N87-25288

UNITED AIRLINES WIND SHEAR INCIDENT

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The NCAR Doppler was operating yesterday afternoon for another experiment and is located about 20 km straight north of Runway 35. It was doing 360° scans throughout the area and identified at 1330 a divergent outflow, or microburst, that passed just south of the VORTAC located approximately off the left side of Runway 35 left. The divergent center passed just on the west side of the runway. It moved very slowly and pulsed. It was very strong at 1330, decreased in intensity to about 1343, then increased rapidly in intensity at 1347, then at 1353 was no longer apparent. There was a small-scale microburst, essentially, with a single Doppler radar showing flow to the south and to the north.

The NCAR Doppler radar confirmed that there was a microburst center of divergence. The maximum reflectivity observed was 25 dbZ. It was a classical, high-based, non-thunderstorm virga case. Virga was observed throughout the area. The King-Air from NCAR was in flight at the time, doing soundings about 25 km north of the airport at the time of this incident. Therefore, we have a thermodynamic sounding and wind sounding at the time of the incident.

This is a relatively weak microburst case, however, and is near the bottom threshold of events that we looked at in JAWS; however, there are some difficulties with the information. It is considered a non-exciting borderline case. The radar was looking straight down the runway, so we have the head wind/tail wind component that is pertinent to the runway. The radar has been sited--not for Stapleton, but for another experiment located at the BAO tower north of Denver--and there is a blocking hill. So, the lowest elevation angle we have is 7/10 of a degree. Therefore, the winds that we see, and what we are reporting here, are no lower than 500 meters above the ground, so that the lowest flow is not seen by the Doppler. That is one reason it may be stronger than what we saw on the radar at the time.

A couple of things are important here. (1) There was a very strong convergence aloft at about 20,000 feet. There are some aloft signatures that were quite apparent in the case. (2) Another Fernando Caracena, who is working with us on JAWS very closely, does a daily microburst forecast. Yesterday morning, he predicted a high probability of microburst in Denver based on the 12Z sounding yesterday morning. It was a classical microburst case in terms of sounding, which means that three conditions were present: (a) there was mid-level moisture around 500 millibars; (b) there was a dry adiabatic lapse rate below the cloud base, below this mid-level moisture; and (c) it was very dry, as indicated by the temperature dewpoint difference. So, it met all the classical cases that we are developing as microburst forecast tools when conditions are ripe for microbursts. Extensive virga were reported in the area at the time this occurred. We know nothing about the LLWSAS at this time.