Mission report summary

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Mission number: 11
Start of Mission: 08, Nov, 2013. 1527 UTC
End of Mission: 08, Nov, 2013. 2116 UTC

Summary:
1. Scientific background
   A shallow trough aloft and to the east of Hawaii island chain along with low-level moisture transported through the tradewind inversion layer created some instability in the 12Z Lihue sounding. Synoptically the potential for convection was favorable but the level of free convection was near 800 m above ground due to some dry air being advected near the surface. It was expected during the course of the morning this convective inhibition would give way or the tradewinds would be strong enough to produce some orographic enhanced convection on the windward side.

2. General description of the mission
   The radar site was located at the Kualoa ranch in Waimea, and the GPS coordinates were 21°31.1548N, 157°50.2095W. The truck parked on horse pasture which provided an open area. The truck faced to the north into the mountain range ahead of us. Mountain ranges blocked the beams towards northeast, but the radar had a nice view to the south and east. Upon arrival and generally throughout the day cloud development was observed over the Koolaus with a few quick showers over Kaneohe. Clouds also developed off-shore.

3. Scanning strategy
   In the beginning, elevation of 0.5, 1, 2, 3, 5, 10, 15, 20, 25, 30° were chosen in PPI mode with scanning azimuth rate of 30°. We chose a PRF of 2500s⁻¹ to explore activity in a longer range. The PRF was changed to 5000s⁻¹ for shorter range scan to observe some small cumulus cloud near the coast. Since the wind was calm and the synoptic background is quite weak, only some topographic cloud over mountain top, and small cumulus cloud near coast formed and drifted very slowly. Due to mountain blocking, topographic lifting cloud couldn’t be observed well by radar. RHI scans were done to see the clouds which formed in close distance from the radar.

4. Radiosounding system
   The antenna was settled to the west of the truck and the balloon was launched around 8 am HST (1800 UTC). Skies during the launch were clear enough to see the balloon rise to nearly 500 mb. The signal was received through the tropopause. Returned skew-T sounding indicated cold, dry temperatures aloft, around 600 mb, associated with the upper level low, corresponding well with the Lihue sounding.