

Mission Summary Report

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Mission Number: IOP 10

Start of Mission: 7 November 2013 2000 UTC

End of Mission: 8 November 2013 0200 UTC

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Summary:

1. Scientific Background

This mission occurred during a moderately vigorous afternoon convective pattern. A light southerly synoptic background flow allowed moderately deep convection to develop over the interior and north shore of Oahu. While no thunder was reported on Oahu this day, several team members did note possible rotation near cloud base to the northeast of the site during the mission. Figure 2 shows the radar presentation of this rotation. It is not uncommon for funnel clouds to form at the base of vigorous deep convection on days with light winds and strong sea breeze convergence over central Oahu.

2. General Description of Mission

Radar was deployed in a dirt parking lot off of Kaukonahua Road in Wahiawa. The site is just east of Schofield Barracks at 21°30.8306N 158°3.8164W. Considerable ground clutter return was noted in the lowest elevation angles to the southwest through northwest of the site due to the proximity of the Waianae range, and also farther to the east through southeast of the site from the nearby Koolau range.

3. Report on the Scanning Strategy

The initial radar configuration was a medium range scan meant for monitoring development over the central valley of Oahu. We used 400 ns pulse, 2500 Hz PRF, a 4:5 stagger, with 60 m range gates. Many low-elevation sweeps were utilized to monitor cumulus development, with the surveillance scan including 0.5, 0.75, 1, 1.25, 1.5, 2, 2.5, 5, 10, 15, and 20 degree slices. No RHIs were done at the start of the mission.

Shortly after arrival, we switched to utilizing the high resolution short range scan. We hoped it would allow us to study the building cumulus, as well as the possible development of funnel clouds. Our configuration was a 200 ns pulse with 5000 PRF, a 4:5 stagger, and 30 m range gates. This would allow us to see across the central valley with a high level of detail. However, at 2113 UTC, a problem with the transmitter (particularly with the low frequency scan, which kept dropping out), forced us to utilize a new configuration. We switched to 400 ns pulse with 2500 PRF, 4:5 stagger, 30 meter range gates (and a range of 45 km). At 2146 UTC, we removed the 20 degree slice and added two additional lower elevation slices at 3.5 and 7.5

degrees. Finally, at 2241 UTC, we adjusted the scan strategy to 0.5, 1, 2, 3, 4, 5, 10, and 15 degrees.

At 2249 UTC we began doing RHI scans on cells of interest. Since these cells were vigorous, but rather short lived, the RHI scans were frequently adjusted throughout the course of the rest of the mission.

4. Report on the Radiosonde System

Since there was the expectation of active afternoon convection, a pre-convective radiosonde release was attempted. The radiosonde was successfully released at the site at 2034 UTC. However, there appeared to be problems with the data below about 950 meters before the data quality appears to improve. Unfortunately, the radiosonde data stopped at a height of 6.6 km. The sounding for this mission is shown in Figure 1, below.

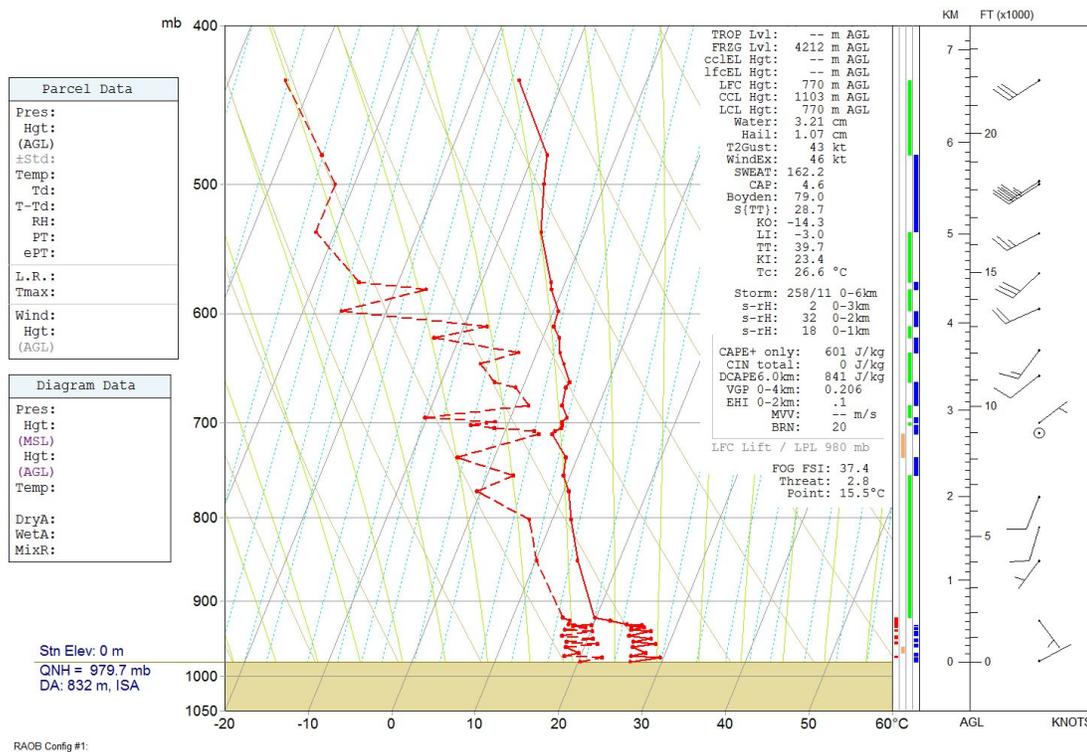


Figure 1. The Skew T, log P diagram for 2000 UTC 7 November 2013 from the Wahiawa, Oahu area.

5. Radar figure

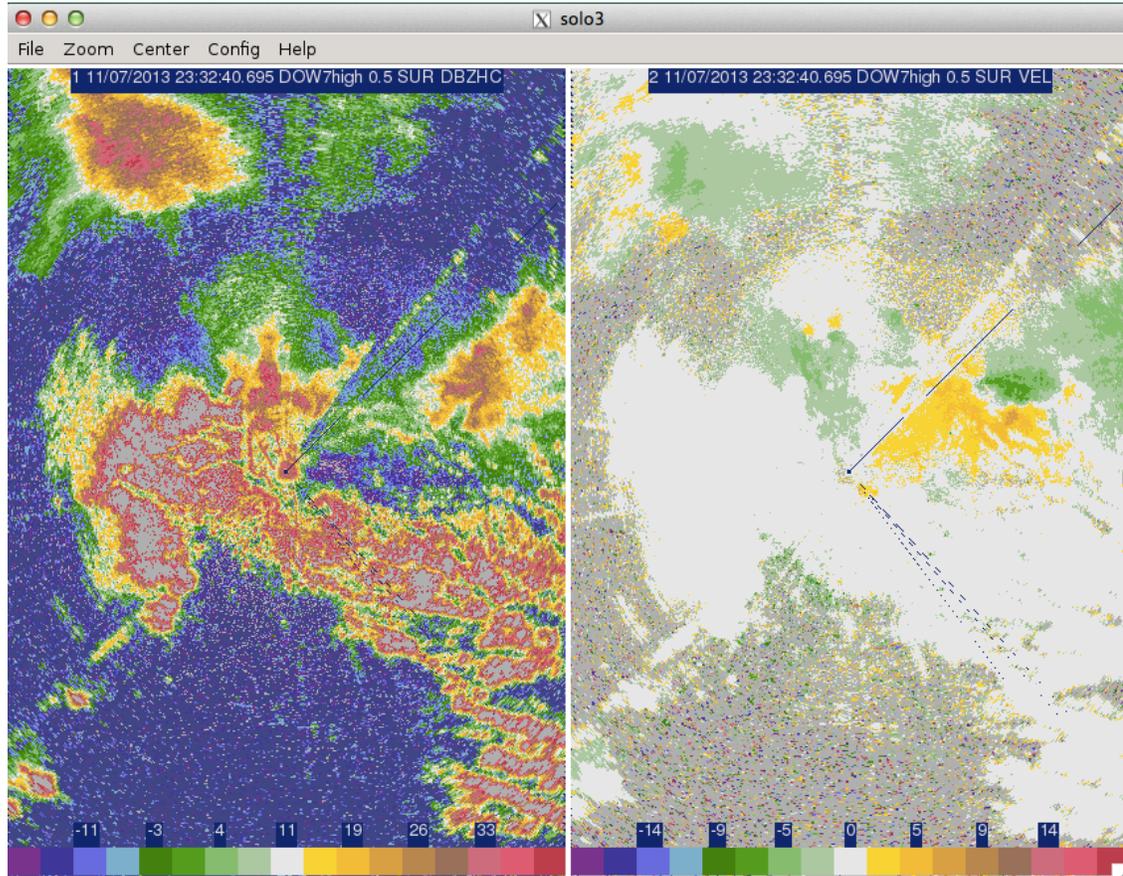


Figure 2. Left panel is radar reflectivity (dBz), the maximum of reflectivity in the cell is about 40 dBz. Right panel is radial velocity (m/s). It shows weak rotation associated with the cell.