

**IOP-13 Summary of Operations**  
**16 January 2010, 1200 UTC – 17 January 2010 0000 UTC**

**Authors: Rauber, Jewett, Knupp, Market**

**1. Summary of storm evolution**

The IOP-13 storm originated over the Gulf of Mexico and moved northward across the southeastern United States. The storm formed in association with a broad trough with a weak embedded short wave that moved across Mexico and swung northeastward over the Gulf (Fig. 1). The low made landfall near Biloxi, MS and propagated northeastward across Alabama, passing almost directly over Moulton, AL, the site of the MIPS deployment. Since this was the first day of the second half of PLOWS, we were unable to deploy the MISS this far south. The low then progressed northeastward into eastern Tennessee. The wrap-around region of the storm was initially poorly organized as it moved over Alabama, with a distinct dry slot hard to detect. Nevertheless, the deployed systems were positioned very well to sample the system. The MAX radar was sited for dual Doppler with HTX in Huntsville, AL and BMX in Birmingham, AL, which both ran VCP-11 scans. The dry slot did develop and move over the MIPS, but the site only resided in the dry slot for about 2 hours when the tail of the wrap around again wrapped over the site. The storm then pulled completely north of Alabama. The aircraft only provided a limited sample of this storm, flying to Huntsville and then immediately returning to Peoria because of a mechanical problem.

**2. Locations of instrumentation platforms**

|                                  |  |
|----------------------------------|--|
| MIPS Location:                   | 34° 29' 47.71" N 87° 16' 58.38" W      |
| Profiler Time of Operation MIPS: | 01/16/10 1710 UTC to 01/17/10 1630 UTC |
| MAX Location:                    | 34° 39' 18.11" N 87° 20' 56.36" W      |
| Radar Time of Operation MAX:     | 01/16/10 1930 UTC to 01/17/10 1620 UTC |
| MISS Location:                   | Not used                               |
| MO Location:                     | 34° 29' 47.71" N 87° 16' 58.38" W      |
| RF-06 Flight operations:         | 01/16/10 2113 to 01/17/10 0036 UTC     |

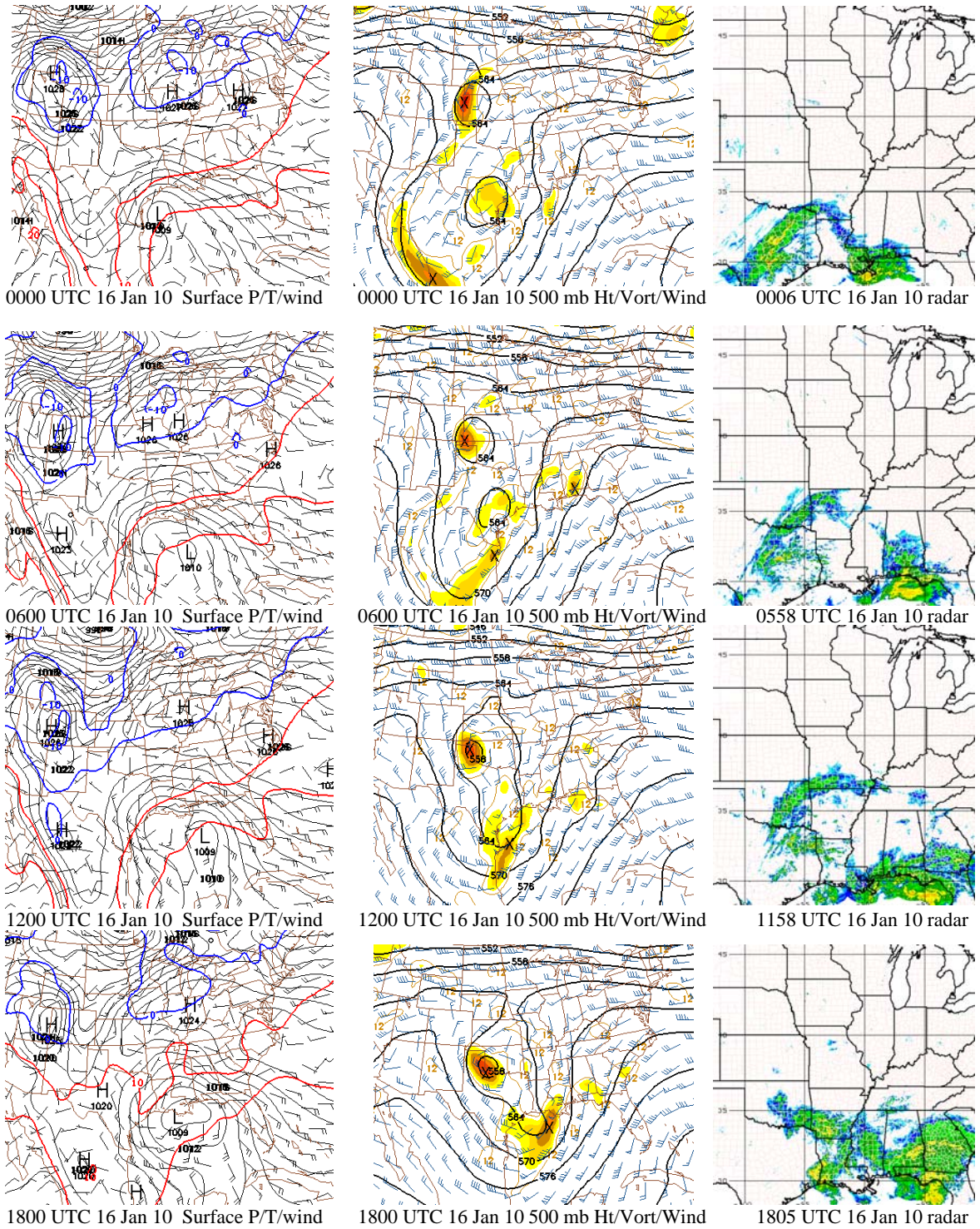


Figure 1: Evolution of the IOP-13 storm at the surface, 500 mb, and radar echoes from 0000 UTC 16 Jan 10 through 1800 UTC 16 Jan 10.

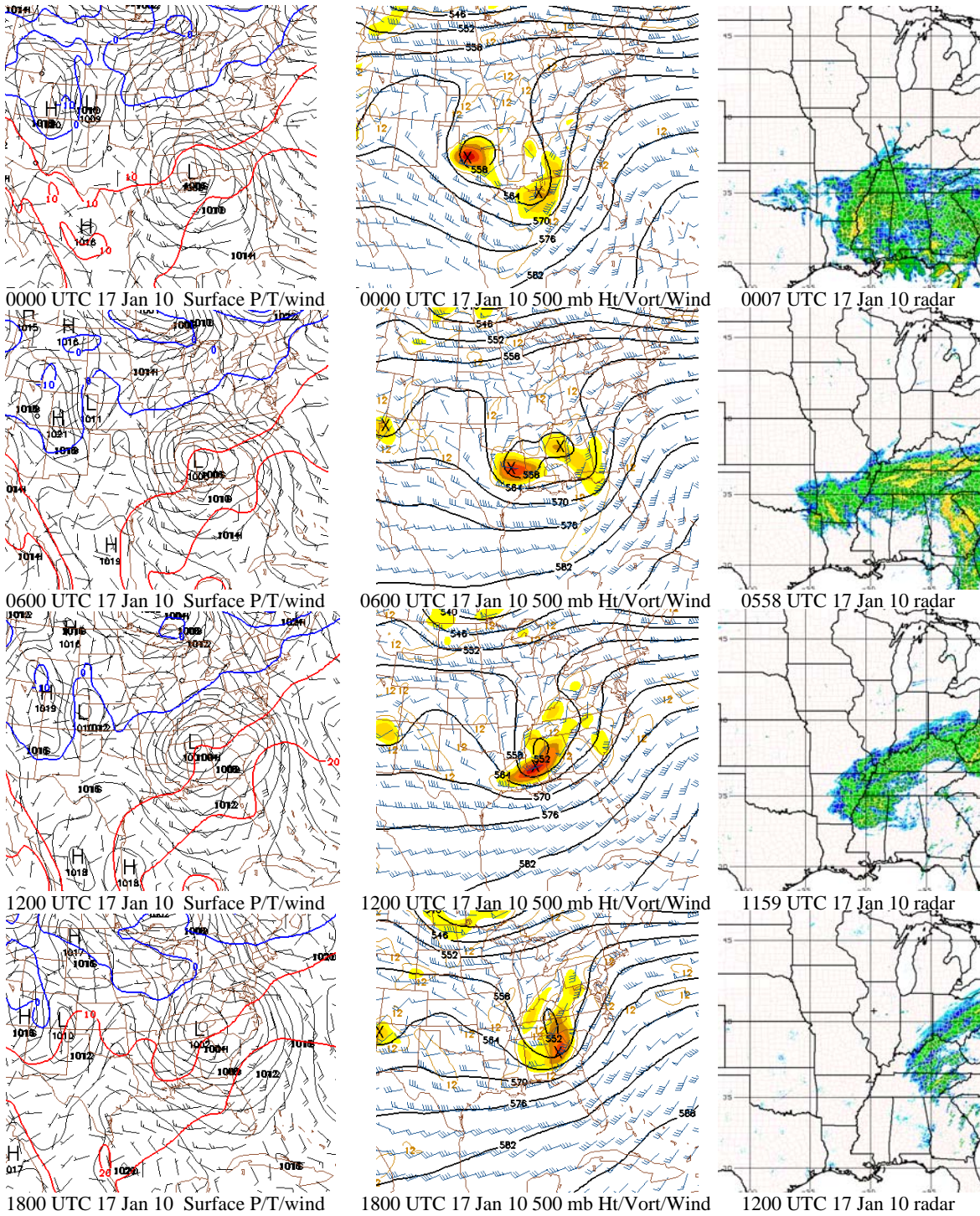
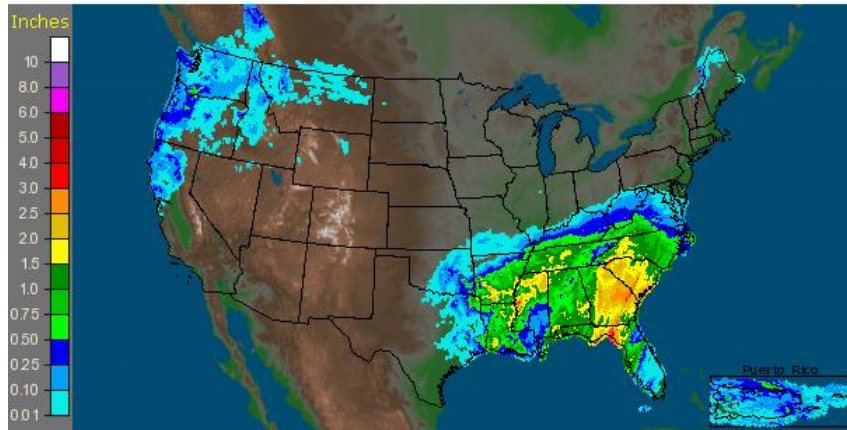


Figure 2: Evolution of the IOP-13 storm at the surface, 500 mb, and radar echoes from 0000 UTC 17 Jan 10 through 1800 UTC 17 Jan 10.



### 3. Precipitation over research area

CONUS + Puerto Rico: 1/17/2010 1-Day Observed Precipitation  
Valid at 1/17/2010 1200 UTC- Created 1/19/10 19:49 UTC



CONUS + Puerto Rico: 1/18/2010 1-Day Observed Precipitation  
Valid at 1/18/2010 1200 UTC- Created 1/20/10 11:31 UTC

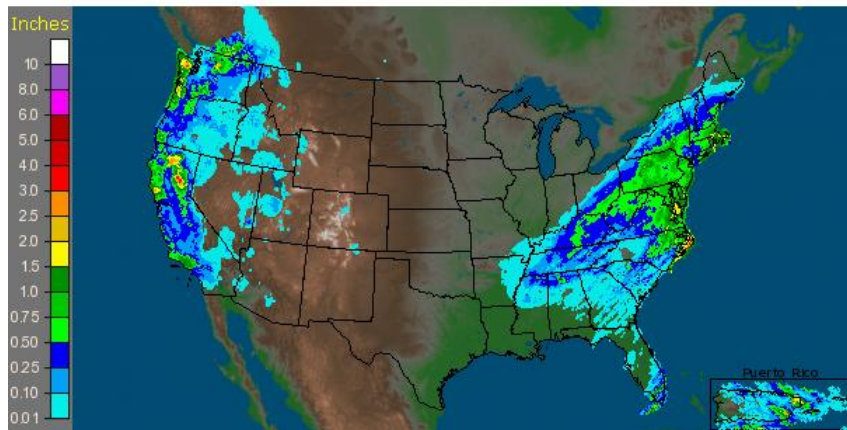
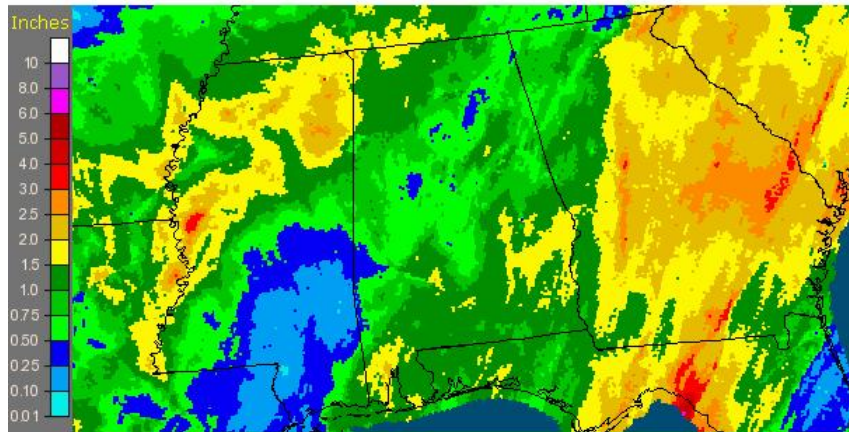


Fig. 3: 24 Hour precipitation ending at 1200 UTC 01/17/10, 1200 UTC 01/18/10 over the United States

Alabama: 1/17/2010 1-Day Observed Precipitation  
Valid at 1/17/2010 1200 UTC- Created 1/19/10 19:51 UTC



Alabama: 1/18/2010 1-Day Observed Precipitation  
Valid at 1/18/2010 1200 UTC- Created 1/20/10 11:32 UTC

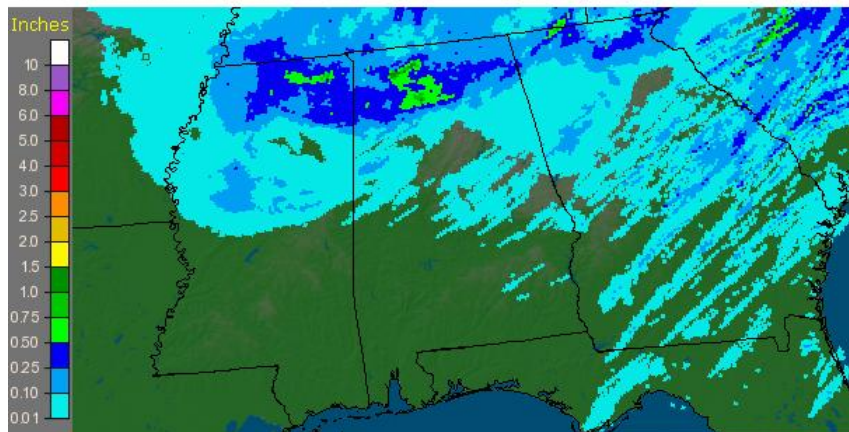


Fig. 4: 24 Hour precipitation ending at 1200 UTC 01/17/10, 1200 UTC 01/18/10 over Alabama

## 4. Flight Summary

### C-130 Flight RF-06

The C-130 flight was abbreviated because of a mechanical problem. The aircraft started engines at Peoria at 2113 UTC, departing and flying southeastward to the southwest tip of Indiana. The aircraft then proceeded southward to over Moulton, AL at 21000 ft altitude. At that time, the malfunction was detected and the aircraft turned and returned direct to Peoria. A small sample of the storm's northern periphery was the only data collected.

#### C-130 Flight RF-06 Flight track

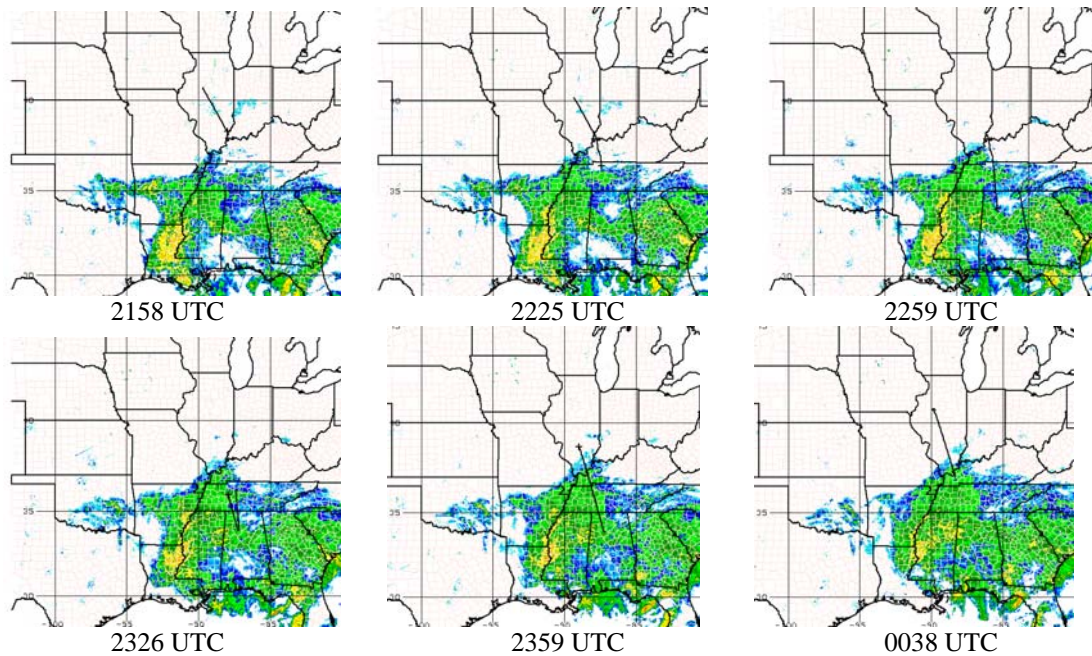


Figure 5: C-130 flight track overlaid on radar composites from 2158 UTC 16 Jan 10 through 0038 UTC 17 Jan 10. Times shown are the times of the radar composites. The flight track for the period just before the composite is shown.



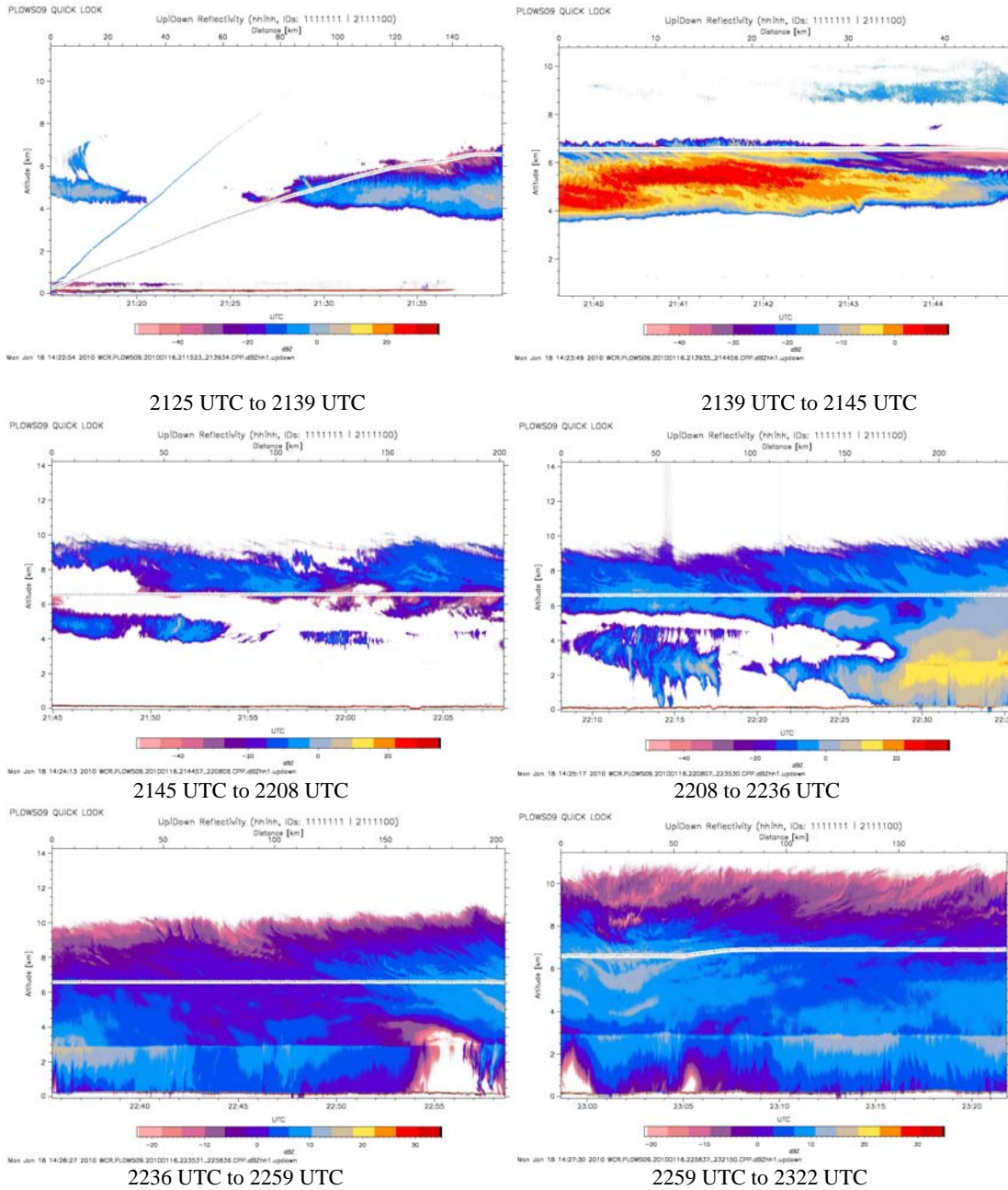


Fig. 6: Wyoming Cloud Radar Quicklook of radar reflectivity between 2125 UTC 16 Jan 10 and 2322 UTC 16 Jan 10.

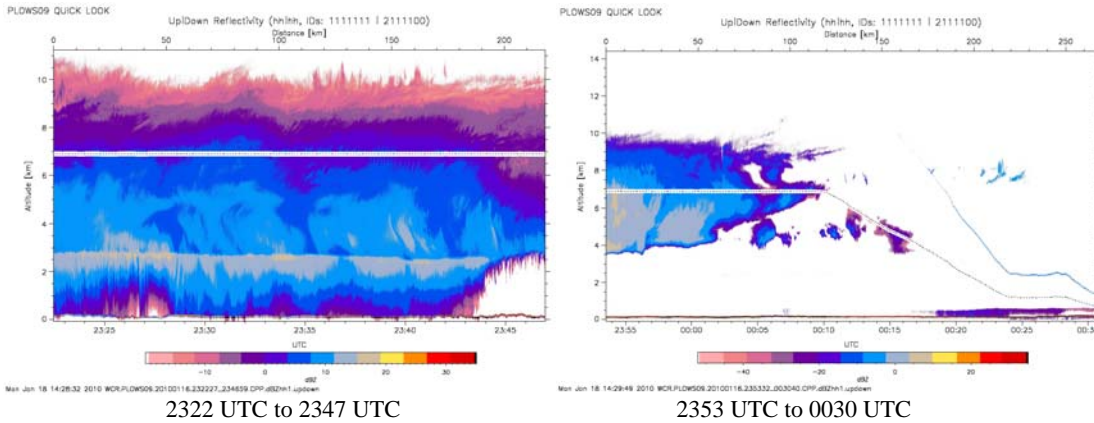


Fig. 7: Wyoming Cloud Radar Quicklook of radar reflectivity between 2322 UTC 16 Jan 10 and 0030 UTC 16 Jan 10.

## 5. MIPS operations

The MIPS operated from the parking lot of a Kidney Dialysis Center located across the street from the Days Inn Hotel in Moulton, AL. Rain fell at the site during the event with a high melting level observed by the MIPS. Narrow cellular features were common in the SNR field.



Fig. 8: MIPS van deployed during IOP-13

## 6. MAX operations

The MAX operated on a defunct airport taxiway just west of Courtland, Alabama for approximately 21 hours, the full duration of the storm. Radar data were not transmitted in real time so no quicklook plots are available.



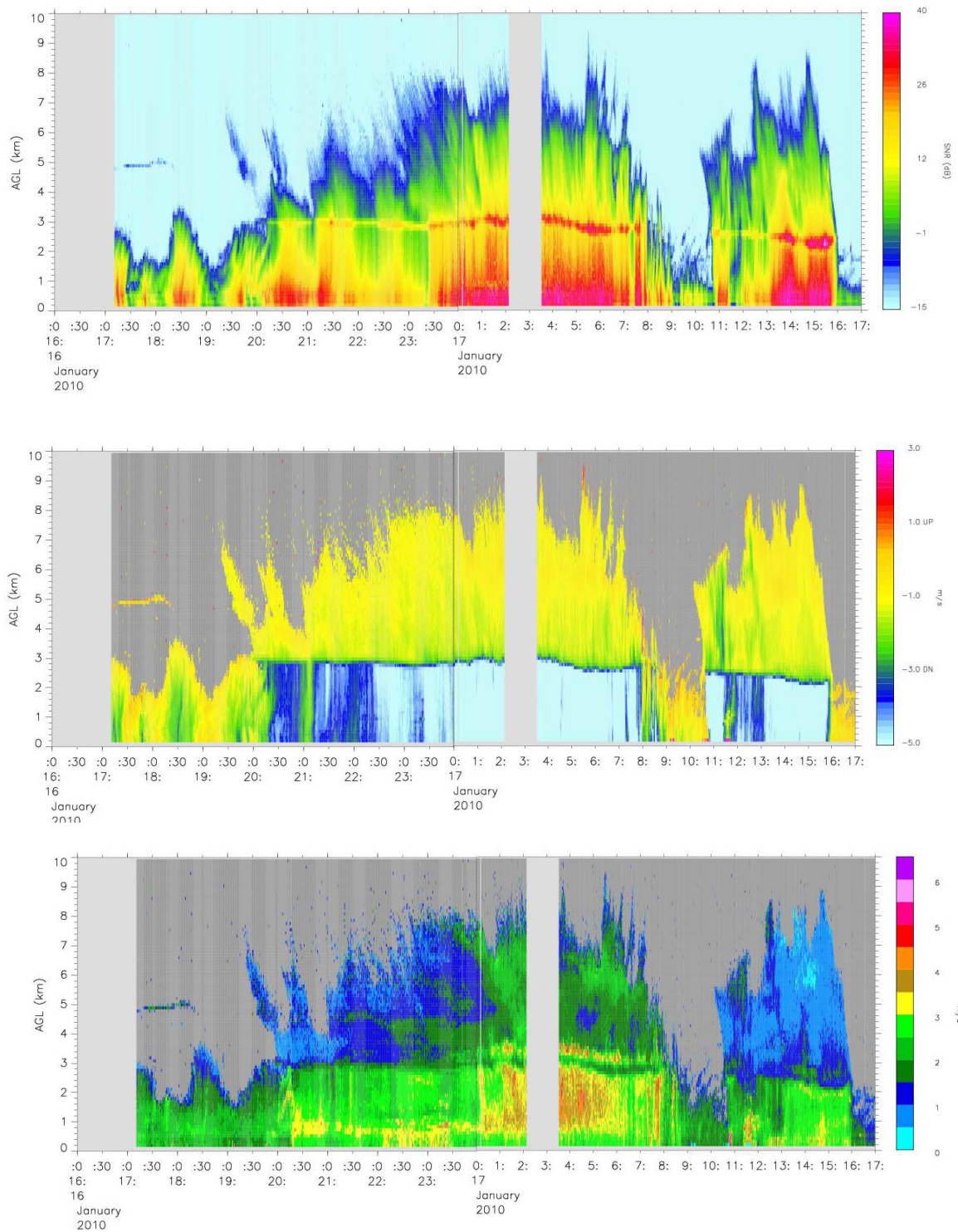


Figure 13: MIPS 915 MHz Profiler SNR (top), Radial Velocity (center) and Spectral Width (bottom) for the period 1700 UTC 16 Jan 10-1700 UTC 17 Jan 10.

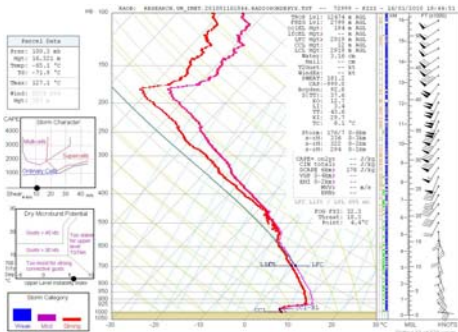
## 7. MISS 915 MHz Profiler

The MISS was not used on this deployment.

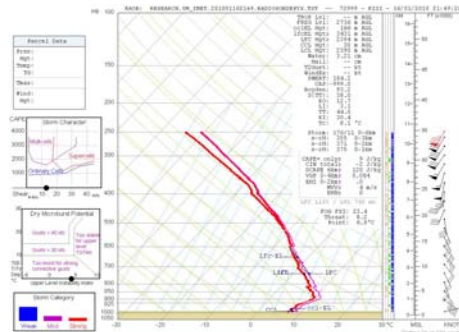
## 8. Rawinsondes

Rawinsondes were launched at the MIPS site at Moulton, AL, by the University of Missouri on a 3-hourly schedule. The following soundings were obtained

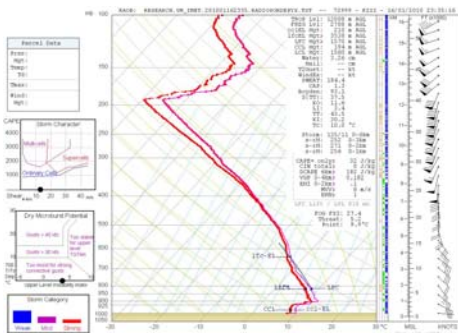
| DATE       | Launch   | Nominal Date and time | Status                    |
|------------|----------|-----------------------|---------------------------|
| 2010 01 16 | 1844 UTC | 2010 01 16 1900 UTC   | Good                      |
| 2010 01 16 | 2149 UTC | 2010 01 16 2200 UTC   | Good                      |
| 2010 01 16 | 2335 UTC | 2010 01 17 0000 UTC   | Good                      |
| 2010 01 17 | 0231 UTC | 2010 01 17 0300 UTC   | Terminated early (~675mb) |
| 2010 01 17 | 0349 UTC | 2010 01 17 0400 UTC   | Good                      |
| 2010 01 17 | 0547 UTC | 2010 01 17 0600 UTC   | Good                      |
| 2010 01 17 | 0842 UTC | 2010 01 17 0900 UTC   | Good                      |



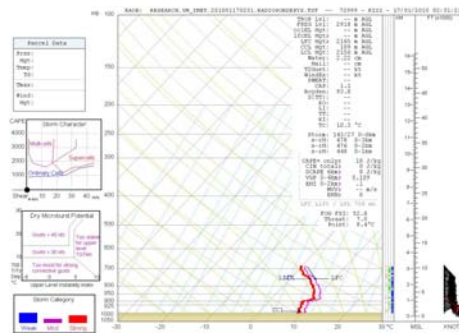
UM sounding 1900 UTC 16 Jan 2010



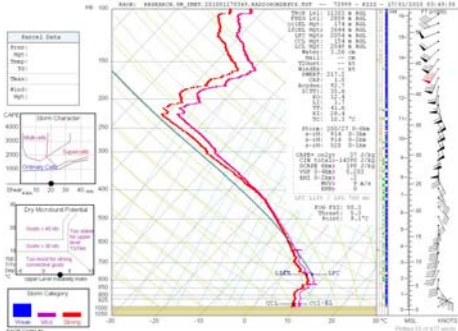
UM sounding 2200 UTC 16 Jan 2010



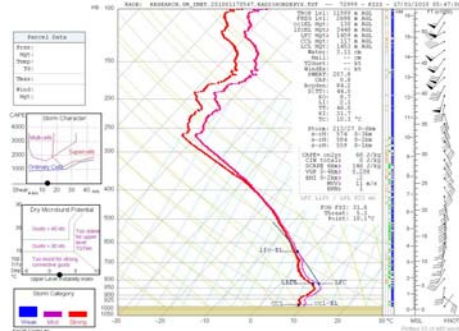
UM sounding 0000 UTC 17 Jan 2010



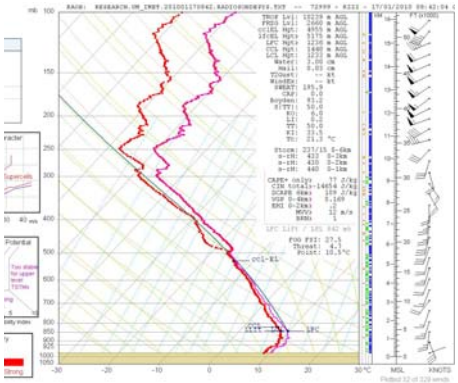
UM sounding 0300 UTC 17 Jan 2010



UM sounding 0400 UTC 17 Jan 2010



UM sounding 0600 UTC 17 Jan 2010



UM sounding 0900 UTC 17 Jan 2010