

Aerosondes in CAMEX 4



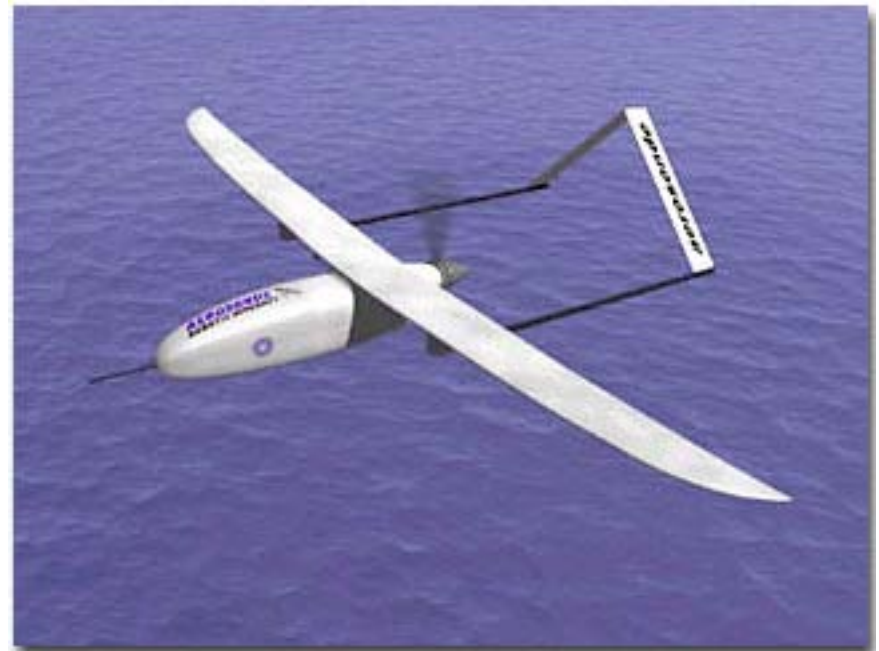
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www.aerosonde.com

Aerosonde Features

- Robotic operation
- Relatively low cost
- Low risk
- Long range
- Low speed
- Large altitude range
- Maneuverability
- Low overhead



Aerosonde Robotic Aircraft Mark 3

Weight	14 kg
Wing span	2.9 m
Engine	24 cc, fuel injected
Speed	32 m/s
Range, Endurance	>3000 km >30 hrs
Altitude range	100 m - > 6 km
Payload	2 kg with full fuel load



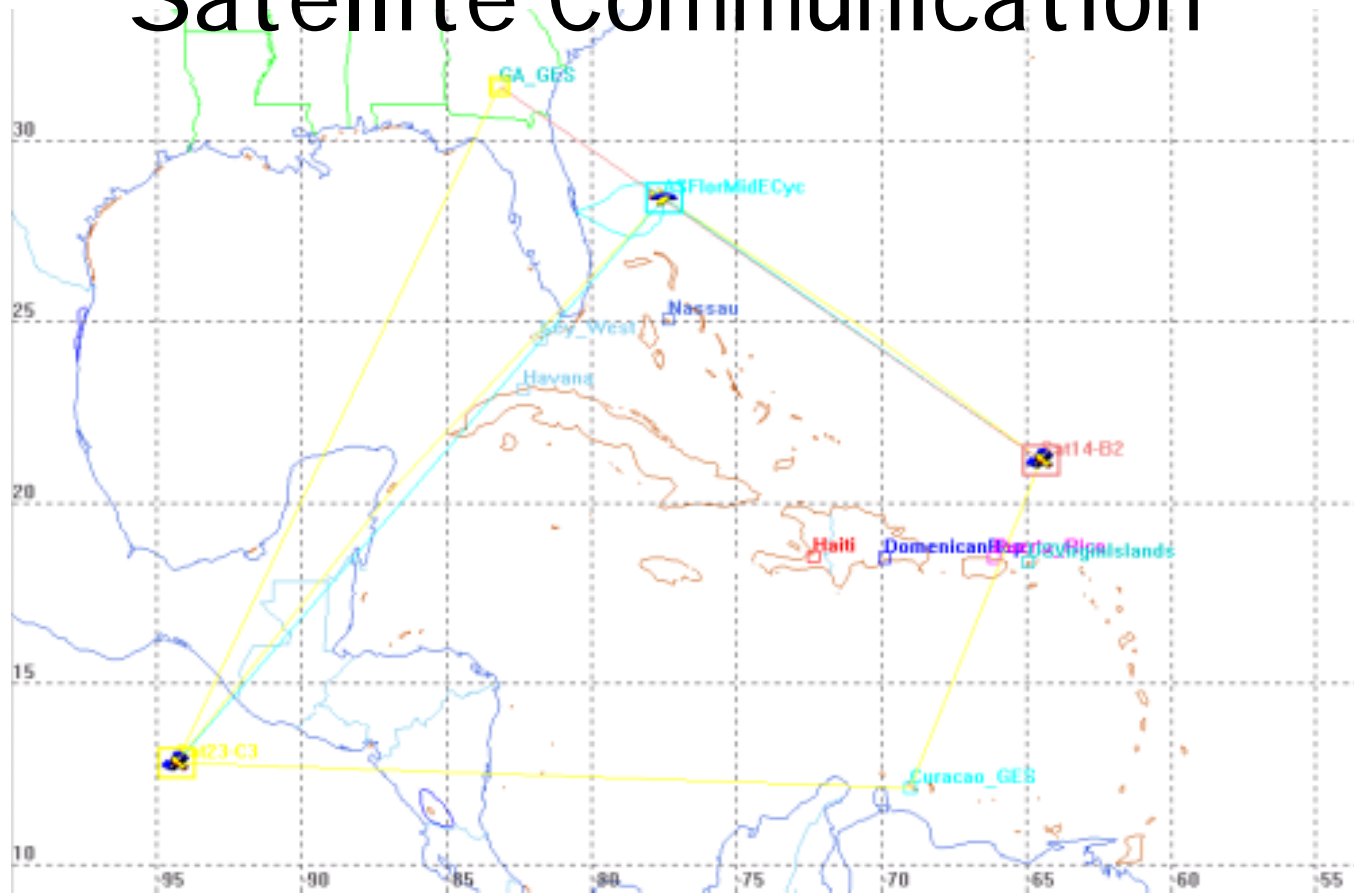
The scientific objectives Aerosonde missions during CAMEX are to:

- Document and analyze the mesoscale circulations in mesoscale convective systems embedded within the tropical cyclone.
- Provide comprehensive horizontal analysis of the boundary-layer structure in the high wind region.
- Examine the impacts of the mesoscale convective systems on their larger-scale environment.

Risk Assessment

- Ten major risk Areas were assessed for the NASA Flight Safety Review Board, including:
 - Collision with other vehicles;
 - Failure of a critical component.
- Aerosonde was the first UAV to pass a NASA review for operation with other manned aircraft.

Satellite Communication



Map displaying location of closest Orbcomm gateways in Georgia and Curacao. Continuous communication accomplished 61% of the time. Longest period with no coverage is 29 minutes.

Aerosonde Virtual Field Environment

The interface displays a satellite map of Florida with a flight path overlaid. The path starts at a point labeled '190' and proceeds towards the east coast, with waypoints '31', '1', and '32' marked. A white aircraft icon is positioned on the path. The map includes a grid and various overlays like a red boundary line.

Aerosonde Panel:

- Z In, Z Out
- Pan, Center
- Reset, UsrMap
- Layers:
 - Base Map
 - Raster Map
 - Landmarks
 - User Map
 - Relief Layer
 - Flight Plans
 - Echoed plans
 - Wind/PTU

Flight ... Panel:

- New, Open, Delete, Save, Upload, Select, Close

Tracking Panel:

- Waypoint: 95
- Mode: Tracking

GPS Panel:

- Age: 3.67 [min]
- Longitude: -80.5349 [deg]
- Latitude: 30.4847 [deg]
- Altitude: 163 [m]
- Speed: 0.0 [m/s]
- Heading: 0 [deg]

Range and Bearing Panel:

- Altitude: 978 [ft]
- Range: 46 [nmi]
- Magnetic: 93 [deg]

From Panel:

- Longitude: -81.4255 [deg]
- Latitude: 30.3885 [deg]
- Variation: 10.0 [deg]

Flight data Panel:

- Age: 3.67 [min]
- Altitude: 298 [m]
- TAS: 25.1 [m/s]
- Alt CMD: 300 [m]
- TAS CMD: 24.9 [m/s]

Systems Panel:

- RPM: 5167
- Throttle: 0.43
- CHT: 93.1 [°C]
- Battery: 13.53 [V]
- Battery: 0.00 [A]
- Generator: 17.66 [V]
- Generator: 0.59 [A]

Satellite Messages Panel:

- Messages: 37
- GlobalGrams: 0
- Position Reports: 0
- Reports: 0

Navigation Panel:

- Nav0, Nav1, Nav2, Nav3, Nav4, Nav5, Nav6, Nav7

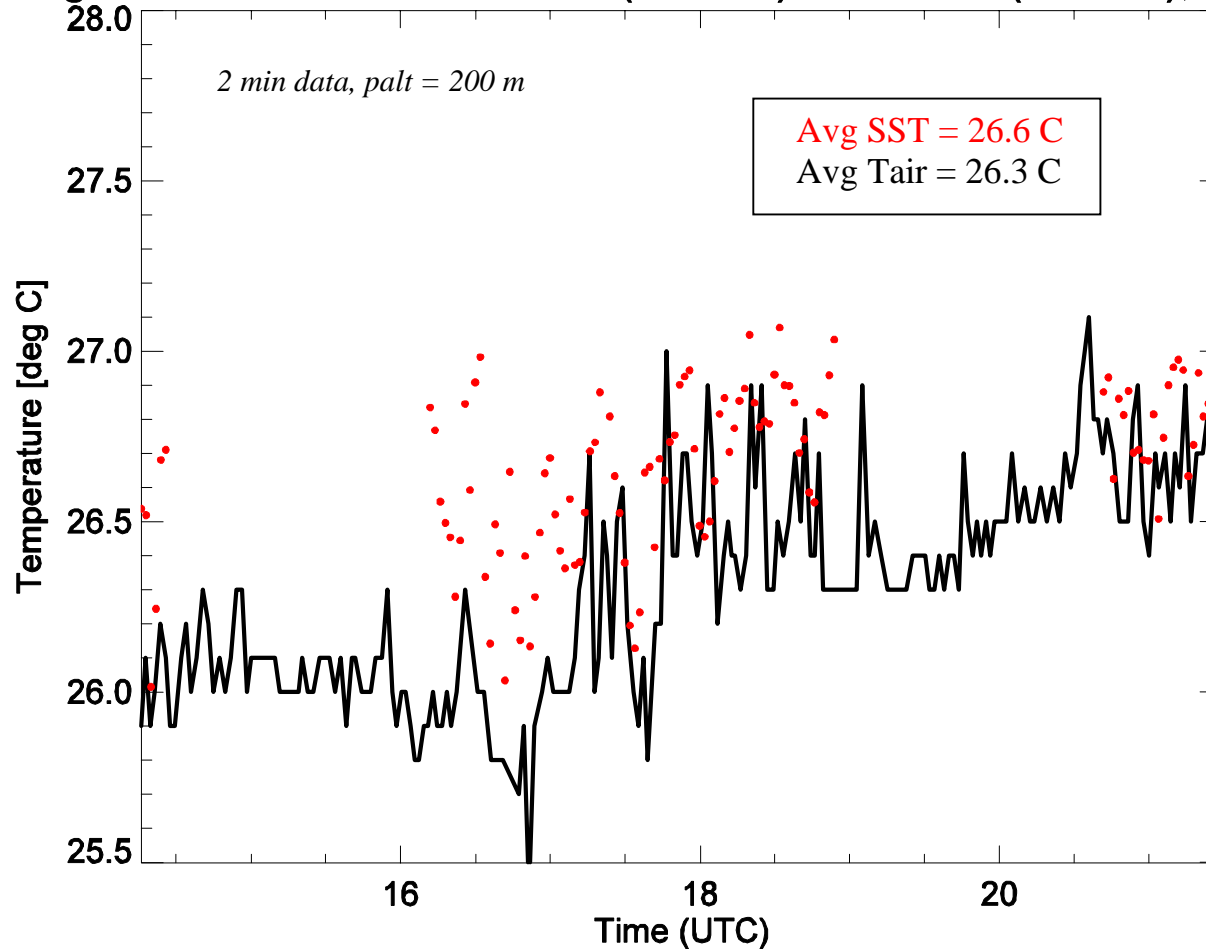
Mission Summary

Date	Launch time (Z)	Landing time (Z)	Flight duration	Comments
Aug 19	18:19	20:52	2:33	NASA Flight Safety Review
Aug 22	10:53	22:13	11:20	Local Storms
Aug 23	12:43	13:06	0:23	Short publicity flight for NASA video crew
Aug 24–25	18:00 (24th)	14:02 (25th)	20:02	Low-level Mission near Tropical Wave “Dean”.
Aug 28	11:07	22:00	10:53	Local Convective Systems.
Aug 30	11:14	22:37	11:23	Local Convective Systems.
Sep 4	11:35	22:31	10:56	Local Convective Systems, with KT-11 pyrometer.
Sep 6	11:27	22:25	10:58	Local Convective Systems with NASA DC-8.
Sep 8-9	19:21 (8th)	16:24 (9th)	21:03	Local Convective Systems.

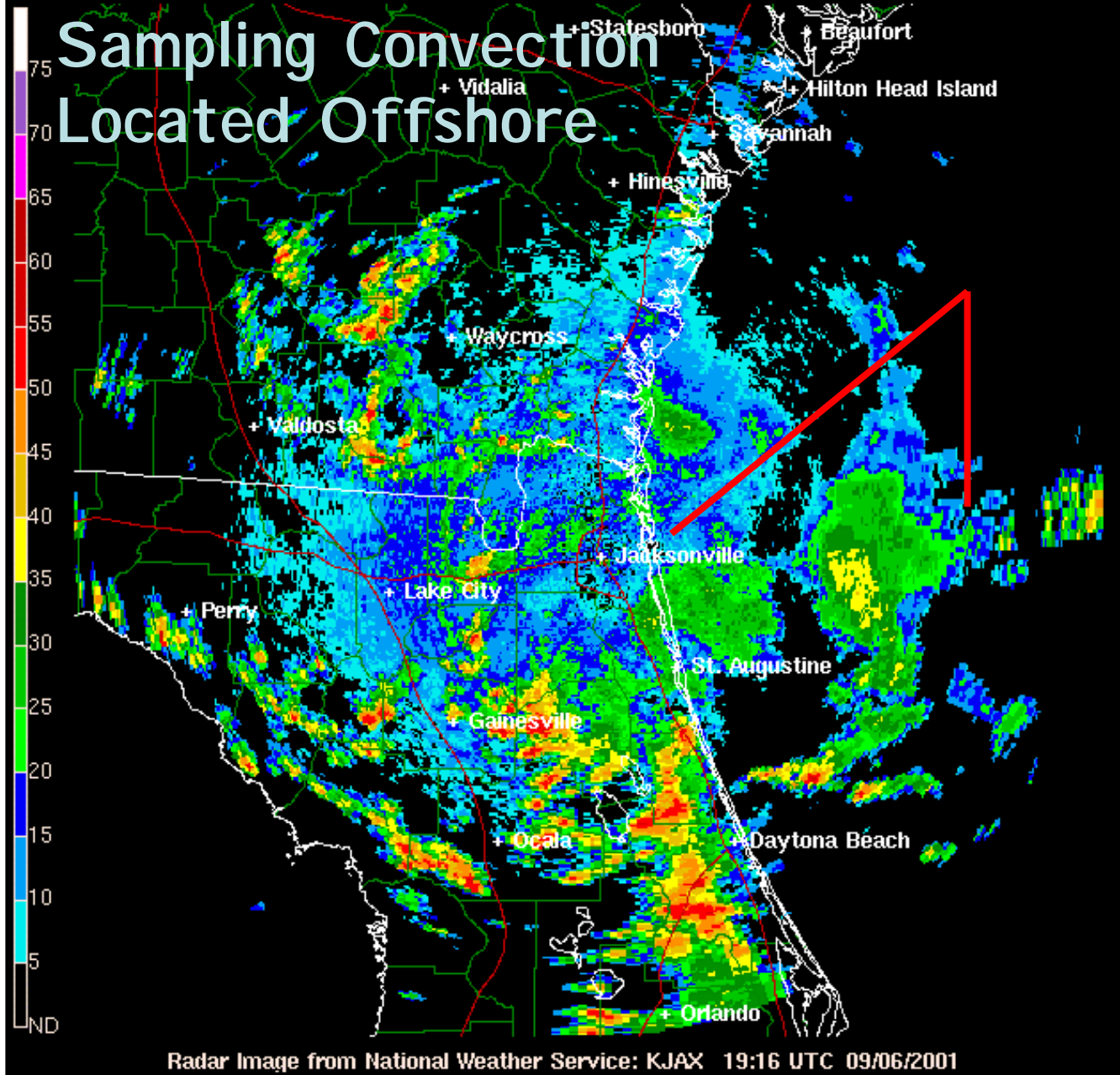
Total Flight Hours = 98:33

SST and Surface Air Temperatures

Flight: Sortie7 Times: 09-04-01 (14 UTC) - 09-04-01 (21 UTC), 990 mb



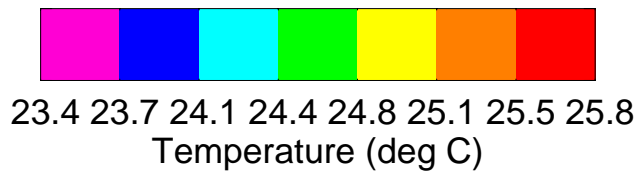
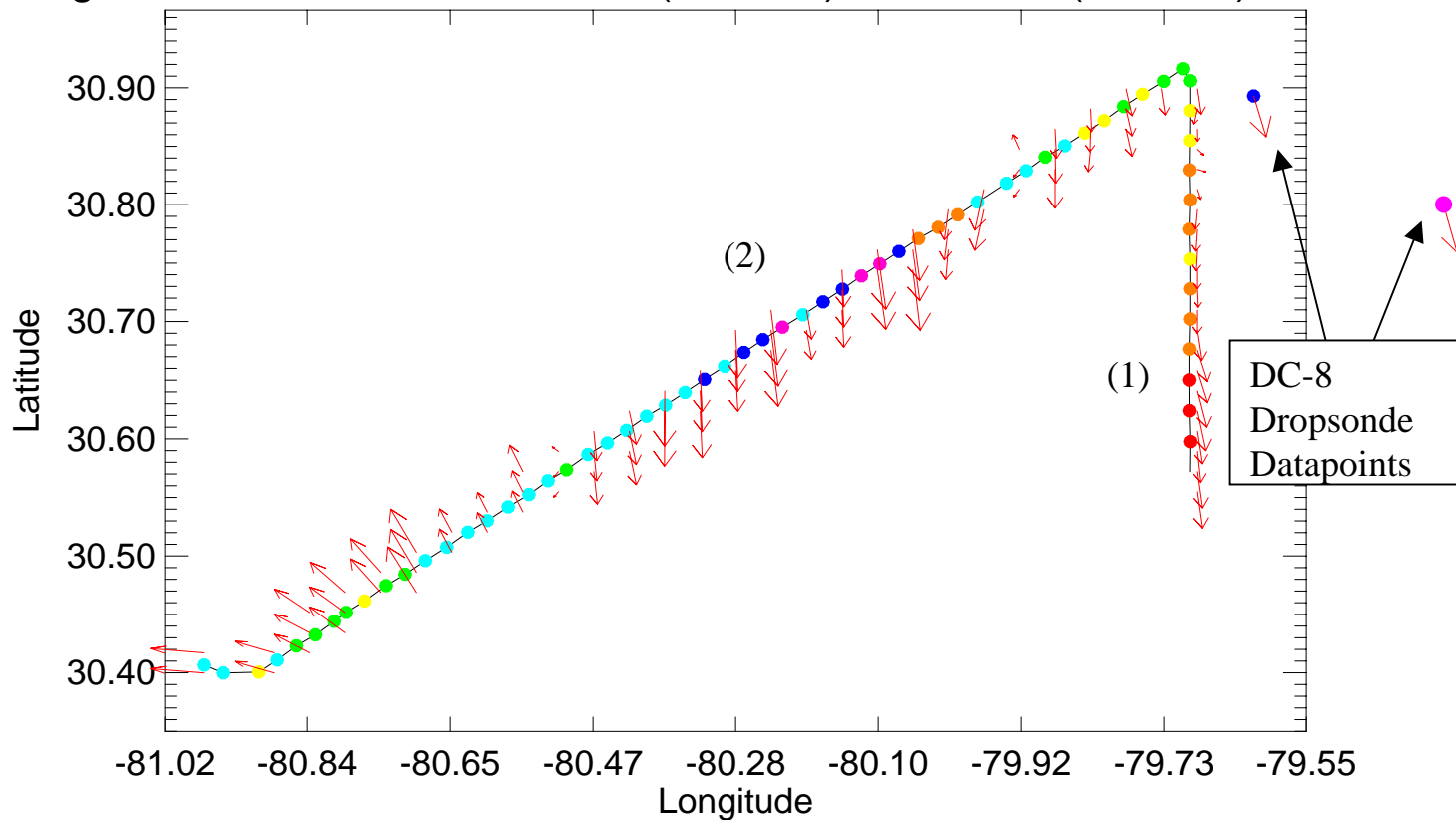
Sampling Convection Located Offshore



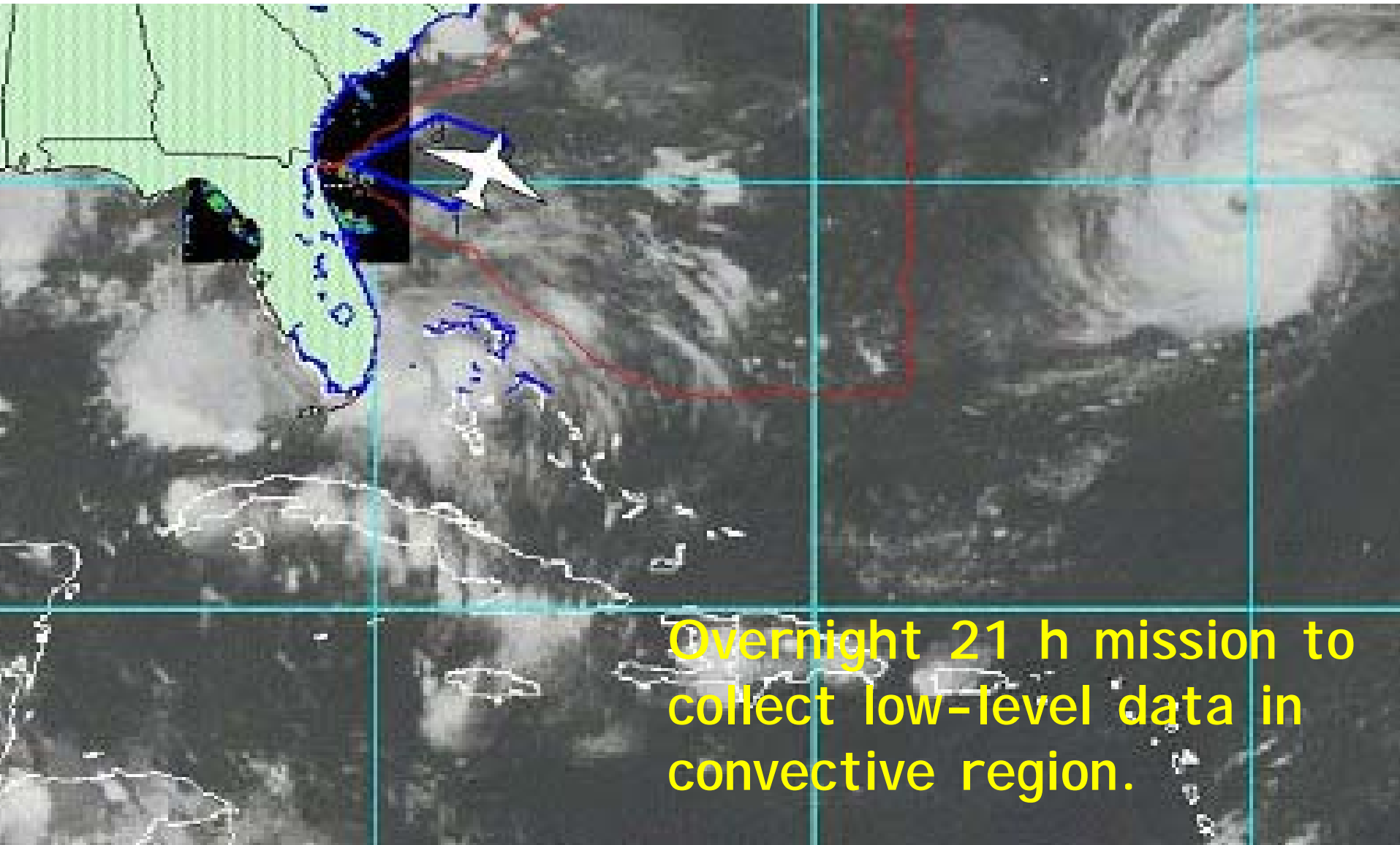
Radar Image from National Weather Service: KJAX 19:16 UTC 09/06/2001

Mesoscale Variations in a Convective Environment

Flight: Sortie8 Times: 09-06-01 (18 UTC) - 09-06-01 (20 UTC), 1000 mb



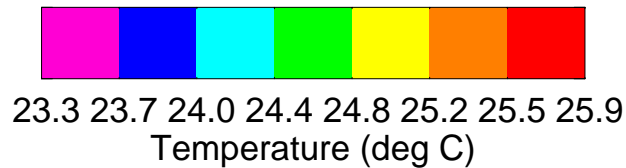
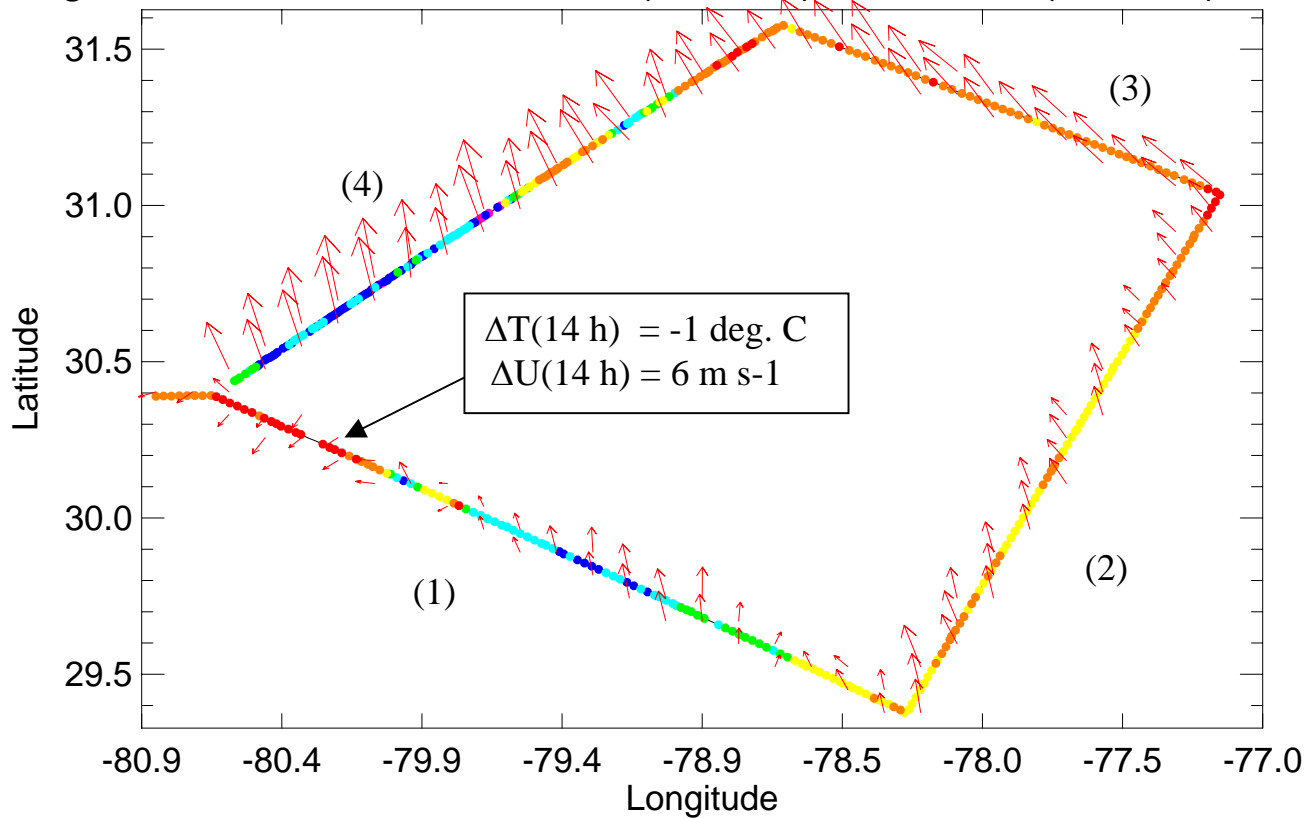
September 8 and 9



Overnight 21 h mission to collect low-level data in convective region.

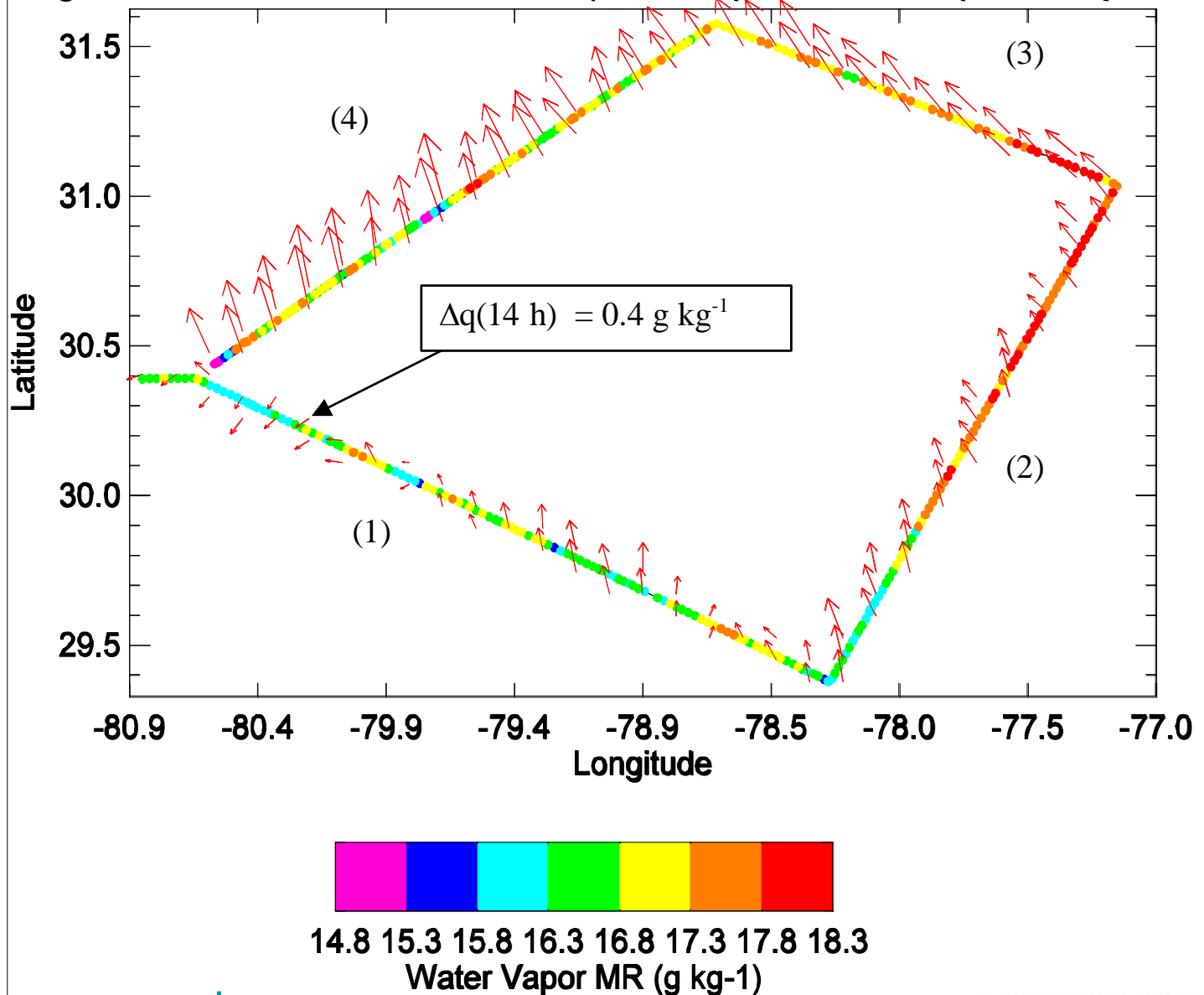
Mesoscale Variations in a Convective Environment

Flight: Sortie9 Times: 09-08-01 (21 UTC) - 09-09-01 (11 UTC), 988 mb



Mesoscale Variations in a Convective Environment

Flight: Sortie9 Times: 09-08-01 (21 UTC) - 09-09-01 (11 UTC), 988 mb



Thank You

