Observing and analysing meso-scale vortices by weather radar

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Abstract

This paper presents a simple method for estimating the divergence and vorticity of the meso-scale vortices occurred in the Beijing-Tianjin-Hebei area based on the radial velocity data from a single Doppler weather radar. The results show that the formation of severe meso-scale weather systems is closely related to the turning or convergence/divergence in the wind field. The cyclonic vorticity should be an indicator for heavy rains, which is potentially a very powerful tool for the convection recognition.

Key words: Meso-scale vortex; Velocity image; vorticity