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ANOTHER EXAMPLE OF A DRY MICROBURST

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Introduction

This Technical Attachment (TA) continues a series on predicting microburst winds in the Intermountain Region. Western Region TA 97-21 introduced some basic concepts regarding dry microburst precursors: extremely low reflectivity values; descending reflectivity core; and radial convergence near or above cloud base. The microburst described in this TA formed near South Jordan, UT and exhibited all of the above features.

Also discussed in TA 97-21 was that forecasters should be on the alert for environmental conditions that are favorable for dry microbursts. Typically, the forecaster is looking for "blobs of red" that result from moderate-to-large potential instability and precipitable water. However, in this case (as well as in TA97-21), peak reflectivities were below minimum cell identification algorithm thresholds used in the WSR-88D. Forecasters need to be proactive in anticipating dry microburst conditions.

South Jordan Microburst Analysis

The lead author watched the event from a hill top for about 20 minutes as a semi-circular band of dust expanded while it moved eastward. The microburst is believed to have begun near 2245 UTC. At 2310 UTC, an anemometer measured a peak wind of 56 mph. A virga shaft accompanied the microburst. The sounding, confirmed by observations, indicated that cloud base was ~8500 ft AGL. Recall from TA97-21 that upper radar tilts must be examined to assess precursors near or above cloud base.

A series of reflectivity and velocity vertical cross sections from three consecutive volume scans is shown in Fig. 1. At 2232 UTC (left-most images), a small core was aloft with a maximum reflectivity of 34 dBZ. Even though this is above the 30 dBZ threshold for identification by the WSR-88D storm cell identification and tracking (SCIT) algorithm, a cell was never detected due to the small size of the area greater than 30 dBZ. The velocity cross section shows very weak convergence (~ 11 kt over 3 nm) just below the core but above cloud base (~6000 ft ARL). Six minutes (2238 UTC; middle images), the core had descended about 6000 ft and moderate convergence (22 kt velocity difference over 3 nm) had developed. Finally, at 2243 UTC (right-most images), near the time of the onset of the surface outflow, the core had descended at least another 5000 ft and the convergence peaked at 23 kt over 3 nm. Note that the reflectivity in the core increased as it dropped pass the melting level (~ 6000-7000 ft ARL). A weak gust front can be seen in the 0.5 deg reflectivity and velocity fields at 2301 UTC (Fig. 2). The storm rapidly dissipated thereafter.

Conclusions

The microburst in this TA conformed to the classic model of a dry microburst. It had a descending reflectivity core and convergence near cloud base. The convergence was moderate and short lived as was the surface outflow. Peak storm reflectivities never exceeded storm cell identification thresholds. <u>Forecasters need to be proactive in anticipating dry microburst conditions</u>. <u>Then, given dry conditions, forecasters must examine the structure and evolution of weaker "non-traditional" storms.</u>

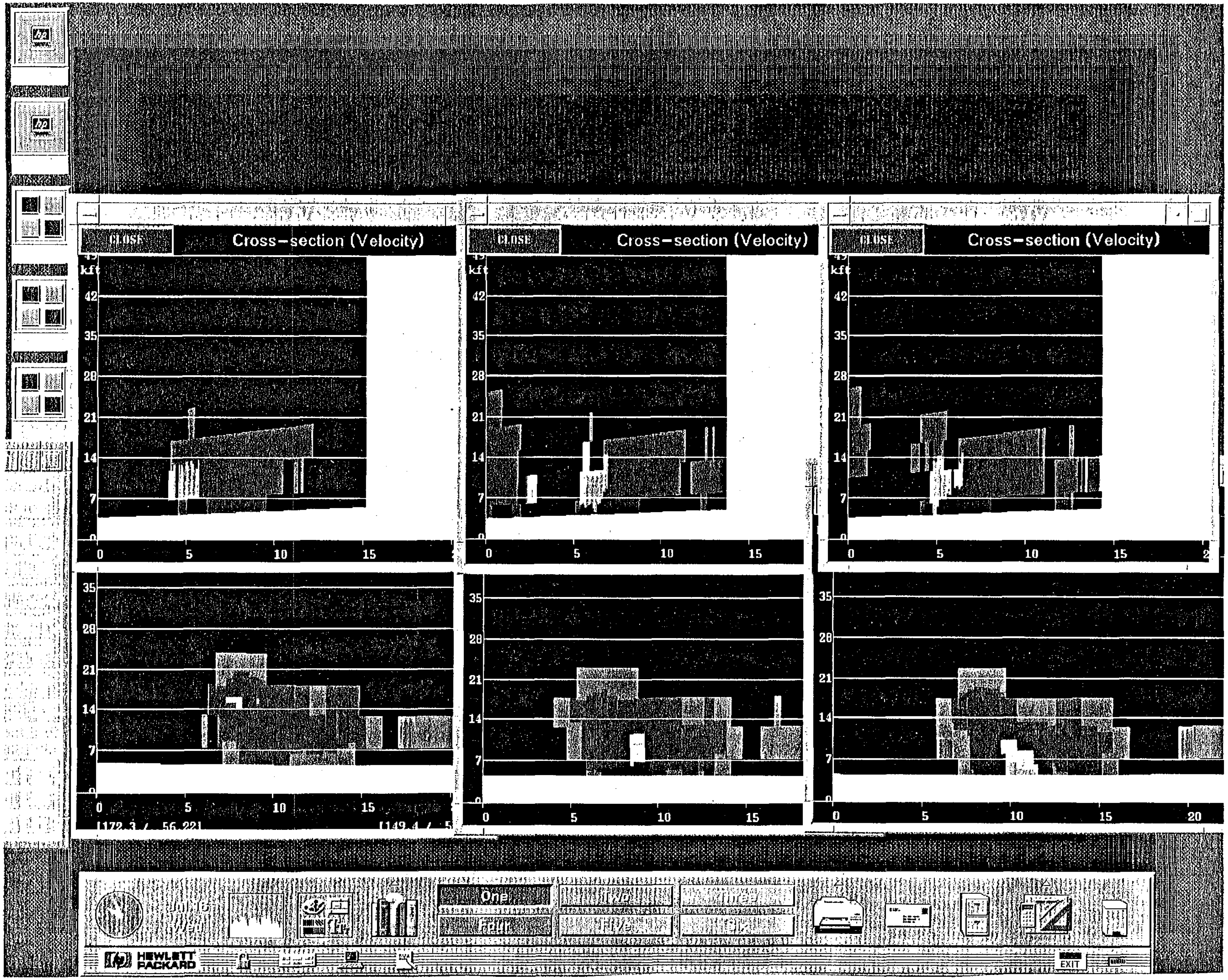

Figure 1. Series of reflectivity and velocity vertical cross sections at consecutive volume scans. The orientation of the reflectivity cross sections is along the path of motion. The velocity cross section is radially-oriented.

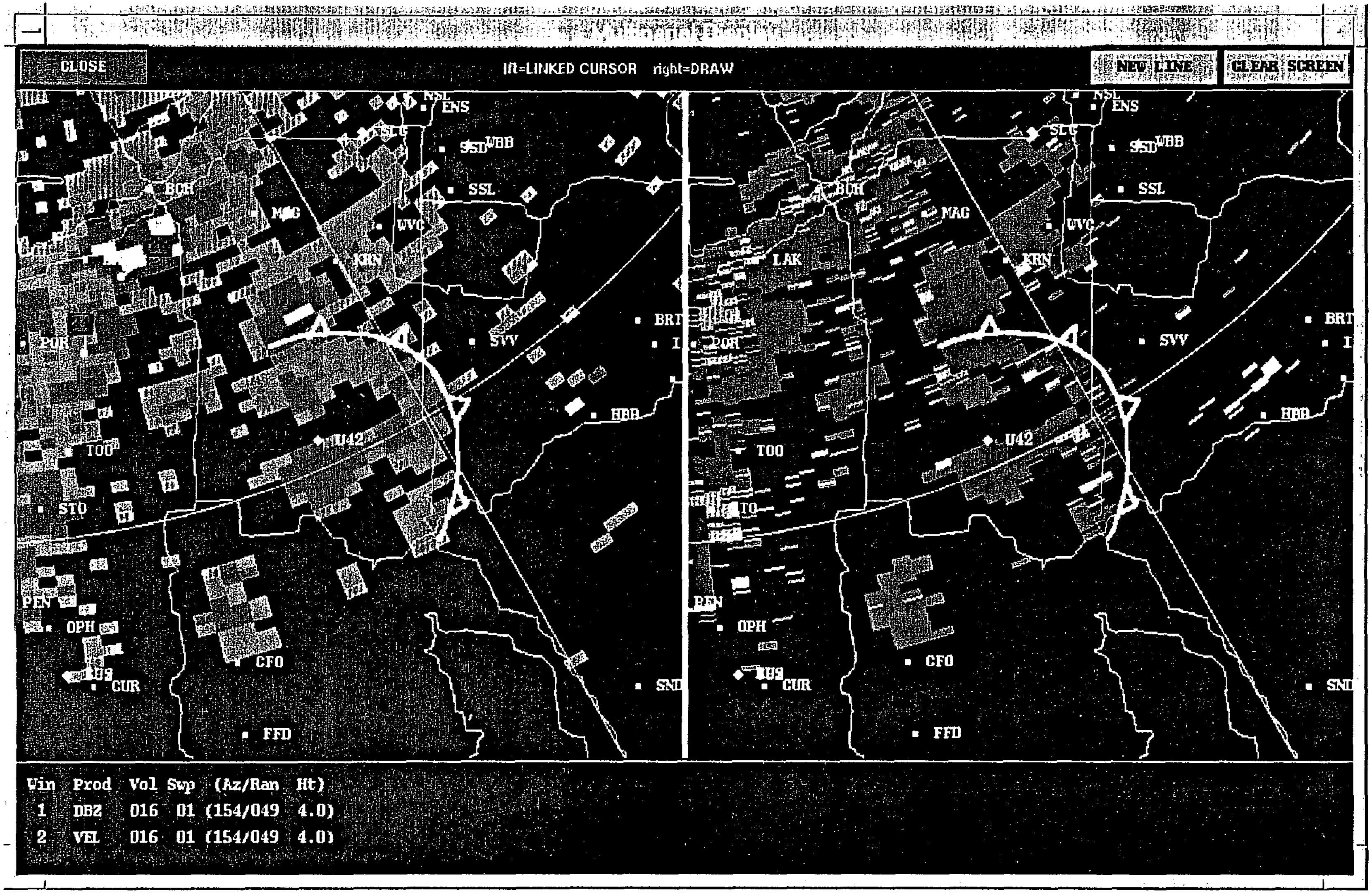

Figure 2. 0.5 deg reflectivity and radial velocity at 2301 UTC.