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The Vertical Vorticity Structure within a Squall Line Observed during BAMEX: Banded Vorticity Features and the Evolution of a Bowing Segment

Abstract

The two airborne doppler radars were used to observe the quasi-linear convective line during the Bow Echo and Mesoscale Convective Vortex Experiment (BAMEX). From the reflectivity and radial wind observation by radars, the staggered vertical vorticity band occurred in the parallel direction of the convective line. The Bow echo also occurred in the convective system, but its dynamic mechanism was seldom discussed from previous studies.

The counterrotating circulation patterns embedded within the system also can be observed by the radars, and they are the main factor to form the Bow echo in the convective system. These circulations can be formed by the horizontal vorticity (produced by the cold pool) tilted by the updraft in the leading edge of the convection, which also enhances the formation of rear inflow jet in the back of the convective line and influences the shape and the movement of the convective system.

Keywords

Cold pool

Bow Echo

Reference

Wakimoto, R. M., P. Stauffer, and W. Lee, 2015: The Vertical Vorticity Structure within a Squall Line Observed during BAMEX: Banded Vorticity Features and the Evolution of a Bowing Segment. *Mon. Wea. Rev.*, **143**, 341–362, <https://doi.org/10.1175/MWR-D-14-00246.1>.