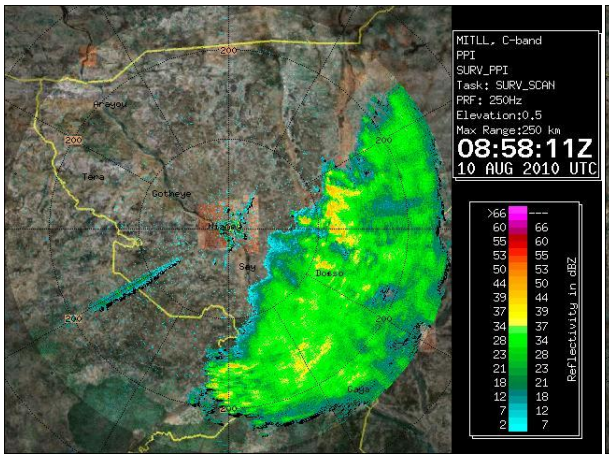


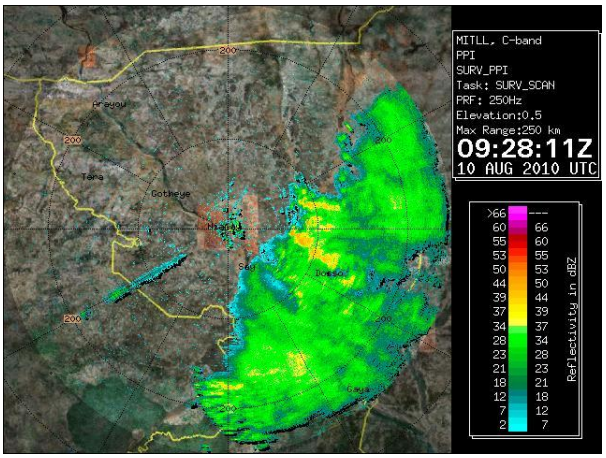


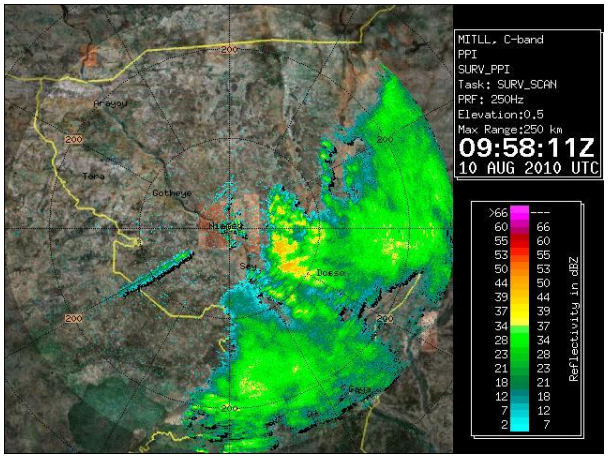


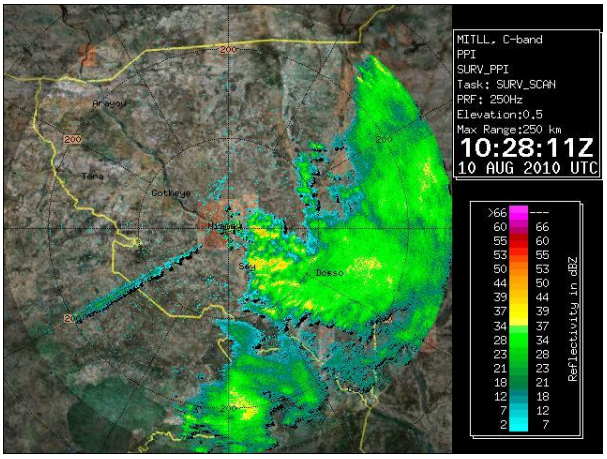


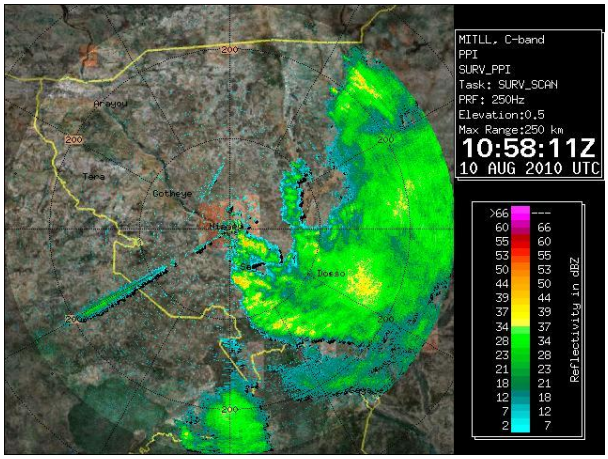


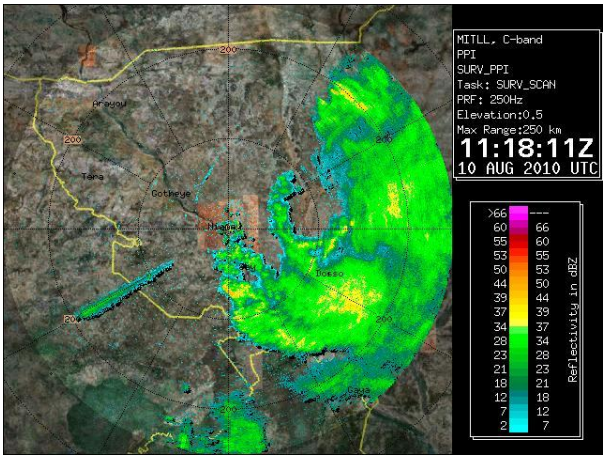

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
08:58:11Z
10 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
09:28:11Z
10 AUG 2010 UTC
Reflectivity in dBZ

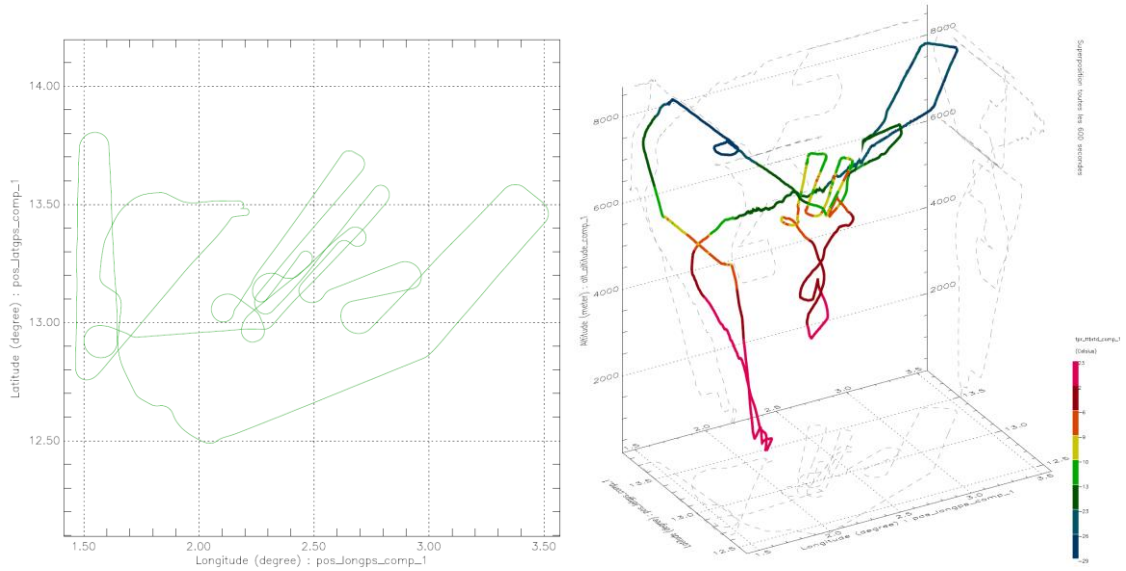

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
09:58:11Z
10 AUG 2010 UTC
Reflectivity in dBZ

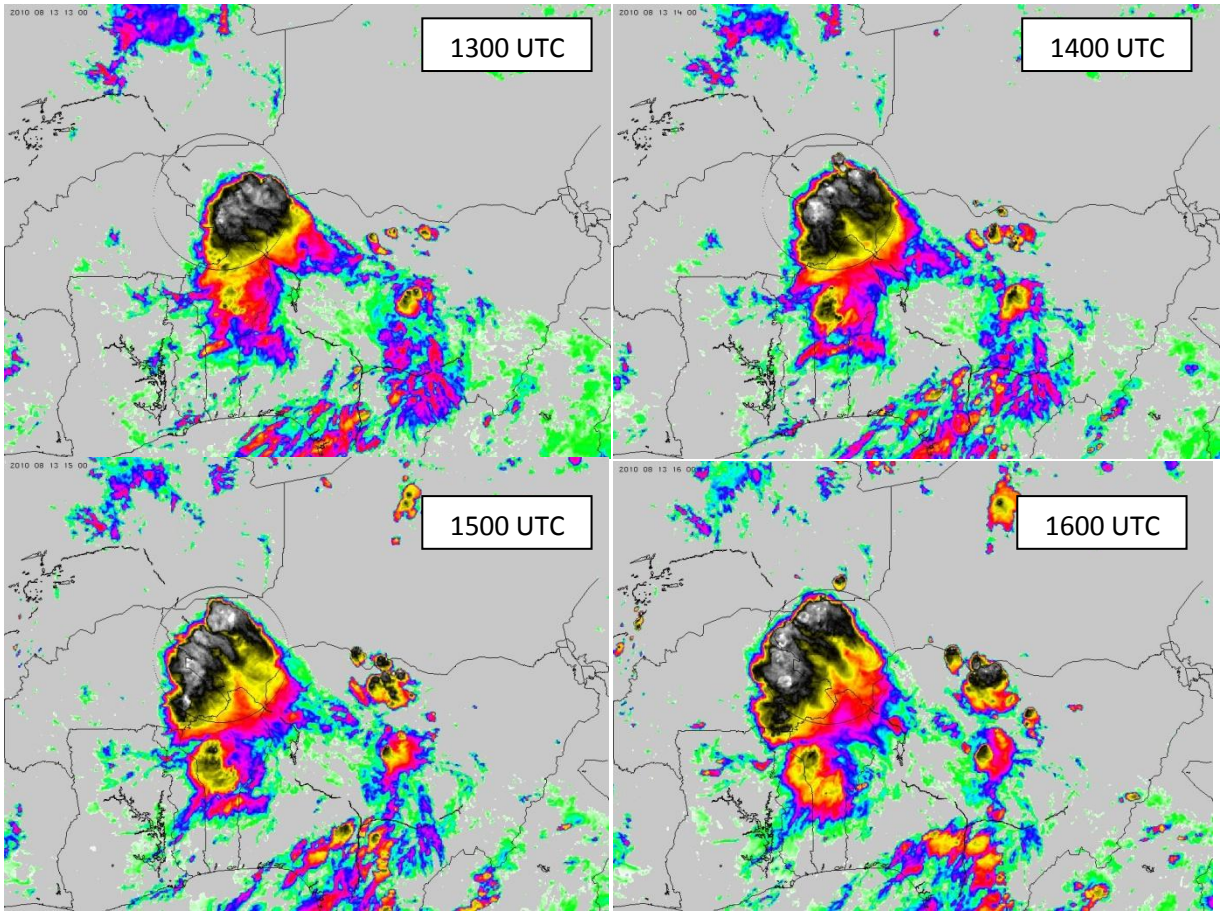

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
10:28:11Z
10 AUG 2010 UTC
Reflectivity in dBZ

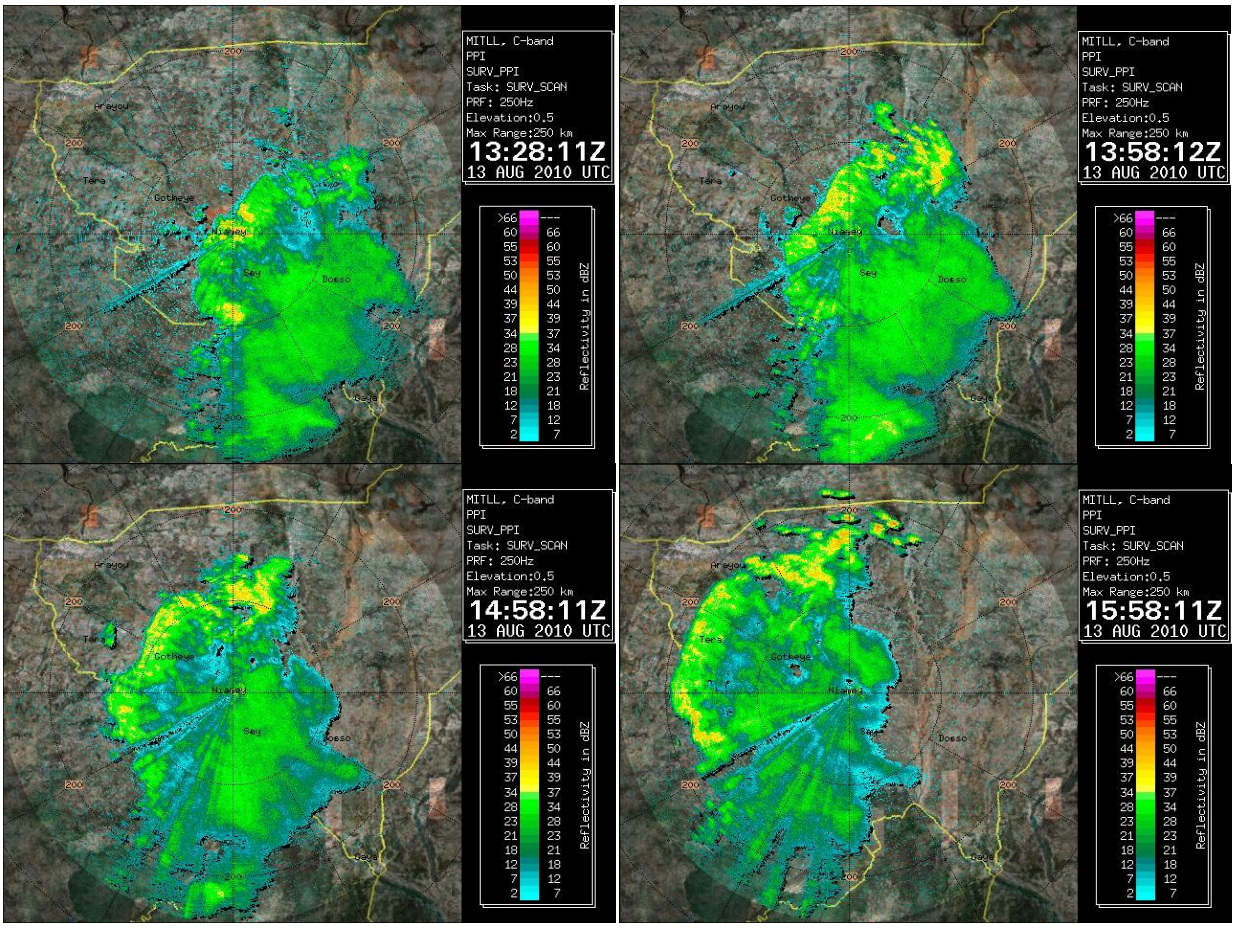

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
10:58:11Z
10 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
11:18:11Z
10 AUG 2010 UTC
Reflectivity in dBZ

Flight # 4 13 August 2010 : Take-off at 1320 UTC, Landing at 1625 UTC

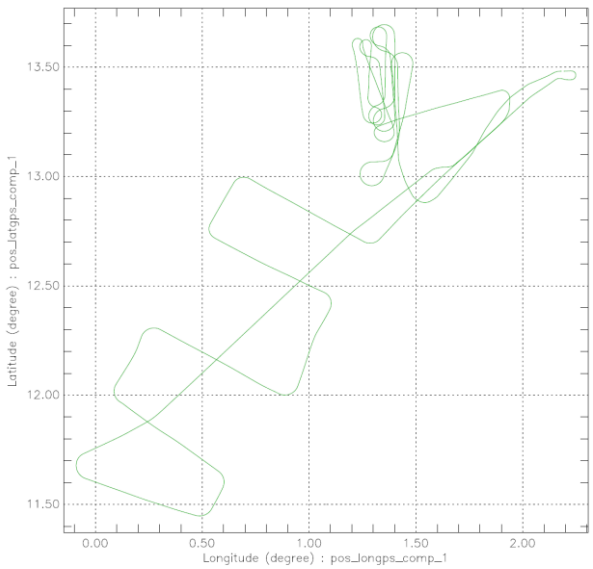


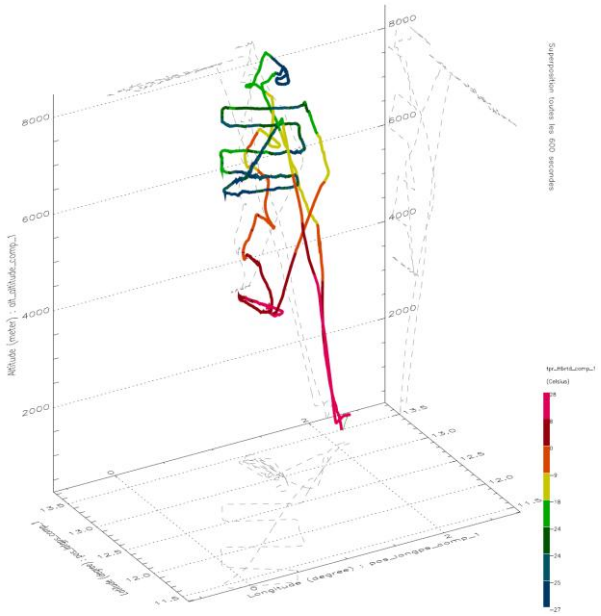


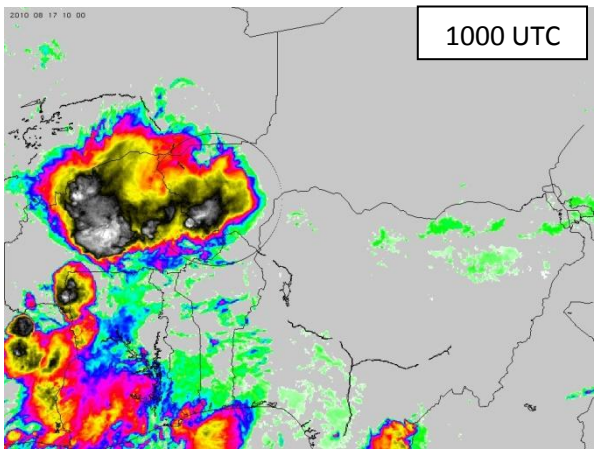

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
13:28:11Z
13 AUG 2010 UTC
Reflectivity in dBZ
MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
13:58:12Z
13 AUG 2010 UTC
Reflectivity in dBZ
MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
14:58:11Z
13 AUG 2010 UTC
Reflectivity in dBZ
MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
15:58:11Z
13 AUG 2010 UTC
Reflectivity in dBZ

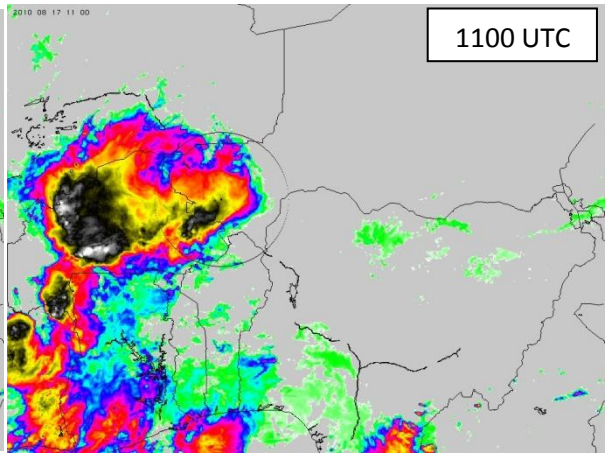
Flight # 5 17 August 2010 : Take-off at 1030 UTC, Landing at 1340 UTC

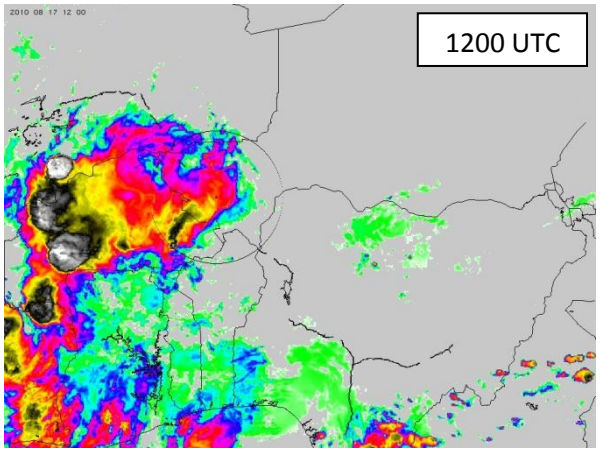
Decision to fly was made on a convective cell growing southwest of the MIT radar. When the aircraft took off the leading convective cell was decaying and all that was left when the aircraft reached the target area was an elongated stratiform rain pocket. Decision was then made to chase up a cell further southwest which was growing rapidly and proved to be fairly intense and was producing a fair amount of lightning.

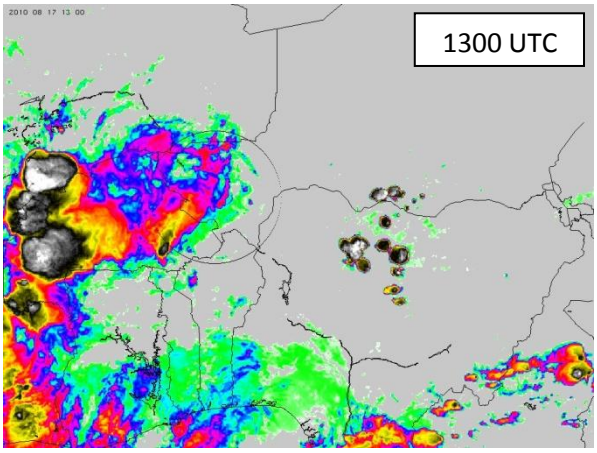


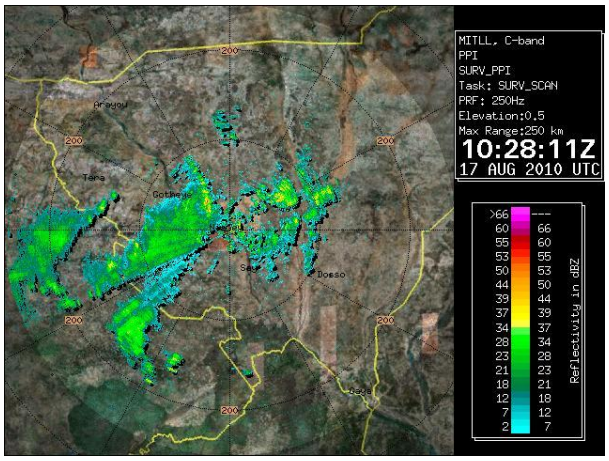


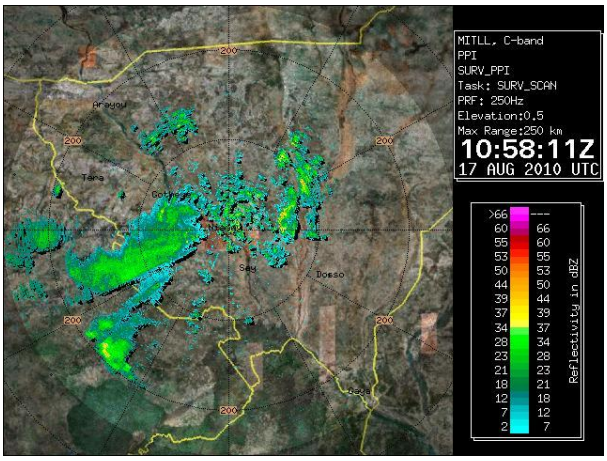


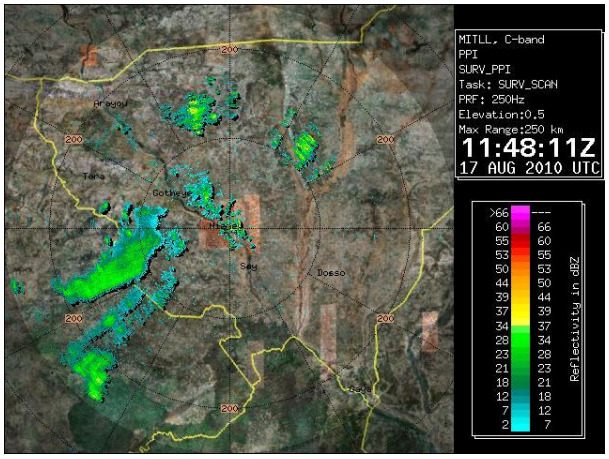








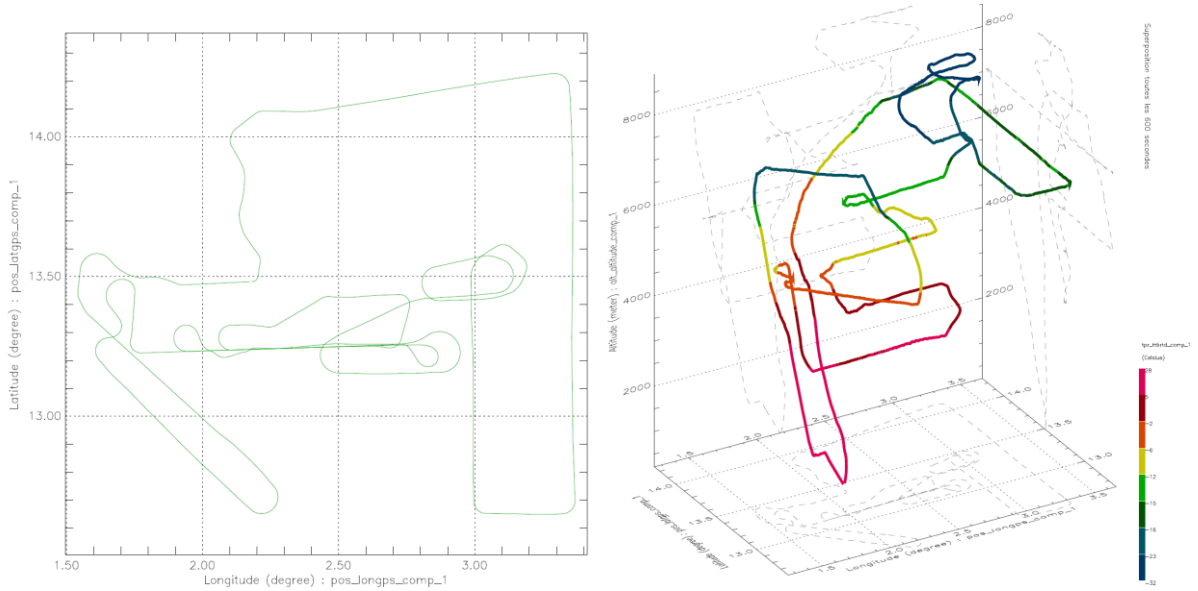


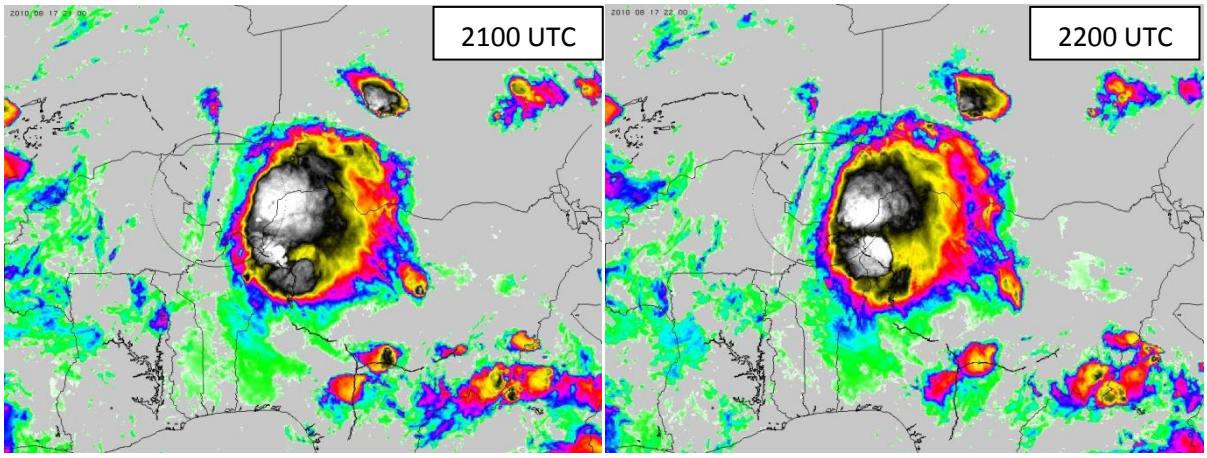


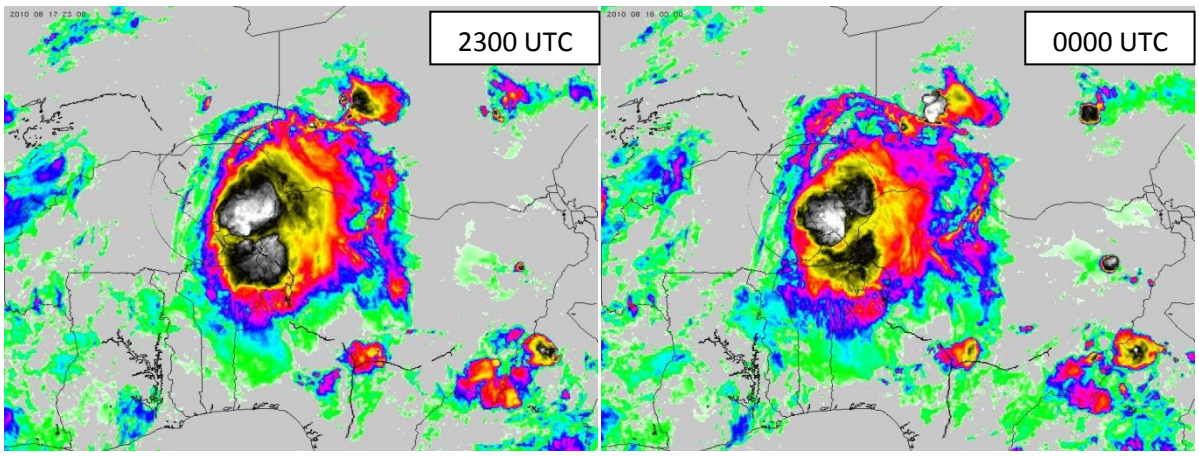
Then out of range of the MIT radar (southwest)

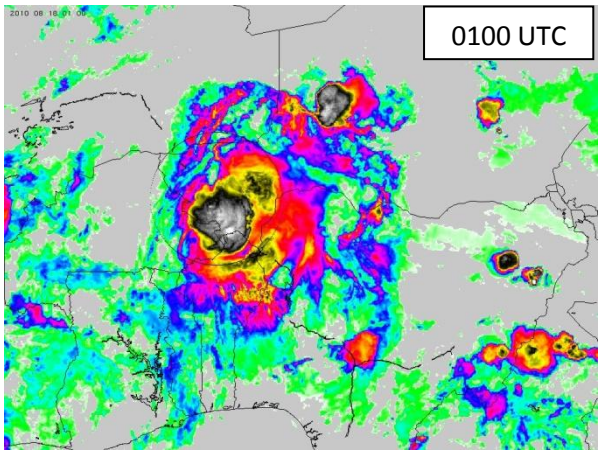
Flight # 6 17-18 August 2010 : Take-off at 2335 UTC, Landing at 0240 UTC

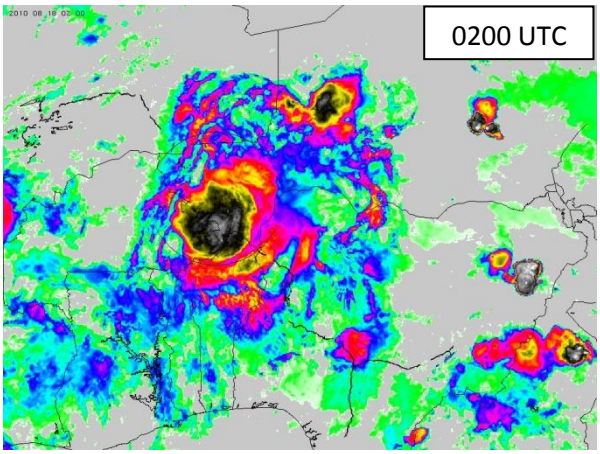
Large convective cell growing in the afternoon and progressively organizing as a westward moving squall line. Sampled with the aircraft when the stratiform part was mature, with a well-defined bright band. Not a very deep anvil (12 km), suggesting that updraft was not very strong in the convective part. Microphysical measurements indicate little or no supercooled liquid water, unlike the four first flights in younger and smaller systems. The leading convective line decayed during the aircraft sampling. Lightning activity was high.

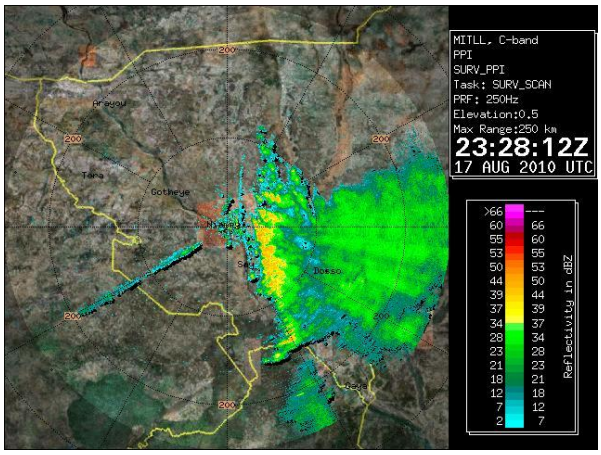


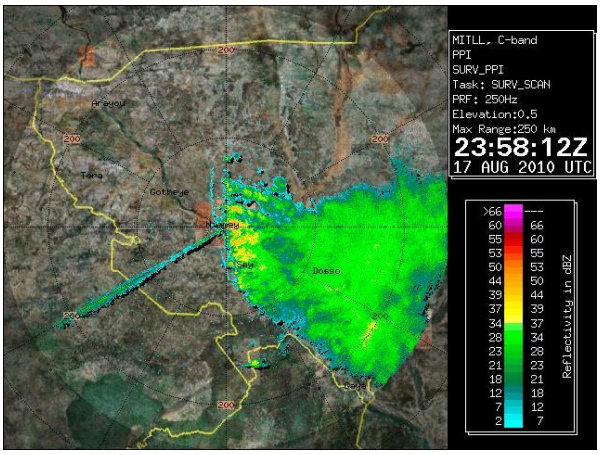


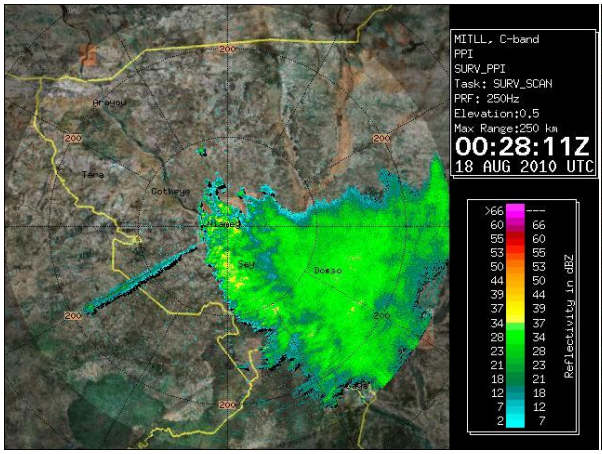


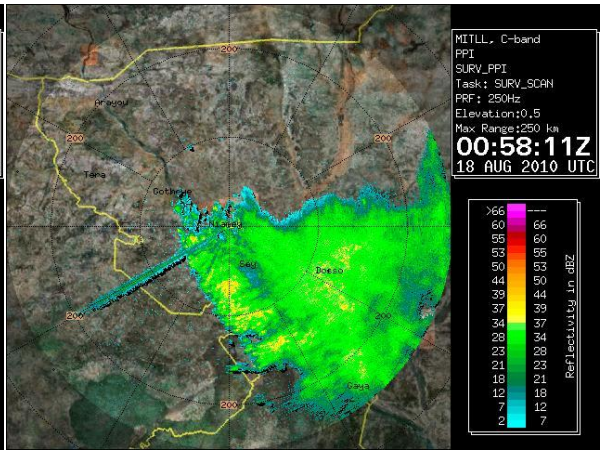

0100 UTC

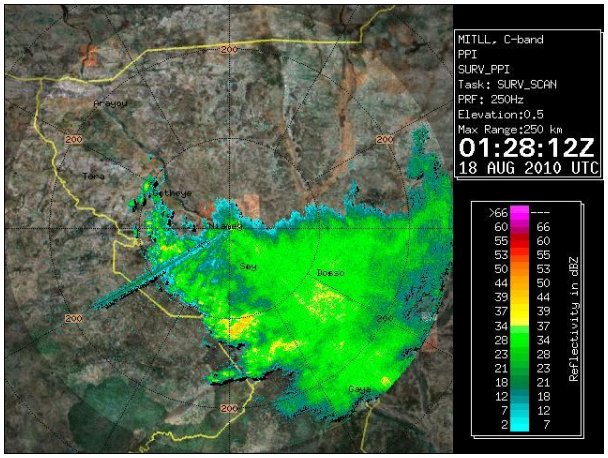

0200 UTC

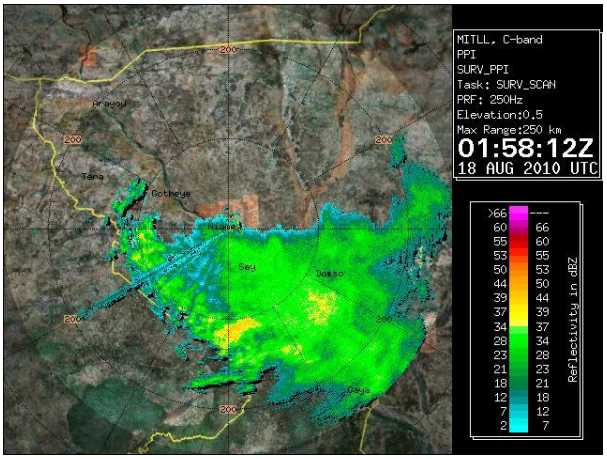

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
23:28:12Z
17 AUG 2010 UTC
Reflectivity in dBZ

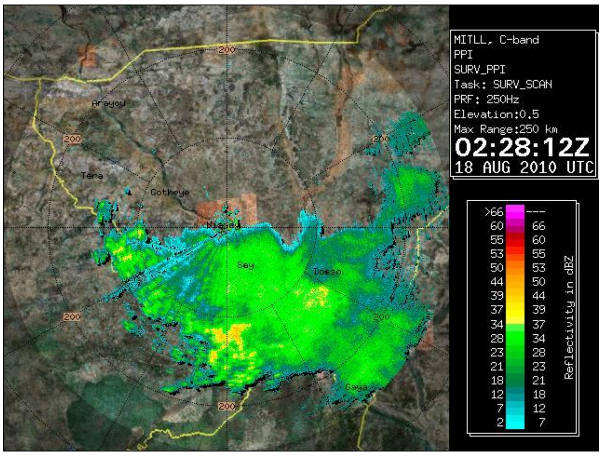

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
23:58:12Z
17 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
00:28:11Z
18 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
00:58:11Z
18 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
01:28:12Z
18 AUG 2010 UTC
Reflectivity in dBZ

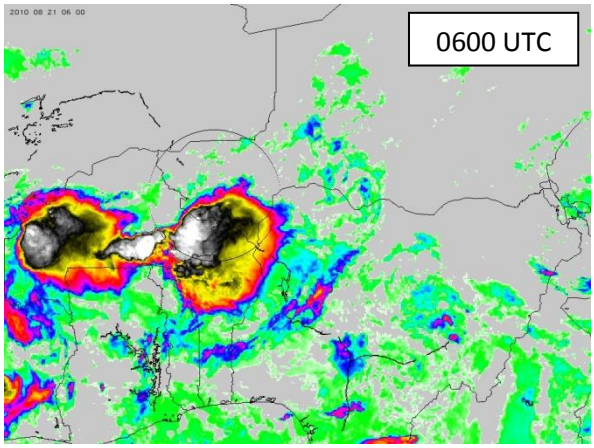

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
01:58:12Z
18 AUG 2010 UTC
Reflectivity in dBZ

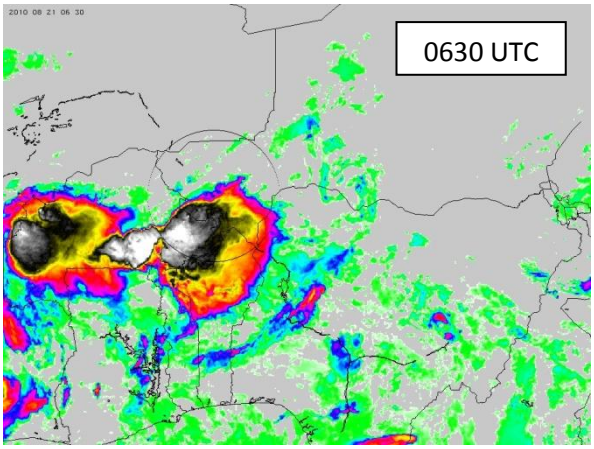


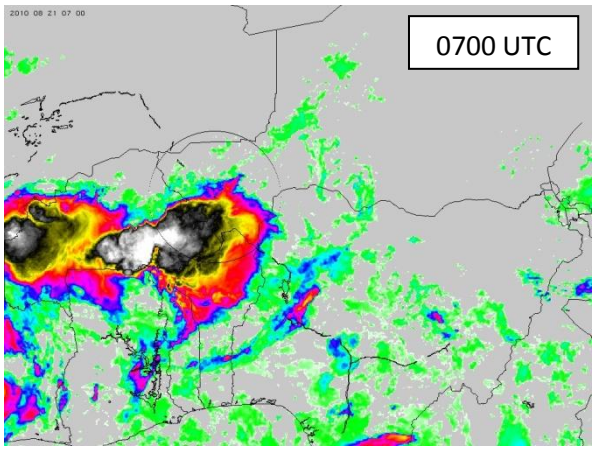
MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
02:28:12Z
18 AUG 2010 UTC
Reflectivity in dBZ

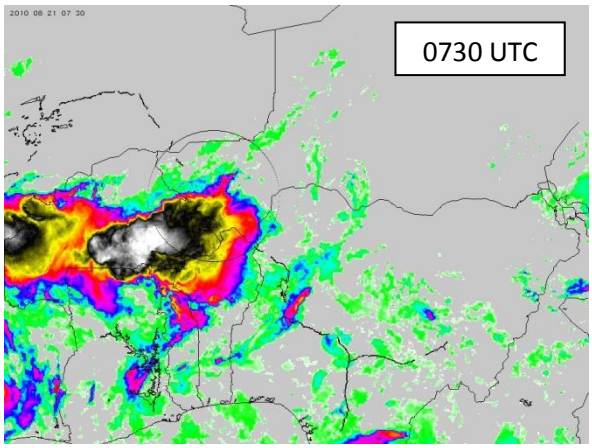
Flight # 7 21 August 2010 : Take-off at 0650 UTC, Landing at 1000 UTC

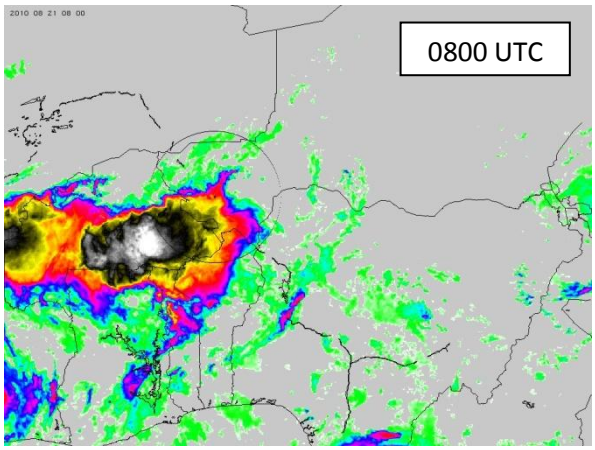
Many large convective cells have grown since yesterday 1800 UTC in the area, this one grew near 0200 UTC on the southeastern corner of the 250 km range of MIT. Grew rapidly from 0200 to 0400 UTC. At 0500 UTC a leading convective line is visible on the MIT radar images, as well as a well-developed stratiform part. The aircraft took off to the south and sampled the stratiform part with a racecourse pattern. Then the convective system ahead (moving slowlier than that one) merged with our system at the moment it was decaying, producing a new leading convective line. The second part of the flight has been dedicated to the sampling of the rear of this convective line, with good approaches of convective cells (a few kilometers). Lightning activity was not high (even in the second part near the convective line)

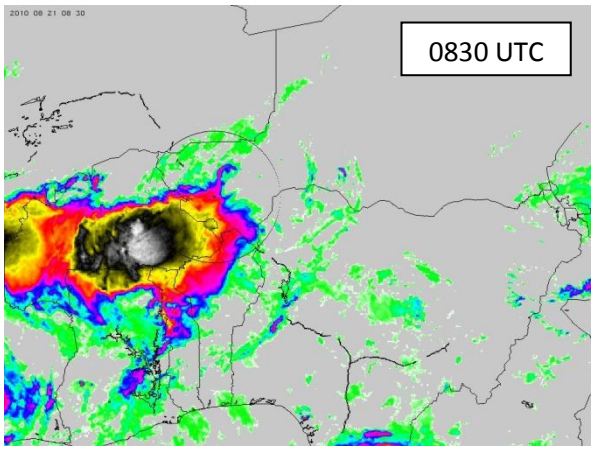


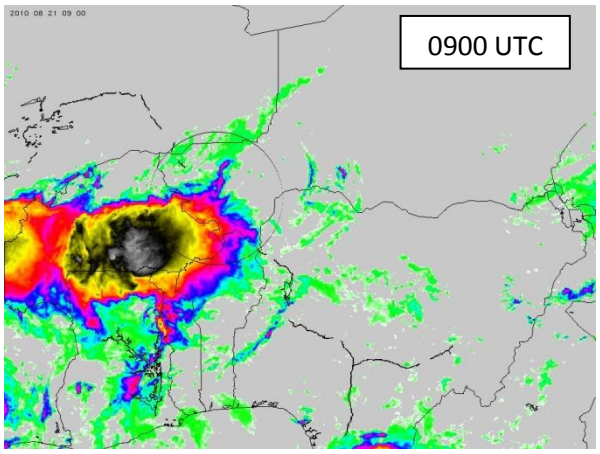








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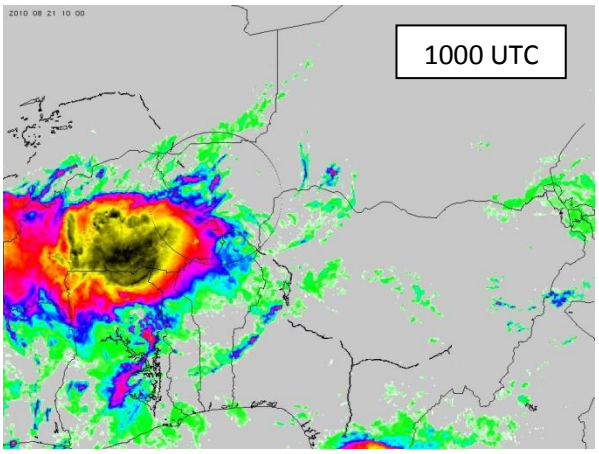
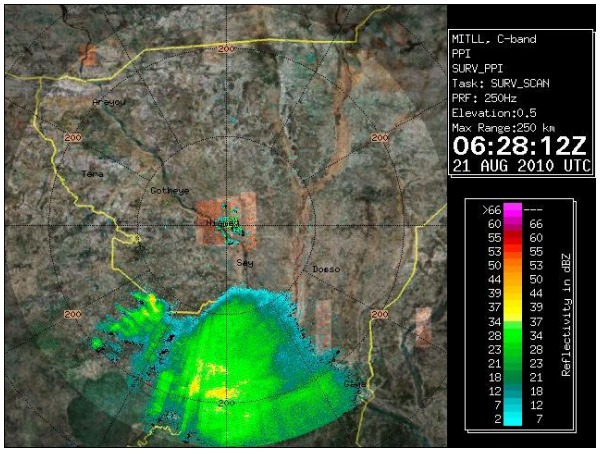
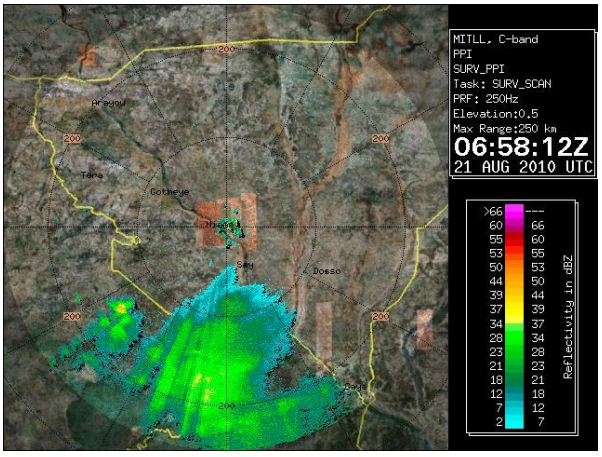
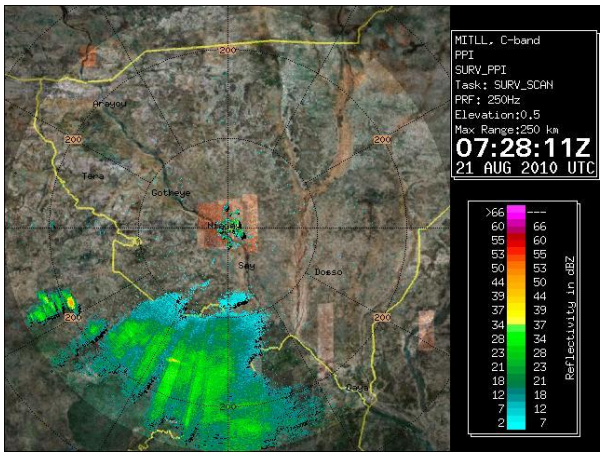
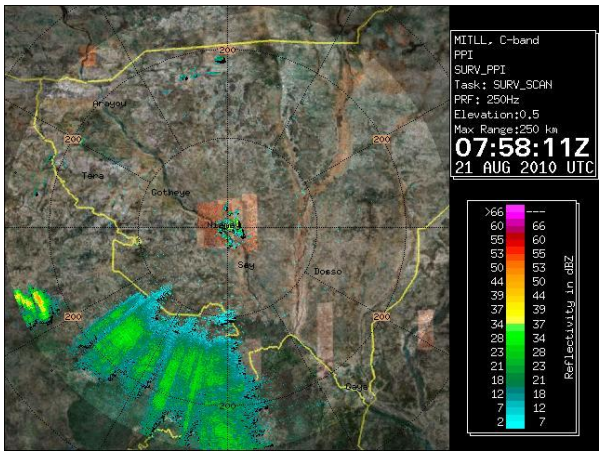
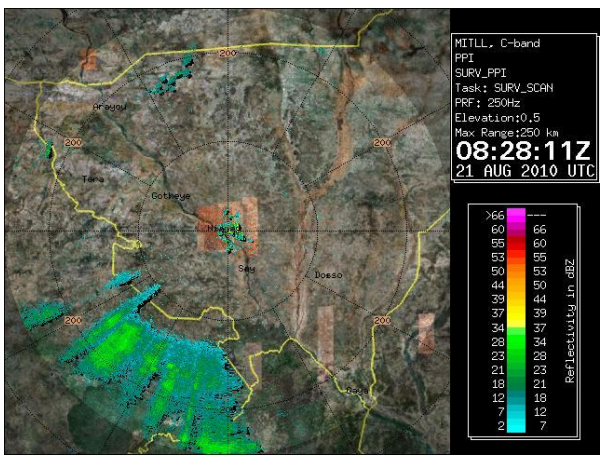

1000 UTC

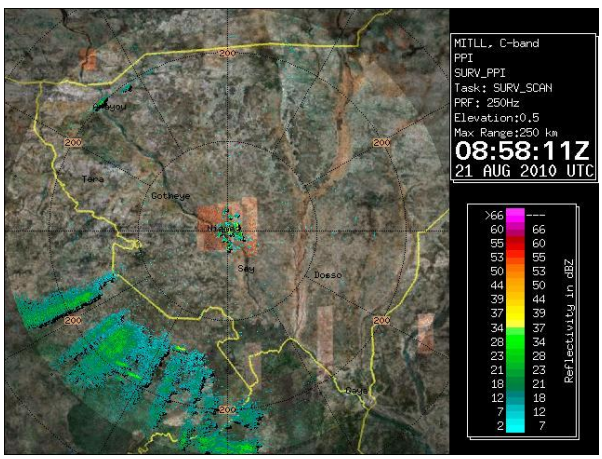

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
06:28:12Z
21 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
06:58:12Z
21 AUG 2010 UTC
Reflectivity in dBZ


MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
07:28:11Z
21 AUG 2010 UTC
Reflectivity in dBZ

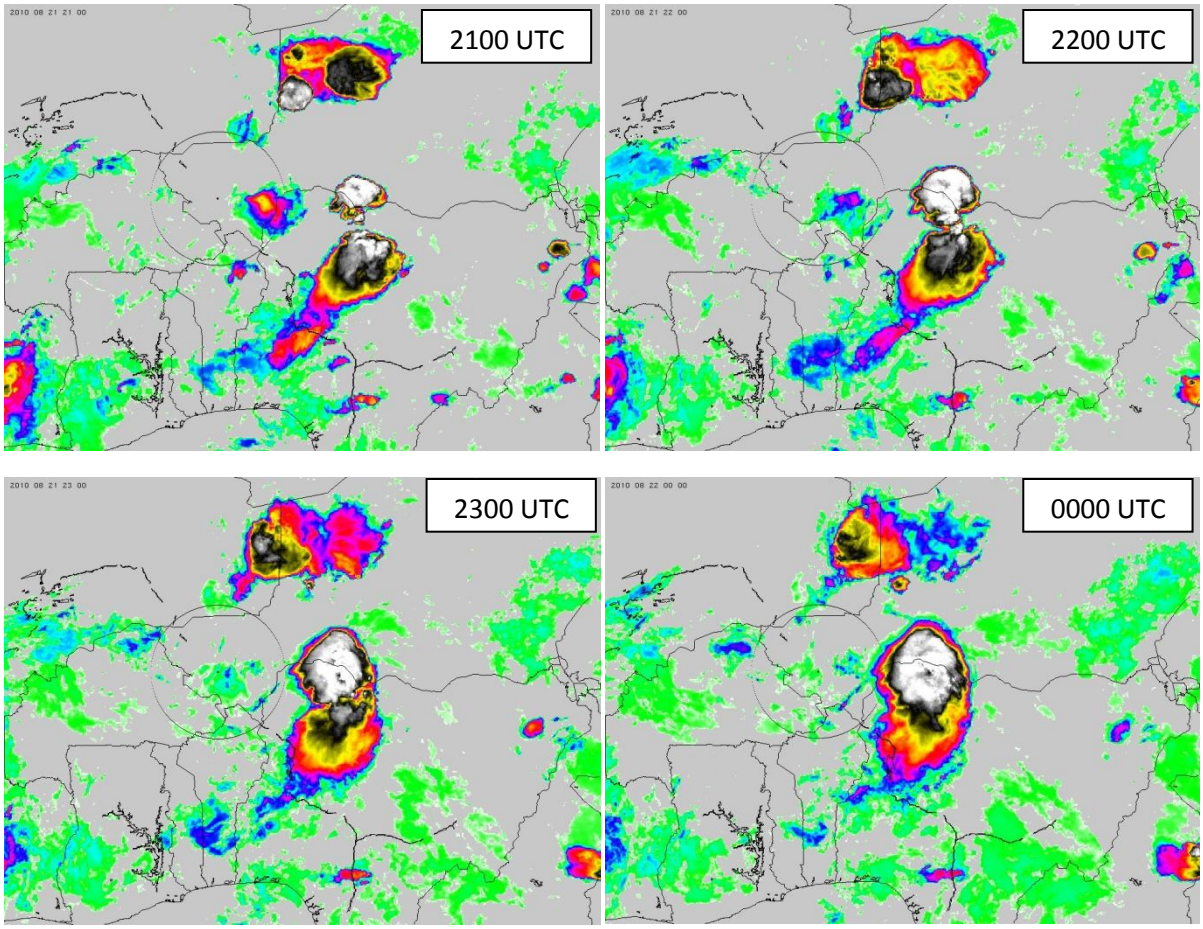

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
07:58:11Z
21 AUG 2010 UTC
Reflectivity in dBZ

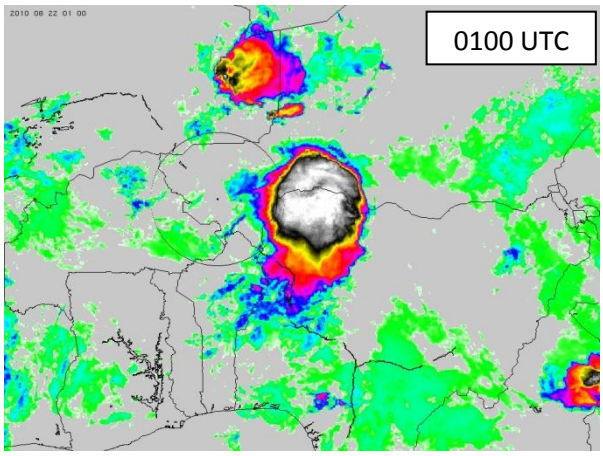

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
08:28:11Z
21 AUG 2010 UTC
Reflectivity in dBZ

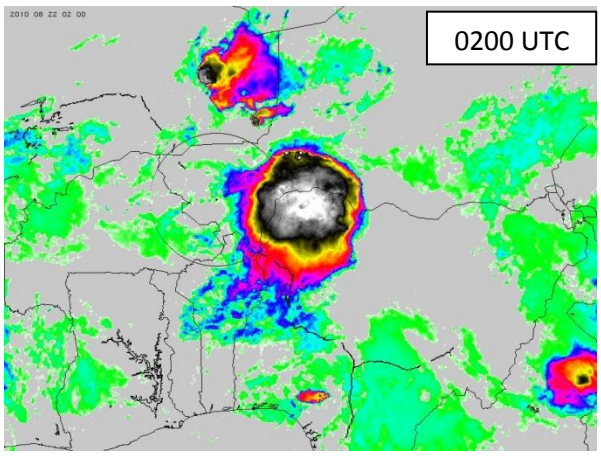

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
08:58:11Z
21 AUG 2010 UTC
Reflectivity in dBZ

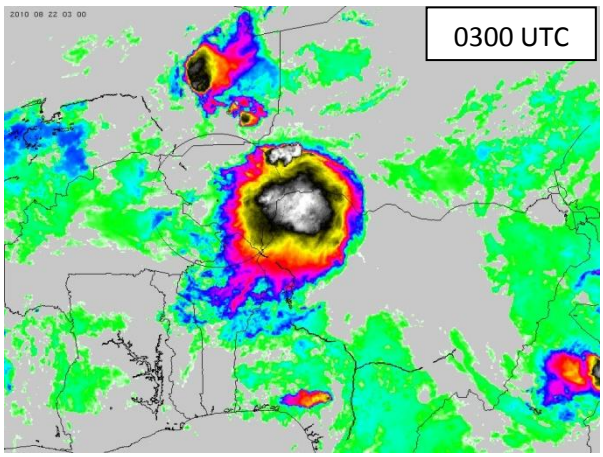
Flight # 8 22 August 2010 : Take-off at 0450 UTC, Landing at 0720 UTC

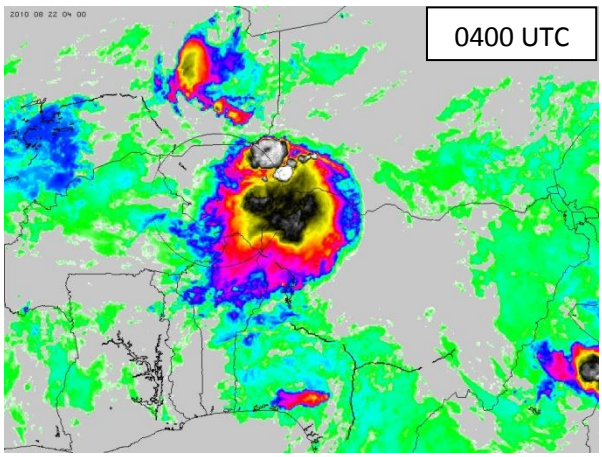
A complex situation throughout the day. Two large convective cells merged from 2100 UTC on 21 August to 0000 UTC on 22 August. The resulting convective cell grew rapidly and decision to fly was made at 0100 UTC. While preparing for take-off the situation changed rapidly, with the target cell decaying and leaving a trailing stratiform precipitation area, and many small new cells growing rapidly to form a new convective complex on the northeast corner of the MIT radar coverage. Started the flight by sampling the remnant stratiform produced by the southernmost cell using a "racecourse" pattern and then moved quickly to the rear of the well-developed leading convective line (the most intense since the beginning of the experiment) to perform a second "racecourse" pattern. Unfortunately the Falcon has been struck by lightning at 0627 UTC and this pattern has been interrupted at FL 270. The lightning activity near the convective line was much higher than during the previous night flight (17-18 august).

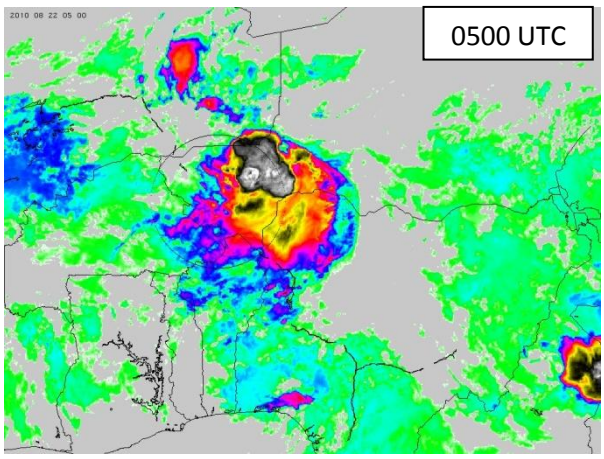


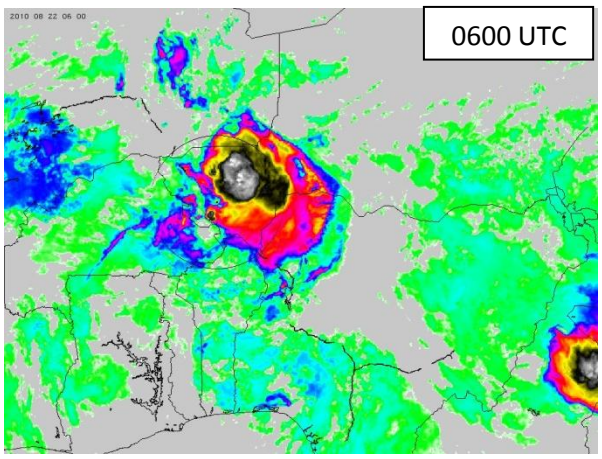

0100 UTC

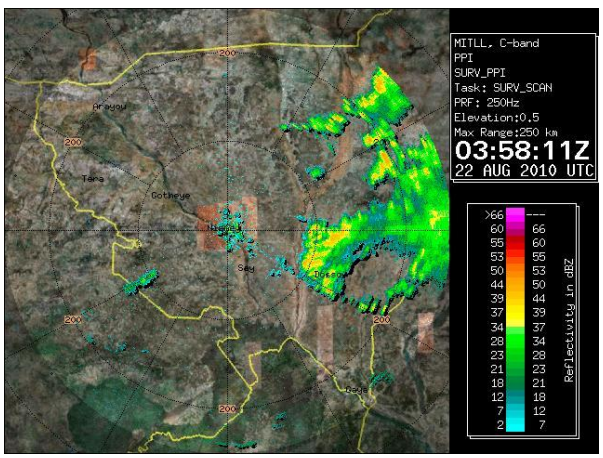

0200 UTC

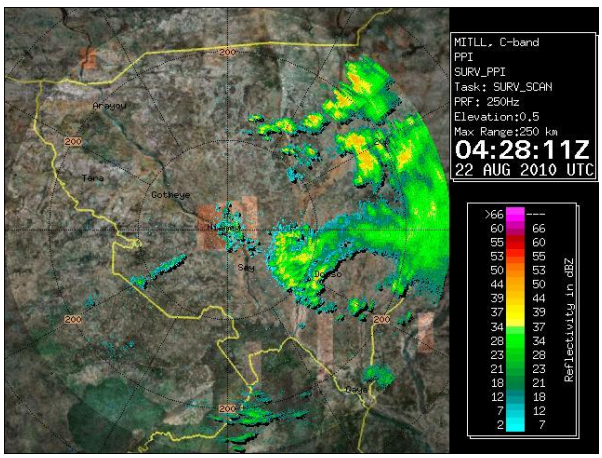

0300 UTC

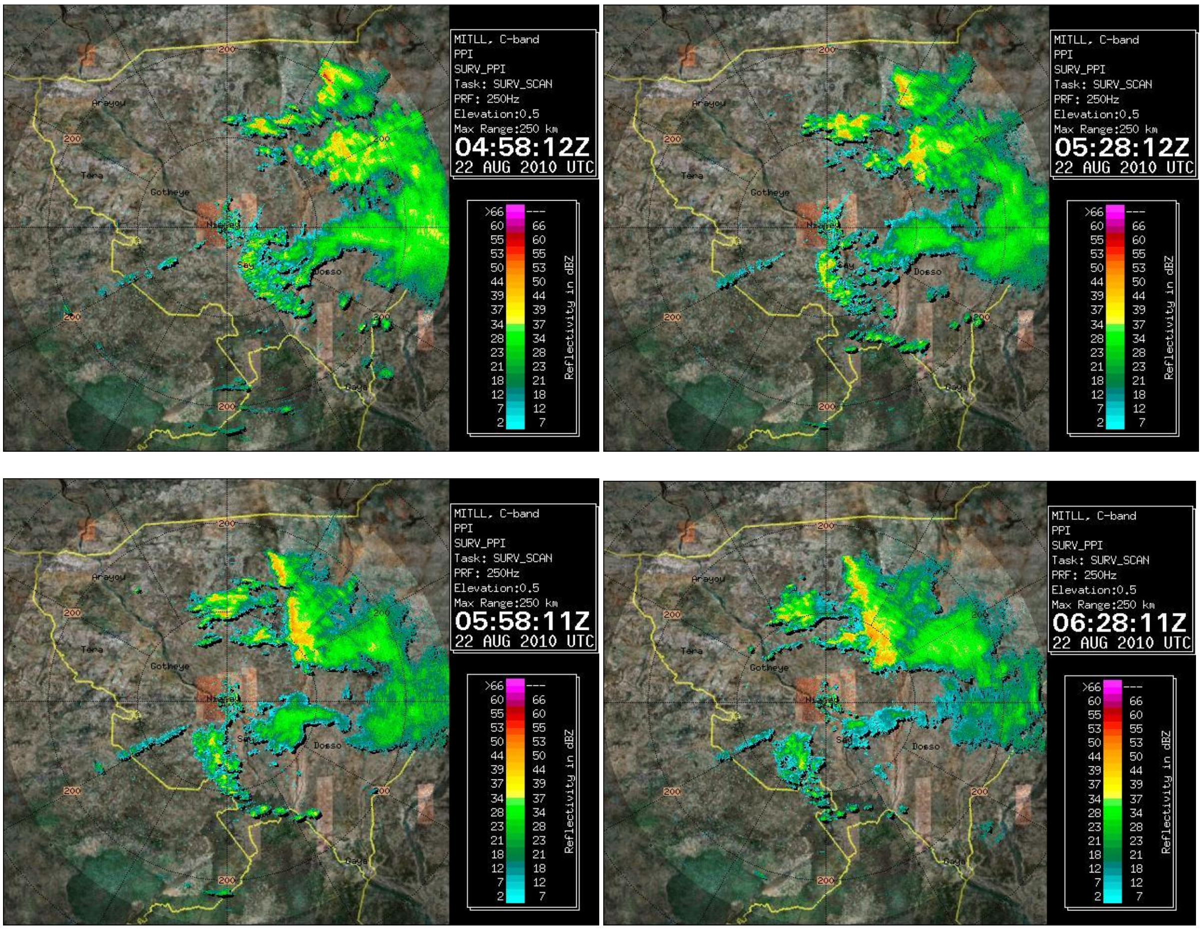

0400 UTC


0500 UTC


0600 UTC

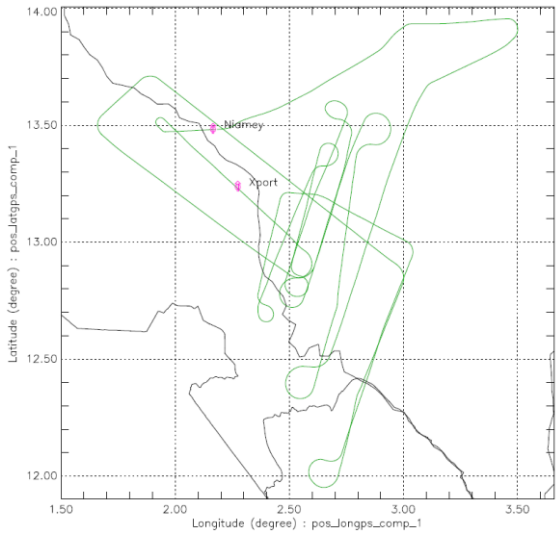

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
03:58:11Z
22 AUG 2010 UTC
Reflectivity in dBZ

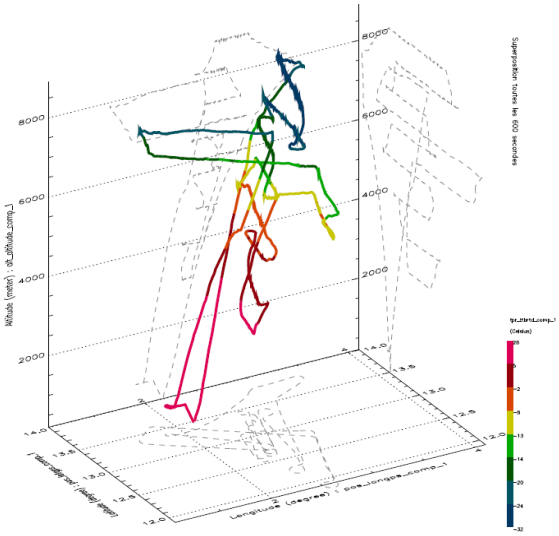

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
04:28:11Z
22 AUG 2010 UTC
Reflectivity in dBZ

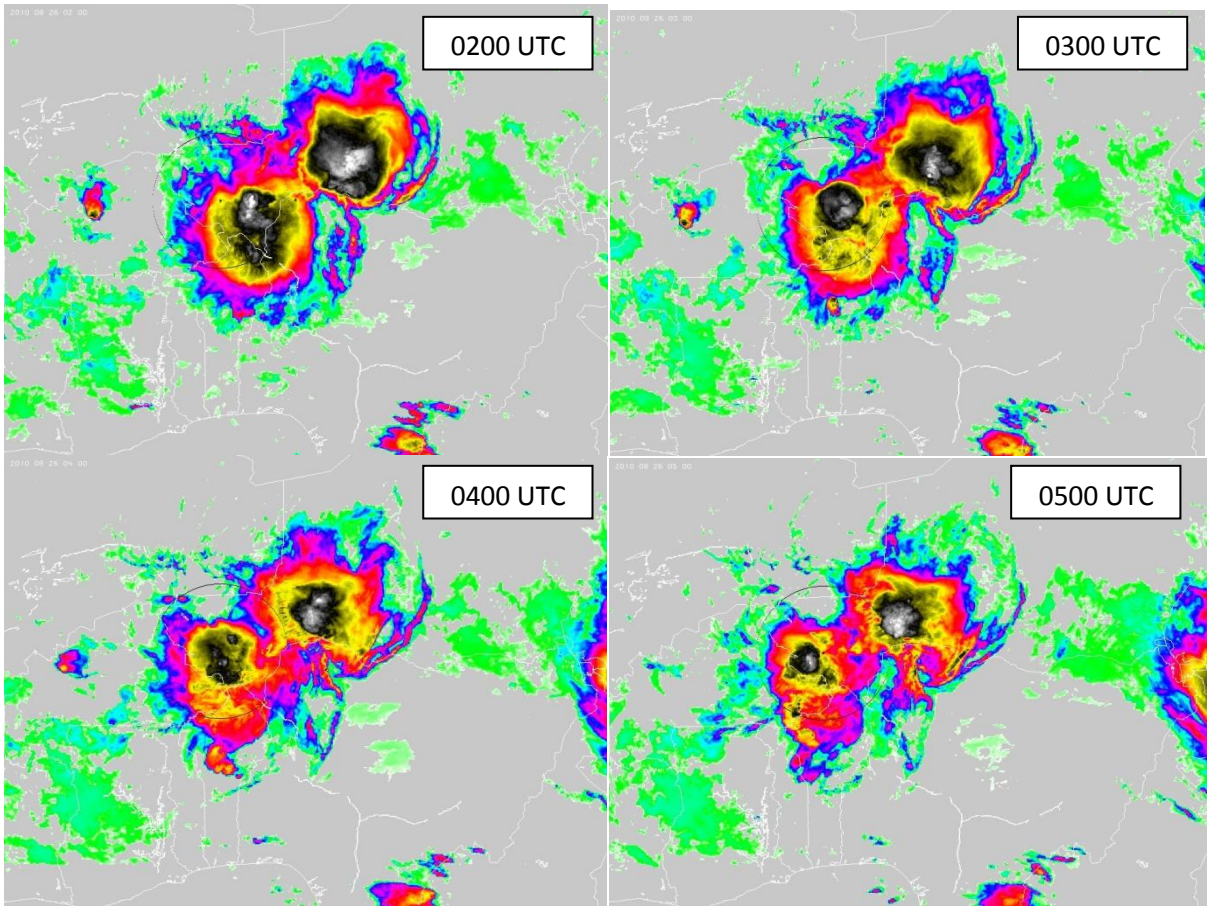

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
04:58:12Z
22 AUG 2010 UTC
05:28:12Z
22 AUG 2010 UTC
05:58:11Z
22 AUG 2010 UTC
06:28:11Z
22 AUG 2010 UTC
Reflectivity in dBZ
>66 ---
60 66
55 60
53 55
50 53
44 50
39 44
37 39
34 37
28 34
23 28
21 23
18 21
12 18
7 12
2 7
Arayou
Tera
Gotheye
Dosso
200

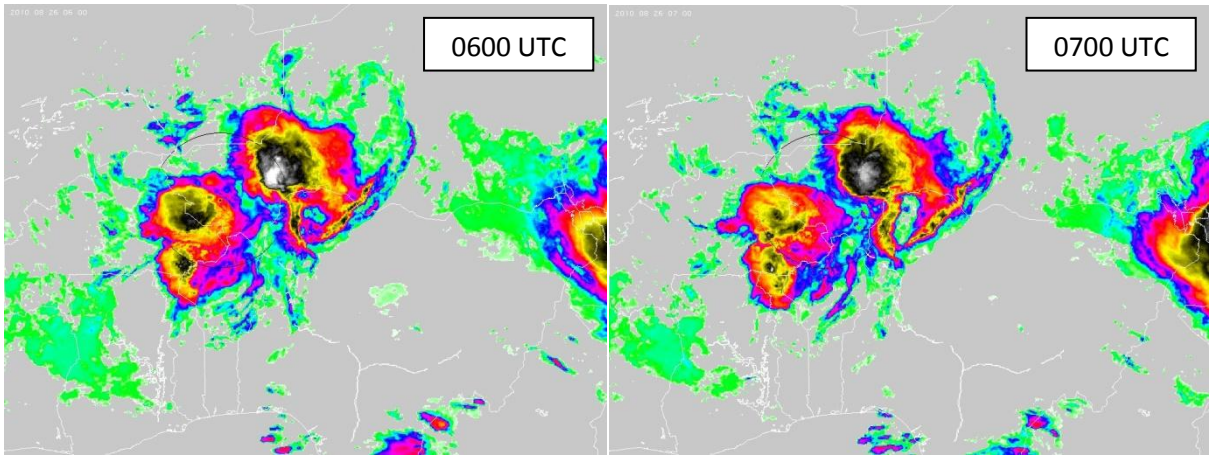
Flight # 9 25-26 August 2010 : Take-off at 0250 UTC, Landing at 0610 UTC

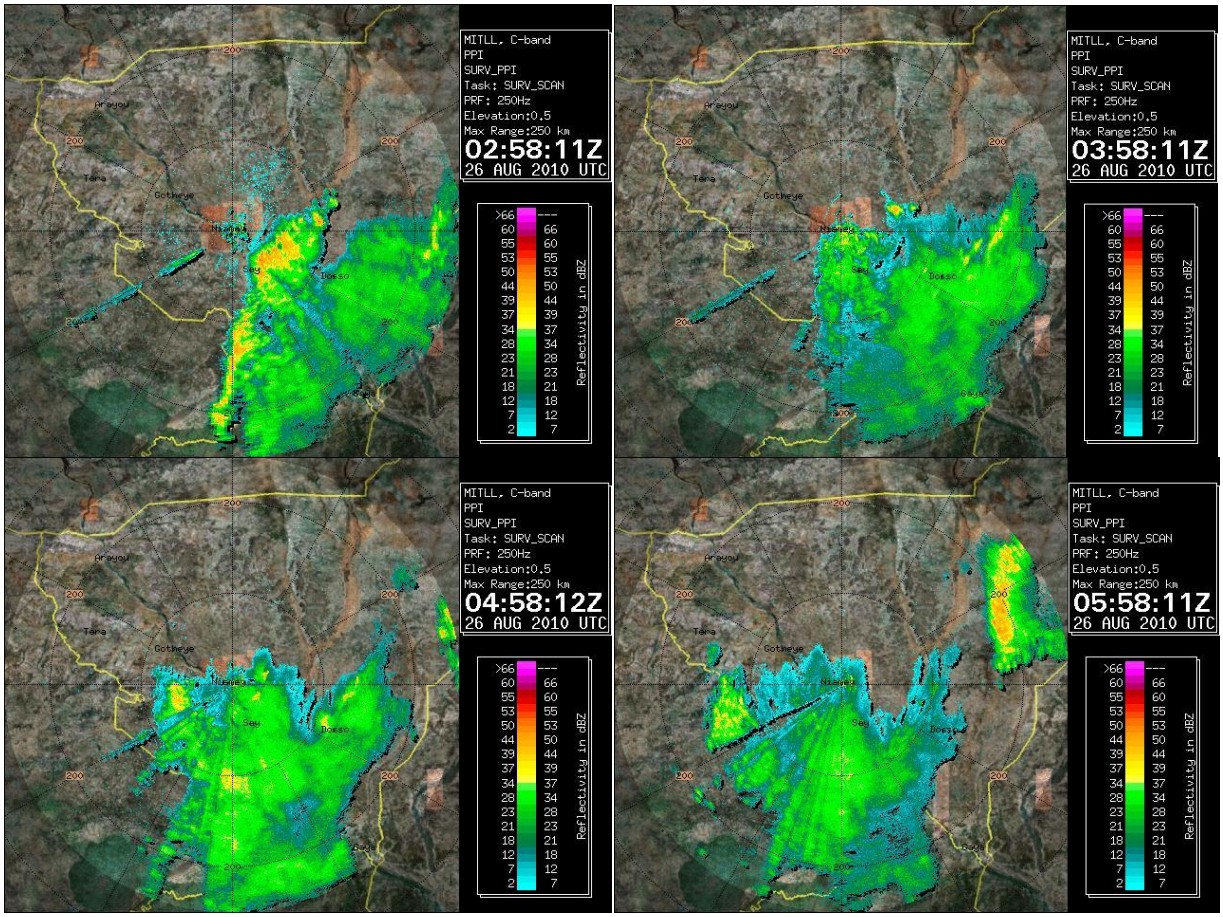
Multiple fast-moving cells approaching from the east of the sampling domain, aligned along a southwest-northeast axis since 1500 UTC on the 25 august. Very unusual development of convective cells in the middle of the cloud system (instead of the front part). After checking with MIT RHIs this impression was due to a very developed forward anvil, much more widespread than usual. Two southernmost cells merged and contributed to significantly enhance the convective activity in this area, which was chosen as the target for the flight. Then, early in the flight the south part of the convective line decayed and the northernmost part of the line re-developed very rapidly.





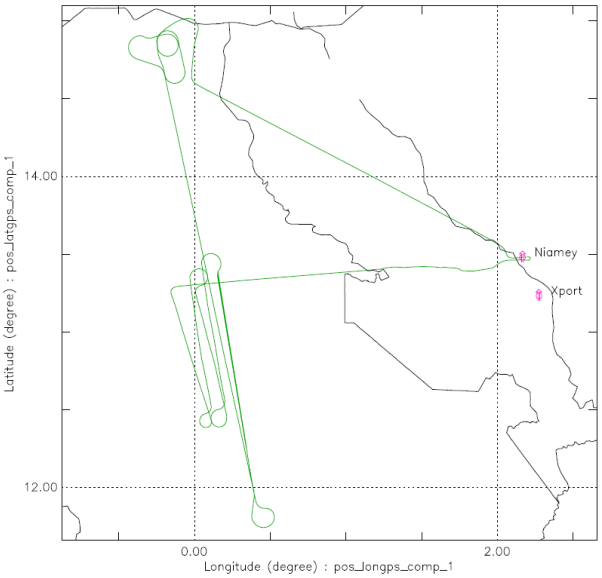


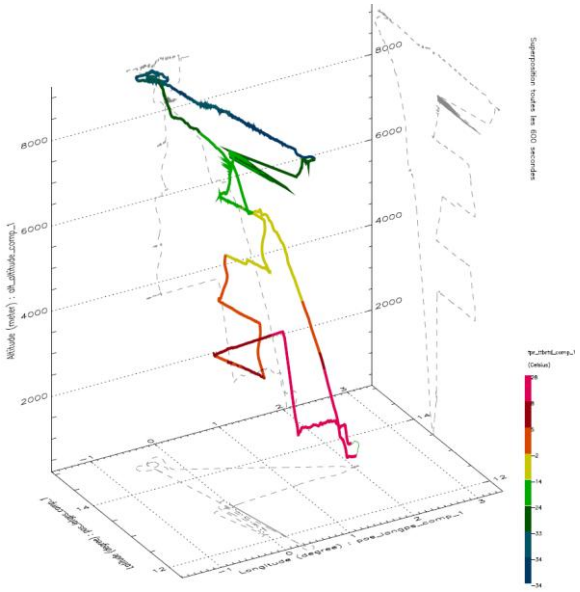

0600 UTC
0700 UTC

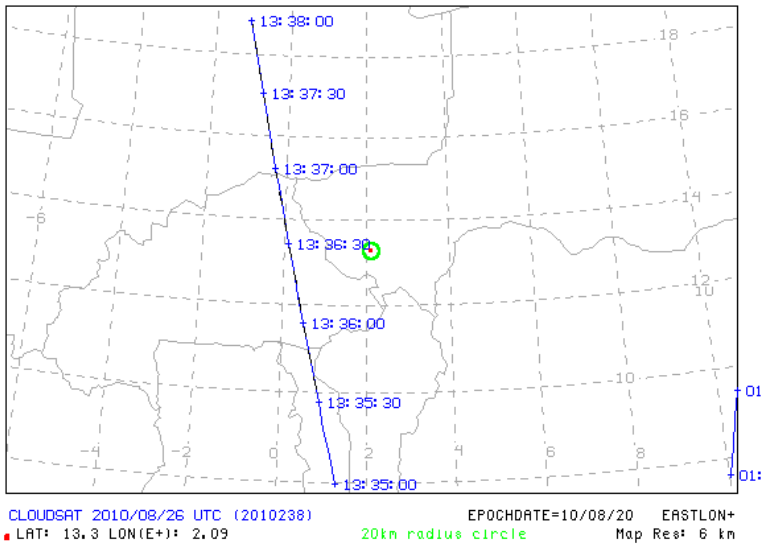

MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
02:58:11Z
26 AUG 2010 UTC
03:58:11Z
26 AUG 2010 UTC
04:58:12Z
26 AUG 2010 UTC
05:58:11Z
26 AUG 2010 UTC
Reflectivity in dBZ

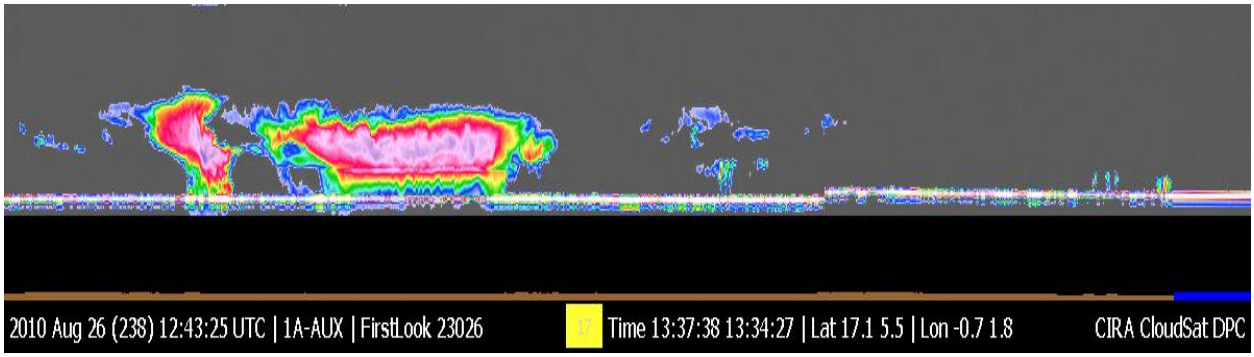
Flight # 10 26 August 2010 : Take-off at 1230 UTC, Landing at 1530 UTC

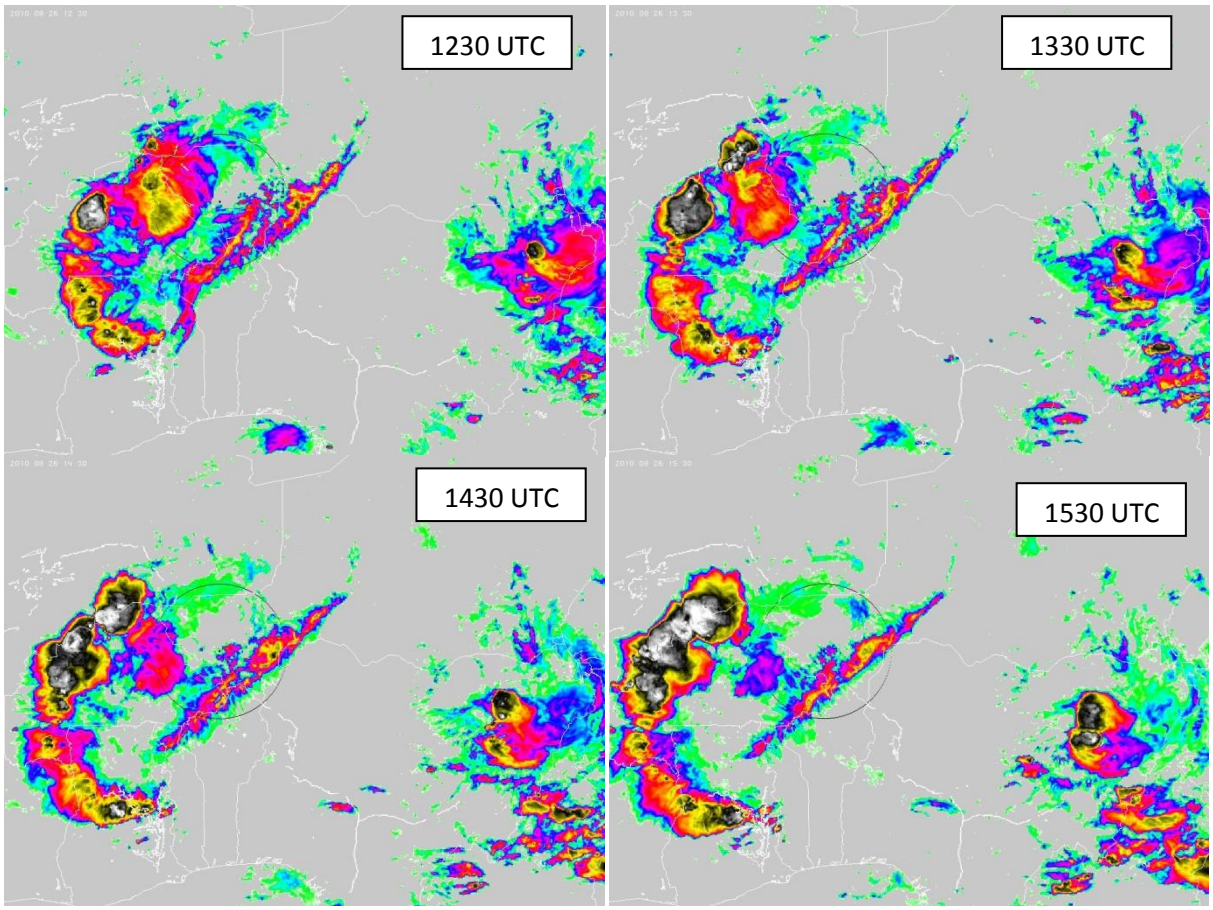
This flight is planned under the CloudSat-CALIPSO track in order to calibrate the RASTA radar. It turned out to be an excellent Megha-Tropiques flight, with the proximity to convective cells and widespread stratiform area in which we flew. One of the cells dissipating from the night-time activity re-developed in the area of interest when taking off.







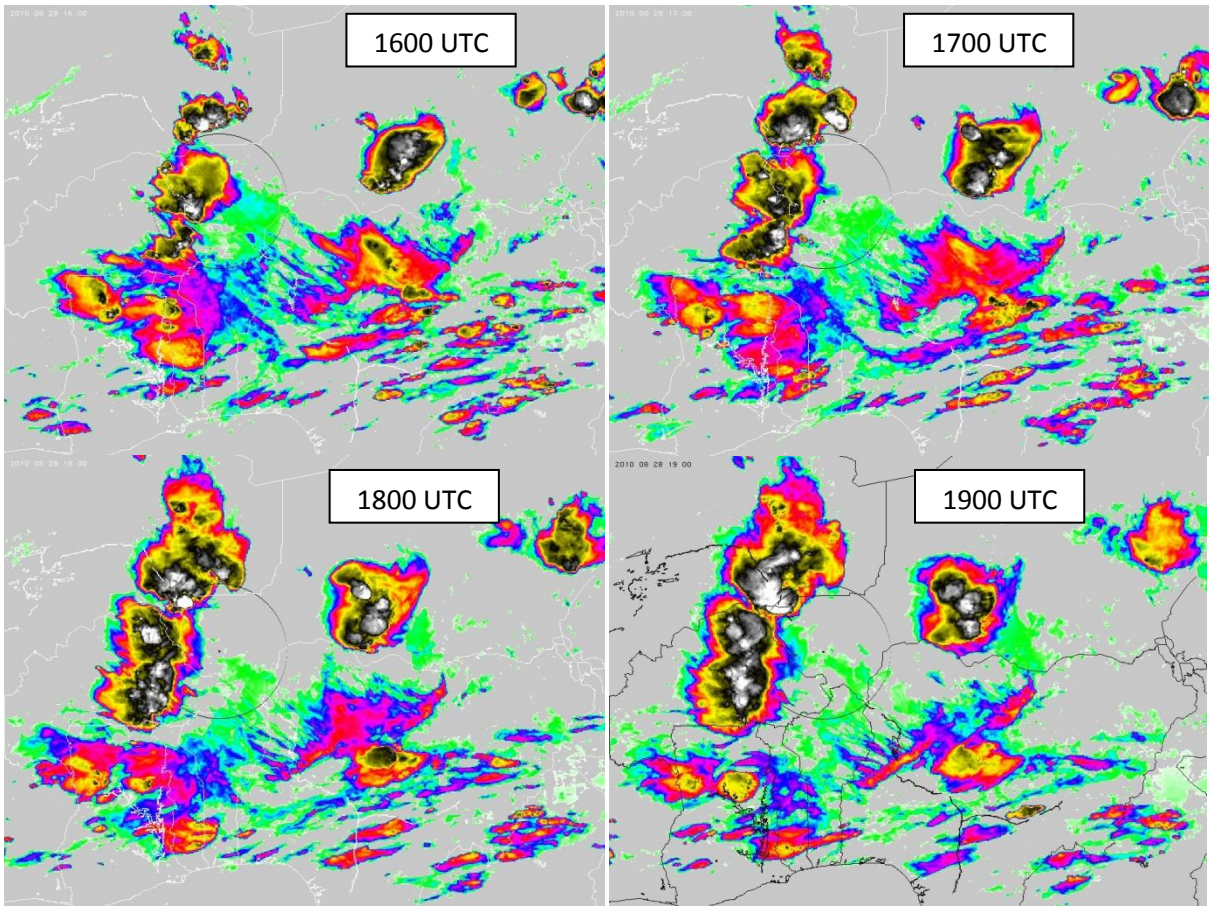


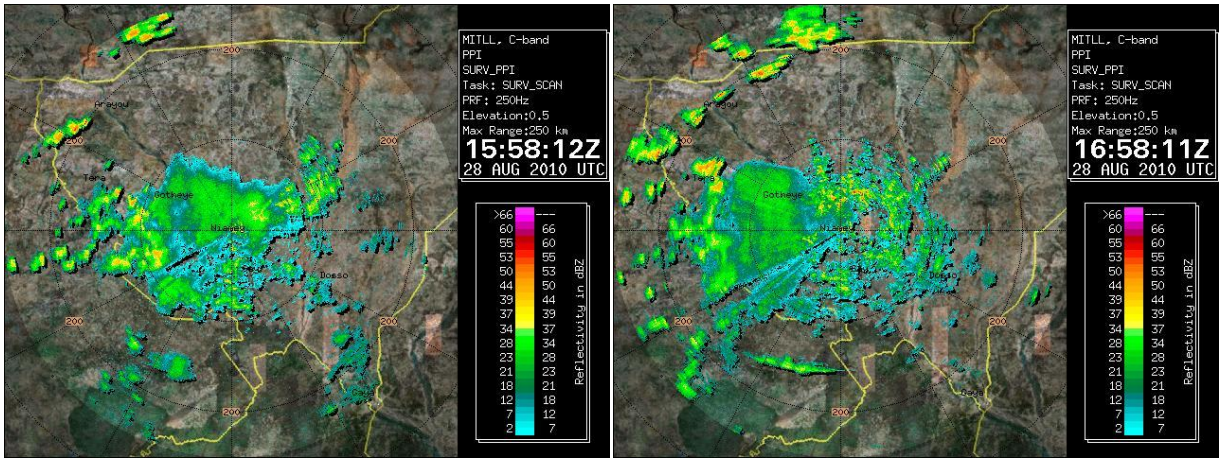


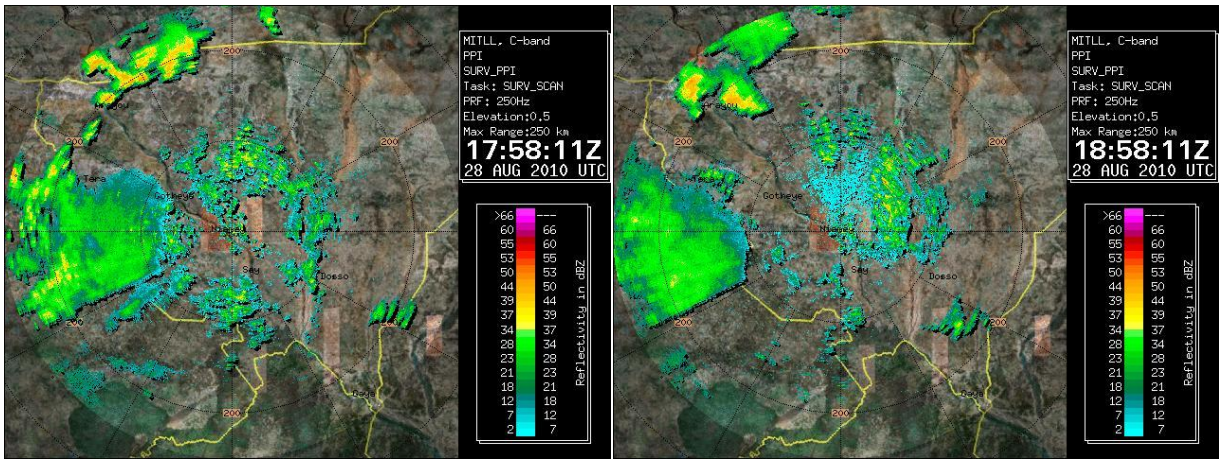
No MIT image since the sampling was done outside the MIT 250 km range (to the west).

Flight # 11 28 August 2010 : Take-off at 1600 UTC, Landing at 1900 UTC

No Safire data yet …






MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
17:58:11Z
28 AUG 2010 UTC
>66 ---
60 66
55 60
53 55
50 53
44 50
39 44
37 39
34 37
28 34
23 28
21 23
18 21
12 18
7 12
2 7
Reflectivity in dBZ
MITLL, C-band
PPI
SURV_PPI
Task: SURV_SCAN
PRF: 250Hz
Elevation:0.5
Max Range:250 km
18:58:11Z
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>66 ---
60 66
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34 37
28 34
23 28
21 23
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12 18
7 12
2 7
Reflectivity in dBZ